IMMIGRATION, WAGES, AND COMPOSITIONAL AMENITIES

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Abstract
There is strong public opposition to increased immigration throughout Europe. Given the modest economic impacts of immigration estimated in most studies, the depth of anti-immigrant sentiment is puzzling. Immigration, however, does not just affect wages and taxes. It also changes the composition of the local population, threatening the *compositional amenities* that natives derive from their neighborhoods, schools, and workplaces. In this paper we use a simple latent-factor model, combined with data for 21 countries from the 2002 European Social Survey (ESS), to measure the relative importance of economic and compositional concerns in driving opinions about immigration policy. The ESS included a unique battery of questions on the labor market and social impacts of immigration, as well as on the desirability of increasing or reducing immigrant inflows. We find that compositional concerns are 2–5 times more important in explaining variation in individual attitudes toward immigration policy than concerns over wages and taxes. Likewise, most of the difference in opinion between more- and less-educated respondents is attributable to heightened compositional concerns among people with lower education. (JEL: F22, J01, I31)

1. Introduction

Immigration routinely appears near the top of public policy concerns in Europe. In the 2006 Eurobarometer poll, for instance, migration ranked fourth among a list of 14 issues in the EU, after unemployment, crime and the economic situation (Eurobarometer 66 2006). Fierce opposition to immigration is also a defining issue for far-right political parties throughout the EU (for example, van der Brug, Fennema, and Tillie 2000). The depth of public concern over immigration is somewhat puzzling, given that most studies find only small economic impacts on the native population (for example, Ottaviano

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and Peri forthcoming; Manacorda, Manning, and Wadsworth forthcoming).[1] Concerns over immigration also weigh more heavily than those over international trade, despite the similar impacts of the two policies on relative factor prices (Mundell 1957).[2]

A distinctive feature of immigration is that it changes the composition of the receiving country's population, imposing potential externalities on the existing population. Several previous studies have focused on the *fiscal* spillovers created by redistributive taxes and benefits (for example, MaCurdy, Nechyba, and Bhattacharya 1998; Borjas 1999; Hanson, Scheve, and Slaughter 2007). A broader class of externalities arises through the fact that people value the 'compositional amenities' associated with the characteristics of their neighbors and co-workers. Such preferences are central to economic models of discrimination (Becker 1957) and neighborhood choice (for example, Bayer, Ferreira, and McMillan 2007) and arguably play an important role in mediating opinions on immigration.

This paper presents a new method for quantifying the relative importance of compositional concerns in shaping individual attitudes toward immigration. Our approach uses the information in a series of questions included in the 2002 European Social Survey (ESS) that elicited views on the effects of immigration on specific domains—including relative wages, fiscal balances, and social tensions—as well as on the importance of shared religious beliefs, language, traditions, and customs. We use a latent-factor approach to combine these questions into two summary factors: one that represents concerns over wages, taxes, and benefits, and another that represents concerns over compositional amenities. We then relate opinions on immigration policy, and views about the effects of immigration on the economy and the quality of life, to these latent factors. Our method provides a simple way to measure the relative importance of the two channels, and allows us to decompose differences in opinions between demographic groups (e.g., more- and less-educated worker) into differences in the two types of concerns.

Previous studies, including Scheve and Slaughter (2001), Gang, Rivera-Batiz, and Yun (2002), Fertig and Schmidt (2002), O'Rourke and Sinnott (2003), Mayda (2006), and Facchini and Mayda (2008, 2009) have analyzed the determinants of individual preferences over immigration policy. Some of these studies focus exclusively on economic concerns (for example, Scheve and Slaughter 2001) while others—notably Mayda (2006) and Facchini and Mayda (2009)—allow for the influence of both economic and non-economic factors in shaping attitudes toward immigrants. For the UK, Dustmann and Preston (2007) explicitly model the influence of racially-driven concerns in forming views about immigration. The contribution of this paper is to use the information in the ESS on views about the economic and social impacts of

1. There is still some controversy over the wage impacts of immigration, with larger impacts emphasized by Borjas (2003) and Borjas and Katz (2007), and smaller impacts emphasized by Card (1990, 2001), Altonji and Card (1991), Butcher and Card (1991), Friedberg (2001), Dustmann, Fabbri, and Preston (2005), and Dustmann, Frattini, and Preston (2008).

2. For example, a recent international opinion poll conducted by the Pew Foundation (Pew Global Attitudes Project 2007) found uniformly more positive views for free trade than for immigration. Mayda (2008) documents the same divergence using data from the International Social Survey Program.

immigration, and about the importance of cultural, linguistic, and ethnic homogeneity, to separately identify the two main types of concerns, and to systematically evaluate the robustness of this identification strategy.

Our empirical analysis reveals that views about *immigration policy*—reflected in answers to the question of whether more or less immigrants should be permitted to enter the country—are driven by a combination of concerns over the conventional economic effects of immigration (on wages and taxes) and concerns over compositional amenities. We find that compositional concerns are substantially more important, explaining 2–5 *times* as much of the variation in answers to the question of whether more or fewer immigrants should be permitted to enter than concerns over wages and taxes.[3] They also account for a much larger share of the gap in attitudes between more- and less-educated respondents, and between younger and older people. Compositional concerns are even more important in understanding differences in attitudes toward immigrants from poorer countries, and toward those of a different ethnicity.

In contrast, we also find that differences in views about whether immigration is *good or bad for the economy* are mainly driven by concerns over the economic impacts of immigration. This finding provides support for our approach for separating economic and compositional concerns, and implies that the higher weight given to compositional concerns in forming opinions about immigration policy is not simply a measurement problem or a consequence of our identification assumptions.

The next section of the paper gives a brief overview of the ESS and the patterns of responses to the key questions about immigration in the survey. Section 3 describes our statistical methodology for evaluating the relative importance of economic versus compositional concerns in shaping attitudes toward immigration. Section 4 presents our main empirical findings, while Section 5 presents a series of extensions and robustness checks. We conclude in Section 6.

2. Data Sources and Descriptive Statistics

2.1. The 2002 ESS Survey

We use data from the European Social Survey (ESS), an annual cross-country survey covering 21 European countries, with 1,500–3,000 respondents per country.[4] In collaboration with the ESS survey design team we developed a special immigration module for the 2002 survey. The purpose of the module was to gather respondents' opinions about how immigration affects various outcomes in their country, *and* their views on immigration policy, in order to better understand the channels that mediate pro- or anti-immigrant sentiment. We developed a series of questions that attempt to

3. A similar conclusion is reached by Citrin et al. (1997) using data for the United States and by Dustmann and Preston (2007) using data for the UK.

4. Israel also participated in the 2002 ESS, but is excluded from our analysis. Detailed information on the 2002 ESS design and implementation is available at http://ess.nsd.uib.no/index.jsp?year=2003&country=&module=documentation.

distinguish between the perceived impacts of immigration on economic conditions (wages, taxes, unemployment) and on cultural life and social cohesion that we use as indicators of economic and compositional concerns.

Some descriptive statistics for the 2002 ESS survey are presented in Table A.1, which shows sample sizes and demographic characteristics of respondents in each country. The combined sample for all 21 countries includes about 40,000 adult respondents. Overall, 90% of ESS respondents are natives, while 10% are immigrants and 3% are members of ethnic minority groups. Across countries, immigrant shares are relatively low in Finland, Hungary, and Poland and relatively high in Luxemburg and Switzerland. On average about one-half of ESS respondents were employed at the time of the survey; another 20% were retired. Forty percent of respondents have only lower secondary schooling while 40% have completed upper secondary schooling and 20% have some tertiary education. Consistent with other data sources (e.g., OECD 2010), the fraction of less-educated respondents (i.e., with lower secondary education or less) is relatively high in Portugal, Spain, Greece, and Italy, and relatively low in Norway and Germany.

2.2. Respondent Attitudes to Immigration

An immediate problem for a multi-national survey like the ESS is the definition of *immigrants*. In Standard English *immigrants* are people who were born outside their country of residence. In countries with citizenship based on blood ancestry, however, a translation of *immigrants* can include people who were born in the country but are not citizens (e.g., children of Turkish nationals born in Germany).[5] To eliminate ambiguity all the questions in the ESS module refer to *people who come to live in a country*, rather than to *immigrants*. Nevertheless, for readability we use the term *immigrants* as shorthand for people who come to live in a country.

Our analysis distinguishes between three dimensions of respondent opinions about immigration. As in most existing studies our primary focus is on opinions about *Immigration Policy*, as revealed in answers to the question:

IP: *To what extent do you think [this country] should allow people to come and live here?*

Recognizing that people may have differing views about immigrants from different source countries, the ESS module asked the policy question (**IP**) with respect to immigrants from four broad source groups: rich European countries; poor European countries; rich non-European countries; and poor non-European countries. In addition, there were separate questions about admitting people with the same and different ethnicity as the majority population. We consider responses to each of these six questions, as well as an unweighted average of the (rescaled) ordinal responses to the first four.

5. Likewise, people who were born abroad but of the right ancestry may not be classified as immigrants, as is the case for ethnic Germans born in Eastern Europe who moved to Germany after 1990.

We also consider opinions on whether immigration is good for the economy and whether it makes the country a better place to live. Specifically, we study responses to two *Summary Assessment* questions:

SA1: *Would you say it is generally bad or good for [this country's] economy that people come to live here from other countries?*

SA2: *Is [this country] made a worse or a better place to live by people coming to live here from other countries?*

Panel A of Table 1 summarizes the responses to the immigration policy question **IP** for different source groups.[6] Opinions were elicited on a four-point scale ("allow many to come here", "allow some", "allow a few", "allow none"). We show the complete distribution, as well as the mean response (assigning "none" = 1 and "many" = 4) and the standard deviation. There is wide diversity of opinion on immigration policy, with 40%–45% of respondents preferring to admit none or only a few immigrants, and 55%–60% preferring to admit some or many. Respondents are slightly more supportive of immigrants from rich European countries than from poor non-European countries, and of immigrants who share the same ethnicity as the majority in their country.

Panel B of Table 1 shows the distributions of responses to the summary assessment questions **SA1** and **SA2.** These responses were elicited on an eleven-point scale (scored 0 to 10).[7] For simplicity we group the data into five intervals: 0–1 (relatively strong negative opinion); 2–4 (somewhat negative); 5 (the midpoint response); 6–8 (somewhat positive) and 9–10 (relatively strong positive). As with the policy questions there is a wide range of opinion on the summary questions, though respondents tend to have more positive views about the economic effects of immigration than on the question of whether immigrants make the country a better place to live. For example, 38% rate the economic effect of immigration with a score of 6 or higher (on a 0–10 point scale), whereas only 28% rate the effect on the quality of life in the same positive range. The difference suggests that many respondents associate immigration with negative consequences that partially offset the economic benefits of population inflows.

In the remainder of the paper we work with re-scaled versions of the ordinal responses to the immigration policy and overall assessment questions. Specifically, we transform the ordinal responses so that the most positive (pro-immigrant) response is 1 and the most negative (anti-immigrant) response is 0. Table 2 shows the correlation matrix of the re-scaled responses to the eight questions, plus the average response on the policy question for the four country groups. The main entries in the table are simple correlations, while the entries in italics are the correlations of residuals from regressions of the responses on country dummies and a set of observed covariates (gender, age, ethnicity, employment status, and city residence). Responses to the immigration

6. In Table A.1 and elsewhere in the paper we drop all missing or "don't know" responses.

7. That is, respondents were asked to fill in a number between 0 and 10 with 0 representing "bad for the economy" (or "worse place to live") and 10 representing "good for the economy" (or "better place to live").

TABLE 1. Distributions of opinions on immigration policy and the effects of immigration.

Panel A: Immigration policy – whether to allow many/some/few or none of different immigrant groups (Question **IP**)

	Mean[a]	Standard deviation	Percentage distribution of preferred number allowed to immigrate			
			None	Few	Some	Many
	(1)	(2)	(3)	(4)	(5)	(6)
People from rich European countries	2.72	0.85	9.9	32.6	43.3	14.2
People from poor European countries	2.57	0.81	9.0	36.8	42.8	11.4
People from rich non-European countries	2.53	0.84	11.3	36.2	41.1	11.4
People from poor non-European countries	2.49	0.82	10.8	39.0	40.1	10.0
People of the same race/ethnicity as the majority	2.73	0.80	6.3	30.8	47.1	15.8
People of a different race/ethnicity as the majority	2.48	0.82	11.3	38.9	40.0	9.7

Panel B: Overall assessments of the effect of immigration (Questions **SA1** and **SA2**)

	Mean[a]	Standard deviation	Percentage distribution of responses: 0–10 scale				
			0–1	2–4	5	6–8	9–10
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Immigration is good/bad for the economy (**SA1**)	4.97	2.36	9.3	25.0	28.1	32.0	5.5
Immigrants make the country a better/worse place (**SA2**)	4.77	2.18	8.3	28.1	34.6	24.8	4.3

Notes: Sample size ranges from 37,778 to 38,087 depending on question (missing values are excluded).
[a]Respondents select one of four possible responses, which are coded as none = 1, few = 2, some = 3, many = 4.
Notes: Sample sizes are 37,405 for **SA1** and 37,823 for **SA2**.
[a]Respondents select a score between 0 and 10, with most negative response = 0, most positive = 10.

