

# **Economic Determinants of Attitudes towards Non - Traditional Immigrants in a Non - Traditional Immigration Country**

First Draft

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## Abstract

This article offers an investigation of the determinants of attitudes towards immigrants. Theoretically, the formation of attitudes is related to two economic factors: feeling of relative deprivation and labour market considerations. Methodologically, endogeneity of these factors is explored within the trivariate probit framework. Empirically, the research employs two data sets: a survey of natives of Ukraine, and a survey of immigrants to Ukraine, using the opinions of immigrants as instruments for the opinions of natives. The fact that the data were collected in Ukraine presents an interest in itself, allowing to shed light on the peculiarities of the formation of attitudes in a country, which is new to immigration, and to better understand its possible future immigration policies. The major findings are that attitudes towards immigrants are determined by such factors as the perceived relative deprivation of the natives and labour market fears.

Keywords: immigration attitudes, migration sentiment, relative deprivation, labour concerns, triprobit, principal components analysis.

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## Introduction

While western societies have a long-lasting academic, political, and social debate over the immigrants' impact upon labor markets, welfare state, political and social relations, these issues are still relatively new for the citizens of Ukraine. This article offers an investigation of the determinants of attitudes towards immigrants from Asia and Africa in the capital of Ukraine, Kyiv.

The paper contributes to the existing literature on the attitudes of native populations towards immigrants in the following way. First, it offers an investigation into how two economic factors - relative deprivation and labour market considerations - influence the attitudes towards immigrants. Second, the methodological novelty is to view these factors as endogenous to attitudes, and to treat them within the instrumental variables (specifically, trivariate probit) framework. In addition, the empirical peculiarity is that the research builds up on the data of two surveys – a survey of natives and a survey of both legal and illegal immigrants, allowing to incorporate more objective information regarding economic disparities between these two population groups. Both surveys were conducted in 2000-2001 in the capital of Ukraine by the Kennan Institute Kyiv Project of the Woodrow Wilson International Centre for Scholars.

An investigation of attitudes towards immigrants in Ukraine also presents an interest in itself, as it is placed in a context of a non-traditional immigration country towards non-traditional migrants<sup>1</sup>. We speak of Ukraine as a non-traditional immigration country in a sense that it is a large emigration country and most often is studied as such. At the same time, the immigrants that it receives come, in majority, from the neighbouring ex-Soviet republics. In this sense, African and Asian migrants who started recently appearing in the country are non-traditional migrants for a country like Ukraine.

Understanding the determinants of attitudes towards immigrants in a country, which finds itself on a relatively early stage of its immigration history, may prove useful in understanding the evolution of the attitudes to the stage at which they currently are in countries with longer immigration histories. More importantly, the results of this research may help predict future voting behaviour in Ukraine. Furthermore, since immigration is a new phenomenon in Ukraine, and there are very few institutional mechanisms to regulate or control it, understanding the attitudes towards migrants may be important for designing a suitable immigration policy (Zimmermann, 2000).

The past decade has witnessed an upsurge of interest in analyzing the determinants of attitudes towards migrants. Previous empirical and theoretical research has shown that attitudes towards immigrants are strongly determined by sociological and psychological factors, such as racism and xenophobia, but also by the way the natives perceive the impact of the immigrants on the economy.

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<sup>1</sup> The term “non-traditional immigrants” was coined by Braichevska et al (2004).

Hatton and Williamson (2004) document an increasing negative public opinion towards immigrants as a result of the economic threats in 1890th in North America and in contemporary European countries. Dustmann and Preston (2000) disentangle three major factors that underlie the attitudes towards migrants: racial prejudice, labour market fears, and welfare concerns. According to them, while racial prejudice is the strongest factor responsible for the formation of negative attitudes towards immigrants, labour market considerations (primarily among the skilled and educated) and the concerns of the use of the welfare system also play a role. In their 2001 article, Dustmann and Preston also show the importance of the position of individuals in the income distribution in the formation of the attitudes. Likewise, Gang et al (2001) find that ethnic or racial prejudice negatively affect the attitudes of natives, and being a labor market competitor, currently or in the past, plays a significant role in explaining negative sentiment towards foreigners. In his turn, Zimmermann (2000) also finds that natives in countries that receive mostly economic immigrants are more concerned about their impact on unemployment rates than in countries receiving non-economic immigrants.

At the same time, the evidence of the real impact of immigrants on the labor markets is ambiguous. Borjas (2003) finds that “immigration has indeed harmed the employment opportunities of competing native workers”. In contrast, Ortega (2000) theoretically shows how immigration may have positive employment effects. Others (Zimmerman (1994a), Gang et al (2001)) suggest that there is no or little impact of immigration on employment opportunities of natives. Friedberg and Hunt (1995) offer a literature survey on the labor market effects of immigration and conclude that both empirical and theoretical research on this question gives contradictory answers. Depending on the underlying assumptions of a model (closed or open economy; complementarity or substitutability of the immigrant labor force as of a production factor, to name a few), immigration will have different effects on the labor markets.

In this context, it is apparent that it is the perceived, subjective, rather than objective, economic threat that plays a role in the formation of attitudes. Public fears of the labor market competition, for example, may lead to persistent stereotyping and negative perceptions of immigrants.

However realistic or unrealistic these sentiments may be, it is important to understand them because in the democratic states they determine political action and governmental policies, reflecting the individual preference of voters (O’Rourke and Sinnott, 2004). In words of Friedberg and Hunt (1995), “In Europe, for example, support has risen in recent years for virulently anti-immigrant political parties, such as the National Front in France, the National Alliance in Italy, and the Republikaner in Germany” (p.24). Hatton and Williamson (2002), too, are convinced that the voter attitude is influenced by the economic conditions and the quality of the immigrants that change.

The main focus of this paper is on the economic determinants of attitudes towards immigrants. In particular, the attention is paid to two factors: the perceived difference between natives and immigrants in material status and the perceived difference in chances to find a job. An important aspect of these two economic characteristics is that they are subjective, rather than objective determinants. We argue that since the attitudes

are formed subjectively and individually, what matters in their formation is the perception of the economic characteristics and differences of natives and immigrants, rather than the real characteristics and differences.

The perceived difference between natives and immigrants in material status is treated in the framework of the relative deprivation theory. The motivation behind this choice is that the theory of relative deprivation is based on inter-group comparisons (natives versus immigrants), and involves subjective feelings, perceptions, rather than objective income position. In this article we make one step further: while relative deprivation theory asks how an individual feels about his or her situation by making a comparison with the situation of others, here we would like to ask how an individual feels about others, once having made a comparison of his/her and their situation and once having assessed the degree of his/her deprivation or gratification.

Links between attitudes to the feelings of deprivation are widely researched in the field of psychology. For example, Pettigrew (2002) constructs a model that explains the determinants of blatant prejudice. Using Eurobarometer 1988 data, he finds that, after accounting for relative deprivation, there is no direct impact of family income or subjective social class on prejudice.

Another reason for choosing the relative deprivation framework is that it allows distinguishing between the feelings of individual and group deprivation. It has been proven that feelings of group, rather than relative deprivation are a better predictor of collective actions, and are more linked to the promotion of social change, than personal relative deprivation (Tougas F. and Beaton A., 2002). Moreover, group deprivation can lead to political protest and active attempts to change the social system (Smith et al, 2002; Pettigrew, 1964) - something that we want to consider when predicting the voters' behaviour and formation of the immigration policy.

In what follows, we assess the role of these two economic variables in determining the natives' answers to a set of attitudinal questions that are believed to reveal true attitudes towards immigrants. We argue that the variables of our interest can be potentially endogenous, and treat them as such. The endogeneity stems from the fact that it is difficult to differentiate whether the labour fears and the feelings of relative deprivation lead to the negative attitudes towards migrants, or the negative attitudes enhance the labour fears and aggravate the perceptions of income differences. To tackle the endogeneity problem, we employ a set of instruments that is formed from another survey, a survey of immigrants, and reflects the perceived differences in material status and in chances to find a job from the point of view of immigrants, rather than natives. In our view, instrumenting the opinions of natives with the opinions of immigrants provides a more objective information of the disparities in material status and in working opportunities.

We build an econometric model consisting of three equations: determinants of attitudes, relative deprivation, and labour market concerns. The model is estimate separately for each of the attitudinal questions. The estimation is based on the GNK simulator and is carried out within a trivariate probit framework. Our major finding are that the economic

variables of interest do play a significant role in determining that attitudes towards immigrants. Other factors, such as age, education, and residing in a city for less than 5 years also play a role. For a robustness check, we employ a principal components analysis to reduce the number of attitudinal questions.

The paper is organized as follows.

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## **A Brief Overview of the Immigration Situation in Kyiv**

Despite the fact that Kyiv has been long considered to be a multinational city<sup>2</sup>, the issue of attitudes towards migrants from African and Asian countries is relatively new for its natives.

During the Soviet times, a large majority of migrants arrived to Kyiv from other regions of Ukraine and of the Soviet Union, accounting for 55% of its residents by the year 1989 (Braichevska et al, p.7). Foreigners from other countries were coming mainly within the frameworks of student and working arrangements between the Soviet Union and countries with pro-Soviet orientation, and were supposed to return to their home countries at the end of the programs.

It was not until the independence in 1991 that Ukraine has witnessed an influx of other, new, categories of migrants, such as workers, refugees, asylum seekers, illegal migrants, from countries not traditional to Ukraine. Braichevska et al (2004) distinguish three periods of immigration from Asia and Africa to Kyiv: before 1991, between 1991 and 1998, and after 1999.

