# Is Immigration Good or Bad for the Economy?

# Analysis of Attitudinal Responses[*]

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## Abstract

In this paper we study attitudinal responses of host country residents towards further immigration that are triggered by economic considerations. We develop an economic model motivating the empirical work that takes a broader view on these issues than previous papers. We provide empirical analysis that is based on data more specific and better suited to pick up the many channels of economic interest through which benefits and costs of immigration may be felt. Results support previous literature in establishing strong associations between individual characteristics and a wide range of responses to questions relating to perceived impact of immigrants on economic outcomes. Our analysis points toward harmful effects of immigration on the economy being felt through immigration being a fiscal burden rather than having adverse effects on the labour market.

# 1  Introduction

A large empirical literature in economics is concerned with identifying the effects of immigration on the economy. A particularly strong focus has been on the effect on wages and employment (see Borjas 1994, 1999b, and Friedberg and Hunt 1995, and Dustmann and Glitz 2005 for overviews). Many of the papers in this literature fail to find large effects, although there is controversy about this (see recent papers by Borjas 2003 and Card 2004). In any case, effects of labour market competition are frequently perceived to be one of the main driving forces determining public attitudes towards immigration. Those for whose skills immigrant labour is likely to be a substitute may oppose immigration whereas those for whose skills it is complementary may view immigration more sympathetically.

Of course, immigration also has other economic aspects. Individuals may fear that immigrants burden public finances - either through using public services intensively or by contributing to costly social problems such as unemployment - or they may by contrast welcome the contributions made by immigrants to the public exchequer[1]. Furthermore, immigrant inflows are frequently suggested as a solution to specific sorts of skill shortages. In political debate this is often used as an argument in support of more liberal migration policies (see for instance the debate in European member states on allowing for free movement of labour after EU enlargement as of May 1st 2004). Individuals taking a wider view may in addition appreciate the efficiency gains to be expected from free international movement of labour. Economic enquiry can contribute to arguments on all of these issues by attempting to extend knowledge of the nature and extent of any such economic gains and losses.

Recently, a literature has evolved that addresses the formation of opinion and attitudes towards immigrants and immigration in a more direct way than papers that attempt to quantify the economic impact of immigration itself. These papers are based on empirical analysis of attitudinal responses towards immigration and immigrants (see, for example,

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[1]Research for the British Home Office (Gott and Johnston 2002) recently suggested, for example, that immigrants to the UK make a positive net contribution to British public finances.

recent papers by Scheve and Slaughter 2001, Gang, Rivera-Batiz and Yun 2002, Mayda 2002, Schmidt and Fertig 2002, O'Rourke and Sinnott 2003, Dustmann and Preston 2004 and Bauer, Lofstrom and Zimmermann 2001 among others)[2].

Typically such papers relate responses about individual attitudes to further immigration to individual specific characteristics. Interpretation of the coefficient estimates in the economic part of this literature often relies on well established economic theory, most prominently the Hecksher-Ohlin model (see, for example, Scheve and Slaughter 2001), assigning particular interpretation to variables such as education and skills. Other researchers emphasise the importance of non-economic determinants of attitudes to immigration (see, for example, Espenshade and Hempstead 1996). Dustmann and Preston (2004) develop a model which allows for three factors in determining anti-immigrant feelings: labour market considerations, welfare considerations, and racial attitudes. They find all three determinants to be important in affecting attitudes, but identify a dominant role for the race factor, in particular for the lower educated.

The plausibility of the conclusions reached in these papers about the nature and role of economic considerations is not helped by the need to rely on secondary analysis of responses to questionnaires which are rarely explicit about economic issues. Most of the papers mentioned above rely on attitudes to further immigration as a measure for individual perception of harmful or beneficial effects of immigration in the host economy. The association of this response with skill or education of the respondent is then interpreted within a Heckscher-Ohlin type framework, where differential responses across skill groups are compatible with differently perceived labour market competition from new immigrants.

In this paper, we add to this literature in several ways. Firstly, we broaden the economic argument, by allowing for consideration not only of factors relating to labour market competition, but also to factors relating to public burden, and efficiency considerations. Secondly, we

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[2]Related issues come up also in the literature on preferences on trade policies - see for instance papers by Mayda and Rodrik (2001), Scheve and Slaughter (2001) and O'Rourke and Sinnot (2001).

discuss the way such consideration may affect welfare of residents of different skill background in a simple general equilibrium framework. Thirdly, our empirical investigation is based on more specific survey responses than have been used previously. In particular, we not only study the association between economic opinion and demographic characteristics, but also, having conditioned on such effects, seek to structure the interrelation between overall opinions on whether immigration is good or bad for the economy and opinions on more specific economic effects. In our analysis we allow this overall response to be related to three more specific concerns: labour market competition, public burden, and efficiency considerations. We identify these three response sets from specific survey questions that are directly related to each of these factors.

We draw on new and informative data from the European Social Survey (ESS). This survey includes attitudinal information for some 22 European and associated countries, and has a specific module on migration and minority related issues. This module provides information on the overall attitudinal response of individuals to further immigration, but also direct responses to a battery of questions concerning the effect on the economy.

Our interpretation of the data follows structure imposed by economic theory. We first present a simplified theoretical model which describes the manner and the circumstances under which immigration may benefit or harm different groups in the population. This model is in its nature similar to standard equilibrium models in the literature, but, besides allowing analysis of labour market effects of immigration, allows in addition analysis of welfare effects of immigration through taxation and welfare payments. According to Borjas (1999) these are the two main concerns people have when forming attitudes about migration. We also discuss generalisations to capture other possible dimensions of economic concern. It is not so important in the current context whether this model accurately reflects the workings of the economy as whether it captures the way individuals might sensibly think about the gains or losses they will incur as a consequence of immigration.

We then discuss the empirical implications of this model, and the way these may be re-

flected in the data we have available. Our empirical analysis has a descriptive part where we relate responses to the overall evaluation of immigration, as well as to demographic information of respondents. We then proceed to a more structural analysis, where we impose a factor structure on the responses concerning particular issues, and where seek to distinguish between labour market concerns, public burden, and efficiency considerations. Each of these factors is related to a set of responses regarding particular implications of immigration, and we determine the way these factors, in turn, relate to the overall evaluation of whether immigration is good or bad for the economy.

The structure of the paper is as follows. In the next section, we present the background theoretical model(section 2). We then discuss briefly implications for empirical analysis (section 3). We describe the data set we use for our analysis in section 4), and provide descriptive information (section 5). We then explain our estimation method (section 6) for the factor model and discuss results in section 7. Finally, section 8 concludes.

## 2 Immigration: wages, taxes and general welfare effects

Our prime interest in this paper it to understand the considerations lying behind individuals' general opinions on whether immigration is harmful or beneficial for the economy. As we explain in the introduction, these drivers of opinion may relate to labour market competition, to the welfare and tax system, as well as to distributional aspects of migration and general welfare considerations reaching beyond national borders.

Economic theory is well suited to investigate all these aspects in simple equilibrium models. Even though it would be silly to believe individuals form judgements by working explicitly through models of this sort, individuals observe outcomes in the economies which they inhabit and it is not unreasonable to look to the basic mechanisms of such models for guidance as to the sort of beliefs it would be sensible to imagine people might form on the workings of the relevant economic processes.

As a motivation for our empirical analysis below, to impose an economically motivated structure on these processes, and to help derive well founded empirical implications, we therefore commence by presenting a simple equilibrium model which helps to structure the way individuals might think about the effect of immigration on the labour market and the welfare system. Although the model allows relatively straightforward derivation of the basic welfare and labour market effects of immigration, the complexity of extending it to general welfare considerations forbids formal development in this paper. While we use formal argumentation to cover wage, employment and tax effects, we use intuitive argumentation to develop ideas about extensions to other aspects.

**A simple equilibrium model**

Our model distinguishes between two types of workers (skilled and unskilled) to emphasise the differences in opinion that may result from the different ways immigration can affect current residents in various skill categories.