TABLE 2. Simple correlations of standardized responses to views on immigration.

	Correlation with variable number							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1. Allow people from rich European countries to come	1.00							
2. Allow people from poor European countries to come	0.63 *0.59*	1.00						
3. Allow people from rich non-European countries to come	0.82 *0.8*	0.65 *0.61*	1.00					
4. Allow people from poor non-European countries to come	0.60 *0.55*	0.87 *0.84*	0.68 *0.64*	1.00				
5. Allow people of the same ethnicity to come	0.61 *0.58*	0.80 *0.77*	0.66 *0.62*	0.81 *0.78*	1.00			
6. Allow people of different ethnicity to come	0.64 *0.6*	0.72 *0.69*	0.62 *0.58*	0.69 0.65	0.73 *0.7*	1.00		
7. Immigration is good/bad for the economy	0.33 *0.29*	0.41 *0.37*	0.35 *0.31*	0.41 *0.37*	0.42 *0.38*	0.37 *0.33*	1.00	
8. Immigrants make the country a better/worse place to live	0.33 *0.26*	0.44 *0.37*	0.35 *0.29*	0.45 *0.36*	0.46 *0.39*	0.39 *0.32*	0.57 *0.53*	1.00

Note: Main entries are unweighted correlations of standardized responses to eight questions across all respondents in 2002 ESS. Entries in Italics are adjusted correlations, based on residuals from regressions on country dummies and observed covariates. Original 4-point or 11-point responses are linearly re-scaled to lie between 0 (most negative response) and 1 (most positive).

policy questions are highly correlated with each other ($\rho = 0.6$–0.8) while the correlations between these questions and the summary assessment questions are weaker ($\rho = 0.3$–0.4). Throughout the table the adjusted correlations are only slightly smaller in magnitude than the raw correlations, reflecting the fact that the R-squared coefficients from the first-step regressions are modest (<0.15).

Although our focus is on understanding the channels that mediate pro- and anti-immigrant sentiment *within* a given country, much existing research has addressed cross-country differences in attitudes toward immigration.[8] Table A.2 presents the means of the standardized responses to the questions described in Tables 1A and 1B for each of the 21 countries in our sample. The range of average opinions is wide: in the two countries with the most negative views about immigration (Greece and Hungary) the mean standardized response to the question on allowing more immigrants of a different ethnicity is 0.31,[9] whereas in Sweden—the country with the most positive view—the mean standardized response is 0.69. Opinions are also relatively negative in Portugal (mean response = 0.41) and Austria (0.44) and more positive in Switzerland (0.59) and Italy (0.57).

8. Recent contributions include Gang, Rivera-Batiz, and Yun (2002), Mayda (2006) and Davidov et al. (2009).

9. Note that the standardized response for this question assigns a value of 1 for "allow many", 0.66 for "allow some", 0.33 for "allow few", and 0 for "allow none. A mean value of 0.31 implies that the average response is somewhat less favorable than the second lowest category.

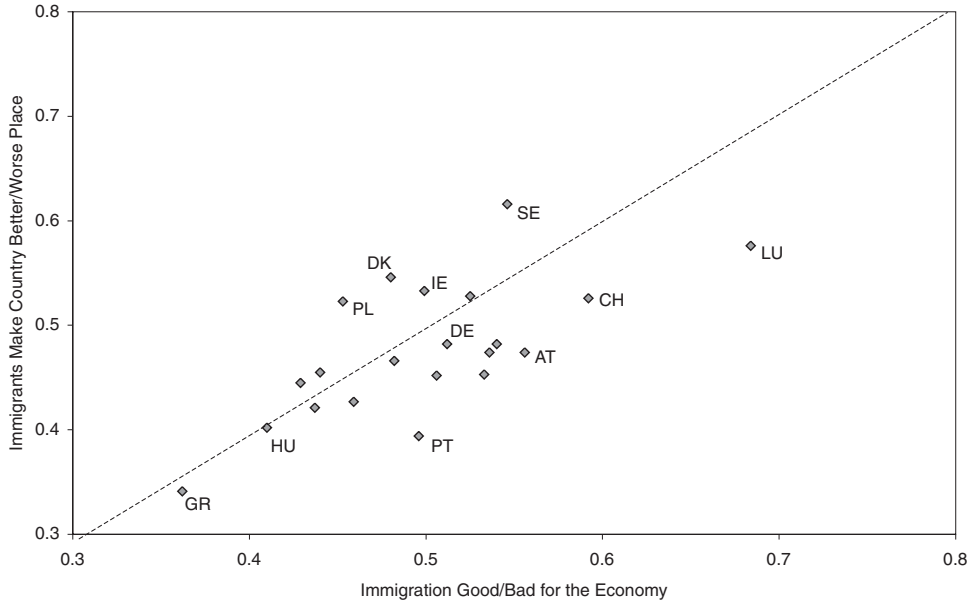

FIGURE 1. Cross-country correlation in two assessments of the effect of immigration.

Figure 1 illustrates the cross-country variation in average responses to the two summary assessment questions. Each point in the figure represents a country: the x-axis shows the mean response to question **SA1** (are immigrants good or bad for the economy) while the y-axis shows the mean response to question **SA2** (do immigrants make the country a better or worse place to live). The mean responses are strongly correlated ($\rho = 0.7$), though there are some notable departures from the 45 degree line. Sweden (SE) and Austria (AT) form an interesting contrast: residents of the two countries have similar (relatively positive) opinions about the *economic* effects of immigrants, but different views about their effect on quality of life. Interestingly, their views on the immigration policy questions are more closely aligned with the latter: Swedes have the most positive opinion on allowing more immigrants, whereas Austrians are among the most negative.

2.3. Indicators of Concerns about the Effects of Immigration

A unique feature of the 2002 ESS is the series of questions about the effects of immigration on wages, job opportunities, and taxes, on the one hand, and social, cultural, and linguistic cohesion on the other. As described in detail in the next section, we use these *indicator questions* to estimate the intensity of concerns about

the economic and compositional effects of immigration. We assume that respondents' economic concerns are reflected in their answers to five questions:[10]

IE1. *Do you agree or disagree that wages and salaries are brought down by immigration?*
IE2. *Do you agree or disagree that immigrants harm the economic prospects of the poor?*
IE3. *Do you agree or disagree that immigrants help to fill jobs where there are shortages of workers?*
IE4. *Would you say that immigrants generally take jobs away from natives or help create new jobs?*
IE5. *On balance do you think that immigrants take out more (in health benefits and welfare services) than they put in (in taxes)?*

Similarly, we assume that concerns about compositional effects are reflected in answers to five additional questions:

IC1. *Do you agree or disagree that it is better for a country if everyone shares the same customs and traditions?*
IC2. *Do you agree or disagree that it is better for a country if there is a variety of different religions?*
IC3. *Do you agree or disagree that it is better for a country if everyone can speak one common language?*
IC4. *Would you say that a country's cultural life is undermined or enriched by the presence of immigrants?*
IC5. *Do you agree or disagree that a country should stop immigration if it wants to reduce social tensions?*

Table 3 shows the mean values of the standardized responses to these ten questions (column (1)), and their correlations with our three main outcome variables: the average response to the four questions about allowing more or less people from different sending country groups (column (2)); the response to whether immigration is good or bad for the economy (column (3)); and the response to whether immigrants make the country a better or worse place to live (column (4)).[11]

The data in column (1) of Table 3 suggest that ESS respondents are mildly concerned about the economic effects of immigration. For example, the mean responses to the questions "Do you agree or disagree that wages are brought down

10. These questions elicit sociotropic concerns over the effects of immigration on wages and job opportunities in general, rather than opinions on individual-specific impacts. This choice was made by the ESS design team based on findings of Kinder and Kiewert (1981) and others that policy opinions are more closely aligned with sociotropic concerns than egotistical concerns. Whether this is because people care more about society-wide impacts than personal impacts is widely debated. Our view is that responses to sociotropic questions reflect a combination of perceived personal and social impacts. A similar view is expressed in Bobo and Kluegel (1993).

11. As with the questions on immigration policy and the overall effect of immigration, we standardize the responses to the indicator questions using a linear transformation of the original ordinal scale that sets the most negative (anti-immigrant) response to 0 and the most positive (pro-immigrant) response to 1.

TABLE 3. Responses to indicator questions and correlations with summary views on immigration.

		Correlation of indicator with opinion variables		
	Mean of standardized response[a] (1)	Allow many/none (**IP**, average of four country groups) (2)	Immigration good or bad for the economy (**SA1**) (3)	Immigrants make country better/worse place (**SA2**) (4)
Indicators of economic concerns				
IE1: Wages are brought down by immigrants (5 point agree/disagree; agree = 0)	0.49	0.33	0.34	0.34
IE2: Immigrants harm the prospects of the poor (5 point agree/disagree; agree = 0)	0.43	0.35	0.37	0.38
IE3: Immigrants fill jobs where there are shortages (5 point agree/disagree, disagree = 0)	0.63	0.17	0.26	0.19
IE4: Immigrants take away jobs/create jobs (11 point numerical scale, take away = 0)	0.45	0.36	0.52	0.47
IE4: Immigrants take out more/less than they put in (11 point numerical scale; take out more = 0)	0.42	0.32	0.52	0.45
Indicators of compositional amenity concerns				
IC1: It is better to have common customs/traditions (5 point agree/disagree; agree = 0)	0.41	0.33	0.31	0.35
IC2: It is better to have a variety of religions (5 point agree/disagree, disagree = 0)	0.51	0.25	0.25	0.29
IC3: It is better to have a common language (5 point agree/disagree; agree = 0)	0.17	0.10	0.08	0.12
IC4: Immigrants undermine/enrich cultural life (11 point numerical scale; undermine = 0)	0.58	0.42	0.56	0.61
IC5: Stop immigration to reduce social tensions (5 point agree/disagree; agree = 0)	0.47	0.46	0.43	0.45

TABLE 3. Continued.

	Mean of standardized response[a] (1)	Correlation of indicator with opinion variables: Allow many/none (**IP**, average of four country groups) (2)	Immigration good or bad for the economy (**SA1**) (3)	Immigrants make country better/worse place (**SA2**) (4)
Extra indicator of both concerns				
Crime: Immigrants make crime worse/better (11 point numerical scale; worse = 0)	0.31	0.31	0.38	0.47
Indicators of Altruistic Concerns:				
IA1: Immigration has good/bad effect on sending country (11 point numerical scale; bad effect = 0)	0.44	−0.02	0.05	0.03
IA2: Rich Rich countries have a responsibility to accept imms. (5 point agree/disagree, disagree = 0)	0.60	0.23	0.20	0.24
IA3: All countries benefit from free mobility (5 point agree/disagree; agree = 0)	0.68	0.14	0.14	0.12

Notes: Sample sizes range from 37,244 to 39,149. Entries in columns (2)–(4) are correlations of standardized indicator with standardized responses to views on immigration (also scaled between 0 and 1).
[a]Original 5-point or 11-point responses are linearly rescaled to lie between 0 (most negative response) and 1 (most positive).

by immigration?" and "Do you agree or disagree that immigrants harm the economic prospects of the poor?" are 0.49 and 0.43, respectively, using the scaling convention that "strongly agree" = 0 and "strongly disagree" = 1. There is more variability across the indicators of compositional concerns. For example, there is wide agreement over the value of a common language (mean = 0.17), whereas there is a more positive view of the effect of immigration on cultural life (mean = 0.58).

In the analysis that follows, we use these indicator questions to measure the importance of economic and compositional concerns in mediating individual attitudes about immigration. In one of our robustness checks we consider the extra information in responses to an eleventh indicator question: "Are crime problems made worse or better by people coming to live here?" As shown in Table 3, many ESS respondents agree that immigration raises crime: the standardized response is 0.31, with 40% of respondents in the lowest three categories (0–3 on a 0–10 scale).[12] Interestingly,

12. Immigrants are over-represented in the prison populations in many European countries—see Wacquant (1999). See Butcher and Piehl (2007) for an analysis in the US context.

opinions about the effect on crime are about as highly correlated with indicators of the economic impact of immigration (average correlation with the five indicators = 0.27) as with indicators of compositional concerns (average correlation = 0.27).