Immigrants that arrived to Kyiv before 1991 account for approximately one fifth of all immigrants of the city. Primarily, they came as students or workers under the agreements between their countries and the Soviet Ukraine, and have stayed after the collapse of the Soviet Union.

The majority of immigrants arrived to Kyiv between 1991 and 1998. Three main reasons account for this increased inflow. First, the research shows that most of the immigrants came to Ukraine legally in search of employment and better living conditions. Regardless of the economic hardships of the first years of independence, the market reforms and the democratization of civic life made Ukraine attractive for immigrants from Asia and Africa.

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<sup>2</sup> The 2001 census shows that the largest nation groups living in Kyiv were Ukrainians (82.2%), Russians (13.1%), Jews (0.7%), Belorussians (0,6%), Poles (0,3%), and Armenians (0,2%).

*Source:* State Statistics Committee of Ukraine

Second, after the collapse of the Soviet Union, Ukraine found itself with a deteriorated border protection. This was due to the fact that internal borders between the Soviet republics were administrative, and non-protected. Immediately after the independence, eastern and northern borders of Ukraine remained open for foreigners. Delays in creation of the proper border controls, as well as deficiencies in the legislative framework, in the immigration policy and in visa regimes allowed many foreigners to take advantage of the situation. It is in this period that Ukraine has also become a large transit point for immigrants from Asia and Africa, mainly on their way to other European countries (Malynovsky, 2000).

Finally, the influx of immigrants to Ukraine was also related to external political factors. For example, political processes in Afghanistan, the new regimes of the Mujahiddin and the Taliban, did not favor its citizens who previously studied or worked in the Soviet Union. As a result, many former Afgan students stayed in Kyiv after completing their studies, and many more left Afganistan and returned to Ukraine as refugees. Among them there were not only functionaries and specialists previously trained in Ukraine or those who supported the communist regime, but also businessmen and families with socially active females (Braichevska et al, p.17). At the same time, military conflicts in Africa (Mozambique, Ethiopia, Angola and Congo) led to the outflow of refugees who were trying to reach Western European countries. Many of them turned to traffickers who used Ukraine as a transitory point on the way to Western Europe. Having not reached Western European countries, some of them finally settled in Kyiv.

The period of immigration to Ukraine that started after 1999 is characterized by a decreased inflow of foreigners, mainly due to significant improvements in the border controls, a new visa regime, and policies against illegal immigration. By the year 2001, approximately 15,000 immigrants from Asian and African countries were permanently residing in Kyiv, accounting for 0.6% of the total population of the city<sup>3</sup>.

In these new and changing circumstances, Ukrainians experience a formation of an entirely new type of interpersonal relations with migrants, as well as a formation of a set of complex attitudes towards them. However, to date, the public opinion about immigrants is being formed by occasional anecdotal evidence from the media, while the governmental policy is still random, and the social discourse on this topic is scarce. In many instances, the attitudes of natives towards immigrants are formed on the basis of occasional personal contacts, but mostly on the basis of rumors and stereotypes. The survey data show that the majority of the respondents do not have an informed opinion on the number of immigrants in Kyiv and their characteristics, and many have never had an experience of dealing with immigrants. It seems important to understand what drives these initial sentiments towards immigrants, so that an appropriate governmental migration policy could be developed in the future.

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<sup>3</sup> These estimates are based on official as well as survey data. Braichevska et al (2004).

## **Theoretical Considerations**

In this paper, we are focusing our attention on two economic factors that may underlie the attitudes towards immigrants: the (perceived) difference in incomes and the (perceived) difference in chances to find employment between natives and immigrants. The first question to answer is how, from a point of view of economic theory, these factors enter the function of attitudes? While, to our knowledge, there is no formal theory which would model attitudes as a function of both income and labour market considerations, several theories put together help to justify the choice of these economic determinants.

### ***Labour Market Considerations as Determinants of Attitudes towards Immigrants***

Labour market concerns are normally quoted to be of significant importance in determining the attitudes towards immigrants on the grounds of standard economic theories. In words of Dustmann and Preston (2000), “[t]he way individuals form their views about the effects of immigration... relates to basic intuitions about labour market equilibria. These perceptions may be best represented by simple equilibrium models” (p. 6). High unemployment rates, perceived labour market threats such as direct competition and feeling of job insecurity all may lead to more negative attitudes towards immigrants.

One of the most widely used approaches is to view attitudes towards immigrants in a framework of the Heckscher-Ohlin trade theory, predicting the groups of winners and losers from free trade. For example, Mayda (2005) develops a model based on both the Heckscher-Ohlin and the factor-proportions-analysis models to show how immigration influences natives’ utilities through factor markets. According to her, the degree of production diversification and the skill composition of both natives and immigrants play a role in determining the attitudes towards migrants. Whenever production is not diversified, or whenever natives and immigrants have a different skill composition, “in countries characterized by high skill composition of natives relative to immigrants, skilled (unskilled) individuals should favour (oppose) immigration, while the opposite is true in countries with low relative skill composition of natives to immigrants” (p.10).

Likewise, O’Rourke and Sinnott (2004) explore the Heckscher-Ohlin theory to make predictions regarding anti-immigrant sentiment on the basis of countries’ skill compositions and incomes. While in rich countries highly skilled individuals would be more probable to have pro-immigrant attitudes, in poor countries highly skilled individuals would be more likely to exhibit anti-immigrant attitudes. Using the Borjas (1987) model of occupational self-selection, O’Rourke and Sinnott also predict that the higher is the level of inequality in a country, the more negative sentiment towards immigrants will be exhibited by high-skilled individuals.

While these theoretical justifications make the labour market considerations a potential and justified determinant of attitudes, it is still not clear what prediction we should make for the case of Ukraine. Being rather a poor than a rich country, with a high level of inequality, Ukraine also has a high skilled-to-unskilled workers ratio. Given the

prediction above, we may expect that high-skilled individuals would have a negative sentiment towards immigrants. The problem, however, is that, due to the period of transition impact on the labour markets, high-skilled individuals more often than not find themselves performing unskilled jobs. One of the bright examples of a labor market segment where both unskilled and highly skilled but displaced natives compete with both skilled and unskilled immigrants is the markets of imported goods to Ukraine. The jobs at such markets do not require particular skills. This being said, roughly 25% of all survey immigrants in our data are employed in the markets; over 25% of them have higher education; at the same time over 60% of natives of the sample have education higher than secondary school. In these circumstances, the overall skilled to unskilled ratio in the meaning in which it is understood in the above theories, is quite distorted in Ukraine. Thus, in our empirical work we hold to the simplest labour market considerations: perceptions of differences in easiness to find employment between natives and immigrants; but we also consider how these perceptions are influenced by the level of educational attainment, and by competing in the same sectors of the labour market.

### ***Relative Deprivation as a Determinant of Attitudes towards Immigrants***

If the differences between natives and immigrants in terms of income exist and are strongly perceived by the natives, do these differences play a role in determining the attitudes towards immigrants? In order to answer this question, we apply a concept or relative deprivation, and of its counterpart – relative satisfaction – to studying the attitudes of natives towards immigrants. The feeling of relative deprivation presupposes the existence of at least one reference group, that is, a group of individuals, with whom an individual in question compares his or her present status. It is the existence of such reference groups that allows us to relate the theory of relative deprivation to studying the attitudes towards immigrants.

The concept of relative deprivation is a well-known and a well-explained idea in the fields of economics, sociology, and psychology. Originally introduced in 1942 by Herbert Hyman<sup>4</sup>; conceptualized by Stouffer et al in 1949, and since then known in reference to “the American soldier”<sup>5</sup>; further expanded and formally stated by Runciman in 1966<sup>6</sup>; the notion of relative deprivation has been investigated for more than half of a century. In the theory of economics, the conceptualization of the idea of relative deprivation has been pioneered by Yitzhaki, Stark and Taylor.<sup>7</sup>

Relative deprivation has been defined as a perception of being unfairly disadvantaged compared to other individuals as a result of not having something that others have, and wanting to have it. Repeatedly stated in the literature, the best definition of the relative deprivation is still the one originally proposed by Runciman (1966). It is based on the four conditions necessary for a person to feel relatively deprived: “We can roughly say that [a person] is relatively deprived of X when (i) he does not have X, (ii) he sees some

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<sup>4</sup> Hyman, H. H. , 1942.

<sup>5</sup> Stouffer, S. A., 1949.

<sup>6</sup> Runciman, W.E., 1966.

<sup>7</sup> Yitzhaki (1979), Yitzhaki (1982), Stark (1984a), Stark and Taylor (1989).

other person or persons, which may include himself at some previous or expected time, as having X (whether or not this is or will be in fact the case), (iii) he wants X, and (iv) he sees it as feasible that he should have X (op. cit., p.10). [Note 1]

The twin concept, that of relative satisfaction (or relative gratification)<sup>8</sup>, is based on the feelings of having, and in this sense it is closely related to the notion of utility (Yitzhaki, 1982). The underlying utility function, however, can have various forms, so that the utility of having can be positive or negative. What matters for the relative satisfaction, is the fact that an individual does possess some items (or income) that not necessarily every one else has.