Suppose there are two labour types, skilled ($S$) and unskilled ($U$), earning wages $w_S$ and $w_U$. The numbers of workers of the two types are given by

$$x_i = \phi_i N + \psi_i M, \qquad i \in I \equiv \{S, U\},$$

where $N$ is the total current population, $M$ is total immigrant population and $\phi_i$ and $\psi_i$ are skill group shares in the two groups.

We consider below the marginal effects of immigration at the current position where the ratio of immigrants to the current population is $\pi = M/N = 0$. Changes in skill group shares follow from

$$\mathrm{d} \ln x_i / \, \mathrm{d}\pi \simeq \beta_i \qquad i \in I$$

where $\beta_i = (\psi_i/\phi_i)$ is the relative skill share of immigrants, assumed constant. Capital is assumed elastically supplied at a return to capital, $r$, which is fixed on world markets.

We consider two cases differing in the number of goods produced by the economy. Either the economy produces one good in quantity $y_0$ or two goods in quantities $y_0$ and $y_1$. We denote the set of goods by $J$ which therefore equals $\{0\}$ or $\{0,1\}$. These goods are assumed traded and the economy small so that their prices $p_0$ and $p_1$ are set on world markets. This distinction allows us to differentiate between the case where the economy adjusts to immigration through the output mix, and where the only channel of adjustment is through factor prices.

Assuming constant returns to scale and excluding the possibility of joint production, we write the unit cost function for the $j$th output as $c^j(w_S, w_U, r)$, $j \in J$. Letting $c_i^j(w_S, w_U, r)$ denote the derivative $\partial c^j / \partial w_i$, demand for the $i$th type of labour is therefore $\sum_{j \in J} y_j c_i^j$ by Shephard's lemma.

Wages and outputs are determined by two equilibrium conditions. Firstly, labour market equilibrium requires equality of demand and supply of labour, i.e.

$$\sum_{j \in J} y_j c_i^j(w_S, w_U, r) - x_i = 0 \qquad i \in I \,, \tag{1}$$

and secondly, firms earn zero profits and therefore

$$\ln c^j(w_S, w_U, r) - \ln p_j = 0 \qquad j \in J \,. \tag{2}$$

## The Government budget constraint

Both immigrants and those currently resident consume government services. However since immigrants differ from current residents in their age, health, number of children and so on we should expect them to consume different amounts of government services than residents. We assume therefore that each current resident consumes $G$ and each immigrant $\Gamma$ of public services[3]. Government spending is financed by a proportional tax on labour income[4] at a

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[3]We could allow these amounts to depend also on the levels of wages and the skill compositions of the two groups. However this would complicate the model without adding any appreciable insight.

[4]We exclude, for convenience, the possibility that capital income is also taxed domestically. Since we have assumed capital to be elastically supplied at a fixed (posttax) return, labour inflows should also lead to inflows

rate $t$ which is determined to secure government budget balance:

$$t \sum_{i \in I} x_i w_i = GN + \Gamma M \tag{3}$$

The welfare of currently resident workers depends on their after tax wages $W_i = (1 - t)w_i$, $i \in I$ so that

$$\frac{\mathrm{d}\ln W_i}{\mathrm{d}\pi} = \frac{\mathrm{d}\ln w_i}{\mathrm{d}\pi} - \frac{t}{1-t}\frac{\mathrm{d}\ln t}{\mathrm{d}\pi} \qquad i \in I. \tag{4}$$

In other words, the effect of migration on after-tax wages works through two channels: by affecting before-tax wages and the tax rate.

**Two output goods**

Consider first the case with two types of output. Reasoning only from (2) and noting that output prices are fixed by the small country assumption , we have

$$\theta_S^0 \, \mathrm{d}\ln w_S + \theta_U^0 \, \mathrm{d}\ln w_U = 0$$
$$\theta_S^1 \, \mathrm{d}\ln w_S + \theta_U^1 \, \mathrm{d}\ln w_U = 0$$

where $\theta_i^0 = \partial \ln c^0 / \partial \ln w_i$ denotes a factor share. From this it follows immediately that $\mathrm{d}\ln w_U / \mathrm{d}\pi = \mathrm{d}\ln w_S / \mathrm{d}\pi = 0$. This result, essentially similar to the factor price equalisation theorem (Samuelson 1953), is what Leamer and Levinsohn (1995) call *factor price insensitivity*. Wages are determined solely by prices through the zero profit condition (2). Insensitivity extends to nonmarginal changes $\Delta \pi$ provided that immigration is not so large as to take factor endowments out of the economy's cone of diversification, in which case the economy would stop producing one of the two goods.

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of capital. To the extent that the returns to that capital attract domestic tax liabilities this should soften the impact of immigration on public finances. However since the owners of capital may reside abroad it is not obvious how their income would be taxed.

Rather than impacting on wages, long run effects of immigration are felt in the output mix. These responses can also be deduced and follow from (1) given unchanged factor prices:

$$\rho_S^0 \, \mathrm{d} \ln y_0 + (1 - \rho_S^0) \, \mathrm{d} \ln y_1 = \beta_S \, \mathrm{d}\pi$$

$$\rho_U^0 \, \mathrm{d} \ln y_0 + (1 - \rho_U^0) \, \mathrm{d} \ln y_1 = \beta_U \, \mathrm{d}\pi$$

where $\rho_i^j = y_j c_i^j / \sum_{k \in J} y_k c_i^k$ denotes a sectoral share in a factor market. Therefore

$$\frac{\mathrm{d} \ln(y_0/y_1)}{\mathrm{d}\pi} = \frac{\beta_S - \beta_U}{\rho_S^0 - \rho_U^0}$$

and unskilled immigration leads to a relative expansion of the sector using unskilled labour relatively intensively, in line with the Rybczinski (1955) theorem.

For fixed levels of output, equilibrium between cost-minimising factor demands and changed labour endowments would imply wage changes. However these would lead to positive profits being earned in sectors using intensively labour types which become cheaper. Output in such sectors would be expected to expand driving back up wages and long run equilibrium would not be restored until wages were driven back to their initial levels.

Given the absence of wage effects, effects of immigration on the welfare of current workers of both types is dependent solely on the change in the tax rate required by government budget balance. From (3) follows

$$\mathrm{d} \ln t + \zeta_S \, \mathrm{d} \ln x_S + \zeta_U \, \mathrm{d} \ln x_U = \gamma \, \mathrm{d}\pi$$

where $\zeta_i = w_i x_i / \sum_{k \in I} w_k x^k$ is a share in labour income and $\gamma = \Gamma/G$ denotes relative publicly funded consumption of immigrants. Thus, noting that $\zeta_i = t w_i \phi_i / G$,

$$\frac{\mathrm{d} \ln t}{\mathrm{d}\pi} = \gamma - \frac{t}{G}(w_S \psi_S + w_U \psi_U)$$

which simply says that immigration is beneficial to current workers if and only if immigrants contribute more in labour taxes than they take out in consumption of government services. Note that if $\gamma = \beta_S = \beta_U = 1$ so that immigrants are identical to the current population in both skill composition and public service consumption then $\frac{\mathrm{d} \ln t}{\mathrm{d}\pi} = 0$ by

simple substitution from the government budget constraint. However if immigrants differ from the current population in either respect then there may still be positive or negative welfare effects. For a given public service consumption $\Gamma$, the perceived gain or loss depends on the allocation of immigrants to skill groups. If immigration is mainly skilled, contributions to the welfare system will be larger and immigration more favourable.

## One output good

We now consider the case where the economy is not able to react to immigration that differs in skill composition from the current labour force by adjusting the output mix. The simplest model to reflect insufficient flexibility is the one output model. This model is often used in the labour literature to motivate the way immigration may affect employment and wages (see, for example, Altonji and Card 1991 and Borjas 1994). In this model there will be employment- and wage effects whenever the immigrant population differs in skill mix from the current population.