As shown in columns (2)–(4) of Table 3, responses to most of the indicator questions are reasonably highly correlated with views on immigration policy (column (2)), and with overall assessments of the effects of immigration (columns (3) and (4)). Among the economic indicators the weakest correlations are for the question on whether immigrants tend to fill vacant jobs **(IE3)**. Among the compositional indicators the weakest correlations are for the question about the value of a common language (**IC3**).[13] In our analysis in what follows we therefore consider models that ignore these two questions and rely on only four indicators for each concern. We also consider models that use only two of the clearest indicators of economic concerns (**IE1** and **IE4**) and two of the most direct indicators of compositional concerns (**IC1** and **IC4**).

3. Theoretical Framework and Estimation Methodology

3.1. Basic Framework

We turn now to a simple theoretical model of how individuals respond to questions about immigration policy, and a set of assumptions that allow us to identify the relative importance of economic versus compositional concerns. We assume that a given individual (indexed by i) evaluates alternative policy scenarios though an indirect utility function that depends on net income and on characteristics of his or her community:

$$u_i(w_i+b_i-t_i,a_i),$$

where w_i represents individual i's gross income, b_i and t_i represent transfer benefits and taxes, respectively, and a_i is a (multi-dimensional) summary of the characteristics of i's community, including such features as the ethnic composition and religious affiliation of i's neighborhood, and their mean income and poverty rate.

When asked to decide whether immigration should be increased (or to provide an overall assessment of the effect of immigration on quality of life), we assume that the individual compares a hypothetical scenario with more immigrants (w_i',b_i',t_i',a_i') to the current situation $(w_i^\circ,b_i^\circ,t_i^\circ,a_i^\circ)$ and reports a transformation of the difference in indirect utilities:

$$y_i = g_i[u_i(w_i'+b_i'-t_i',a_i')-u_i(w_i^\circ+b_i^\circ-t_i^\circ,a_i^\circ)],$$

13. The low correlation between the common language question and the three overall-opinion questions reflects a near-consensus on the importance of a common language: 93% of respondents either strongly agree (42%) or agree (51%) that a common language is better. Note that concern over a common language could be interpreted as an economic concern if people believe a common language improves economic efficiency (e.g., Lazear 1999).

where g_i is a person-specific response function (assumed to be increasing). Taking a first order approximation, and allowing for an additive effect from a vector of covariates (X_i), the observed response of individual i is

$$y_i \approx \lambda_{1i}(\Delta w_i + \Delta b_i - \Delta t_i) + \lambda_{2i}\Delta a_i + \alpha X_i + \mu_i \tag{1}$$

where $\Delta w_i = w_i' - w_i^\circ$ is the difference in gross earnings between the alternative scenarios, $\Delta b_i, \Delta t_i$, and Δa_i are the corresponding differences in benefits, taxes, and compositional amenities, respectively, and μ_i is an error.[14] Defining $\lambda_1 = \mathrm{E}[\lambda_{1i}]$ and $\lambda_2 = \mathrm{E}[\lambda_{2i}]$, equation (1) can be rewritten as

$$y_i = \lambda_1 f_{1i} + \lambda_2 f_{2i} + \alpha X_i + \mu_i, \tag{2}$$

where

$$f_{1i} \equiv [\lambda_{1i}/\lambda_1] \times (\Delta w_i + \Delta b_i - \Delta t_i),$$

and

$$f_{2i} = [\lambda_{2i}/\lambda_2] \times \Delta a_i.$$

The individual-specific variables f_{1i} and f_{2i} represent the relative intensities of individual i's concerns over the direct economic effect and the compositional amenity effect of the change, respectively. Importantly, f_{1i} and f_{2i} incorporate both the magnitudes of the changes envisioned by the individual (i.e., the size of $\Delta w_i, \Delta b_i, \Delta t_i, \Delta a_i$), and the relative importance of the changes (reflected in the magnitudes of λ_{1i}/λ_1 and λ_{2i}/λ_2).[15] Individuals who anticipate larger impacts on variables of concern, or are more responsive to given changes in net income or compositional amenities, will express stronger views on the impacts of immigration.

We do not observe f_{1i} and f_{2i} directly. Instead, we observe responses to a series of questions that provide information about an individual's realizations of f_{1i} and f_{2i}. In particular, we assume that concerns about the direct economic effects of immigration are reflected in answers to the five questions **IE1**–**IE5** described earlier, while concerns about compositional amenities are reflected in the in answers to questions **IC1**–**IC5**.

Formally, we assume that the responses to these ten questions, denoted as indicators $(z_{1i}, z_{2i}, \ldots, z_{10i})$, are related to the underlying factors f_{1i} and f_{2i} and to observed characteristics of the respondent by a set of linear equations:[16]

$$z_{ji} = M_j f_{1i} + c_j X_i + \nu_{ji}, \quad j = 1, 2, \ldots, 5, \tag{3a}$$

14. We can view this as an approximation error. Alternatively μ_i may include the effect of other dimensions of concern. Our estimation strategy is robust to the presence of other concerns provided that variation in these dimensions is orthogonal to our main channels of interest.

15. From (1), $\lambda_{1i} = g_i' \times \partial u_i/\partial w_i$ and $\lambda_{2i} = g_i' \times \partial u_i/\partial a_i$. Thus variation in λ_{ji}/λ_j reflects variation in the way that different individuals interpret the response scale used to measure their policy views, as well as in the marginal utilities of wages and amenities. Note that the relative magnitude of λ_{1i} and λ_{2i} does not depend on g_i'.

16. Note that the indicator questions are all rescaled so that the responses to lie between 0 (most negative about immigration) and 1 (most positive).

$$z_{ji} = M_j f_{2i} + c_j X_i + v_{ji}, \quad j = 6, 7, \ldots, 10. \tag{3b}$$

Thus, responses to the first five questions are treated as noisy indicators of f_{1i}, while responses to the second group of questions are treated as noisy indicators of f_{2i}.

To complete the model, we assume that the latent factors are related to the observed respondent characteristics and a pair of idiosyncratic errors:

$$f_{1i} = b_1 X_i + \omega_{1i}, \tag{4a}$$

$$f_{2i} = b_2 X_i + \omega_{2i}. \tag{4b}$$

Combining equations (2)–(4) yields a set of reduced forms for the observed outcome variable (y_i) and the observed indicator questions (z_{ji}):

$$y_i = \Gamma_0 X_i + \varepsilon_{0i}$$

$$\Gamma_0 = \lambda_1 b_1 + \lambda_2 b_2 + \alpha; \quad \varepsilon_{0i} = \lambda_1 \omega_{1i} + \lambda_2 \omega_{2i} + \mu_i, \tag{5a}$$

$$z_{ji} = \Gamma_j X_i + \varepsilon_{ji}$$

$$\Gamma_j = M_j b_1 + c_j; \quad \varepsilon_{ji} = M_j \omega_{1i} + v_{ji}, \quad j = 1, 2, \ldots, 5, \tag{5b}$$

$$\Gamma_j = M_j b_2 + c_j; \quad \varepsilon_{ji} = M_j \omega_{2i} + v_{ji}, \quad j = 6, 7, \ldots, 10.$$

These equations form a linear system with cross-equation and covariance restrictions.

Our goal is to identify the *relative* importance of the factors f_{1i} and f_{2i} in shaping preferences over immigration policy.[17] We proceed by making a series of assumptions on the covariances between the error components in the structural equations (2), (3), and (4) that allow us to identify λ_1, λ_2, and the M_j from Var[$z_i \mid X_i$] and Cov[z_i,$y_i \mid X_i$] (i.e., the variance–covariances of the indicators, and the covariance of the indicators with the outcome variables y, after adjusting for the effect of the X). The remaining parameters—in particular the coefficients α, b_1, and b_2 that determine the projection of y on the X—are then identified from the Γ_j (i.e., the reduced-form regression coefficients).

We assume that the error components ($\mu_i, v_{ji}, \omega_{1i}, \omega_{2i}$) are independent of the observed X and satisfy the following restrictions:

$$Var[\omega_{1i}] = 1, Var[\omega_{2i}] = 1, \quad Cov[\omega_{1i}, \omega_{2i}] = \sigma_{12}, \tag{6a}$$

$$Var[v_{ji}] = \phi_j, Cov[v_{ji}, v_{ki}] = 0 \ (j \neq k), Cov[v_{ji}, \omega_{1i}] = Cov[v_{ji}, \omega_{2i}] = 0, \tag{6b}$$

$$Var[\mu_i] = \sigma_\mu^2, Cov[\mu_i, \omega_{1i}] = Cov[\mu_i, \omega_{2i}] = Cov[\mu_i, v_{ji}] = 0. \tag{6c}$$

Equations (6a) are normalizations: we scale the model by assuming that the variances of the unobserved determinants f_{1i} and f_{2i} are both equal to 1, with an arbitrary correlation σ_{12} between them. With these normalizations the relative size of λ_1 and λ_2 directly measures the relative strength of economic and compositional concerns.

17. Following footnote 15, note that since $\lambda_{1i} = g_i' \times \partial u_i / \partial w_i$ and $\lambda_{2i} = g_i' \times \partial u_i / \partial a_i$, the relative magnitude of λ_{1i} and λ_{2i} does not depend on g_i'.

Equations (6b) are substantive restrictions: here we are assuming that the correlation between the unobserved components of any two indicators arises *solely* through their joint dependence on the latent factors f_{1i} and f_{2i}. Substituting these equations into (5a) we have

$$\text{Var}[z_{ji} \mid X_i] = \text{Var}[\varepsilon_{ji}] = M_j^2 + \phi_j, \tag{7a}$$

$$Cov[z_{ji}, z_{ki} \mid X_i] = Cov[\varepsilon_{ji}, \varepsilon_{ki}] = M_j M_k \quad j \neq k,\ j, k \text{ from same group of indicators} \tag{7b}$$

$$Cov[z_{ji}, z_{ki} \mid X_i] = Cov[\varepsilon_{ji}, \varepsilon_{ki}] = M_j M_k \sigma_{12} \text{ if } j \neq k,\ j, k \text{ from different groups.} \tag{7c}$$

These equations imply that the elements of the covariance matrix formed from the residuals of OLS regressions of the indicator questions on the observed X depend on only 21 parameters: ten of M_j, ten of ϕ_j, and σ_{12}. Not surprisingly, this structure is too restrictive to fully describe the residual correlations between the indicator questions (see in what follows). As a check on our identification methods, we therefore consider models in which we reduce the number of indicator questions to eight (four per factor) or four (two per factor).

The restrictions in equations (6c) are also substantive: here we are assuming that the error component in the primary response equation, μ_i, is homoskedastic and uncorrelated with the unobserved determinants of the latent factors, and with structural errors in the equations for the indicators z_{ji}. Provided that the two latent factors f_{1i} and f_{2i} are the *only* channels that mediate concerns over immigration, these restrictions are plausible, since then μ_i is effectively an approximation error. We evaluate this assumption by fitting a more general model that allows for a third independent factor representing altruistic concerns over people in other countries.

Equations (6c) imply a simple structure for the covariances between the outcome variable y_i and the reduced-form residuals of the indicator responses z_{ji}:

$$\text{Cov}[y_i, z_{ji} \mid X_i] = \text{Cov}[\varepsilon_{0i}, \varepsilon_{ji}] = (\lambda_1 + \lambda_2 \sigma_{12}) M_j, \quad j \leq 5, \tag{8a}$$

$$Cov[y_i, z_{ji} \mid X_i] = Cov[\varepsilon_{0i}, \varepsilon_{ji}] = (\lambda_2 + \lambda_1 \sigma_{12}) M_j, \quad j \geq 6, \tag{8b}$$

$$Var[y_i \mid X_i] = Var[e_{0i}] = \lambda_1^2 + \lambda_2^2 + 2\lambda_1 \lambda_2 \sigma_{12} + \sigma_\mu^2, \tag{8c}$$

where $\sigma^2{}_\mu = \text{Var}[\mu_i]$. Given σ_{12} and the M_j, these covariances identify λ_1, λ_2, and $\sigma^2{}_\mu$. In practice we fit equations (7) and (8) jointly by minimum distance to the 11×11 matrix of residuals from OLS regressions of $(y_i, z_{1i}, z_{2i}, \ldots, z_{10i})$ on X_i, and obtain $(M_j, \sigma_{12}, \lambda_1, \lambda_2, \sigma^2{}_\mu)$ in one step.[18]

Our minimum distance approach is similar to, but more general than, a simplified procedure in which the average of the responses to questions **IE1**–**IE5** is treated as

18. As explained in what follows, for our main estimates we actually fit the system with multiple y-variables, allowing separate values of λ_1 and λ_2 (and a separate value for the variance v) for each y-variable. We have also estimated the model separately for each choice of the y-variable, and obtained nearly identical results.

an error-free measure of economic concerns, and the average responses to questions **IC1–IC5** is treated as an error-free measure of compositional concerns. To see the connection recall that the jth indicator of economic concerns is $z_{ji} = M_j f_{1i} + X_i c_j + v_{ji}$. In the special case where all the M are equal to 1, the average of the economic indicators is

$$\bar{z}_{1i} = f_{1i} + X\bar{c}_1 + \bar{v}_1,$$

where $\bar{c}_1$ is the average of $c_1,\ldots, c_5$. Similarly, the average of the compositional indicators is

$$\bar{z}_{2i} = f_{2i} + X\bar{c}_2 + \bar{v}_{2i},$$

where $\bar{c}_2$ is the average of $c_6,.. c_{10}$. Under the assumption that $\bar{v}_{1i} = \bar{v}_{2i} = 0$, one could run a simple regression of the outcome variable y_i on X_i and these averaged responses and obtain consistent estimates of the factor loadings λ_1, λ_2. In practice such a procedure has two limitations. First, even with five indicators per factor, $\text{Var}[\bar{v}_{1i}] > 0$ and $\text{Var}[\bar{v}_{2i}] > 0$, implying that the estimates of λ_1, λ_2 will be attenuated by measurement error. Second, as shown in Table 3, some of the indicators are more strongly related to the outcome variables than others, suggesting that not all the M are equal. Our approach forms a weighted average of the indicators based on the degree of inter-correlation between them, and properly accounts for the remaining measurement error.