We follow Stark and Taylor (1989) and Yitzhaki (1979) in the theoretical exposition of the notions of relative deprivation and relative satisfaction with respect to income. In case of continuous income distribution, each income unit can be represented by an income

range,  $[y, y+\Delta]$ ,  $\Delta y \rightarrow 0$ . If  $F(y) = \int_0^y f(z)dz$  is the cumulative income distribution, then

$1-F(y)$  is the relative frequency of individuals whose income is above  $y$ . Thus,

$$RD(y_i) = \int_{y_i}^{\infty} [1 - F(z)] dz \quad 9$$

$$RS(y_i) = \int_0^{y_i} [1 - F(z)] dz$$

Relative deprivation is an increasing function of the relative frequency of persons whose income is higher than  $y$  (that is,  $1-F(y)$ ), while relative satisfaction is an increasing function of the relative frequency of persons whose income is lower than  $y$ .

Understanding that at one and the same point in time each individual feels relatively deprived of some income that she does not have, and relatively satisfied with the income that she has, for further convenience we collapse the feelings of deprivation and of satisfaction into a category that we will call relative self-valuation:

$$RSV = \begin{cases} RD, \text{ for } \forall y > y_i; \\ RS, \text{ for } \forall y < y_i; \end{cases} \quad \text{or,}$$

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<sup>8</sup> In the economic theory, this concept is more known as relative satisfaction (Yitzhaki (1979), Hey and Lambert (1980)). In sociology, this concept is more known as relative gratification, or relative advantage (Pettigrew T., 2002; Colin et al, 2002). We use these terms interchangeably. See also Note 3.

<sup>9</sup> Stark and Taylor (1989) show that such notation is a simplified version of a more general one:

$$RD(y_i) = \int_{y_i}^{\infty} h[1 - F(z)] dz \quad \text{where } h[1-F(z)] \text{ is deprivation from not having } [y, y+\Delta].$$

$$RSV = \begin{cases} \int_{y_i}^{\infty} [1 - F(z)] dz, & \text{for } \forall y > y_i; \\ \int_0^{y_i} [1 - F(z)] dz, & \text{for } \forall y < y_i; \end{cases}$$

[Note 2]

In this article we would like to make one step further: while relative deprivation theory asks how an individual feels about his or her situation by making a comparison with the situation of others, here we would like to ask how an individual feels about others, once having made a comparison of his/her and their situation and once having assessed the degree of his/her deprivation or gratification. Primarily, we are interested in seeing whether making such comparisons plays any role in determining how this individual would feel towards others at all. Thus, while a concept of relative deprivation is a self-oriented feeling, we view the attitudes as reciprocal feelings, as a reaction to the self-assessed situation. In this sense, we would expect that an attitude is a function (a sort of a reaction function) of the relative deprivation or relative satisfaction that an individual feels.

Drawing on the theory of psychology (Leach et al 2002.), an attitude towards immigrants (the individuals of a reference group) is a function of a relative deprivation, or a relative satisfaction, that an individual in question (native) feels. More generally, an attitude will be a function of a relative self-valuation of a native as opposed to an immigrant.

$$A_i = f(RSV_i)$$

A priori, it is not known with what sign relative deprivation and relative satisfaction enter the function of attitudes. On the one hand, the feeling of relative satisfaction, for example, can provide a feeling of pleasure of one's own position, and a pity for the disadvantaged. On the other hand, it may also lead to the feelings of gloating or disgust, which would be associated with negative feelings towards immigrants. Thus, empirical evidence could help to understand whether feeling relatively deprived or relatively satisfied leads to more positive or more negative attitudes towards immigrants.

Up till now we have been defining the relative self-valuation concept in terms of one individual. At this point, however, we need to distinguish between the feelings of personal deprivation (satisfaction), and group deprivation (satisfaction). This distinction is an important one in the theory of psychology, and it has been shown that the feelings of group, rather than personal, relative deprivation, can lead to political protest and active attempts to change the social system (Smith et al, 2002; Pettigrew, 1964).

Personal relative deprivation is referred to comparisons made between oneself as an individual and the other members of the reference group, while group relative deprivation is referred to comparisons made between oneself as a representative of a specific group and the members of another reference group (Tougas F. and Beaton A., 2002). Group relative deprivation can be viewed as a result of the generalization of experiences of personal relative deprivation in a sense that individuals transcend their personal

experiences to the collective level (Pettigrew (1964)). For example, a question of the type "Do you think you are earning enough?", asked to a female manager, evokes the notion of the individual relative deprivation. A question such as "Do you think female managers are earning as much as male managers?" would be an example of a group relative deprivation (Walker, J. and Smith, H., 2002).

Two types of relative deprivation play a different role in explaining different types of behaviour. Framing the same problem in either personal or group terms can lead to different reactions. Personal relative deprivation results in personal enhancement strategies, while group relative deprivation leads to strategies that aim to improve the situation of the whole group (Runciman, 1966). Along the same lines, Smith and Ortiz (2002) conclude that when a disadvantage is defined in intergroup terms, individuals may feel more empowered to deal with it.

The model of group deprivation would require making comparisons between two income distributions, because one group can feel deprived only with respect to another group, it can not feel deprived just on its own. The question, then, is: how a group deprivation can be modeled?

$$F(y) = \int_0^{\infty} f(x)dx$$

- income distribution of natives

$$G(y) = \int_0^{\infty} g(x)dx$$

- income distribution of immigrants

we would like to have some sort of a measure, such as:

RGV=(Mean income of the group of natives-Mean income of the group of migrants)□Proportion of migrants  
 (if the sign is positive, this will be group satisfaction of natives, if negative - group deprivation)

$$\implies \implies \implies \implies \text{RGV} = \int_0^{\infty} xf(x)dx - \int_0^{\infty} xg(x)dx$$

## Econometric Specification

The attitudes that we are trying to capture, are, in fact, not observed. Instead, we have to reveal the attitudes, relying on the measures of individual opinions regarding several attitudinal questions. Similar approach has been widely used in the literature on attitudes: Dustmann and Preston (2001), Fertig and Schmidt (2002), Gang et al (2001), Mayda (2005), all face similar problem of having to rely on a set of measures proxying latent attitudes rather than using an observed measure. While we estimate 11 equations of

attitudinal answers, in the last section we also address the issue of reducing the number of questions.

### ***Single-Equation Probit Models***

One of the ways of assessing the influence of the feelings of relative deprivation and of the labour market concerns on the attitudes towards immigrants is to incorporate the measures of the deprivation and of the labour market concerns directly into the attitudinal equations.

We observe a set of discrete (binary) responses to the set of questions regarding immigrants. Denoting by  $A$  the attitudes, and by  $A^*$  the corresponding latent, true, attitudes,  $A = 1$  reveals a positive (“yes”) answer to an attitudinal question, and  $A = 0$ , otherwise. Given this, the problem is formulated as a latent variable model<sup>10</sup>.

$$(1) \quad A^* = X\alpha_1 + RD\alpha_2 + LC\alpha_3 + \varepsilon$$

where  $X$  is a vector of socio-economic characteristics of individuals,  $RD$  is a perception of relative deprivation,  $LC$  is labour concerns of the natives, and  $\varepsilon$  is a normally distributed random error with zero mean and unit variance. Natives will only respond positively to an attitudinal question if the expected benefits of such answer are positive. Hence, the probability that a native gives a positive answer is

$$\text{Prob}[A^* = 1] = \text{Prob}[X\alpha_1 + RD\alpha_2 + LC\alpha_3 + \varepsilon > 0]$$

The method of estimation would be maximum likelihood.

### ***Simultaneous Binary Choice Model***

The problem with the proposed strategy of estimating a set of simple probit models for each attitudinal question is that it suffers from a potential endogeneity. There is a high chance that unobserved characteristics of natives may jointly determine the perceived relative deprivation, the labour market considerations, and the responses to the attitudinal questions<sup>11</sup>. Moreover, a priori, it may be difficult to say whether natives exhibit negative sentiment towards immigrants as a result of feeling relatively deprived, or whether they feel deprived as a result of having a negative attitude towards immigrants. The same line of reasoning goes for the labour market concerns. Consequently, the appropriate econometric model must take into account possible endogeneity, since the failure to account for it would lead to the biased estimates in single-equation estimations.

To tackle the endogeneity problem, we would need to have an instrument for the feeling of relative deprivation and an instrument for the labour market concern. Since these

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<sup>10</sup> We follow Evans and Schwab (1995) in this exposition.

<sup>11</sup> Technically, our approach here is close to that of Antecol and Cobb-Clark (2005).

endogenous variables are the perceptions, rather than being the true observed characteristics of the agents, the proposed instruments would be the variables of the real, rather than perceived, deprivation and the labour concern. To restate, a person who feels relatively deprived, does not need to be really, “objectively” deprived., what matters is the sense of the deprivation.<sup>12</sup> However, the feeling of deprivation of a native is based, at least in part, on the observed real, objective, situation vis-à-vis an immigrant. Thus, we would assume that the real difference in incomes between the groups, as well as the percentage of immigrants, as opposed to the natives, with a higher income, plays a role in the formation of the feeling of relative deprivation. If we could have an objective measure of the deprivation, it could serve as an instrument for the perception of relative deprivation.

Likewise, if the natives are concerned about losing their jobs to immigrants, these feelings of fear are also based, at least in part, on the real labour market situation, on the objective difference in the probabilities of finding a job by a native, and by an immigrant. Hence, an objective, rather than a subjective, measure of the labour market opportunities, could serve as an instrument for labour market considerations. At the same time, other characteristics of a native resident, such as age and education, are also responsible for the formation of the feeling of relative deprivation and of the labour market concerns.