In the one output case, we obtain the following system of equations determining output, unskilled and skilled wage changes in response to immigration:

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\begin{aligned}
\mathrm{d}\ln y_0 + \varepsilon_{SS}^0 \, \mathrm{d}\ln w_S + \varepsilon_{SU}^0 \, \mathrm{d}\ln w_U &= \mathrm{d}\ln x_S = \beta_S \, \mathrm{d}\pi \\
\mathrm{d}\ln y_0 + \varepsilon_{US}^0 \, \mathrm{d}\ln w_S + \varepsilon_{UU}^0 \, \mathrm{d}\ln w_U &= \mathrm{d}\ln x_U = \beta_U \, \mathrm{d}\pi \\
\theta_S^0 \, \mathrm{d}\ln w_S + \theta_U^0 \, \mathrm{d}\ln w_U &= 0
\end{aligned}
$$

where $\varepsilon_{ij}^0 = \partial \ln c_i^0 / \partial \ln w_j$ denotes a labour demand elasticity.

Hence, by substitution we obtain,

$$
\frac{\mathrm{d}\ln w_U}{\mathrm{d}\pi} = \frac{\beta_U - \beta_S}{\varepsilon_{UU}^0 - (\varepsilon_{SU}^0 + \frac{\theta_U^0}{\theta_S^0}\varepsilon_{US}^0) + \varepsilon_{SS}^0 \frac{\theta_U^0}{\theta_S^0}} \tag{5}
$$

$$
\frac{\mathrm{d}\ln w_S}{\mathrm{d}\pi} = -\frac{\theta_U^0}{\theta_S^0}\frac{d\ln w_U}{d\pi} \tag{6}
$$

It is immediately obvious from these two equations that in the case where immigrants resemble in their skill composition the resident labour force, we should again expect no wage effects, as $\beta_U = \beta_S$. Tax and welfare effects are therefore as in the two good case.

If however the skill mix differs then we should expect changes in wages (and output mix). Negativity of the denominator in (5) follows from concavity of the cost function[5] and therefore immigration should be expected to depress the wages of workers competing with the type relatively more abundant in immigrant labour and to raise the wages of the other labour type. For example, unskilled immigration therefore depresses unskilled wages and raises skilled wages. There are wage effects but they are not uniform and therefore also raise distributional issues.

At the margin, immigrating labour is paid the value of its marginal product and therefore the total remuneration of the existing workforce is unaffected - gains to one labour type exactly offset the losses of the other. However if we consider non-marginal immigration $\Delta\pi$ we need to appreciate that all immigrating labour is paid the marginal product of the last immigrant and the surplus thus generated on the labour of inframarginal immigrants accrues to owners of other factors (see Berry and Soligo 1969, Johnson and Stafford 1999). Total remuneration of workers already resident rises, albeit that some benefit and some lose - this is the so-called "immigration surplus".

Returning to the government budget constraint, we can infer

$$\frac{\mathrm{d}\ln t}{\mathrm{d}\pi} = \gamma - \frac{t}{G}\sum_{i\in I} w_i\left(\psi_i + \phi_i \frac{\mathrm{d}\ln w_i}{\mathrm{d}\pi}\right)$$

so that effects on the tax rate now require that we recognise the consequences of changes in the wage structure of current workers for tax receipts. Effects on welfare of the workers of

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[5]Note that

$$\varepsilon_{UU}^0 - \left(\varepsilon_{SU}^0 + \frac{\theta_U^0}{\theta_S^0}\varepsilon_{US}^0\right) + \varepsilon_{SS}^0\frac{\theta_U^0}{\theta_S^0} = \frac{w_U}{c_U^0}\left[c_{UU}^0 - 2\frac{c_U^0}{c_S^0}c_{SU}^0 + \left(\frac{c_U^0}{c_S^0}\right)^2 c_{SS}^0\right]$$

which is a positive multiple of a quadratic form in the second derivatives of the cost function and therefore negative.

the two types then follow from (4) and require weighing up labour market and government budget effects.

**Generalisations**

*Traded and non-traded goods, multiple factors, and immigrants' skill composition*

The nature of the solution in general depends upon a comparison between the numbers of goods produced and of labour types. The observations above can be generalised beyond the case of only two labour types and can also be extended to allow for nontraded goods[6]. What is at issue is the ability of the economy to respond to immigration through flexibility in its output mix. With sufficient number of traded goods there is no need for immigration to induce factor price changes - whatever the skill mix of immigrating labour - and welfare effects on current workers follow simply from a comparison of immigrants' tax contributions and consumption of public services.

The same is true, even with fewer output goods, if the skill mix in immigrant labour exactly matches that of the current workforce. However, if the skill mix of immigrant labour does differ, then a smaller number of traded goods means that there are insufficient degrees of freedom to accommodate changes in the skill mix through changes in the output mix and wage changes are therefore nonzero even in the long run. In this case workers of different types are likely to feel differently about the economic effects of immigration and a full evaluation of welfare effects on current workers of any labour type require that we weigh up tax and wage effects.

*Elastic labour supply*

In the analysis above, we have assumed that labour is completely inelastic. Hence, workers will supply labour at any wage, and immigration will not have employment effects. This,

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[6]The relevant algebra can be drawn from trade theory models - see Ethier (1984), Woodland (1982).

of course, can be extended by assuming that labour supply is elastic, so that some current workers will not be willing to work after immigration as wages fall below their reservation wages. By this mechanism reasoning about wage effects of migration can be supplemented with an analysis of voluntary employment responses in the already resident workforce. If unemployed workers can claim from the state then this might open up another mechanism through which tax rates could be affected by immigration.

*Disequilibrium*

The analysis offered so far has been based on assumptions of labour market equilibrium. If we allow for mechanisms preventing factor prices from reaching equilibrium then the effects of immigration will clearly differ. In such cases immigration may act as an alternative means of equilibration by increasing the relative supply of factors in excess demand (though it could also aggravate disequilibrium if tending to bring in factors in excess supply). Arguments about the benefits of migration as a means of, say, alleviating skill shortages could be conceptualised in this way.

**Effects on migrants and sending countries**

Effects of migration are plainly not confined to the residents of the host country. There are welfare consequences for both the migrants themselves and residents of the country that they leave.

To the extent that migration is voluntary and well-informed, it has to be assumed that migrants are better off as a consequence, either economically or in some other way. In economic terms in a model such as that above this could be in wage gains or in access to the public services of the host country.

Effects on residents of the sending country can be analysed in ways which mirror the discussion of the host country above. If the sending country is small, produces both goods and trades at world prices then we should also expect no effect on wages from emigration.

Analysis of general welfare effects requires that we make assumptions about sources of international wage differences. With no international technology differences and both goods produced, for example, trade in goods assures equalisation of factor prices without factor mobility whereas if productivity of different types of workers differs depending upon location then factor prices can differ internationally and labour movement will be correspondingly encouraged[7]. However, if only one good is produced, wages abroad and at home can be affected by labour movement and immigration creates an aggregate deficit in the sending country just as it creates a surplus in the receiving country. The impact on world welfare requires that we balance the loss in one country with the gain in the other and the gain to the migrants. If we assume that migrants move to the country where their labour type is better paid then it can be shown that the overall gain is positive - the world as a whole benefits from movement of labour to locations where it is best remunerated (see Berry and Soligo 1969, Ruffin 1984).

## 3    Empirical Implications

The analysis above provides some suggestions about the range of effects compatible with simple economic models. Individuals are likely to be aware of the overall patterns according to which economic processes determine effects of migration.[8] Below we focus attention on responses to a range of questions from the European Social Survey that are concerned specifically with economic impact. To the extent that answers to these questions are rationalisable in terms consistent with such economic theory the discussion above points to the sort of considerations that might underlie responses. These considerations can be thought of as falling into three types:

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[7]Trefler (1998) discusses welfare effects in such a model, and other cases, drawing attention to terms of trade effects that will occur where the economies are large.