3.2. Decomposing Differences Between Groups

Although the relative magnitude of λ_1 and λ_2 identifies the relative importance of economic and compositional concerns in explaining differences in attitudes *within* demographic groups, a decomposition of differences *between* groups requires estimates of the parameters (α, b_1, b_2). Specifically, equation (5a) states that the reduced-form coefficient vector Γ_0 relating y to the observed X can be written as

$$\Gamma_0 = \lambda_1 b_1 + \lambda_2 b_2 + \sigma. \tag{9}$$

The reduced-form relationship reflects three channels: economic concerns $(\lambda_1 b_1)$, compositional concerns $(\lambda_2 b_2)$, and any direct effect of the X on attitudes (α). To sort out the relative importance of these channels we need estimates of α, b_1, and b_2.

Unfortunately, even knowing $(M_j, \sigma_{12}, \lambda_1, \lambda_2, \sigma^2_\mu)$, the coefficients (α, b_1, b_2) cannot be identified from the Γ_j without further assumptions. To see this, note that equations (5a) and (5b) imply that the eleven reduced-form coefficient vectors $(\Gamma_0, \Gamma_1,\ldots, \Gamma_{10})$ depend on 13 structural coefficient vectors $(\alpha, b_1, b_2, c_1,\ldots, c_{10})$. Obviously we need to impose some restrictions on the c to identify (α, b_1, b_2). We consider two cases. As a baseline we assume that $c_j = 0$ for $j = 1,2,\ldots,10$ (i.e. the indicator questions collected in the vectors z_j $(j = 1,\ldots,5)$ and $(j = 6,\ldots,10)$ are not correlated with the variables in the X vector, conditional on the factors f_1 and

f_2 respectively). Under this assumption, $\Gamma_j = M_j b_1$ for $j = 1,2,\ldots,5$ and $\Gamma_j = M_j b_2$ for $j = 6,7,\ldots, 10$. Given estimates of the Γ_j and M_j we can estimate b_1 and b_2 by forming simple weighted averages (e.g., $b_1 = (\Gamma_1/M_1 + \Gamma_2/M_2 + \Gamma_3/M_3 + \Gamma_4/M_4 + \Gamma_5/M_5)/5$). A weaker assumption is that the X have the same direct effects on the indicators for each of the underlying factors, that is, that

$$c_1 = c_2 = c_3 = c_4 = c_5 = c^E \quad \text{and} \quad c_6 = c_7 = c_8 = c_9 = c_{10} = c^C.$$

In this case $\Gamma_j = M_j b_1 + c^E$ for $j = 1, 2,.., 5$, and $\Gamma_j = M_j b_2 + c^C$ for $j = 6, 7,.., 10$. Given estimates of Γ_j and M_j we can estimate b_1, b_2, c^E, and c^C by a least-squares procedure. As we discuss in more detail in what follows, our decomposition results turn out to be quite similar regardless of the restrictions we impose on the c to achieve identification.

4. Estimation Results

4.1. Preliminaries

Our estimation procedure has three steps. First, we estimate unrestricted OLS regressions of the outcome variables (y) and the indicators (z) on the observed covariates X. As explained earlier, we use the eight different y-variables whose correlations are shown in Table 2. We then take the covariance matrix of the reduced form residuals and apply a minimum-distance technique to estimate the structural parameters ($M_1,\ldots,M_{10}$, $\varphi_1,\ldots,\varphi_{10}$, σ_{12}, λ_1, λ_2, σ^2_μ).[19] Finally, we use these parameters and the estimated reduced-form coefficients Γ_j ($j = 0,1,\ldots,10$) to estimate the coefficient vectors b_1, b_2, and $c_1,\ldots,c_{10}$. Our procedures for obtaining standard errors for the various estimated parameters are explained in more detail in Appendix A.

We assume that X includes a constant, 20 country dummies, and 13 personal characteristics: indicators for age (three dummies), gender, education (two dummies), labor force status (three dummies), immigrant status, minority status, and city size (two dummies). Thus, the Γ_j and the vectors (α, b_1, b_2, c_j) all have dimension 34. Estimates of the Γ_j for the eight y-variables and the various indicator variables used in our analysis are available on request.

4.2. Results for Baseline Model

Table 4 summarizes the estimation results from our baseline specification, which assumes the X have no direct effect on the indicator variables (i.e., the c_j are all set to 0).

19. We fit the model to the indicators and the full set of eight y-variables jointly. Thus we estimate ($M_1,\ldots,M_{10}$), ($\varphi_1,\ldots,\varphi_{10}$), σ_{12}, and eight pairs of coefficients (λ_1, λ_2)—one for each y. We also allow an unrestricted 8×8 matrix of contemporaneous variances and covariances between the outcomes. Estimates that take one outcome variable at a time are quite similar. Copies of the programs used to perform the estimation are available on request.

TABLE 4. Summary of estimates from baseline model.

	Dependent variable (y)		
	Allow many/none (average of four country groups) (1)	Immigration good or bad for the economy (2)	Immigrants make country better/worse place to live (3)
1. Estimates of λ:			
a. λ_1 = effect of economic concerns on y	0.027	0.122	0.048
	(0.003)	(0.003)	(0.003)
b. λ_2 = effect of compositional concerns on y (estimated correlation of f_1 and f_2 = 0.79)	0.102	0.038	0.101
	(0.003)	(0.003)	(0.003)
2. Fraction of Var[$y\|X$] explained by factors	0.315	0.504	0.496
3. Decomposition of age gap (age > 60 vs. age < 30)			
a. Total estimated gap	−0.071	−0.019	−0.043
b. Gap attributed to economic concerns	−0.006	−0.025	−0.010
c. Gap attributed to compositional concerns	−0.047	−0.018	−0.047
4. Decomposition of education gap (tertiary vs. lower secondary)			
a. Total estimated gap	0.134	0.124	0.102
b. Gap attributed to economic concerns	0.020	0.091	0.036
c. Gap attributed to compositional concerns	0.095	0.035	0.094
5. Decomposition of unemployment gap (unemp. vs. employed)			
a. Total estimated gap	−0.030	−0.035	−0.030
b. Gap attributed to economic concerns	−0.009	−0.040	−0.016
c. Gap attributed to compositional concerns	−0.014	−0.005	−0.014
6. Decomposition of urban gap (large city vs. rural)			
a. Total estimated gap	0.028	0.030	0.023
b. Gap attributed to economic concerns	0.003	0.013	0.005
c. Gap attributed to compositional concerns	0.021	0.008	0.021
7. Goodness of fit test (315 d.f.)	1000.0	1000.0	1000.0

Notes: Estimated by minimum distance on reduced form residual variance-covariance matrix (see text). Standard errors in parentheses. Sample size is 29,036 with nonmissing data on outcomes, indicators, and covariates.

Each column of Table 4 corresponds to a different y-variable: the average response to the policy question for the four sending-country groups (column (1));[20] whether immigration is good or bad for the economy (column (2)); and whether immigrants make the country better or worse (column (3)). For each outcome we show the estimated values of the loading factors (λ_1, λ_2), the fraction of the variance in the outcome variable that is explained by the two factors (conditional on the X), and the implied decompositions of the estimated differentials in the outcomes between young (under 30) and old (over 60) respondents (rows 3a–3c), between high- and low-education

20. This average response is perhaps most similar to the question typically analyzed in the literature (for example Scheve and Slaughter 2001; Mayda 2006; O'Rourke and Sinnott 2003), which asks whether immigration should be reduced or increased, with no reference to source country.

respondents (rows 4a–4c), between unemployed and employed respondents (rows 5a–5c), and between big-city residents and residents of rural areas (rows 6a–6c).[21]

Looking first at our main outcome measure—the averaged immigration policy variable in column (1)—the estimates of λ_1 and λ_2 are 0.027 and 0.102, respectively. Since the latent factors are scaled to have unit variances, these estimates imply that compositional concerns are roughly four times more important than concerns over wages and taxes in explaining the variation in opinions on immigration policy within demographic subgroups.

The estimated correlation of the latent factors f_1 and f_2 is relatively high ($\approx$0.8) suggesting that people with stronger concerns about the economic impacts of immigration have stronger concerns about the compositional impacts. According to our model the size of this correlation depends on the degree of correlation between respondents' conjectured changes in net incomes and local amenities, and on how these impacts are correlated with the *loudness* with which people express their concerns.[22] If people who anticipate larger impacts of immigration on their wages and local amenities also tend to select *extreme* responses, any correlation between their anticipated changes in income and amenities will be magnified.

The decomposition results in rows 3–6 suggest that a relatively high fraction of the differences in opinions about immigration policy by age, education, labor force status, and city size is explained by differences in compositional concerns. Specifically, about 70% of the gap between older and younger respondents, and between low-educated and high-educated respondents, is attributed to compositional concerns. Compositional concerns explain a little less of the gap in opinions between people with a job and those who are unemployed (50%), but a little more of the gap between large city and rural residents (77%).

The results in column (2) for the question of whether immigration is good or bad for the economy provide an interesting contrast to those in column (1). Here, the loading factors are 0.122 and 0.038, respectively, suggesting that the latent component of variance we are identifying as economic concerns has over a four times larger effect on the overall assessment about economic effects of immigration than the component we are identifying as compositional concerns. One possible explanation for the fact that the compositional concerns play *any* role in the response on the "good or bad for the economy" question is that ESS respondents, like many economists, view cultural, linguistic, and ethnic diversity as potentially costly to economic success. Lazear (1999), for example, has argued that a common culture and language enhance trade and specialization, whereas diversity tends to inhibit economic efficiency. Likewise, a

21. As shown in equation (5a), the reduced form regression coefficients Γ_0 (from the regression of y on X) can be decomposed as: $\Gamma_0 = \lambda_1 b_1 + \lambda_2 b_2 + \alpha$. Since all the elements of X are dummies, the estimated coefficients in Γ_0 represent differentials in mean responses across groups.

22. Suppose that respondent i believes that an increase in immigration will lead to a change Δw_i in her wage, and a change Δa_i in the composition of her neighborhood. Suppose that people have similar indirect utility functions $u(w+b-t, a)$, but vary in their response functions g_i. Respondent i's concern about the wage effect of immigration is $f_{1i} = g_i' \cdot \partial u/\partial w \ \Delta w_i$ while her concern about the amenity effect is $f_{2i} = g_i' \cdot \partial u/\partial a \ \Delta a_i$. The correlation of the reported concerns depends on how g_i is correlated with Δw_i, and Δa_i.

large literature in development economics has concluded that ethnic diversity harms political stability and growth (see for example Easterly and Levine 1997; Alesina and La Ferrera 2003).

Consistent with the relative magnitudes of λ_1 and λ_2, a relatively large share of the between-group differences in answers to the "good or bad for the economy" question is explained by differential economic concerns. For example, about 70% of the 0.12 gap between high- and low-education respondents to this question is attributable to economic concerns. Economic concerns also more than fully explain the gaps between young and old respondents, and between the employed and unemployed.