Thus, we formulate the following model:

$$(2) \quad A^* = X\alpha_1 + RD\alpha_2 + LC\alpha_3 + \varepsilon^A$$

$$RD = X_i\beta_1 + RDreal\beta_2 + \varepsilon^{RD}$$

$$LC = X\delta_1 + LCreal\delta_2 + \varepsilon^{LC}$$

Where  $A_{ij}^*$  is an  $I \times J$  matrix of latent responses to  $J$  attitudinal questions for  $I$  individuals  $X$  is a vector of socio-economic characteristics of individuals,  $RD$  is a perception of relative deprivation,  $RDreal$  is a real, objective, deprivation of the individuals.  $LC$  stands for labour concerns of the natives, while  $LCreal$  reflects the objective differences in labour market opportunities.

In a specification of this kind error terms are correlated across equations, thus explicitly allowing to account for the unobserved effects that may be jointly responsible for the formation of attitudes, the feelings of relative deprivation, and the feelings of labour market fears. This is important, because not only the formation of the feeling of relative deprivation can be correlated with the attitudes, but also the perception of being relatively deprived can be correlated with the perception of being less competitive in the labor market.

The credibility of our model rests upon the assumption that the real deprivation (based on the differences in incomes and the percentage of the population with higher income), and

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<sup>12</sup> Runciman, W.E., 1966. p.10.

the real differences in labour market opportunities, do not have a direct impact on the expressed attitudes towards immigrants, but influence them through the feeling of relative deprivation and labour market considerations. Intuitively this assumption is quite appealing since, again, what matters is the subjective feeling of being deprived of income or of work.

All the questions contained in our dataset are phrased on a yes/no basis, thus leaving us with a set of binary dependent variables on attitudes. Moreover, as will be explained later, both endogenous variables are also binary. According to Greene (1997), the peculiarities of this model - the binary dependent variable, and endogenous binary variables – preclude from using the least squares and standard simultaneous variables techniques. Following Evans and Schwab (1995), Greene (1997), and Antecol and Cobb-Clark (2005), we estimate a simultaneous binary choice model. The presence of two, rather than one, binary endogenous variables determine the choice of the estimation procedure: maximum-likelihood multivariate probit estimation technique developed by Cappellari and Jenkins (2003)<sup>13</sup>. This technique is based on the GHK smooth recursive simulator which is frequently used in computing functions involving multivariate normal integrals (Greene, 2000).

Our dataset contains  $i$  individuals, for which the attitudes are revealed through a set of  $j$  answers to the questions regarding immigrants. The individual subscripts are suppressed for the purpose of the exposition. We estimate the model  $j$  times, separately for each response to each of the attitudinal questions, keeping the second and the third equations the same in all reestimations.

Based on the model above, we estimate the following trivariate probit model:

$$\begin{aligned} \text{Prob}[A^* = 1] &= \text{Prob}[X\alpha_1 + RD\alpha_2 + LC\alpha_3 + \varepsilon^A > 0] \\ \text{Prob}[RD = 1] &= \text{Prob}[X_i\beta_1 + RD_{real}\beta_2 + \varepsilon^{RD} > 0] \\ \text{Prob}[LC = 1] &= \text{Prob}[X\delta_1 + LC_{real}\delta_2 + \varepsilon^{LC} > 0] \end{aligned}$$

$$\text{Where } \begin{pmatrix} \varepsilon^A \\ \varepsilon^{RD} \\ \varepsilon^{LC} \end{pmatrix} \sim N(0, \Sigma)$$

For the identification purposes, the set of  $X$  characteristics is not identical across the equations. While each equation contains such characteristics as age, gender, education, the relative deprivation equation also contains... and the labour market considerations equation also contains

For identification reasons, the variances of the epsilons must equal 1.<sup>14</sup>

<sup>13</sup> The model is estimated using Stata package. The techniques for the trivariate probit estimation in Stata are developed by Antoine Terracol (2002).

<sup>14</sup>Terracole A. “Triprobit and GNK Simulator: A Short Note” [http://team.univ-paris1.fr/teamperso/terracol/GHK\\_note.pdf](http://team.univ-paris1.fr/teamperso/terracol/GHK_note.pdf)

## The Data

For our empirical research we use two micro data sets obtained as a result of two surveys. The surveys were conducted within the framework of the Comparative Urban Studies Project “Nontraditional Migrants in Kyiv” in 2001–2002, with the support of the George F. Kennan Fund of the Woodrow Wilson International Center for Scholars’ Kennan Institute, and with the assistance of the US-Ukraine Foundation and the Office of the United Nations High Commissioner for Refugees (UNHCR) in Ukraine.

The first data set comes from a survey of the natives of Kyiv and covers 1,000 respondents. We use these data to extract the major part of the information about the attitudes of natives towards immigrants. During the survey, natives of Kyiv were asked a variety of questions regarding their attitudes towards immigrants from Asia and Africa, enabling us to construct several variables measuring attitudes. In addition, the survey contains extensive information on social and economic characteristics of natives. Based on the principle of multilevel quota sampling, it well represents the adult population of Kyiv according to gender, age, level of education, as well as territorial features (Kyiv city districts). A detailed explanation of the multilevel quota division, as well as the sampling techniques, are described in the Project Report “Nontraditional Migrants in Kyiv” (Braichevska et al, 2004).

To measure the attitudes, we rely on answers to several attitudinal questions, which, we believe, help revealing the true sentiment towards immigrants. As in much of the previous empirical work (Dustmann, 2001; Fertig and Schmidt, 2002; Gang, 2001), there is a set of questions concerning opinions about immigrants which can be grouped into several categories reflecting various concerns of natives: acceptance of immigrants; questions regarding immigrants’ crime participation; questions concerning government action; and questions regarding overall attitude towards immigrants. The precise wording of these questions is provided in Appendix 1.

We create binary variables for all responses, and come up with the following eleven variables measuring attitudes:

Variables 1-6: Equal one if a natives agrees to accept an immigrant as member of the family; as a friend; as a neighbour; as a resident of a microdistrict; as a resident of the city; as a work colleague.

Variables 7-8: Equal one if a native believes that immigrants are victims of crimes; commit crimes.

Variables 9: Equals one if a native believes in a rather pro-immigration government than anti-immigration government (this binary variable is constructed from the question regarding the government action: we treat affirmative responses to the propositions to do nothing particular about immigrants, to secure equal treatment for natives and for immigrants, and to provide more help to immigrant, as pro-immigration responses. The affirmative responses to the propositions of stopping immigration and expelling immigrants from the country are treated as anti-immigration responses).

Variables 10-11: Equal one if a native believes that the overall attitude of the natives of Kyiv towards immigrants is negative; if a native believes that the overall attitude of the immigrants towards natives of the city is positive.

The problem with creating binary variables is that most of the questions contain three response options: “yes”, “no” and “difficult to say”. We estimated our model with omitted “difficult to say” responses, and also with “difficult to say” responses treated as “no” answers. Different treatment did not affect the results. At the end, we kept the binary variables with zeros standing for “no” and “difficult to say” responses.

Furthermore, several questions contain several response options, such as, for example, question 7 in the Appendix: “In your opinion, does the presence of immigrants have an influence of the criminal situation in the city?” The response choices are: “no”, “yes, they participate to committing crimes”, “yes, they are victims of crimes”, “difficult to say”. Thus, when we create a binary variable such as “equals one if immigrants commit crimes”, we end up with too many zeros that are not meaningful: in this particular case a zero answer does not mean “immigrants do not commit crimes”, but rather, it contains three other response options. Unfortunately, we believe that it is for the reason of having too many non-meaningful zeros that several regressions with dependent variables such as “immigrants commit crimes” produce many insignificant coefficients.

Table 1 contains means and standard deviations of the variables that reflect attitudes.

Several interesting facts are revealed from the inspection of some correlations and distributions of responses to the questions regarding attitudes. Only one-third of surveyed respondents (32,2%) have had an experience of communicating with immigrants. The readiness to accept migrants is higher among those natives, who have communicated with them before (Appendix 2). As we proceed from acceptance as city residents to acceptance

**Table 1. Attitudes towards Immigrants: Descriptive Statistics**

<b>Variable (1 – yes, 0 – otherwise)</b>	<b>Mean</b>	<b>St. deviation</b>
<i>Readiness to accept immigrants as:</i>		
Members of a family	0.051	0.220
Close friends	0.170	0.376
Neighbours	0.231	0.422
Residents of the same micro district	0.345	0.475
Residents of the city	0.371	0.483
Work colleagues	0.262	0.439
<i>In your opinion:</i>		
Immigrants commit crimes	0.483	0.499
Immigrants are victims of crimes	0.108	0.310
Government should be pro-immigrant	0.204	0.403
Natives show negative attitude towards immigrants	0.250	0.433
Immigrants show negative attitude towards natives	0.238	0.426

as family members, or, as the “social distance” shortens, natives tend to be more decisive in their “accept/reject” attitudes, (i.e., the number of respondents who hesitate to give an accept/reject answer decreases).

While a large proportion of the city residents have never communicated with immigrants from Asia and Africa, (67,8%), 56% of the respondents believe that immigrants have a negative impact on the life of the city (54,87% of those who have never communicated with them). Twenty five percent of respondents think that natives show a negative attitude towards immigrants. At the same time, 33.50% think that immigrants show bad attitudes towards natives (36.96% of those who have never communicated with them). A significant number of natives (49,14 %) believe that immigrants influence the crime rates in the city. At the same time, the official data of the Ministry of Internal Affairs show that only 0,5% of all registered crimes can be attributed to foreigners<sup>15</sup>. These revealed opinions clearly hint to the fact that the judgments about immigrants are based more on stereotypes, rather than on the first-hand experience and the real data.