[8]Of course, evaluation of the benefits and costs of immigration may also be motivated by considerations which are non-economic (see Dustmann and Preston 2004 for analysis of racial aspects to attitudes towards immigration).

**Labour market competition**

Firstly, immigration has the potential to alter labour market outcomes if the skill mix among immigrants is expected to differ from that of the current workforce. In our model these effects could arise if the economy reacts to changes in the skill mix through wage adjustments. If there are effects on wages then these will differ across skill groups and we should therefore expect awareness of such effects to differ across different skill groups. In particular, low skilled migration should be felt as threatening by low skilled residents. As we point out, with elastic labour supply, adjustment through wages may also induce unemployment - again being harmful for those who are in competition with immigrant labour. Furthermore, as we point out above, although the unskilled may be harmed, skilled labour will generally benefit, thus creating distributional effects. We should therefore also expect to find such considerations manifested in concerns about effects on the income distribution.

**Public finance burden**

Secondly, immigration can increase or alleviate tax burdens if immigrants are expected to differ from the current population either in skill mix or in propensity to consume public services. In particular, if immigrants are expected to consume more out of public services than residents, then this may be perceived as a possible disadvantage of the overall effects of migration. To the extent that the implied additional tax burdens fall more heavily on the rich then this may again be a source of difference in opinion across skill groups and income classes. Furthermore, any expected impact on unemployment may also be expected to feed through into concerns about public tax and welfare burdens: If immigration creates unemployment, it will increase the tax burden, thus harming the economically active in the resident workforce.

**Efficiency**

Immigration may be felt to enhance efficiency domestically by alleviating disequilibrium in factor markets, as our discussion above suggests. Also, for those with a broader perspective

the beneficial impact on world allocation of factor resources may be felt as an international efficiency gain. Notice that efficiency gains of this sort should be of potential benefit to all residents collectively and can be less clearly related to individual circumstances.

## 4   The European Social Survey

The data we use for our empirical analysis comes from the European Social Survey (ESS). The first wave of the ESS was conducted in fall 2002. The ESS interviews between about 1,200 and 3000 people in each of 22 countries, including all the countries then belonging to the EU, seven former Eastern European countries and Israel. Included in the first ESS is a topical module on attitudes toward immigrants and minorities. The module includes over 50 questions.[9]

A subset of these are specifically economic and address themselves to precisely the considerations alluded to in the theory above. We concentrate on seven questions and display means and standard deviations of these questions in Table 1[10].

The first question is an overall question on whether immigration is considered to be good or bad for the economy (*Overall*). In our analysis below, we seek to explain this question by more specific underlying economic concerns as addressed by the latter six questions. These relate to the underlying issues identified above.

The questions *Wage* and *Jobs* directly relate to concerns individuals may have about the labour market impact of migration - the first set of our empirical implications discussed above. The question *Poor* addresses directly distributional aspects and is also most plainly thought of in terms of labour market competition. As we have pointed out above immigration

[9]See Card, Dustmann and Preston 2006 for a more detailed description of the survey's immigration module.

[10]The variable names are chosen by us to reflect the earlier economic discussion rather than taken from the coding. We have reordered responses so that higher values indicate a more positive response to immigration for each question.

Table 1:

| Variable Name | Survey Question | Range of responses | Mean | Standard Deviation | |
|---|---|---|---|---|---|
| | | | | Total | Between Country |
| Overall | Immigration is good or bad for country's economy | 0: bad for the economy - 10: good for the economy | 4.98 | 2.37 | 0.65 |
| Wage | Average wages are generally brought down by immigrants | 1: agree strongly - 5:disagree strongly | 2.95 | 1.13 | 0.41 |
| Poor | Immigrants harm economic prospects of the poor more than the rich | 1: agree strongly - 5:disagree strongly | 2.69 | 1.09 | 0.34 |
| Jobs | Immigrants take jobs away in country or create new jobs | 0: take jobs away - 10: create new jobs | 4.54 | 2.24 | 0.81 |
| Tax | Immigrants take out more in services more than they put in through taxes | 0: generally take out more - 10: generally put in more | 4.24 | 2.23 | 0.50 |
| Fill | Immigrants help to fill jobs where there are shortages of workers | 1: disagree strongly - 5: agree strongly | 3.50 | 1.01 | 0.23 |
| Gain | All countries benefit if people can move where their skills are needed | 1: disagree strongly - 5: agree strongly | 3.73 | 0.90 | 0.14 |

may harm some, but will benefit others, even though typically generating an overall surplus for the receiving economy.

The question *Tax* directly addresses concerns individuals may have about the tax and public spending implications of immigration. Answers regarding *Jobs* and *Poor* because relevant also to distributional impacts which may feed through into taxation and government spending can also be thought relevant to public finance implications.

Finally, the last two questions (*Fill* and *Gain*) are statements primarily relating to efficiency aspects of migration - also discussed above. Because the filling of labour market vacancies may also affect wages of other workers, the question *Fill* may in addition relate to the labour market aspects of immigration.

The objective of the analysis below is to estimate a model that allows us to identify the relevance of these concerns to overall assessment of the impact of immigration on the economy as captured in responses to the first question. In order to do that, we impose a particular factor structure described below. We first describe the responses in more detail in the next section.

## 5    Descriptive Overview

In the following figures, we display the mean responses to the 7 questions we use for our analysis. The graphs plot the means of responses by age- and education group. We distinguish between 4 age groups (14-30, 31-45, 46-60, and above 60) and three education groups (low, intermediate and high education). Figure 1 displays group means for the general questions whether immigrants are good or bad for the economy. Responses differ clearly between education groups, with the low educated being less positive than the highly educated. There are only slight differences in responses across age groups.

Figures 2 displays responses to questions on wage- and employment effects. Again, the differences across educational categories are quite dramatic, with the low educated being much

Figure 1: Immigrants and the Economy



Immigrants bad/good for economy

| | Age 20–30 | Age 31–45 |
| Age 46–60 | Age > 60 | |
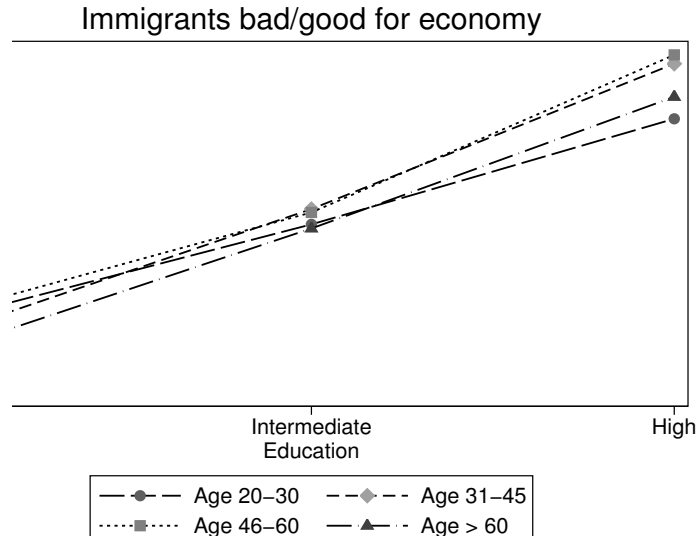
more inclined to assume negative wage- and employment effects than the highly educated. This is compatible with our model if immigration is perceived to be mainly unskilled.

Figures 3 display responses to questions regarding the effects of immigration on taxes and services (left panel) and distributional effects. Regarding taxes and welfare receipts, it is again the lower educated who are more concerned about immigrants being net recipients of the public finance system. Quite interesting are also the relatively large differences between the young and the old, with older respondents tending to be more sceptical about immigrants making a positive contribution.

Regarding distributional concerns, the differences in both age- and educational groups are clearly visible. The less educated seem to be more concerned about immigration imposing a larger burden on the poor - a view that is compatible with our model above in the case of unskilled immigration. While the three younger age groups seem to be quite similar in responses, it is the groups of the above 60 year olds that is most concerned about more harmful effects on the poor.