Column (3) shows the results for our second summary assessment question—do immigrants make the country a better or worse place to live? For this question $\lambda_1 = 0.048$ and $\lambda_2 = 0.101$, implying that compositional concerns are about twice as important as economic concerns in explaining within-group variation in opinions. Between demographic groups, compositional concerns are even more important, explaining 3–4 times more of the age- and education-related gaps in opinions about immigration for quality of life.

Although the average response to the questions about admitting more or fewer immigrants from different source country groups is a convenient summary measure of policy views, it is also interesting to compare the relative importance of economic and compositional concerns in explaining opinions about specific immigrant groups. Table 5 shows the results for the average measure (top row of the table) and for each of the four country groups, as well as for questions about admission of people of the same or different ethnicity. The estimate of λ_1—which reflects the relative intensity of economic concerns—is a little bigger for European than non-European immigrants. One explanation for this pattern is that respondents perceive European immigrants as closer substitutes for their labor services. The estimates of λ_2—which reflect the relative intensity of compositional concerns—follow a very different pattern, with lower magnitudes for immigrants from richer countries (and for those of the same ethnicity), and higher for people from poor countries (and for those of a different ethnicity).

As shown in columns (3)–(8) of Table 5, differences in the intensity of economic concerns explain a relatively modest share (6% to 20%) of the age and education gaps in average opinions about admission of different groups. Differences in the intensity of concern over compositional effects play a larger role, explaining 50% of differential between high- and low-educated respondents in views about admitting people from rich European countries and 90% of the gap in views about admitting people from poorer countries or those of a different ethnicity.

4.3. Alternative Assumptions on the c-vector

Our model identifies the relative magnitude of economic and compositional concerns (that is, λ_1 and λ_2) from the correlations between the outcome variable (y) and the various indicators variables (the z), after conditioning out the effects of the X (i.e.,

TABLE 5. Explaining variation in attitudes toward different potential immigrant groups.

	Estimates of λ:		Age gap (age >60 vs. age <30)			Education gap (tertiary vs. lower sec.)		
	Economic	Composition		Explained by:			Explained by:	
	λ_1 (1)	λ_2 (2)	Actual (3)	Economic (4)	Composition (5)	Actual (6)	Economic (7)	Composition (8)
By country of origin								
Average of 4 country groups	0.027	0.102	−0.071	−0.006	−0.047	0.134	0.020	0.095
	(0.003)	(0.003)		8.5%	66.2%		14.9%	70.7%
People from rich European countries	0.029	0.079	−0.050	−0.006	−0.036	0.149	0.022	0.073
	(0.004)	(0.004)		12.0%	72.6%		14.6%	49.2%
People from poor European countries	0.030	0.111	−0.081	−0.006	−0.051	0.120	0.022	0.104
	(0.004)	(0.004)		7.4%	63.5%		18.6%	86.3%
People from rich non-European countries	0.023	0.095	−0.064	−0.005	−0.044	0.146	0.017	0.088
	(0.004)	(0.004)		7.8%	68.8%		11.8%	60.4%
People from poor non-European countries	0.024	0.124	−0.089	−0.005	−0.057	0.120	0.018	0.115
	(0.004)	(0.004)		5.6%	64.0%		15.1%	95.7%
By ethnicity								
People of same ethnicity	0.037	0.084	−0.068	−0.008	−0.039	0.133	0.027	0.078
	(0.004)	(0.004)		11.9%	57.6%		20.6%	59.0%
People of different ethnicity	0.016	0.135	−0.094	−0.003	−0.062	0.140	0.012	0.126
	(0.004)	(0.004)		3.2%	66.0%		8.2%	89.6%

Notes: Based on estimates from baseline model summarized in Table 4 with alternative dependent variables. Dependent variable in each row is rescaled response to question of whether many, some, few, or no immigrants from indicated source group should be allowed to come to live in the respondent's country. Standard errors in parentheses. Percentages below the explained gaps represent shares of the actual gap explained by the factor.

TABLE 6. Decompositions of immigration policy views with alternative assumptions on *c*-coefficients

	Assumption on *c*-vector	
	$c_j = 0$ (baseline) (1)	Factor-specific *c*-vector (2)
1. Decomposition of age gap (age>60 vs. age<30)		
a. Total estimated gap	−0.071	−0.071
b. Gap attributed to economic concerns	−0.006	−0.010
c. Gap attributed to compositional concerns	−0.047	−0.066
2. Decomposition of education gap (tertiary vs. lower secondary)		
a. Total estimated gap	0.134	0.134
b. Gap attributed to economic concerns	0.020	0.028
c. Gap attributed to compositional concerns	0.095	0.124
3. Decomposition of unemp. gap (unemp. vs. employed)		
a. Total estimated gap	−0.030	−0.030
b. Gap attributed to economic concerns	−0.009	−0.009
c. Gap attributed to compositional concerns	−0.014	−0.015
4. Decomposition of urban gap (large city vs. rural)		
a. Total estimated gap	0.028	0.028
b. Gap attributed to economic concerns	0.003	0.002
c. Gap attributed to compositional concerns	0.021	0.018

Notes: Estimated by minimim distance on reduced form coefficients and residual variance-covariance matrix (see text). Standard errors in parentheses. Estimates of λ_1, λ_2, and σ_{12} are the same as in Table 4. Specification in column (1) sets all c-vectors to 0. Specification in column (2) assumes $c_j = c^e$ for the five indicators of economic concerns, and $c_j = c^a$ for the five indicators of compositional concerns (i.e. factor-specific *c*-vectors).

within demographic groups). As noted earlier, however, we have to restrict the way that the X affect the indicator questions (i.e., the c vectors in equations (3a) and (3b)) in order to identify the contributions of economic and compositional concerns in explaining differences in average opinions *across* demographic groups. Our baseline model imposes the rather strict assumption that $c_j = 0$ for all j. As an alternative we consider a model in which the X are allowed to directly influence the indicators, with a common effect for the economic indicators, and a separate effect for the compositional indicators (that is, $c_j = c^E$ for all five indicators of economic concern and $c_j = c^C$ for all five indicators of compositional concerns).[23]

Table 6 reports the implied decompositions of between-group differences in opinions on immigration policy under our baseline specification (as in Table 4) and this alternative. Comparisons between the columns of the table suggest that the alternative choices lead to similar conclusions about the relative importance of economic and compositional concerns in explaining views about admitting more or less immigrants. In both cases most of the differences in average opinions by age, education, employment status, and city size are driven by differences in compositional concerns.

23. Note that alternative assumptions on c_j have no effect on the estimates of λ_1, λ_2, or σ_{12}.

We have also compared the decompositions of between-group differences in the summary assessment questions and found that the qualitative conclusions are invariant to the specification of the c-vector. As in our baseline specification, between-group differences on views about whether immigration is good or bad for the economy are mainly driven by economic concerns, while differences in views about whether immigrants make the country a better or worse place to live are mainly attributed to differences in compositional concerns.

5. Robustness Checks and Extensions

The identification of our structural model is predicated on an a priori link between the latent factors and the indicator questions. We have estimated a variety of alternative specifications in which we varied the assumed structure of this linkage. This section briefly summarizes some of our findings. We begin by showing a model that includes views about the effect of immigration on crime. We then consider alternative specifications of our baseline model that use only a subset of indicator questions for each factor. Next, we discuss an extended model that includes a third possible concern over the welfare of immigrants themselves and their home countries. Finally, we show models that are estimated separately for natives and immigrants, and briefly discuss the results of estimating separate models for each country in our data set.

5.1. Adding an Indicator Question on Crime

Let z_{11i} denote the standardized response of individual i to the question "Are crime problems made worse or better by people coming to live here?" We assume that responses to this question are related to the underlying factors f_{1i} and f_{2i} by

$$z_{11i} = M_{1,11} f_{1i} + M_{2,11} f_{2i} + c_{11} X_i + V_{11i}. \tag{3c}$$

Allowing an indicator question to depend on both factors leads to somewhat different expressions for the reduced-form residual covariances (equations (7) and (8)) but does not create any new issues for our identification or estimation strategy, provided that there is at least one indicator for each factor that does not affect the other factor.

Table 7 summarizes the estimation results from a model that includes the question on crime as an indicator of both economic and compositional concerns. Although not shown in the table, the estimates of the coefficients $M_{1,11}$ and $M_{2,11}$ suggest that views about the effect of immigration on crime are significantly related to both concerns, with a slightly bigger role for economic concerns. (The estimates are $M_{1,11} = 0.34$ and $M_{2,11} = 0.21$, with standard errors of less than 0.01). A comparison of the coefficients in column (1) of Table 6 to those of the corresponding column of Table 4 suggests that the addition of crime concerns has very little impact on the estimates of the factor loadings λ_1 and λ_2 for the average response to the immigration policy question, nor does it affect the decompositions of the differences in policy views by age, education, employment status, or urban location. A similar conclusion holds for the two assessment questions

TABLE 7. Summary of estimates from alternative model with crime as indicator of both factors.

	Dependent variable (y)		
	Allow many/none (average of four country groups) (1)	Immigration good or bad for the economy (2)	Immigrants make country better/worse place to live (3)
1. Estimates of λ			
a. λ_1 = effect of economic concerns on y	0.026	0.124	0.053
	(0.003)	(0.003)	(0.003)
b. λ_2 = effect of compositional concerns on y (estimated correlation of f_1 and f_2 = 0.79)	0.102	0.036	0.099
	(0.003)	(0.003)	(0.003)
2. Fraction of Var[y|X] explained by factors	0.313	0.509	0.521
3. Decomposition of age gap (age >60 vs. age <30)			
a. Total estimated gap	−0.071	−0.019	−0.043
b. Gap attributed to economic concerns	−0.006	−0.027	−0.012
c. Gap attributed to compositional concerns	−0.048	−0.017	−0.047
4. Decomposition of education gap (tertiary vs. lower secondary)			
a. Total estimated gap	0.134	0.124	0.102
b. Gap attributed to economic concerns	0.018	0.088	0.038
c. Gap attributed to compositional concerns	0.093	0.033	0.090
5. Decomposition of unemp. gap (unemp. vs. employed)			
a. Total estimated gap	−0.030	−0.035	−0.030
b. Gap attributed to economic concerns	−0.009	−0.042	−0.017
c. Gap attributed to compositional concerns	−0.015	−0.005	−0.015
6. Decomposition of urban gap (large city vs. rural)			
a. Total estimated gap	0.028	0.030	0.023
b. Gap attributed to economic concerns	0.003	0.013	0.006
c. Gap attributed to compositional concerns	0.021	0.007	0.020
7. Goodness of fit test (315 d.f.)	1000.0	1000.0	1000.0

Notes: Estimated by minimim distance on reduced form coefficients and residual variance-covariance matrix (see text). Standard errors in parentheses. This variant includes an extra indicator question, based on whether the respondent thinks immigrants increase crime problems, that is treated as a potential indicator of both economic concerns and compositional concerns.

(columns (2) and (3) of Tables 4 and 7). Overall, we conclude that views about the impact of immigration on crime reflect a combination of economic and compositional concerns, but that adding this question to the set of indicators has little effect on our estimation results.

5.2. Varying the Indicator Questions

As a second robustness check, we re-estimated our baseline model, excluding some of indicator questions for each of the two latent concerns. Table 8 summarizes the estimates and between-group decompositions, focusing on our main outcome variable

TABLE 8. Robustness of implied factor weights to varying assumptions on indicator questions.

	Dependent variable (y) = average response on allowing more or less immigrants from four country groups		
	Baseline model (5 indicators) (1)	4 indicators per factor (2)	2 indicators per factor (3)
1. Estimates of λ			
a. λ_1 = effect of economic concerns on y	0.027	0.021	0.039
	(0.003)	(0.003)	(0.005)
b. λ_2 = effect of compositional concerns on y	0.102	0.108	0.084
	(0.003)	(0.003)	(0.005)
2. Correlation of economic/compositional factors	0.786	0.776	0.810
3. Fraction of var($y \mid X$) explained by factors	0.315	0.319	0.284
4. Decomposition of age gap (age >60 vs. age <30)			
a. Total estimated gap	−0.071	−0.071	−0.071
b. Gap attributed to economic concerns	−0.006	−0.005	−0.006
c. Gap attributed to compositional concerns	−0.047	−0.051	−0.034
5. Decomposition of education gap (tertiary vs. lower secondary)			
a. Total estimated gap	0.134	0.134	0.134
b. Gap attributed to economic concerns	0.020	0.015	0.034
c. Gap attributed to compositional concerns	0.095	0.104	0.077
6. Decomposition of unemp. gap (unemp. vs. employed)			
a. Total estimated gap	−0.030	−0.030	−0.030
b. Gap attributed to economic concerns	−0.009	−0.007	−0.016
c. Gap attributed to compositional concerns	−0.014	−0.015	−0.010
6. Decomposition of urban gap (large city vs. rural)			
a. Total estimated gap	0.028	0.028	0.028
b. Gap attributed to economic concerns	0.003	0.002	0.004
c. Gap attributed to compositional concerns	0.021	0.023	0.018
7. Summary of goodness of fit to Var($(Z,y)\mid X$)			
a. Number of second moments	190	153	91
b. R-squared for model of second moments	0.989	0.990	0.996
c. Chi-square (d.f.)	5832 (108)	4274 (75)	546 (21)

Notes: Estimated by minimim distance on reduced form residual variance-covariance matrix (see text). Standard errors in parentheses. Model in column (1) has five indicators per factor. Model in column (2) has four indicators per factor. Model in column (3) has two indicators per factor.