In the estimations of attitudes, we use socio-economic variables standard to this type of research (Dustmann, 2001; Gang et al, 2001; Mayda, 2005). These include age, gender, education, and labour-force variables. Table 2 contains their descriptive statistics.

Age is collapsed into 6 main categories: less than 20 years old, from 20 to 29, from 30 to 39, from 40 to 49, from 50 to 59, and above 60. Two largest categories of respondents are aged between 30 and 49. Likewise, education is described by four categories (the highest educational attainment is reported): non-completed secondary school, completed secondary education, vocational training, and higher education. The predominant majority of respondents have either completed their secondary education, or vocational training (39.62%, 30.02% respectively). Women comprised 53.9% of the surveyed participants.

The survey also provides information on the length of respondent’s residency in Kyiv. It covers respondents who were born in Kyiv, resided in Kyiv for more than 20 year, for more than 10 years, for more than 5 years, or for up to 5 years.

Additionally, we generate dummy variables indicating whether a respondent is employed in private sector, unemployed, or retired. We also explore whether the answers to the questions “Have you ever communicated with an immigrant” (a measure of exposure to foreigners), and “In your opinion, what are the reasons that drive immigrants to Kyiv?” play a role. Other variables used in estimations and for the sensitivity analysis include the ethnic background of the resident (Ukrainian, Russian, Belorussian, Armenian, Jew, Turkish) and the area of the city where a respondent lives.

Finally, we construct two explanatory variables of major interest: relative deprivation and labour market considerations. In the survey, natives were asked to assess their own financial status, the financial status of all natives of Kyiv, and of immigrants, as well as employment opportunities of natives and of immigrants, on the scale from 1 to 5. Thus,

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<sup>15</sup> Osaulenko, O. H. „Statystychnyi shchorichnyk Ukrainy za 2000 rik” Tekhnika . Kyiv. 2001

with the data at hand it is possible to construct the measures of both individual and group relative deprivation, and of the labour market concerns.

*Table 2. Descriptive Statistics of Socio-Economic Variables*

<b>Variable</b>	<b>Definition</b>	<b>Mean</b>	<b>St. Dev.</b>
Age	1: <=20, 2: 20 to29, 3: 30 to 39, 4: 40 to 49, 5: 50 to 59, 6: >= 60	3.632	1.474
Gender	1-f, 0-m	0.537	0.499
Education	1 - unfinished secondary, 1 -completed secondary education, 3 - vocational training, 4 - higher education	2.696	0.905
Residency in Kyiv:	1-up to 5 years, 2- 6 to10 years, 3-11 to 20years, 4-more than20years, 5 – born in the city	4.302	0.994
Residing in Kyiv for less than 5 years	1- yes, 0 - otherwise	0.028	0.165
Occupation: private	1- yes, 0 - otherwise	0.249	0.433
Occupation: unemployed	1- yes, 0 - otherwise	0.054	0.226
Retired	1- yes, 0 - otherwise	0.168	0.374
Never communicated with an immigrant	1- true, 0 - otherwise	0.678	0.467
Believe that immigrants came to study	1- yes, 0 - otherwise	0.325	0.469
Feeling of group relative deprivation	1- yes, 0 - otherwise	0.413	0.493
Labour Market Concern: Natives of Kiev have a better chance to be employed	1- yes, 0 - otherwise	0.418	0.493

Group relative deprivation is constructed by subtracting the answers to the question “Estimate the financial status of non-traditional immigrants in Kyiv on the scale from 1 to 5, 1 meaning “poor”, and 5 meaning “very well off”” from the answers to the question “Estimate the financial status of the residents of Kyiv on the scale from 1 to 5, 1 meaning “poor”, and 5 meaning “very well off””. The resulting difference in answers, discretely distributed on a scale from –4 to +4 is treated as the “relative self-valuation” variable. While it may be interesting to work with this variable in itself, we turn it into a dummy variable of relative group deprivation. The reason for not working with the relative self-valuation variable is that, since the reported financial status is subjective, we can not effectively distinguish between the relative self-valuation coded as, for example, –2 and that coded as –1 by a native. Thus, a single dummy capturing whether the person feels deprived or not seems to be more meaningful.

In exactly the same manner, we construct the measure of individual relative deprivation. For the reasons described earlier, we keep the group deprivation as our primary variable of interest. As we can see from Table 2, on average, residents of Kyiv believe that immigrants are better off than natives.

Lastly, we construct a dummy variable that reflects the difference in employment opportunities for natives and for immigrants. Taking differences of the reported easiness of finding employment in Kyiv for natives and for immigrants estimated on the scale from 1 to 5 (5 meaning that the chances are high), we then construct a binary variable, “labour market considerations”. This variable equals 1 if natives believe that they have more chances to find a job in the city.

### ***Constructing a representative migrant***

As discussed in the previous section, the variables measuring group relative deprivation and labor market concerns are potentially endogenous in our type of research. A possible instrument to tackle the endogeneity problem could have been some measure of a real, rather than perceived, a less subjective measure of the difference between the income of natives and of migrants, as well as between the rated chances to find employment.

It is at this point that we explore our second data set, and use it to complement the data set on natives. This second data set has been obtained in the course of the same survey and covers (non-traditional) immigrants from 23 African and Asian countries. It comprises of 547 observations, out of which 150 observations are on children below the age of 16, so it is sufficiently small to allow any econometric estimations in their own right. However, it is sufficiently large to complement the first data set that we have and to satisfy our purposes. By construction, this data set contains some questions, which are phrased in exactly the same way as in the questionnaire for natives. In particular, migrants are asked in the same manner to natives to assess their own financial status as well as employment opportunities in Kyiv. In what follows, we explore these complementary questions across the two data sets.

Ideally, we would like to have an index which would reflect the difference between what natives think about their own financial status and the financial status of Kyivans, and what migrants think about their own financial status. This will no longer be an index of personal perception of the difference between the two groups, but an index formed on the basis of opinions of both parties – natives and migrants – about their income levels, thus reflecting a more objective difference between the two population groups. To construct such index, we need to match the immigrants and the natives of the two surveys. It is not possible to perform such a match in a straightforward unique way, as we have individual-level data. However, we can construct a so-called representative migrant, and then use its characteristics to obtain the index of the true difference between the income levels of natives and the income levels of representative immigrants.

We construct a representative migrant unique to each of ten micro-districts of the city (see Note 4). We are primarily interested in the responses of a representative migrant to

two questions: estimate financial status of immigrants from Asia and Africa in Kiev, and estimate the easiness of finding employment for immigrants in the city. We average the responses of all surveyed immigrants to these particular questions by district, and view these average responses as a response by a representative migrant.

As a next step, the averaged responses of immigrants to the two questions of interest are input into the data set of natives, by area. To obtain an index of real group difference in financial status, we look at the difference between the responses of natives to the question “Estimate the financial status of the natives in Kyiv” and the responses of representative migrants to the question “Estimate the financial status of immigrants in Kyiv”. The real individual difference in financial status as well as the real difference in employment opportunities is obtained likewise.

Table 3 provides a description of the obtained variables. Comparing with the variables described in Table 2, we see that, while 41,3% of natives feel relatively deprived compared to immigrants, the difference in opinions of natives and of immigrants, Table 3, shows that natives, on average, in fact estimate financial status of natives higher than immigrants estimate the financial status of immigrants.

**Table 3. Characteristics of a Representative Immigrant**

<b>Variable</b>	<b>Definition</b>	<b>Mean</b>	<b>St. Dev.</b>
Estimated material status of all immigrants, provided by a representative immigrant	Averaged, by district, estimates of the material status of all immigrants, on a scale from 1 to 5, given by immigrants	2.658	0.492
Real difference in material status (used as an instrument for the feeling of relative deprivation)	A difference between estimates of the material status of natives, provided by natives, and estimates of the material status of immigrants, provided by immigrants	0.024	1.113
Estimated employment opportunities of all immigrants, provided by a representative immigrant	Averaged, by area, estimates of the employment opportunities of all immigrants, on a scale from 1 to 5, given by immigrants	2.484	0.427
Real difference in employment opportunities (used as an instrument for the labour market concerns)	A difference between estimates of the employment opportunities of natives, provided by natives, and estimates of the employment opportunities of immigrants, provided by immigrants	0.232	1.152

### ***Further Model Specification***

In this section we briefly discuss the basic specification of the model (2), as well as alternative specifications.

In the basic specification, the equation of attitudes contains two economic variables of interest: relative deprivation and labour market fears, as well as age, education, and gender. In addition, we include the variables containing labour market information: dummies for being unemployed, and for being employed in private sector (rather than in the state sector or military). Although with the data at hand we cannot distinguish between different labor market segments and differentiate between natives who directly compete for jobs with immigrants and those who do not, inclusion of the “privately occupied” dummy variable at least partially allows to account for a different labour market segment.

We also have a dummy variable for being a pensioner. This variable is interacted with the age variable. The reason for having done so is that in earlier estimations we have consistently found that age had a negative impact on attitudes, while being a pensioner had a positive impact at the same time. These puzzling and contradictory results lead to seeking various specifications: including both age and being a pensioner, age squared, or interacting both terms. The interaction of the two allowed producing the most reasonable outcomes.