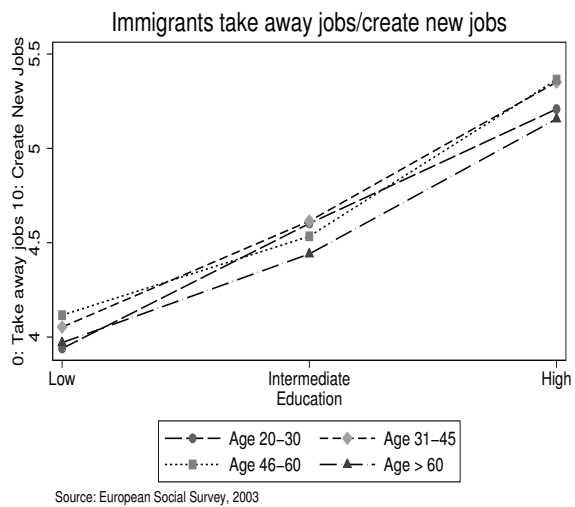Figure 4 displays responses to questions relating to efficiency aspects of migration. In the
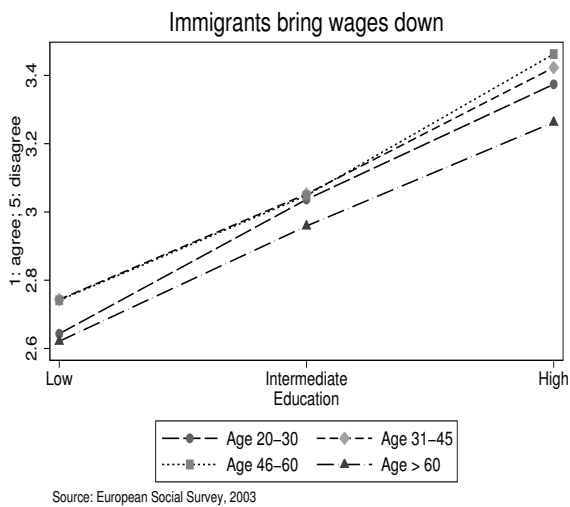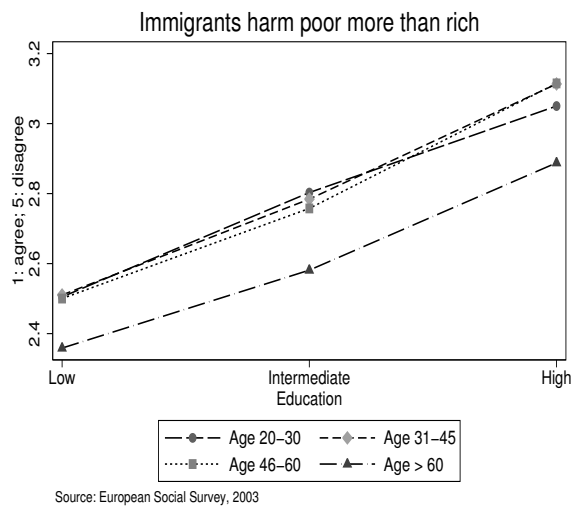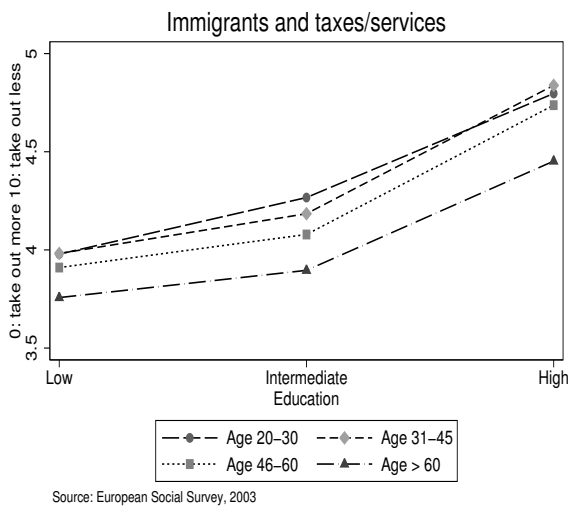
Figure 2: Wages and Jobs
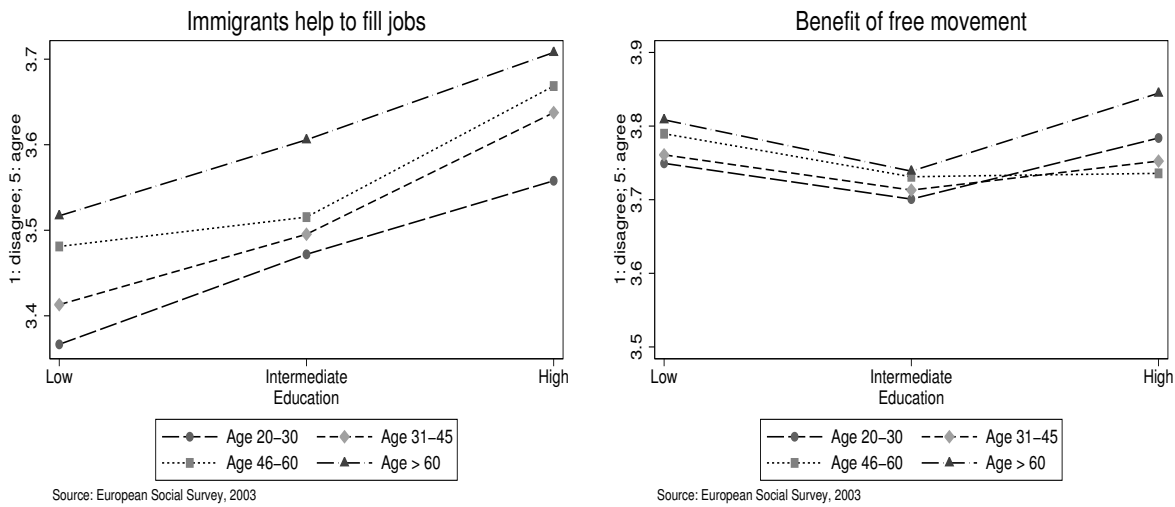


Figure 3: Taxes and Distribution

Figure 4: Efficiency

left panel, responses are displayed that relate to whether respondents believe that immigrants fill jobs where there are shortages, an argument that is often used as justification for more liberal migration policies. Responses differ again between educational categories, but there are also substantial differences across age groups, with older workers being more in agreement with immigrants filling jobs where there are shortages.[11] There is a clear ordering across age groups, with the youngest being most skeptical.

The right panel in figure 4 relates to overall assessment of the benefits of allowing workers to move where their skills are needed. In terms of our model, this should be welfare enhancing, and the majority of respondents are in agreement with that. Furthermore, there are no strong education patterns, as we observed in the previous responses, and small age differentials, with the older ones being more in agreement with beneficial effects from free movement than the younger ones.

Notice that the nature of our data (we only observe a cross section) does not allow us to distinguish between age- and cohort effects, so that the differences in responses across

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[11]As pointed out by a referee, one reason for this may be that immigrants are often employed in jobs related to care for the elderly.

different age groups may be either an age effects, or a cohort effect, or both.

Table 2: Variable Names and Descriptive Statistics

| Variable name | Proportion | Standard Deviation | |
|---|---|---|---|
| | | Total | Between countries |
| *Labour market status* | | | |
| Unemployed | 0.036 | 0.187 | 0.019 |
| Inactive | 0.020 | 0.140 | 0.011 |
| Retired | 0.208 | 0.406 | 0.041 |
| House work | 0.235 | 0.424 | 0.109 |
| Student | 0.106 | 0.308 | 0.047 |
| *Education* | | | |
| Secondary | 0.635 | 0.481 | 0.165 |
| Higher | 0.208 | 0.400 | 0.069 |
| *Immigrant status* | | | |
| Immigrant | 0.092 | 0.289 | 0.080 |
| Father immigrant | 0.136 | 0.343 | 0.145 |
| Mother immigrant | 0.132 | 0.339 | 0.139 |
| *Other* | | | |
| Male | 0.498 | 0.500 | 0.031 |
| Minority | 0.039 | 0.193 | 0.028 |
| City | 0.335 | 0.472 | 0.106 |
| Town | 0.297 | 0.457 | 0.089 |
| Variable name | Mean | Standard Deviation | |
| | | Total | Between countries |
| Age (in years) | 45.60 | 17.54 | 2.26 |

The participating countries in the ESS that are included in our sample are: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Luxembourg, Netherlands, Norway, Poland, Portugal, Slovenia, Spain, Sweden, Switzerland, United Kingdom

In our analysis below, we will associate each of these responses to a set of additional individual characteristics, over and above age and education. The variables we use are displayed in table 2.