(the averaged response to the immigration policy question). The first column simply re-states the baseline results from column (1) of Table 4. The second column reports estimates based on only four indicator questions per factor. In this specification we have omitted **IE3**, the question on whether immigrants fill jobs where there are shortages, and **IC3**, the question on the value of a common language. This change leads to similar estimates of λ_1 and λ_2, but a slight *increase* in the explained share of the conditional variance in the outcome (see row 3), suggesting a small improvement in the power of the model.

The bottom rows of Table 8 present further comparisons of model fit. Row 7b presents a simple *R*-squared statistic that summarizes how well our model describes the variances of the indicators and their covariances with the outcome variables (the total number of variances and covariances fit in the estimation procedure is shown in row 7a). Although these *R*-squared statistics are quite high, the sample variances and covariances are very precisely estimated and a formal goodness-of-fit test (shown in row 7c) strongly rejects the restrictions implied by our models.[24] Nevertheless, the actual fit of the critical covariances between the indicator questions and the outcome variables is relatively good. Table A.3 shows the actual and fitted covariances between our main outcome variable (the averaged responses to the policy question **IP** across four country groups) and the indicator questions for the models in Table 8. The errors in fit are small and unsystematic, though statistically significant.

In column (3) we present a model that uses only two indicators per factor. For economic concerns, we focus on the two simplest indicators of the fear of labor market competition: indicator **IE1** (do you agree/disagree that immigration lowers wages) and **IE4** (do you think that immigrants take jobs away from natives or create new jobs). For compositional concerns we use the two most direct indicators of the value of cultural homogeneity: **IC1** (do you agree/disagree that it's better if everyone shares the same customs and traditions) and **IC4** (is a country's cultural life undermined or enriched by immigrants). In this specification the relative magnitude of λ_2 to λ_1 falls from 4:1 in our baseline model to 3:1. Interestingly, however, compositional concerns still explain five times more of the age gap in views about immigration policy, and nearly three times more of the education gap.

We have also estimated models in which we sequentially allowed each of the ten basic indicator questions to reflect a combination of economic and compositional concerns. (That is, we take one of the indicators and assume that it depends on both factors, as in equation (3c), and then re-estimate the model). For all but two of the indicator questions this change has little effect relative to our baseline model. When either **IC4** (the question on whether the immigrants undermine or enrich cultural life) or **IC5** (the question on whether a country should stop immigration to reduce social tensions) is allowed to depend on compositional *and* economic concerns the relative magnitude of λ_2/λ_1 falls, yielding estimates that are similar to those in column

24. We compute the optimal weighting matrix following Abowd and Card (1989).

(3) of Table 8.[25] Our models therefore suggest that compositional concerns are 2 to 5 times more important than economic concerns in determining views about immigration policy, with an upper bound from specifications that use both **IC4** and **IC5** as indicators of compositional concerns, and a lower bound from models that exclude one of these questions (as in column (3) of Table 8) or assume that one of these questions reflects both economic and compositional concerns.

5.3. Three-Factor Model

Our baseline model assumes that respondents answer questions about immigration policy from a purely self-interested perspective, giving no weight to the welfare of potential immigrants. To evaluate the potential limitations of this view we developed a three-factor model that includes a third, *altruistic* concern. We use the three questions from the ESS survey as indicators of respondents' altruistic concerns:

IA1: *Do you think that immigration is good or bad for the sending countries in the long run?*
IA2: *Do you agree or disagree that richer countries have a responsibility to accept people from poorer countries?*
IA3: *Do you agree or disagree that all countries benefit if people can move where their skills are most needed?*

Estimation results for this model are summarized in Table A.4. This model has three factor loading coefficients, λ_1, λ_2, and λ_3, reflecting economic, compositional, and altruism concerns. There are also three correlation coefficients, reflecting the correlations between economic and compositional concerns, economic and altruism concerns, and compositional and altruism concerns. The estimates of the loading factors λ_1 and λ_2 for economic and compositional concerns are not too different from our baseline model, although in the case of the immigration policy question (column (1)) the altruism factor appears to pick up some of the variation that was attributed to compositional concerns in our two-factor model. For the overall assessment questions (columns (2) and (3)) the estimates of λ_3 are statistically different to 0 but of a relatively small magnitude. The estimated correlation between economic and compositional factors is very similar to the estimate in our baseline model (just under 0.8). The correlations of these two factor with the altruism factor are smaller (0.4–0.5) but positive.

Interestingly, the addition of altruistic concerns does not change our conclusion about the relative importance of economic and compositional concerns in explaining differences in views across groups. The decompositions shown in Table A.4 suggest that compositional concerns account for 60% or more of the gaps across age and

25. The estimates of λ_1 and λ_2 are 0.048 and 0.084 when the response to the question of whether immigration undermines or enriches culture is allowed to depend on both concerns, and 0.040 and 0.089 when the response to the question on reducing social tensions is allowed to depend on both concerns.

education groups, whereas economic concerns account for no more than 13%. Overall, we conclude that the addition of another factor has only a modest impact on the conclusions from our basic two-factor model.

5.4. Preferences of Immigrants

In our discussion so far we have implicitly interpreted the responses in the ESS survey as reflecting the views of natives in each country. In fact, as noted in Table A.1, just under 10% of the respondents are themselves immigrants. An interesting question is to what extent immigrants and natives share the same or different views about the desirability of additional immigrants. In this section we summarize the results from fitting our model of preferences separately for immigrants and non-immigrants.

On average, immigrants are more supportive of increased immigration than natives, and have more positive views about their effect on the economy, and whether they make the country a better place to live.[26] Like natives, however, the views of immigrants vary substantially across countries and within countries by age, education, and location. The average views of immigrants and natives in the same country are very highly correlated: across the 21 countries in the ESS the correlation of the average responses to the questions on allowing more or fewer immigrants is 0.68, while the correlation of responses to the question of whether immigrants are good or bad for the economy is 0.74.

Table 9 summarizes the results of fitting our baseline model separately for natives and immigrants. For nonimmigrants, the estimates of the relative importance of economic and compositional concerns are very close to the estimates we obtained for the pooled sample (compare the results in row 1 to the estimates in row 1 of Table 4). This is not surprising, given that natives comprise over 90% of the pooled sample. For immigrants, the results are also broadly similar, although for all three dependent variables it appears that immigrants put more weight on economic concerns, and less on compositional concerns, than natives. For example, the value of λ_1 relative to λ_2 in forming views about the desirability of allowing more or fewer immigrants is about 0.25 for natives (0.026/0.103) but 0.35 for immigrants (0.030/0.085). We believe this makes sense, since previous immigrants are most directly substitutable with future immigrants, whereas natives' skills are more complementary. On the other hand, previous immigrants may feel less strongly than natives about the compositional effects of further immigration.

26. The average of the standardized responses on allowing more immigrants from each of four country groups is 0.51 for natives and 0.59 for immigrants. The average standardized response on whether immigration is good or bad for the economy is 0.49 for natives and 0.60 for immigrants. The average standardized response on whether immigration makes the country a better or worse place to live is 0.47 for natives and 0.57 for immigrants.

TABLE 9. Comparison of estimates from baseline model for non-immigants and immigrants.

	Dependent variable (y)		
	Allow many/none (average of four country groups) (1)	Immigration good or bad for the economy (2)	Immigrants make country better/worse place to live (3)
1. Estimates for non-immigrants only ($n = 26{,}914$)			
a. λ_1 = effect of economic	0.026	0.120	0.048
concerns on y	(0.004)	(0.003)	(0.003)
b. λ_2 = effect of	0.103	0.039	0.100
compositional concerns on y	(0.004)	(0.003)	(0.003)
2. Estimates for immigrants only ($n = 2{,}122$)			
a. λ_1 = effect of economic	0.030	0.137	0.040
concerns on y	(0.013)	(0.014)	(0.012)
b. λ_2 = effect of	0.085	0.026	0.108
compositional concerns on y	(0.013)	(0.015)	(0.013)
7. Goodness of fit test (315 d.f.)	1000.0	1000.0	1000.0

Notes: Estimated by minimim distance on reduced form residual variance-covariance matrix (see text). Standard errors in parentheses.

5.5. Fitting the Model by Country

Up to this point we have pooled responses to the ESS survey from each of the 21 countries, allowing country dummies in the vector X to adjust for differences across countries. Arguably, however, there are such wide differences across European countries in the historical context of immigration, and in the salience of economic and compositional concerns, that the full set of parameters in our model may vary across countries. As a final robustness check we therefore estimated our baseline model separately for each country. The results are summarized in Table 10, where we show country-specific estimates of the key parameters λ_1 and λ_2 for the policy question of whether more or less immigrants should be admitted. We also show the fractions of the age and education gaps in average opinions on this question that are attributable to economic and compositional concerns.

The estimates of λ_1 and λ_2 suggest that in nearly all European countries, compositional concerns outweigh economic concerns in mediating opinions about immigration policy. In two countries—Spain and France—the estimate of λ_1 is actually slightly negative (but insignificant) while in eight others the estimate is positive but relatively small and insignificantly different from 0. In contrast, the estimates of λ_2 are all positive and significant, with a range of point estimates from 0.05 to 0.16.[27] The sole exception to the tendency for the estimate of λ_2 to exceed the estimate of

27. Although not reported in the table, the estimates of the correlation between the latent factors are all in the range of 0.70 to 0.90.

TABLE 10. Summary of estimates of baseline model, estimated by country.

	Estimates of λ			Age gap (age >60 vs. age <30)			Education gap (tertiary vs. lower sec.)		
	Economic λ_1 (1)	Compositional λ_2 (2)	Correl. (3)	Actual (4)	Explained by: Economic (5)	Composition (6)	Actual (7)	Explained by: Economic (8)	Composition (9)
Austria	0.006	0.105	0.800	−0.115	−0.001	−0.061	0.126	0.005	0.106
	(0.016)	(0.015)							
Belgium	0.012	0.121	0.739	−0.040	−0.002	−0.066	0.205	0.008	0.150
	(0.014)	(0.014)							
Czech Republic	0.048	0.087	0.798	−0.071	−0.009	−0.037	0.147	0.041	0.078
	(0.019)	(0.019)							
Denmark	0.006	0.109	0.765	−0.041	0.001	−0.062	0.169	0.004	0.123
	(0.015)	(0.015)							
Finland	0.040	0.092	0.773	−0.083	−0.004	−0.030	0.105	0.025	0.085
	(0.013)	(0.014)							
France	−0.032	0.161	0.877	−0.116	0.013	−0.121	0.148	−0.019	0.142
	(0.026)	(0.027)							
Germany	0.051	0.086	0.778	−0.112	−0.020	−0.050	0.130	0.040	0.063
	(0.011)	(0.011)							
Greece	0.019	0.090	0.883	−0.056	−0.002	−0.027	0.092	0.015	0.077
	(0.022)	(0.023)							
Hungary	0.026	0.071	0.718	−0.045	−0.009	−0.035	0.081	0.017	0.065
	(0.016)	(0.016)							
Ireland	0.040	0.085	0.779	−0.037	−0.008	0.004	0.125	0.035	0.101
	(0.014)	(0.014)							
Italy	0.041	0.113	0.748	−0.038	0.011	−0.025	0.171	0.026	0.086
	(0.018)	(0.018)							
Netherlands	0.037	0.078	0.788	−0.027	−0.001	−0.029	0.131	0.025	0.075
	(0.014)	(0.014)							

TABLE 10. Continued.