Finally, we control for the time span that a native has been living in the city. More than 56% of the respondents were born in Kiev, the rest have arrived to the city, predominantly from other regions of Ukraine, at various stages of their lifetimes. Including a variable “length of residency in Kyiv” for a native, or, rather, including dummy variables for different time periods, we found that only those natives who arrived to the city from other regions of Ukraine less than five years ago, have a systematically different perception of immigrants. Thus, in the basic model, we keep only “less than five years in Kyiv” dummy variable.

The equation of relative deprivation contains an exogenous real difference in incomes variables. It also contains age, gender, education of a native, as well as the length of time lived in the city. Lastly, we include a dummy variable which equals one if a native believes that the reason why immigrants come to Kyiv is because they are seeking a better life.

The equation of labour market concerns (or rather, the labour market superiority, since the dependent variable equals 1 for natives who believe their employment opportunities are higher than those of immigrants) also contains age, gender, education and the length of time lived in the city. In addition, it includes exogenous real difference in employment opportunities and three dummies of the labour market status: being a pensioner, being unemployed, and being employed in a private sector. In addition, it has a dummy which equals one if a native believes that immigrants have problems with finding employment. The expected sign of this variable is positive: the more problematic, in view of natives, is the job search for immigrants, the more secure they feel in the labor market. Finally, this equation also contains a variable measuring the average education of a representative immigrant.

We estimate this basic specification for eleven attitudinal questions, with a response to a particular attitudinal question being an independent variable in the first equation.

$$A = \alpha_1 \text{Age} + \alpha_2 \text{Age} * \text{Pensioner} + \alpha_3 \text{Education} + \alpha_4 \text{Gender} + \alpha_5 \text{Kyiv} < 5 + \alpha_6 \text{Occup\_Private} + \alpha_7 \text{Unemployed} + \alpha_8 \text{RDSocial} + \alpha_9 \text{LC} + \varepsilon^A$$

$$(3) \quad \text{RD} = \beta_1 \text{ReaIncomeDifference} + \beta_2 \text{Age} + \beta_3 \text{Education} + \beta_4 \text{Gender} + \beta_5 \text{Kyiv} < 5 + \beta_6 \text{Reason\_better\_life} + \varepsilon^{\text{RD}}$$

$$\text{LC} = \delta_1 \text{RealLMDifference} + \delta_2 \text{Age} + \delta_3 \text{Education} + \delta_4 \text{Gender} + \delta_5 \text{Kyiv} < 5 + \delta_6 \text{Occup\_Private} + \delta_7 \text{Unemployed} + \delta_8 \text{Pensioner} + \delta_9 \text{Problem\_finding\_employment} + \delta_{10} \text{RepMigEducation} + \varepsilon^{\text{LC}}$$

To check the robustness of the results obtained in the basic model, and to further explore the data at hand, alternative specifications were also estimated.

To start with, we investigate whether including dummy variables for the areas where individuals live would change our basic finding. A number of previous studies find that the characteristics of the area of living, and in particular, the ethnic composition and the concentration of foreigners can have significant influence on the attitudes towards immigrants (Gang and Rivera-Batiz (1994)). Although inclusion of the area variables may lead to an endogeneity bias due to the fact that the location choice of racially intolerant individuals may be linked to their attitudes towards foreigners concentrated in a particular area (Dustmann and Preston, 2001), we believe that it is not grave in our estimations. The reasons for this is that the majority of respondents were either born in Kyiv or have lived there for more than 20 years (83,68% of all respondents). Before the independence, the citizens of the city could rarely choose their place of living, as their living places were provided by the state. Even though after the independence the possibility to change the area of living increased dramatically, relatively low presence of immigrants in the city was probably not the most important factor in determining the location choice. In words of Dustmann and Preston (2001), “the worst part of the bias” that may occur due to self-selection of natives to live in areas with smaller or larger proportion of immigrants is hardly present in our data. The part of a bias, which leads immigrants and new natives in the city settle in the same areas, may, to some extent, remain. The findings, however, not presented here but available on request, show that inclusion of area dummies does not alter the main results. Moreover, the area variables are rarely significant by themselves.

In the same way, accounting for a different ethnic background of natives (distinguishing between residents of Kyiv of Ukrainian, Russian, Belorussian origin, and Jews), did not change the main results and did not reveal any difference in the attitudes across the ethnic groups.

Another factor that may play a role in determining attitudes is the fact of meeting and communicating with immigrants. In words of Fertig and Schimdt (2002), we would expect that the contacts with immigrants may potentially reduce the stereotypes and negative attitudes towards them. At the same time, meeting the immigrants too often may be distressing for the natives. Thus, it is not clear a priori what impact on the attitudes the possible contacts with immigrants can have. In our alternative specification presented

in this paper we include the variable “have never communicated with an immigrant” into the equation of attitudes.

In the alternative specification we also look at whether the beliefs of natives into the reasons of why immigrants come to Ukraine play a role in determining their attitudes. The variable of interest here is a dummy variable “reason\_study”, which equals one if natives believe that immigrants came to Ukraine for studying.

Finally, in this alternative specification we distinguish between the three waves of immigration in order to understand how the attitudes can be different towards each of the immigration groups. The idea behind this is the following. As was described earlier, there were three waves of immigration to Ukraine: before 1991, between 1991 and 1999, and after 1998. The first wave of immigration was associated with immigrants coming within study and working programs. The second wave brought many illegal immigrants, who came to Ukraine escaping military conflicts, in search of better life, or in transition to other countries. The third immigration period was associated with a more strict immigration regime and resulted in a positive selection of immigrants. As the survey was conducted in the year 2001, the natives have had enough time to observe these different immigrants and their characteristics and to form, possibly different, sentiments towards them. Thus, it would seem reasonable to differentiate between the immigrants incoming at different periods of time.

The way such differentiation is achieved is again through the representative immigrant scheme. First, working with the data on immigrants, all immigrants are sorted into three groups (waves of immigration). Second, working with each group separately, we take an average of the length of stay in Kyiv by group and by area. As a result, we have three variables: average length of stay of immigrants who came with the first, the second, and the third immigration waves; each variable taking on ten values, which are the averages by area. We input these variables into the data set of natives, by area, and include these three variables into the relative deprivation and labour market considerations equations. The belief is that the observed length of stay of immigrants, who came in one of the three waves, influences the perception of the labour market differentials and income differentials by the natives, and has an impact on the attitudes only through these variables.

Thus, the alternative specification, reestimated for eleven attitudinal questions, is the following:

$$A = \alpha_1 \text{Age} + \alpha_2 \text{Age} * \text{Pensioner} + \alpha_3 \text{Education} + \alpha_4 \text{Gender} + \alpha_5 \text{Kyiv} < 5 + \alpha_6 \text{Occup\_Private} + \alpha_7 \text{Unemployed} + \alpha_8 \text{RDsocial} + \alpha_9 \text{LC} + \alpha_{10} \text{No\_Prior\_Communication} + \alpha_{11} \text{Reason\_study} + \varepsilon^A$$

(4)  $\text{RD} = \beta_1 \text{RealIncomeDifference} + \beta_2 \text{Age} + \beta_3 \text{Education} + \beta_4 \text{Gender} + \beta_5 \text{Kyiv} < 5 + \beta_6 \text{Reason\_better\_life} + \beta_7 \text{Length\_of\_Stay\_Wave1} + \beta_8 \text{Length\_of\_Stay\_Wave2} + \beta_9 \text{Length\_of\_Stay\_Wave3} + \varepsilon^{\text{RD}}$

$$\begin{aligned}
LC = & \delta_1 \text{RealLMDifference} + \delta_2 \text{Age} + \delta_3 \text{Education} + \delta_4 \text{Gender} + \delta_5 \text{Kyiv} < 5 + \\
& \delta_6 \text{Occup\_Private} + \delta_7 \text{Unemployed} + \delta_8 \text{Pensioner} + \\
& \delta_9 \text{Problem\_finding\_employment} + \delta_{10} \text{RepMigEducation} + \\
& \delta_{11} \text{Length\_of\_Stay\_Wave1} + \delta_{12} \text{Length\_of\_Stay\_Wave2} + \\
& \delta_{13} \text{Length\_of\_Stay\_Wave3} + \varepsilon^{\text{LC}}
\end{aligned}$$

## Results

### *Single Probit Results*

We first estimate equation (1) for 11 attitudinal questions (the specification of this equation is identical to the specification of the first equation of the basic trivariate model). Probit coefficients and standard errors, as well as marginal effects are reported in Appendix 3, Table 1.

Observing the estimation results for acceptance questions, we notice that labour market concerns play an important and significant role in the willingness to accept immigrants. If natives believe that they have higher employment opportunities and are not threatened by immigration, they are more open to accepting immigrants. In its turn, relative deprivation plays a negative role in acceptance of immigrants as microdistrict or city residents and as working colleagues: the more deprived natives feel, the less eager they are to accept foreigners. At the same time, relative deprivation plays no role in willingness to accept immigrants as family members, friends, or neighbours.

Natives who themselves have recently arrived to the city from other parts of Ukraine (up to five years), tend to be more willing to accept immigrants (except for acceptance as family members, in which case the impact is negative). A possible explanation is that these natives can better understand immigrants, who are also newcomers to the city; they are also more open to ideas of changing location and accepting people who are different from them. But an even more plausible explanation is that these newcomers are systematically different from other natives: their closer inspection reveals that 35% of them are aged 20-29, and 46,4% of them have higher education. Being young and educated is likely to be the reason why these individuals are more open to immigration.