# 6 The Econometric Model

Our empirical analysis attempts to relate the overall judgement of whether immigration is harmful or beneficial to three distinct underlying factors: labour market concerns, welfare concerns, and efficiency considerations. We assume that each of these underlying factors is related to a specific subset of survey questions. We explain in this section how our estimation method works.

Notice first that we consider all the outcomes we observe (denoted by $y_i$, $z_i$ and which are displayed in table 1) as discrete responses which relate to underlying continuous and latent variables $y_i^*$, $z_i^*$ in the following way:

$$y^* = f\Lambda + XA + u \tag{7}$$

$$z^* = fM + XB + v, \tag{8}$$

where $y^*$ is an $n \times 1$ vector of latent attitudinal responses to the question on overall economic effect of immigration for $n$ individuals (variable *Overall*), $z^*$ is an $n \times q$ matrix of latent attitudinal responses to the questions on specific economic effects and $X$ is an $n \times k$ matrix of observed characteristics. In our analysis these refer to those characteristics that we display in Table 2.

The matrix $f$ is an $n \times p$ matrix of factor scores capturing the $p$ underlying dimensions to economic concerns, $\Lambda$ is a $p \times 1$ vector of loadings reflecting the importance of these concerns to overall assessment of economic impact and $M$ is a $p \times q$ matrix which maps the factor scores into the opinions on specific effects.

Following our discussion above, we take $p = 3$ with factors corresponding to concerns about labour market competition, public finance burden and efficiency. The $n \times 1$ vector $u$ and $n \times q$ matrix $v$ contain disturbance terms assumed normally distributed and uncorrelated

with either $X$ or $f$ or each other so that

$$\begin{pmatrix} u \\ v \end{pmatrix} \sim N \left( \begin{pmatrix} 0 \\ 0 \end{pmatrix}, \begin{pmatrix} \Sigma_u & 0 \\ 0 & \Sigma_v \end{pmatrix} \right) \tag{9}$$

with $\Sigma_v$ diagonal.

The factors are themselves allowed to be influenced by the regressors $X$:

$$f = X C + w, \tag{10}$$

where $c$ is a $k \times p$ matrix of coefficients in the underlying lower dimensional model. We assume that $w \sim N(0, \Sigma_w)$ with $w$ is uncorrelated with $u$ and $v$. Notice that we do not need to assume diagonality of $\Sigma_w$.

This structure implies an estimable reduced form, which can easily be obtained by substitution. Let $Y^*$ denote the stacked vector of latent responses, $Y^* = \begin{pmatrix} y* \\ z* \end{pmatrix}$. We then obtain

$$Y^* = X \Gamma + \epsilon, \tag{11}$$

where

$$\Gamma = C \begin{pmatrix} \Lambda \\ M \end{pmatrix} + \begin{pmatrix} A \\ B \end{pmatrix} \tag{12}$$

is the $(1 + q) \times k$ matrix of reduced form coefficients and

$$\epsilon = w \begin{pmatrix} \Lambda \\ M \end{pmatrix} + \begin{pmatrix} u \\ v \end{pmatrix}. \tag{13}$$

Then $\epsilon \sim N(0, \Sigma_\epsilon)$, where

$$\Sigma_\epsilon = \begin{pmatrix} \Sigma_u + \Lambda' \Sigma_w \Lambda & \Lambda' \Sigma_w M \\ M' \Sigma_w \Lambda & \Sigma_v + M' \Sigma_w M \end{pmatrix} \equiv \begin{pmatrix} \Sigma_{11} & \Sigma_{12} \\ \Sigma'_{12} & \Sigma_{22} \end{pmatrix} \tag{14}$$

is the $(q + 1) \times (q + 1)$ variance-covariance matrix of the reduced form residuals.

In implementing this it is the restrictions placed on $M$ which are crucial to identification. We assume each factor to load solely on strict subsets of $z^*$. In this we are guided by the core idea that the variables *Wage* and *Poor* are the most relevant for the labour market competition factor, it Jobs and *Tax* for the public burden factor, and *Fill* and *Gain* for the efficiency factor. We have estimated a specification allowing only for these loadings - which is to say with block diagonal $M$ - but also other specifications allowing for a certain overlap. Results are qualitatively robust across these specifications. The results we present below are based on the following relatively permissive specification as suggested by the discussion in Section 4:

- the first factor, reflecting labour market competition, loads solely on the responses *Wages*, *Poor*, *Jobs* and *Fill*.

- the second factor, reflecting public finance burden, loads solely on the responses *Poor*, *Jobs* and *Tax*

- the third factor, reflecting efficiency, loads solely on the responses *Fill* and *Gain*.

## Estimation

We proceed to estimate the model in several stages. Firstly we estimate the reduced form parameters of the model in 11, consisting of the matrix $\Gamma$ and the covariance matrix $\Sigma_\epsilon$, without imposing the restrictions in 12 and 14. We estimate $\Gamma$ by independent ordered probit estimation for the seven responses. We then estimate $\Sigma_\epsilon$ by a series of pairwise bivariate ordered probits fixing the value of $\Gamma$ at their estimated values. Results are reported in Tables 3 and 6 (the latter in the Appendix), and we discuss them in section 7.1 below.

These unrestricted latent covariance estimates allow us to form unrestricted estimates of the implied regression coefficients linking the latent responses $\frac{\partial E(y^*|z^*,X)}{\partial z^*} = \Sigma_{22}^{-1}\Sigma_{12}$. In other words, we derive the parameter estimates we would obtain if we regressed the latent underlying variable of the overall assessment of whether migration is good or bad on the latent

six other more specific responses, conditional on all the regressors included in the matrix $X$. These are reported in Table 4 and we discuss them in section 7.2 below.

We can now impose the additional restrictions in (14), implied by our factor structure on the model. We impose these restrictions by equally weighted minimum distance estimation on the reduced form parameters to identify the parameters in $\Lambda$, $M$ and $\Sigma_w$.

Tests of overidentifying restrictions are calculated using formulae from Newey (1985). The present results in Table 5 and discuss them in section 7.3.[12].

# 7  Empirical Results

## 7.1  Unrestricted ordered probit estimates

In table 3 we display results from the independent ordered probit models. We distinguish between four sets of regressors: The individual's labour market status, education, immigrant status, and other variables, including age, gender, minority affiliation, and urbanisation. In all our regressions we condition on country dummies. The reference category is a native-born rural majority female in paid work without secondary education and with native parents. All responses are normalised in such a way that a positive number indicates a more optimistic view about a particular outcome.

The first pair of columns shows results for the overall assessment of whether immigration is bad or good for the economy and respective t-ratios. The labour market status variables suggest that individuals in paid work or students have an overall more optimistic view about the impact of immigration than the unemployed. This is similar for questions relating to

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[12]For full details of how we calculate standard errors and test statistics we refer the reader to Dustmann and Preston (2004). We draw on the work of Muthén (1984). Note though that identification of parameters in this particular model is subtler than in that paper - in particular the parameters of $M$ are not identified in the current context solely from restrictions on $\Sigma_{22}$ although all parameters of $\Lambda$, $M$ and $\Sigma_w$ are identified from imposition of restrictions jointly on $\Sigma_{12}$ and $\Sigma_{22}$.

labour market competition and public burden, but the relationship seems unclear for some of the efficiency questions.