	Estimates of λ			Age gap (age >60 vs. age <30)			Education gap (tertiary vs. lower sec.)		
	Economic λ_1 (1)	Compositional λ_2 (2)	Correl. (3)	Actual (4)	Explained by: Economic (5)	Composition (6)	Actual (7)	Explained by: Economic (8)	Composition (9)
Norway	0.016	0.095	0.762	−0.090	0.001	−0.036	0.149	0.015	0.107
	(0.013)	(0.012)							
Poland	0.065	0.053	0.776	−0.075	−0.023	−0.037	0.123	0.056	0.047
	(0.014)	(0.014)							
Portugal	0.019	0.126	0.800	0.000	0.000	−0.038	0.150	0.012	0.131
	(0.026)	(0.026)							
Portugal	0.042	0.100	0.788	−0.014	−0.001	−0.016	0.160	0.035	0.117
	(0.023)	(0.023)							
Slovenia	0.023	0.103	0.800	−0.121	−0.026	−0.170	0.116	0.026	0.139
	(0.019)	(0.019)							
Spain	−0.011	0.160	0.762	−0.028	0.002	−0.071	0.077	−0.006	0.094
	(0.020)	(0.020)							
Sweden	0.021	0.103	0.799	−0.033	0.002	−0.028	0.120	0.013	0.085
	(0.014)	(0.013)							
Switzerland	0.007	0.105	0.778	−0.082	−0.002	−0.004	0.136	0.005	0.072
	(0.012)	(0.012)							
United Kingdom	0.049	0.098	0.785	−0.089	−0.004	−0.058	0.182	0.040	0.093
	(0.013)	(0.013)							

Notes: See notes to Table 4. Standard errrors in parentheses. Estimates for Luxembourg not reported: see text.

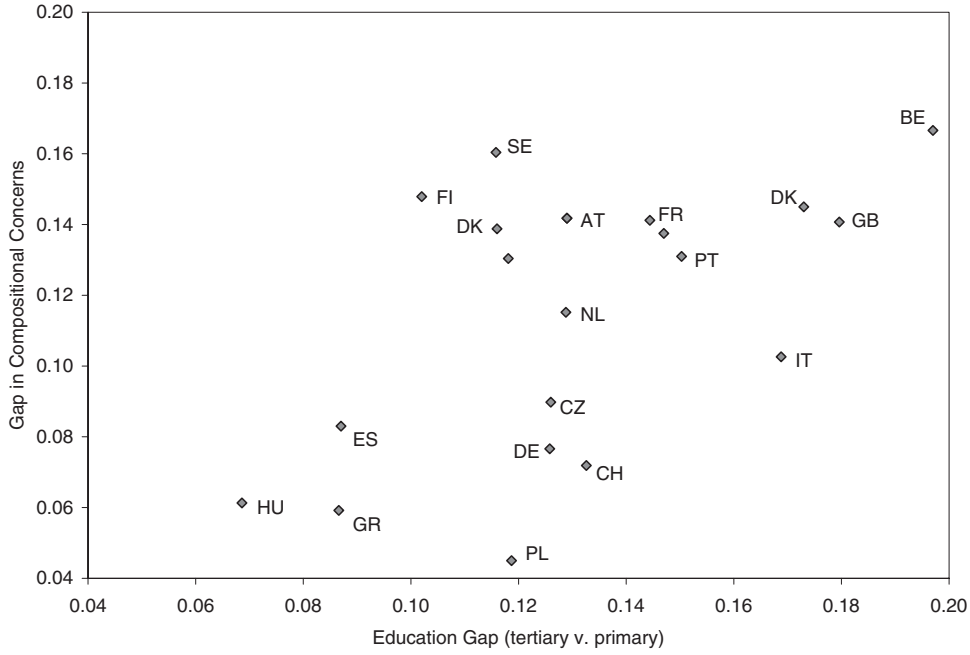

FIGURE 2. Share of education gap in immigration policy views attributed to compositional concerns.

λ_1 is Poland.[28] Reflecting the relative magnitudes of the estimates of λ_1 and λ_2, the decompositions of the age and education gaps in opinions about immigration policy in columns (3)–(8) of Table 10 suggest that compositional concerns are typically more important than economic concerns in explaining the more negative opinions of older (over age 60) versus younger (under age 30) respondents, and likewise in explaining the more positive opinions of highly educated (at least some tertiary education) versus poorly educated (only primary schooling) respondents. The relative importance of compositional concerns in explaining the education gaps for different countries is illustrated in Figure 2, which plots the education gap in compositional concerns in each country against the raw education gap for that country. The scatter of points suggests that a very strong relationship between the total gap and the share attributable to compositional concerns.

We also examined the relative importance of economic and compositional concerns in explaining responses to the two overall assessment questions. Consistent with our findings for the pooled sample, in nearly all countries economic concerns are the dominant channel influencing views about whether immigrants are good or bad for the economy whereas compositional concerns are the dominant channel influencing

28. The parameter estimates for Luxembourg are not reported in Table 9, since the estimates are extremely imprecise, reflecting the small sample size ($n = 553$). The estimates for λ_1 and λ_2 are –0.25 (standard error = 0.30) and 0.38 (0.30) respectively.

views about whether immigrants make the country a better or worse place to live.[29] As in Table 9, the estimates of λ_1 and λ_2 for the two overall assessment questions are relatively tightly distributed around the corresponding point estimates from the pooled model, suggesting that the pooled estimates are a good summary of the *average* importance of the channels in different countries.

6. Discussion and Conclusion

Why are so many people in developed countries opposed to immigration? Most existing studies of the economic impacts of immigration suggest these impacts are small, and on average benefit the native population. But standard economic studies generally ignore the value that people place on having neighbors and co-workers who share their language, ethnicity, culture, and religion. A large body of research has shown that concerns over *compositional amenities* affect decisions about what neighborhood to live in, what schools to attend, and which employees to hire. In this paper we argue that similar concerns play an important part in mediating views about immigration policy.

Using a set of questions explicitly designed for the 2002 European Social Survey we estimate a simple structural model that assumes that people care about both the conventional economic effects of immigration (on wages, taxes, and benefits) and the compositional effects on their neighborhoods, schools, and workplaces. Our empirical results confirm that both concerns are important, though compositional concerns are significantly *more* important in understanding the variation in attitudes toward immigration policy. For example, 70% of the gap between the most- and least-educated respondents in the ESS on the issue of whether immigration should be increased or reduced is attributable to differences in the intensity of concern over compositional amenities, while differences in economic concerns account for 10%–15%. Differences in compositional concerns also explain most of the differences in attitudes between older and younger respondents. The more negative attitude toward increased immigration held by older people is a puzzle for models that ignore compositional amenities, because many older respondents are retired, and even those who work face a lower threat of labor market competition from immigrants (who tend to be relatively young) than younger workers.

While our inferences are based on purely observational data, and rely on a restrictive structural model, we present a number of robustness checks and extensions that support our general conclusions about the importance of compositional concerns. Importantly, we also show that economic concerns explain a very high share of the variation in attitudes to a question about whether immigration is "good or bad for the economy". Thus, respondents appear to distinguish between the effects of immigration on relative wages and fiscal balances, and the effects on compositional amenities, and

29. Luxembourg generates poorly identified (and rather large) estimates for λ_1 and λ_2 for these outcomes too.

place a relatively high weight on the latter in deciding their views about immigration policy.

Appendix A: Estimation Procedures and Identification

In this appendix we explain in more detail how we estimate the parameters of the model and derive standard errors. To simplify notation we use matrix algebra notation. We assume that the sample consists of N independent observations on an outcome response (y), a set of q indicator responses $z_1, z_2, \ldots, z_q$, and a set of observed covariates x. Specifically, let y be the $1 \times N$ vector of outcome responses, let $\mathbf{z}$ be the $q \times N$ matrix of indicator questions, let $\mathbf{X}$ be the $k \times N$ matrix of covariates, and let $\mathbf{f}$ be the $p \times N$ matrix of underlying factors (or *concerns*). (In our baseline model $p = 2$, but we allow for more general specifications). We assume

$$y = \Lambda \mathbf{f} + \alpha \mathbf{X} + \mu, \tag{A.1}$$

$$\mathbf{z} = \mathbf{M}\mathbf{f} + \mathbf{C}\mathbf{X} + \nu, \tag{A.2}$$

$$\mathbf{f} = \mathbf{B}\mathbf{X} + \omega, \tag{A.3}$$

where μ, ν, and ω are $1 \times N$, $q \times N$ and $p \times N$ vectors of residuals, respectively, Λ is a $1 \times p$ vector (with elements λ_1 $\lambda_2, \ldots, \lambda_p$), $\mathbf{M}$ is a $q \times p$ matrix, and α, $\mathbf{C}$, and $\mathbf{B}$ are coefficient vectors (or matrices) of dimension $1 \times k$, $q \times k$, and $p \times k$, respectively. Equation (A.1) corresponds to equation (2) in the text. Equations (A.2) and (A.3) correspond to equations (3a), (3b) and (4a), (4b) where we have again combined parameters to form appropriate matrices. In our baseline two-factor model $\mathbf{M}$ is a 10×2 matrix with

$$\mathbf{M} = \begin{pmatrix} M_1 & 0 \\ 0 & M_2 \end{pmatrix}, \tag{A.4}$$

where M_1 and M_2 are 5×1 vectors.

To form the reduced-form equations (corresponding to equations (5a) and (5b) in the text), we substitute (A.3) into (A.1) and (A.2) to obtain

$$y = (\Lambda \mathbf{B} + \alpha)\mathbf{X} + (\mu + \Lambda\omega) = \Gamma_0 \mathbf{X} + \varepsilon_0, \tag{A.5}$$

$$\mathbf{z} = (\mathbf{M}\mathbf{B} + \mathbf{C})\mathbf{X} + (\nu + \mathbf{M}\omega) = \Gamma_1 \mathbf{X} + \varepsilon_1. \tag{A.6}$$

Define

$$\varepsilon = \begin{pmatrix} \varepsilon_0 \\ \varepsilon_1 \end{pmatrix}$$

and let

$$\Omega = E\left(\varepsilon \varepsilon'\right).$$

Step 1: Estimating the reduced form coefficients and residual covariances.

We estimate OLS regressions of y and each element of $\mathbf{z}$ on the x to obtain estimates $\hat{\Gamma}_0$ and $\hat{\Gamma}_\mathbf{1}$ of the coefficients in (A.5) and (A.6). We then form the matrix of estimated reduced-form residuals:

$$\hat{\varepsilon} = \begin{pmatrix} \hat{\varepsilon}_0 \\ \hat{\varepsilon}_\mathbf{1} \end{pmatrix},$$

and use this to estimate

$$\hat{\Omega} = \frac{1}{N-k}\hat{\varepsilon}\hat{\varepsilon}',$$

which is a consistent estimate of $\mathbf{\Omega}$. Using standard results, we have that

$$\sqrt{N}\begin{pmatrix} \text{vec}\hat{\Gamma} - \text{vec}\Gamma \\ \text{vec}\hat{\Omega} - \text{vec}\Omega \end{pmatrix} \to N\left(\begin{pmatrix} 0 \\ 0 \end{pmatrix}, \begin{pmatrix} \Omega \otimes (\mathbf{X}\mathbf{X}')^{-1} & 0 \\ 0 & \mathbf{Q} \end{pmatrix}\right) \equiv N(0, \mathbf{V}), \tag{A.7}$$

where $\mathbf{Q}$ is an appropriately defined matrix of fourth moments.

Step 2: Estimating the main parameters.

We assume that μ, $\mathbf{v}$ and ω are mutually orthogonal and independent of X so that

$$E\left[\begin{pmatrix} \mu_i \\ \nu_i \\ \omega_i \end{pmatrix}\begin{pmatrix} \mu_i \\ \nu_i \\ \omega_i \end{pmatrix}'\middle| \mathbf{X}_i\right] = \begin{pmatrix} \sigma_\mu^2 & 0 & 0 \\ 0 & \phi & 0 \\ 0 & 0 & \Sigma \end{pmatrix}, \tag{A.8}$$

where $\boldsymbol{\phi}$ (the covariance matrix of the residuals of the indicator questions) is diagonal and $\mathbf{\Sigma}$ (the covariance matrix of the residuals of the latent factors) has several "1" on the diagonal. Therefore,

$$\Omega = \begin{pmatrix} \Lambda\Sigma\Lambda' + \sigma_\mu^2 & \Lambda\Sigma\mathbf{M}' \\ \mathbf{M}\Sigma\Lambda' & \mathbf{M}\Sigma\mathbf{M}' + \varphi \end{pmatrix}. \tag{A.9}$$

We estimate the parameters in Λ, $\mathbf{\Sigma}$, $\mathbf{M}$, $\boldsymbol{\phi}$ and the variance σ_μ^2 by equally weighted minimum distance. Specifically, let θ denote a vector that includes all the parameters of the model (i.e., all the elements in Λ, Σ, $\mathbf{M}$, ϕ, σ_μ^2), and let $m = \text{vec}(\Omega)$ be the vector of elements of the lower-triangular part of Ω**. O**ur assumptions imply that

$$m = h(\theta), \tag{A.10}$$

for a suitably defined function $h(\theta)$. Letting $\hat{m} = \text{vec}(\hat{\Omega})$, we choose θ to minimize

$$[\hat{m} - h(\theta)]'[\hat{m} - h(\theta)].$$

Letting $\mathbf{H} = \partial h(\theta)/\partial\theta'$ we estimate the sampling variance of the estimates of θ by

$$\mathbf{V}(\theta) = (\mathbf{H}'\mathbf{H})^{-1}\mathbf{H}'\mathbf{Q}\mathbf{H}(\mathbf{H}'\mathbf{H})^{-1},$$

where $\mathbf{Q}$ is the matrix of fourth moments defined in (A.7), and $\mathbf{H}$ is evaluated at the minimum distance estimates for θ.