A persistent finding is that older individuals are less willing to accept immigrants, which is consistent with previous research. However, age does not play an important role in decisions to accept immigrants as members of the family or as work colleagues. An interaction term between age and being a pensioner variables suggests that aged individuals who are pensioners are more open to the acceptance of immigrants. A potential explanation can be that there is some nonlinear impact of age on acceptance. Moreover, since pensioners do not compete with immigrants in the labour markets, they may be more tolerant towards them. Another possible explanation may come from the fact that old people in Ukraine are those who did not have an opportunity to go abroad themselves during the Soviet era; having immigrants coming to their city means having

more diversity that they may welcome (especially because old people were used to viewing immigrants as incomers from friendship countries).

Probit results for other dependent variables are less successful, possibly due to, as mentioned before, a large number of non-meaningful zeroes in the dependent variable. Nonetheless, significantly, it is relatively deprived people who tend to think that immigrants commit crimes and that the government should not have a pro-immigration policy. They also do not think that immigrants can be victims of crimes or that immigrants can exhibit a positive attitude towards natives. The feeling of labour market superiority make natives believe that immigrants can be victims of crimes, but also plays a positive role in thinking that natives on average have a negative attitude towards immigrants. Occasionally, we find that being in the city for less makes natives believe that natives are positive about immigrants, while being aged leads to wishing for an anti-immigrant governments. Surprisingly, education is not found to play any role in the determinants of attitudes.

### ***Results of Trivariate Estimations***

We now turn to analysing the results of the system estimation (2). Results of trivariate probit estimates of the basic specification (3) are summarized in Appendix 3, Table 2. Since the coefficients of the multivariate probit can be misleading (Burnett (1997), quoted in Greene (1998)), we report both coefficients and marginal effects of the estimations<sup>16</sup>.

We find that as age increases, individuals are less willing to accept immigrants, and also are more inclined to favour anti-immigration governments. At the same time, pensioners are more tolerant and accepting of immigrants. Higher levels of education play a positive role in willingness to accept immigrants as friends, and also in thinking that immigrants can be victims of crimes. Being a newcomer to the city is associated with being more tolerant and pro-immigrant. Finally, feelings of relative deprivation not only reduce the willingness to accept immigrants, but also make individuals believe that immigrants are not victims or crimes, commit crimes themselves, and exhibit negative attitude towards natives. At the same time, confidence in the employment opportunities of natives, compared to immigrants, increases the probability of accepting an immigrant as a family member, a friend, a neighbour, a microdistrict resident, or a working colleague, and reduces the chances of thinking that natives have a negative attitude towards immigrants.

While these findings are broadly similar to the results obtained in single probit estimations, the difference can be appreciated by exploring correlation coefficients between three structural disturbances of the basic trivariate probit specification (Table 4, Appendix 3). They were allowed to vary freely. Relatively small standard errors suggest that there is a significant degree of correlation between the effects. In particular, we notice that correlation is the strongest between the disturbances that affect formation of

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<sup>16</sup> Stata codes for the estimation of marginal effect are adopted, with adjustments, from Heather Antecol and Deborah Cobb-Clark (2005).

the feelings of relative deprivation and labour market considerations in the majority of the cases. Correlation between the feeling of relative deprivation and attitudes is positive and significant in half of the cases. This indicates that unobservable factors would have caused one-equation estimates of attitudes to be overestimated, and one-equation estimates of relative deprivation equations to be underestimated. Correlation between the feeling of relative deprivation and attitudes is significant in almost all instances, and is negative or positive, depending on the attitudinal question. These facts suggest that trivariate probit estimations provide a higher degree of precision of the coefficients of interest. For example, in case of the last attitudinal question (dependent variable equals one if a native thinks that immigrants show a good attitude towards natives), both correlation coefficients between labour concerns equation and attitudes equation, and between relative deprivation and attitudes equation, are significant and positive. This means that single-probit estimates of attitude are overestimated. In case of other attitudinal questions, often the signs of correlation coefficients are different, like, for example, in the “willingness accept as a friend” estimation. However, greater magnitude of the first correlation coefficient suggests that had endogeneity not been taken into account, we would have overestimated probit coefficients. Moreover, the null hypothesis of the likelihood ratio test that all coefficients are simultaneously equal to zero is rejected in each attitudinal estimation, thus once again justifying the choice of the model that accounts for endogeneity.

As a next step, we consider the results of the extended model specification (4), presented in Appendix 3, Table3. The main findings of the impact of the economic variables are robust to the inclusion of other variables to the model, moreover, occasionally they are improved. Relative deprivation continues playing a negative role in willingness to accept immigrants, now being significant in all acceptance questions. In addition, relative deprivation is an important factor determining responses to questions regarding crime participation of immigrants, crime victimization of immigrants, government action, and opinions about attitudes of immigrants towards natives. In all instances higher degree of perceived deprivation leads to lower degree of acceptance of immigrants. Labour market confidence, on the contrary, invokes higher degree of acceptance and tolerance, being significant in six out of eleven attitudinal equations. Other factors such as age, being a pensioner, being a newcomer to the city, and, occasionally, education, continue playing an important role in determining attitudinal responses.

Two new variables: “no prior communication” and “believed reason for immigrants to be in the city: studying”, are found to influence a few attitudinal responses. Those who have never communicated with immigrants before, have lower willingness to accept immigrant as members of their families. They also tend to be less willing to think that immigrants can be victims of crimes. However, they do not think that overall attitude of natives towards immigrants is negative. If natives believe that immigrants come mostly for studying, they are more likely to accept them as neighbours, city residents, and work colleagues. These natives also tend to think that attitudes of natives towards immigrants are rather positive than negative, and wish to see a pro-immigration government.

Finally, what difference for natives does the lengths of stay of the immigrants in the city make? The extended model (4) contains the information about the length of stay of

immigrants who came with three waves of immigration. In Table 5 of Appendix 3 we present the results of the extended model estimation with all three equations of the model. Considering equations of labour market confidence and relative deprivation also presents an interest in itself as it allows us to see what factors determine the formation of these feelings. Table 5 shows that the length of immigrant's stay does matter for natives and they are able to distinguish between the immigrants of different waves. Interestingly, the presence of immigrants from the first and the third immigration waves significantly affect the feelings of both labour market confidence and relative deprivation, while the presence of immigrants of the second wave does not have any significant impact on the formation of these two sentiments. The same pattern is found in estimation of all attitudinal questions. As explained earlier, it is immigrants of the first and third waves who tend to be more positively selected, while immigrants of the second wave are mostly negatively selected. The findings suggest that not only natives are able to distinguish between them, but also they have significantly different sentiment towards them. Finally, equations of this table also show that the instruments for both endogenous variables are highly significant, along with variables "immigrants are believed to have problems with work" and "immigrants are believed to come to Ukraine in search of better life".

## **Principal Components Analysis**

The major inconvenience of our investigation has been the absence of a unique measure of attitudes. In this section, we apply the principal components analysis to gain more insight onto the issue of common patterns in our high-dimension data (Smith, 2002). The principal components analysis is a mathematical procedure that can be used to reduce the number of variables, and to detect the structure in the relationship between variable (Stevens, 1986). This procedure transforms a number of correlated variables into a smaller number of uncorrelated variables called principal components, thus finding patterns in the data of high dimension. The first principal component accounts for as much of the variability in the data as possible, and each succeeding component accounts for as much of the remaining variability as possible.

Since we assume that the answers to the attitudinal questions are, in part, measuring the same underlying characteristic, it is not difficult to suppose that these answers are correlated with each other. Indeed, the correlation coefficients (Appendix3, Table 6) show that the degree of correlation can be as high as 0.88. There is clearly a room for the principal components analysis here, as, by exploring the correlations, we can obtain a smaller set of artificial variables which as "a linear combination of optimally-weighted observed variables" (Hatcher, 1994). As a result, instead of exploring eleven measures of attitudes, we will rely on a mathematically produced variable, the meaning of which is that it captures the most of the variance in the observed variables.

To give more meaning to the product of the PCA, some variables are recoded. For example, while all acceptance variables equal one in case natives agree to accept immigrants, for consistency, variables such as "natives on average have a negative sentiment towards immigrants" is transformed into a variable "natives on average have a positive sentiment towards immigrants". Applying the PCA technique to the whole set of

attitudinal questions, we find that there are three principal components responsible for the variation in the data (Appendix 3, Table 7: eigenvalues of the first three principal components are greater than one).

For the exposition purposes, we further work with only the first principal component. Roughly speaking, we treat it as (an artificial) measure of positive attitude towards immigrants. The idea is to use it as a dependent variable in the estimations.

The nature of this new variable (continuous, rather than binary), motivates a different estimation procedure. First, we estimate a simple OLS regression of the model such as in (1). Second, we estimate trivariate system of equations (2). The results are summarized in Appendix 3, Table 8. Apparently, these new results are broadly consistent with all previous findings. Age plays a negative role in formation of positive attitudes towards immigrants, while being a pensioner reverses the sentiment. Those natives who are themselves newcomers to the city are inclined to be more pro-immigrant. If natives believe that immigrants came mostly for studying, they are more willing to accept them. Natives who feel income differences in favor of immigrants tend to be less favoring immigration, as well as natives who perceive labour market threat of immigration. Thus, the PCA served as a consistency check, and reinforced our belief into what determinants play the most prominent role in the formation of attitudes.

## Conclusions

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## Notes

1. According to Stark and Taylor (1989), the deprivation concept and the utility concept are closely related: “whereas utility is defined on “having”, deprivation is defined on “not having”” (op. cit., p.3). They also stress the major difference between the two concepts: it is the relativity of the deprivation concept, which presupposes the existence of the reference groups in the society. Moreover, marginal utility of income under the utility approach depends only on the income of an individual, while under the deprivation approach, marginal utility of income depends on incomes of others, as well as on the number of people with a different level of income.