Not surprisingly, immigrants have not only a more positive view about the overall effect of immigration than natives (immigrants are in the reference group), but evaluate also the impact of migration on other concerns more positively. Interestingly, an optimistic view seems to be stronger even among second generation immigrants.

The partial regression coefficients on the educational dummies are much in line with our descriptive graphs above. Higher education is associated with a more optimistic view on migration, and the coefficient estimates are highly significant. This interpretation extends to all the questions in the table, with the weakest association between education and gains from free movement (last column) - as in the figures above.

Age effects differ across responses. This again is in line with our descriptive charts in section 5. Individuals in more densely populated areas have a more optimistic opinion about the overall effects of immigration throughout.

## 7.2 Latent response regressions

In table 4 we display estimates of the implied regression coefficients as calculated from the estimated residual covariance matrix. These are unrestricted estimates of the derivative of the conditional expectation $E(y^*|z^*, X)$ with respect to the latent variables in $z^*$. Notice that normalisation of the variances in the first step estimation implies that estimates are interpretable as the impact of a one standard error change in the respective latent regressor on the latent overall assessment of whether immigration is good or bad, itself expressed in standard errors.[13]

All coefficient estimates are significant. The results suggest that tax and job concerns have the largest impact on the overall assessment of immigration, while the wage and distributional

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[13]The residual correlation matrix on which these results are based is presented in the appendix (Table 6).

Table 3: Perceived Economic Impact

| Variable | Overall | | Wages | | Poor | | Jobs | | Tax | | Fill | | Gain | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Coeff | t-ratio | Coeff | t-ratio | Coeff | t-ratio | Coeff | t-ratio | Coeff | t-ratio | Coeff | t-ratio | Coeff | t-ratio |
| *Labour market status* | | | | | | | | | | | | | | |
| Unemployed | -0.140 | -4.76 | -0.199 | -6.61 | -0.205 | -6.70 | -0.223 | -7.71 | -0.130 | -4.42 | -0.087 | -2.93 | 0.007 | 0.22 |
| Inactive | -0.071 | -1.81 | -0.092 | -2.30 | -0.101 | -2.44 | -0.061 | -1.60 | -0.082 | -2.05 | -0.034 | -0.83 | -0.048 | -1.14 |
| Retired | -0.010 | -0.48 | -0.056 | -2.50 | -0.058 | -2.60 | -0.005 | -0.24 | -0.007 | -0.31 | -0.005 | -0.23 | 0.025 | 1.10 |
| House work | -0.004 | -0.29 | -0.020 | -1.26 | -0.010 | -0.61 | -0.012 | -0.77 | 0.007 | 0.49 | 0.024 | 1.47 | 0.014 | 0.90 |
| Student | 0.260 | 11.08 | 0.169 | 6.91 | 0.131 | 5.44 | 0.193 | 8.30 | 0.187 | 7.89 | 0.123 | 4.97 | 0.060 | 2.49 |
| *Education* | | | | | | | | | | | | | | |
| Secondary | 0.224 | 15.96 | 0.194 | 13.25 | 0.176 | 11.90 | 0.159 | 11.42 | 0.124 | 8.79 | 0.035 | 2.40 | 0.030 | 1.95 |
| Higher | 0.349 | 21.39 | 0.341 | 20.25 | 0.288 | 17.38 | 0.264 | 15.73 | 0.232 | 14.16 | 0.145 | 8.27 | 0.019 | 1.14 |
| *Immigrant status* | | | | | | | | | | | | | | |
| Immigrant | 0.281 | 11.52 | 0.077 | 2.83 | 0.142 | 5.17 | 0.320 | 13.30 | 0.260 | 10.34 | 0.114 | 4.09 | 0.074 | 2.57 |
| Father immigrant | 0.114 | 4.50 | 0.074 | 2.70 | 0.061 | 2.23 | 0.060 | 2.36 | 0.139 | 5.41 | -0.020 | -0.71 | 0.096 | 3.45 |
| Mother immigrant | 0.181 | 6.91 | 0.104 | 3.74 | 0.147 | 5.20 | 0.184 | 7.07 | 0.134 | 5.07 | 0.132 | 4.68 | 0.009 | 0.31 |
| *Other* | | | | | | | | | | | | | | |
| Age/10 | 0.074 | 3.68 | 0.067 | 3.22 | -0.024 | -1.15 | 0.000 | 0.01 | -0.008 | -0.40 | 0.026 | 1.23 | 0.040 | 1.88 |
| $Age^2/100$ | -0.006 | -2.98 | -0.007 | -3.21 | -0.001 | -0.24 | 0.000 | 0.09 | -0.001 | -0.37 | 0.001 | 0.36 | -0.002 | -1.02 |
| Male | 0.137 | 11.35 | -0.054 | -4.29 | -0.005 | -0.40 | 0.019 | 1.60 | 0.027 | 2.20 | 0.018 | 1.44 | 0.015 | 1.20 |
| Minority | -0.070 | -2.56 | -0.105 | -3.59 | -0.049 | -1.68 | 0.001 | 0.03 | 0.051 | 1.81 | 0.072 | 2.46 | 0.069 | 2.29 |
| City | 0.125 | 8.68 | 0.023 | 1.57 | 0.004 | 0.27 | 0.055 | 3.79 | 0.069 | 4.80 | 0.056 | 3.68 | 0.034 | 2.22 |
| Town | 0.059 | 3.99 | 0.033 | 2.20 | 0.020 | 1.31 | 0.014 | 0.95 | 0.055 | 3.71 | 0.014 | 0.90 | 0.039 | 2.54 |
| Sample size | | | | | | | 31822 | | | | | | | |

Note: All ordered probit estimates. Country dummies included in all cases

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aspects are considerably weaker as are perceptions about general welfare gains of immigration.

Table 4: Implied Latent Regression Coefficients

| Variable | Coeff | t-ratio |
|---:|:---:|:---:|
| Wage | 0.0813 | 12.70 |
| Poor | 0.0810 | 12.12 |
| Jobs | 0.2901 | 44.03 |
| Tax | 0.3336 | 54.36 |
| Fill | 0.1027 | 21.81 |
| Gain | 0.0605 | 13.04 |
| Sample size | 31822 | |

## 7.3 Three factor model

We now turn to analysis where we structure the pattern of responses according to the three factor model outlined above, each factor being allowed to be associated with the variable *Overall*. In table 5 we report estimated loadings of the factors on the indicator questions ($M$ matrix) and the vector of factor loadings on the overall assessment question ($\Lambda$ vector) which we obtain by imposing the restrictions in (14) on our estimated reduced form coefficients. Estimates in this table are obtained without imposing any restrictions on the $\Sigma_w$ matrix which determines the correlation between the factors.

Results on the $M$ matrix (displayed in the upper panel of the table) show well determined coefficients in all parts of the matrix. Three of the variables are allowed to enter into more than one factor - namely the *Poor*, *Jobs* and *Fill* variables. While there is evidence in each case of loading on more than one factor, the association is in each case much stronger with a particular one of them.