Step 3: Decomposing differences in the outcomes across X-groups.

(a) Baseline case ($\mathbf{C} = 0$).

When $\mathbf{C} = 0$, equation (A.6) implies that $\Gamma_1 = \mathbf{MB}$. We estimate $\mathbf{B}$ by $\widehat{\mathbf{B}} = (\hat{\mathbf{M}}'\hat{\mathbf{M}})^{-1}\hat{\mathbf{M}}'\hat{\Gamma}_{\mathbf{1}}$ (i.e., by applying equally weighted minimum distance). Equation (A.5) implies that $\Gamma_0 = \Lambda\mathbf{B} + \alpha$: we are interested in estimating the component of the coefficient vector relating the outcome y to the covariates x that is attributable to the factors, which is just $\Lambda\mathbf{B}$. We estimate this as $\hat{\Lambda}\hat{\mathbf{B}}$, and construct sampling variances for this component using the delta method and the estimated variances of $\hat{\Lambda}$, $\hat{\mathbf{M}}$, and $\hat{\Gamma}_{\mathbf{1}}$.

(b) More general cases ($\mathbf{C} \neq 0$).

More generally, equation (A.6) implies that $\Gamma_1 = \mathbf{MB} + \mathbf{C}$. Consider the case where there are factor-specific c-vectors. In this case $\mathbf{C} = \mathbf{ec}$ where $\mathbf{e}$ is a $(q \times p)$ matrix of ones and zeros:

$$\mathbf{e} = \begin{pmatrix} e_1 & 0 & \ldots & 0 \\ 0 & e_2 & \ldots & 0 \\ \vdots & \vdots & \vdots & \vdots \\ 0 & 0 & \ldots & e_P \end{pmatrix} \text{ and c is a (p} \times \text{k) matrix } \mathbf{c} = \begin{pmatrix} c_1 \\ c_2 \\ \vdots \\ c_p \end{pmatrix}.$$

Again we estimate $\mathbf{B}$ and $\mathbf{c}$ jointly by applying minimum distance to the moment condition $\hat{\Gamma}_1 = (\hat{\mathbf{M}}, \mathbf{e}) \begin{pmatrix} \mathbf{B} \\ \mathbf{c} \end{pmatrix}$. As in the baseline case, standard errors are calculated using the delta method and the estimated variances of $\hat{\Lambda}$, $\hat{\mathbf{M}}$, and $\hat{\Gamma}_{\mathbf{1}}$.

TABLE A.1. Characteristics of 2002 ESS sample by country.

		Sample		Age distribution (%)			Ethnicity (%)		Empl. status (%)		In larger	Education (%)	
		size (1)	Male (%) (2)	Under 30 (3)	30–54 (4)	Over 54 (5)	Minority (6)	Immigrant (7)	Employed (8)	Retired (9)	city (%) (10)	Lower sec. (11)	Tertiary (12)
All countries	1	39,860	47.5	22.3	43.1	34.6	3.4	8.1	49.2	20.9	31.6	41.3	17.9
Austria	1	2,257	46.2	20.0	47.8	32.2	5.7	8.9	55.7	24.8	36.2	31.6	12.7
Belgium	2	1,899	51.5	28.1	43.4	28.4	2.2	8.3	49.6	17.9	22.8	35.0	13.6
Switzerland	3	2,040	48.1	16.3	48.6	35.1	4.6	16.9	55.4	17.5	21.1	18.1	16.1
Czech Republic	4	1,360	47.7	15.9	38.2	45.9	2.2	4.3	46.9	33.5	32.8	15.9	11.1
Germany	5	2,919	48.2	19.6	45.3	35.1	3.9	7.3	47.0	23.1	33.2	15.5	21.6
Denmark	6	1,506	50.7	22.0	44.6	33.4	2.5	5.2	59.8	20.4	35.5	24.8	17.2
Spain	7	1,729	47.3	20.7	40.5	38.8	2.9	4.6	42.3	16.8	30.1	58.7	14.6
Finland	8	2,000	48.0	26.1	40.6	33.3	1.2	3.2	52.6	24.7	27.9	40.1	24.9
France	9	1,503	45.2	21.7	42.2	36.1	4.0	10.0	46.7	27.5	36.0	51.7	26.0
United Kingdom	10	2,052	46.6	18.8	43.1	38.1	6.2	9.3	51.7	24.2	29.5	55.8	23.4
Greece	11	2,566	43.4	19.4	38.3	42.3	3.7	9.8	40.8	25.2	56.0	57.8	14.0
Hungary	12	1,685	48.0	24.9	41.4	33.7	5.1	2.4	42.8	22.9	24.9	63.0	13.5
Ireland	13	2,046	46.1	23.5	43.2	33.4	1.7	7.3	51.6	13.5	32.7	47.0	12.8
Italy	14	1,207	45.4	22.2	45.1	32.7	1.0	2.2	49.0	18.6	17.6	56.1	8.0
Luxemburg	15	1,552	47.4	31.8	39.0	29.2	6.8	31.0	40.4	15.9	22.7	46.0	16.7
Netherlands	16	2,364	44.1	16.0	47.4	36.5	4.2	6.6	46.6	15.3	29.3	42.8	23.3
Norway	17	2,036	54.2	20.4	48.4	31.2	2.4	6.5	62.6	15.6	35.6	14.9	28.1
Poland	18	2,110	48.9	32.3	40.8	26.9	2.8	1.5	40.4	23.8	27.4	55.2	14.1
Portugal	19	1,511	41.7	22.2	39.2	38.6	1.2	6.0	49.8	22.2	41.6	75.1	8.9
Sweden	20	1,999	50.8	23.3	41.8	34.9	2.9	10.7	58.9	17.1	32.9	47.8	30.6
Slovenia	21	1,519	47.6	27.8	42.7	29.6	3.0	8.9	39.8	21.0	23.6	30.4	14.1
Means		1811	47.5	22.4	43.1	34.6	3.4	8.1	49.2	20.9	31.6	41.3	17.9
						native = 91.4							

Notes: unweighted means from 2002 ESS sample. Sample sizes include all valid observations: number of valid responses for specific items vary.

TABLE A.2. Mean standardized responses to views on immigration across countries.

	Allow many/some/few/none of:				
	Average of 4 country groups- (1)	People of same ethnicity (2)	People of different ethnicity (3)	Immigration good or bad for the economy (4)	Immigrants make country better/worse place to live (5)
All countries	0.52	0.58	0.49	0.50	0.48
Austria	0.46	0.49	0.44	0.56	0.47
Belgium	0.53	0.58	0.50	0.46	0.43
Switzerland	0.60	0.67	0.59	0.59	0.53
Czech Republic	0.53	0.52	0.46	0.44	0.42
Germany	0.55	0.63	0.53	0.51	0.48
Denmark	0.56	0.65	0.51	0.48	0.55
Spain	0.54	0.56	0.53	0.54	0.47
Finland	0.49	0.56	0.45	0.53	0.53
France	0.49	0.56	0.50	0.51	0.45
United Kingdom	0.49	0.55	0.47	0.44	0.46
Greece	0.36	0.42	0.31	0.36	0.34
Hungary	0.35	0.54	0.31	0.41	0.40
Ireland	0.57	0.66	0.56	0.50	0.53
Italy	0.59	0.62	0.57	0.53	0.45
Luxemburg	0.50	0.56	0.47	0.68	0.58
Netherlands	0.50	0.55	0.52	0.48	0.47
Norway	0.56	0.63	0.54	0.54	0.48
Poland	0.57	0.59	0.53	0.45	0.52
Portugal	0.43	0.44	0.41	0.50	0.39
Sweden	0.69	0.73	0.69	0.55	0.62
Slovenia	0.55	0.57	0.51	0.43	0.45

Notes: Original 4-point or 11-point responses are linearly rescaled to lie between 0 (most negative response) and 1 (most positive). Entries in column (1) are unweighted averages of rescaled responses for questions on allowing many/some/few/none people from rich European countries, poor European countris, rich non-European countries, and poor non-European countries.

TABLE A.3. Actual and predicted covariances between main outcome variable (y) and indicators (Z).

		Fitted covariances		
	Actual covariances (1)	Baseline model (5 indicators) (2)	4 indicators per factor (3)	2 indicators per factor (4)
Covariance of y with indicator questions				
A. Indicators of economic concerns				
1. "Wages and salaries are brought down by immigration"	0.014 (0.0004)	0.015	0.015	0.013
2. "Immigration harms the economic prospects of the poor"	0.015 (0.0004)	0.016	0.016	–
3. "Immigrants help to fill jobs where there are shortages"	0.009 (0.0003)	0.006	–	–
4. "Immigrants take away jobs from natives **or** help create new jobs"	0.013 (0.0003)	0.012	0.012	0.013
5. "Immigrants take out more in benefits than they put in in taxes"	0.013 (0.0004)	0.012	0.012	–
B. Indicators of compositional concerns				
1. "It is better for a country if everyones shares the same customs and traditions"	0.015 (0.0004)	0.017	0.017	0.014
2. "It is better for a country if there are a variety of different religions" (negative scale)	0.012 (0.0003)	0.012	0.012	–
3. "It is better for a country if everyone can speak a common language"	0.003 (0.0002)	0.004	–	–
4. "A country's cultural life is undermined **or** enriched by immigrants"	0.017 (0.0003)	0.018	0.018	0.018
5. "A country should stop immigration to reduce social tensions"	0.022 (0.0004)	0.020	0.020	–

Notes: See notes to Table A.3. Outcome is average response on allowing more or less immigrants fro four country groups. Standard errors of actual covariances in parentheses.

TABLE A.4. Summary of estimates from three-factor model.

	Dependent variable (y)		
	Allow many/none (average of 4 country groups) (1)	Immigration good or bad for the economy (2)	Immigrants make country better/worse place to live (3)
1. Estimates of λ coefficients:[a]			
a. λ_1 = effect of economic concerns on y	0.023	0.123	0.047
	(0.004)	(0.004)	(0.003)
b. λ_2 = effect of compositional concerns on y	0.088	0.034	0.096
	(0.004)	(0.004)	(0.003)
c. λ_3 = effect of altruism concerns on y	0.034	0.005	0.011
	(0.004)	(0.002)	(0.002)
3. Decomposition of age gap (age>60 vs. age<30)			
a. Total estimated gap	−0.071	−0.020	−0.043
b. Gap attributed to economic concerns	−0.005	−0.026	−0.010
c. Gap attributed to compositional concerns	−0.042	−0.016	−0.045
d. Gap attributed to altruism concerns	0.005	0.001	0.002
4. Decomposition of education gap (tertiary vs. lower secondary)			
a. Total estimated gap	0.131	0.120	0.098
b. Gap attributed to economic concerns	0.017	0.089	0.034
c. Gap attributed to compositional concerns	0.081	0.032	0.088
d. Gap attributed to altruism concerns	0.003	0.001	0.010
5. Decomposition of unemp. gap (unemp. vs. employed)			
a. Total estimated gap	−0.029	−0.034	−0.029
b. Gap attributed to economic concerns	−0.008	−0.041	−0.016
c. Gap attributed to compositional concerns	−0.011	−0.004	−0.014
d. Gap attributed to altruism concerns	0.001	0.000	0.000
6. Decomposition of urban gap (large city vs. rural)			
a. Total estimated gap	0.026	0.028	0.022
b. Gap attributed to economic concerns	0.002	0.012	0.005
c. Gap attributed to compositional concerns	0.018	0.007	0.019
d. Gap attributed to altruism concerns	0.002	0.000	0.001

Notes: Estimated by minimim distance on reduced form residual variance-covariance matrix (see text). Standard errors in parentheses. Sample size is 27,302 with nonmissing data on outcomes, indicators, and covariates.
[a]Note: Estimated correlations of three factors: economic and compositional factors = 0.79; economic and altruism factors = 0.40; compositional and altruism factors = 0.47.

Supporting Information

Additional Supporting Information may be found in the online version of this article:

Appendix S1. Data sets, Samples, and Programs for the construction of the final tables in the paper (zip file)

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