The estimates on $\Lambda$ are displayed in the second panel of the table. They appear to suggest the strongest role for fears about public finance burden, and a lower, but still significant role for efficiency considerations. There seems to be no evidence of importance for labour market competition. This may seem strange, given that the estimates in Table 4 in the previous

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Table 5: Three Factor Model

$M$ matrix

| Variable | Labour Market Competition | | Public Burden | | Efficiency | | $\Sigma_v$ |
|---|---|---|---|---|---|---|---|
| | Coeff | t-ratio | Coeff | t-ratio | Coeff | t-ratio | |
| Wage | 0.784 | 28.61 | - | - | - | - | 0.386 |
| Poor | 0.651 | 17.93 | 0.132 | 4.43 | - | - | 0.478 |
| Jobs | 0.098 | 9.69 | 0.638 | 75.62 | - | - | 0.525 |
| Tax | - | - | 0.669 | 120.23 | - | - | 0.553 |
| Fill | -0.052 | -3.57 | - | - | 0.579 | 37.31 | 0.677 |
| Gain | - | - | - | - | 0.334 | 37.27 | 0.889 |

$\Lambda$ matrix

| Variable | Labour Market Competition | | Public Burden | | Efficiency | | $\Sigma_u$ |
|---|---|---|---|---|---|---|---|
| | Coeff | t-ratio | Coeff | t-ratio | Coeff | t-ratio | |
| Overall | 0.021 | 1.89 | 0.728 | 55.78 | 0.080 | 6.70 | 0.388 |

$\Sigma_w$ matrix

| Variable | Labour Market Competition | | Public Burden | | Efficiency | |
|---|---|---|---|---|---|---|
| Labour Market Competition | 1.000 | - | 0.468 | 23.68 | 0.238 | 10.52 |
| Public Burden | 0.468 | 23.68 | 1.000 | - | 0.514 | 37.34 |
| Efficiency | 0.238 | 10.52 | 0.514 | 37.34 | 1.000 | - |

Overidentifying restrictions: $\chi_5^2 = 125.596$

section do suggest a strong association. Notice however that we allow in our specification the different factors to be correlated, and our estimates suggest strong well determined positive correlations across factors (as seen in the $\Sigma_w$ matrix). The results therefore suggest that the variation in the public burden factor absorbs most of the variation in the labour market factor in explaining the overall assessment of whether migration is good or bad.

This is an interesting result. In the strict interpretation of the model we have sketched above and to the extent that our identification of factors is plausible, this tends to suggest that the perception of possible harmful effects of immigration may be less associated with labour market competition than with worries about immigrants being a fiscal burden on the overall economic system. This is to some extent compatible with apparently contradictory results of previous empirical studies who, although establishing a strong link between education and general opposition to further immigration, did not find evidence for tense local labour markets (represented by local unemployment) being significantly associated with such responses.

We should note that the overidentifying restrictions imposed by the model are rejected by the data, as clearly evidenced by the $\chi^2_5$ value of 125.596. However the model may not be badly misspecified when we consider the very large sample size and the possibly questionable auxiliary assumptions of linearity and normality. The uniqueness statistic of 0.388 in the $\Sigma_u$ column shows that the factor structure is capable of accounting for over 60% of the variation in the overall opinion.

If we estimate a model which does not permit correlation between the three factors, restricting the off diagonal elements of $\Sigma_w$ to be zero, we do find a much stronger association between the overall evaluation and the labour market competition factor. Results of that model are displayed in Table 7 in the Appendix. However the massive increase in the $\chi^2$ statistic suggests strong reason to reject the implied orthogonalisation of the factor structure.

One conclusion to be drawn from this analysis is that strict interpretation of attitudinal responses within a labour competition context may be misleading and that there are other economic concerns that may be more prominently determining an overall opinion about the

costs and benefits of immigration.

# 8   Summary and Conclusions

In this paper we provide analysis of individual perceptions about the effects of immigration on the host country's economy. Our paper contributes to a large and growing literature that tries to understand the particular concerns that drive residents' attitudes towards immigration. We contribute to this literature by broadening the economic argument, allowing for consideration not only of factors relating to labour market competition, but also of factors relating to public burden and efficiency considerations. We provide a theoretical discussion that takes a broader view on the channels of welfare effects than much of the previous literature. We present empirical investigation based on more specific survey responses than have been used previously, studying the response to whether immigration is considered as good or bad for the economy as being determined by three more specific concerns: labour market competition, public burden, and efficiency considerations. Identification of these responses is based on specific survey questions that are directly related to each of these factors.

Our analysis yields a set of interesting results. First, our theoretical model suggests that economic self interest points to an assessment of the benefits and costs from immigration that encompasses not only labor market competition, but also taxes and public burden, as well as general welfare effects determined by efficiency considerations. Interpretations that focus solely on the competition aspect seem therefore quite narrow. Our empirical analysis supports findings in much of the previous literature of a strong relationship between education and more positive attitudes towards various issues relating to migration. We also find that the particular questions that focus on very particular concerns are all strongly related to the overall assessment of migration.

When we impose a particular factor structure on the data, we find that concerns regarding economic competition are largely represented by overall concerns regarding public burden.

This is an interesting finding which does not dispute the importance of economic concern in the determination and formation of attitudes and opinion about benefits and costs of migration, but the narrow interpretation within a labour market competition framework.

By no means do we wish to imply that we have exploited the entire range of factors that affect assessment of costs and benefits of migration. We have concentrated here on some factors that are rationalisable within economic models, broadening the perspective of such analysis. However, we strongly believe that opinions on cultural effects and racial tolerance may be equally germane to responses on the overall desirability of immigration. Evidence provided by Dustmann and Preston (2004) supports this conjecture which we are exploring in greater depth using ESS data.

We believe that research into this area is important and that the recent effort undertaken by economists in understanding various attitudes related to immigration and immigrants is most welcome. However, we also believe that the complexity of the processes that contribute to attitude formation requires approaches over and above sole economic argument. We have only just started to understand data regularities and evidence in this important area of research.

# 9 Appendix

Table 6: Residual Correlation Matrix

| Variable | Overall | Wage | Poor | Jobs | Tax | Fill | Gain |
|---|---|---|---|---|---|---|---|
| Overall | 1.000 | 0.306 | 0.342 | 0.524 | 0.532 | 0.242 | 0.160 |
| Wage | 0.306 | 1.000 | 0.559 | 0.310 | 0.237 | 0.065 | 0.069 |
| Poor | 0.342 | 0.559 | 1.000 | 0.352 | 0.301 | 0.091 | 0.065 |
| Jobs | 0.524 | 0.310 | 0.352 | 1.000 | 0.455 | 0.207 | 0.125 |
| Tax | 0.532 | 0.237 | 0.301 | 0.455 | 1.000 | 0.165 | 0.099 |
| Fill | 0.242 | 0.065 | 0.091 | 0.207 | 0.165 | 1.000 | 0.189 |
| Gain | 0.160 | 0.069 | 0.065 | 0.125 | 0.099 | 0.189 | 1.000 |
| Sample size | 31822 | | | | | | |

Note: Pairwise bivariate ordered probit estimates. Country dummies included in all cases

Table 7: Three Factor Model

$M$ matrix

| Variable | Labour Market Competition | | Public Burden | | Efficiency | | $\Sigma_v$ |
|---|---|---|---|---|---|---|---|
| | Coeff | t-ratio | Coeff | t-ratio | Coeff | t-ratio | |
| Wage | 0.939 | 61.79 | - | - | - | - | 0.119 |
| Poor | 0.573 | 65.16 | 0.307 | 45.56 | - | - | 0.578 |
| Jobs | 0.350 | 48.34 | 0.577 | 93.87 | - | - | 0.544 |
| Tax | - | - | 0.818 | 94.86 | - | - | 0.332 |
| Fill | 0.139 | 22.67 | - | - | 0.484 | 42.20 | 0.747 |
| Gain | - | - | - | - | 0.391 | 38.20 | 0.847 |

$\Lambda$ matrix

| Variable | Labour Market Competition | | Public Burden | | Efficiency | | $\Sigma_u$ |
|---|---|---|---|---|---|---|---|
| | Coeff | t-ratio | Coeff | t-ratio | Coeff | t-ratio | |
| Overall | 0.313 | 43.18 | 0.661 | 98.71 | 0.410 | 40.96 | 0.297 |

$\Sigma_w$ matrix

| Variable | Labour Market Competition | | Public Burden | | Efficiency | |
|---|---|---|---|---|---|---|
| Labour Market Competition | 1.000 | 1.00 | - | - | - | - |
| Public Burden | - | - | 1.000 | 1.00 | - | - |
| Efficiency | - | - | - | - | 1.000 | 1.00 |

Overidentifying restrictions: $\chi^2_8 = 3998.698$

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