2. Additionally, we can also specify a notion of relative similarity: a person feels similar to the proportion of all individuals who have the same income as she does. In that case,  $RSim = f(y_i)$ , where  $f(y_i)$  is the mass associated with the mass point  $(y_i)$ . In this case,

$$RSV = \begin{cases} \int_{y_i}^{\infty} [1 - F(z)] dz, & \text{for } \forall y > y_i; \\ f(y_i), & \text{for } \forall y = y_i; \\ \int_0^{y_i} [1 - F(z)] dz, & \text{for } \forall y < y_i \end{cases}$$

For simplicity however, we will continue working with the RSV defined in the text.

3. Relative advantage refers to the consequences of comparing oneself and the reference group, and discovering one's advantaged position. While being a reverse concept, relative advantage has a more complex nature than relative deprivation. Leach et al (2002) argue that relative advantage can reveal itself in three forms, which evoke three types of behaviour. First, the advantage can be taken for granted. If it such, individuals do not compare themselves with the disadvantaged, and to do not take action to eliminate the disparities between themselves and the less advantaged. Second, the advantaged can try to minimize their advantage in order to prevent accusations of injustice, or a direct action, which may lead to threatening of their high positions. Third, advantaged may recognize their advantage. Recognition is based on the downward comparison with the less advantaged, just like relative deprivation is based on the comparisons with those more advantaged. This latter type of relative advantage can be expressed in numerous ways. If the advantaged focus on themselves when making a comparison with less advantaged, the feelings of pride or guilt may evoke. In contrast, when the advantaged are focusing on the disadvantaged in making their comparisons, the feelings may range from sympathy to disgust and disdain. "Perceiving the disadvantaged as responsible for their position is related to less sympathetic responses, while perceiving their misfortune as beyond their control encourages greater sympathy and helping on their behalf" (Leach et al, 2002, p. 141).

4. When the data on immigrants were collected, the city of Kyiv was administratively divided into 21 districts. The data set records the area in which each surveyed immigrant lives. The data on natives were collected six months later, and during these six months an administrative reform took place. As a result of this reform, the city became divided into 10 districts. The data on natives also record the district in which a respondent lives. Thus, firstly, we match the old and the new districts of the city (old and new districts, and their match, are described in the appendix), ending up with 10 new districts of the city. Once the districts are matched, we construct the representative migrant unique for each district. The match of the districts is available upon request.

5. Both data sets contain information about average monthly family earnings of natives and of immigrants. Income levels are reported in Ukrainian hryvna. We use this information to construct kernel densities of incomes and to visually compare income distributions. However, due to a large value of missing observations (319 out of 1000 for natives), in econometric estimations we use the differences in responses to questions "estimate your cohort financial status" as instruments rather than the differences in real income levels. The reduced sample estimation with the true income differences as instruments did not produce significantly different results.

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## **Appendix 1. Precise wording of the questions regarding the attitudes towards migrants:**

### ***Acceptance questions:***

1. Would you agree to accept migrants as members of your family?
2. Would you agree to accept migrants as your friends?
3. Would you agree to accept migrants as your neighbours?
4. Would you agree to accept migrants as your work colleagues?
5. Would you agree to accept migrants as residents of the city area in which you live?
6. Would you agree to accept migrants as residents of your city?

Responses:     a) yes  
                  b) no  
                  c) difficult to say

### ***Crime participation:***

7. In your opinion, does the presence of immigrants have an influence of the criminal situation in the city?

Response:       a) no  
                  b) yes, they participate to committing crimes  
                  c) yes, they are victims of crimes  
                  d) difficult to say

### ***Government action:***

8. In your opinion, what does the government should do with respect to immigration to the city?

Responses:     a) should do nothing particular regarding immigrants  
                  b) should secure equal treatment for natives and for immigrants  
                  c) should provide more help  
                  d) should stop immigration  
                  e) should expel immigrants from the country  
                  f) difficult to say

### ***Impact and attitudes:***

9. In your opinion, do immigrants from Asia and Africa show a good attitude towards the citizens of Kyiv?

Response:       a) yes  
                  b) no  
                  c) difficult to say

10. In your opinion, do citizens of Kyiv immigrants show a good attitude towards immigrants from Asia and Africa?

Response:       a) yes  
                  b) no  
                  c) difficult to say

## Appendix 2. Distribution of Responses to Selected Questions

<b>Readiness to accept migrants:</b>	<b>Yes</b>	<b>No</b>	<b>Difficult to say</b>	<b>Total</b>
As family members	51 5.14%	801 80.66%	141 14.20%	993 100%
As close friends	170 17.12%	660 66.42%	163 16.41%	993 100%
As neighbors	231 23.24%	576 57.95%	187 18.81%	994 100%
As work colleagues	262 26.44%	508 51.26%	221 22.30%	991 100%
As microdistrict residents	345 34.81%	427 43.09%	219 22.10%	991 100%
As city residents	371 37.40%	406 40.93%	215 21.67%	992 100%

\*Reproduced from NMK with slight changes and recalculations

<b>Readiness to accept migrants,</b>	<b>Provided natives communicated with them, %</b>			<b>Provided natives did not communicate with them, %</b>		
	<b>YES</b>	<b>NO</b>	<b>CAN'T SAY</b>	<b>YES</b>	<b>NO</b>	<b>CAN'T SAY</b>
As family members	5.97	78.30	15.72	4.74	81.78	13.48
As close friends	22.01	65.09	12.89	14.81	67.11	18.07
As neighbors	26.02	53.92	20.06	21.93	59.85	18.22
As work colleagues	28.93	50.94	20.13	25.26	51.41	23.33
As microdistrict residents	35.02	41.64	23.34	34.72	43.77	21.51
As city residents	36.16	40.25	23.58	37.98	41.25	20.77

### Appendix 3. Estimation Results

Table 1. Attitudes towards Immigrants. Probit Coefficients, Standard Errors of the Coefficients in Parentheses, and Marginal Effects: Basic Model

Independent Variable:	Age	Age*Pensioner	Education	Gender	Private occupation	Unemployed	Kiev<5	RD	LC	LR chi2(8) P > chi2	Pseudo R2
dependent variable:											
Acceptance as: family members	-0.048 (0.063) -0.005	0.079* (0.043) 0.007	0.033 (0.078) 0.003	0.043 (0.144) 0.004	0.890 (0.179) -0.013	0.001 (0.349) 0.000	-0.148** (0.289) 0.157	-0.244 (0.154) -0.021	0.412** (0.146) 0.041	26.31 0.000	0.068
friends	-0.108** (0.042) -0.026	0.051* (0.030) 0.012	0.072 (0.053) 0.017	0.087 (0.097) 0.021	-0.032 (0.117) -0.007	-0.297 (0.025) -0.063	0.414* (0.258) 0.120	-0.121 (0.101) -0.029	0.226** (0.098) 0.056	24.04 0.004	0.027
neighbours	-0.108** (0.039) -0.033	0.047* (0.028) 0.014	0.021 (0.050) 0.006	-0.032 (0.089) -0.009	-0.046 (0.109) -0.014	0.160 (0.195) 0.051	0.420* (0.247) 0.143	-0.075 (0.093) -0.022	0.175* (0.091) 0.053	17.74 0.038	0.016
microdistrict residents	-0.115** (0.037) -0.042	0.066** (0.026) 0.024	-0.009 (0.047) -0.003	-0.041 (0.084) -0.015	-0.002 (0.103) -0.001	0.067 (0.187) 0.025	0.557* (0.247) 0.217	-0.332** (0.087) -0.119	0.223* (0.086) 0.082	44.15 0.000	0.035
city residents	-0.141** (0.037) -0.053	0.074** (0.026) 0.028	-0.039 (0.047) -0.019	-0.023 (0.083) -0.008	0.058 (0.102) 0.022	0.101 (0.185) 0.038	0.572** (0.251) 0.225	-0.369** (0.086) -0.136	0.173** (0.085) 0.065	52.37 0.000	0.040
work colleagues	-0.058 (0.038) -0.019	0.031 (0.027) 0.010	0.038 (0.048) 0.012	-0.032 (0.087) -0.010	0.113 (0.105) 0.037	-0.028 (0.201) -0.009	0.507** (0.245) 0.184	-0.169* (0.091) -0.054	0.216** (0.089) 0.071	23.48 0.005	0.021
Crime victims	-0.001 (0.048) -0.001	0.021 (0.034) 0.003	0.112 (0.062) 0.019	-0.084 (0.109) -0.015	-0.001 (0.134) -0.001	0.492* (0.218) 0.109	-0.305 (0.386) -0.043	-0.396** (0.120) -0.065	0.281** (0.112) 0.049	29.16 0.000	0.043
Crime participation	-0.004 (0.035) -0.002	-0.027 (0.025) -0.011	0.011 (0.045) 0.004	0.100 (0.081) 0.039	-0.045 (0.099) -0.018	-0.277 (0.184) -0.108	0.015 (0.245) 0.006	0.348** (0.083) 0.138	-0.042 (0.084) -0.016	24.58 0.004	0.018
Government pro-immigrant	-0.102** (0.040) -0.028	0.039 (0.029) 0.012	0.026 (0.052) 0.007	-0.067 (0.093) -0.018	0.037 (0.112) 0.010	0.236 (0.199) 0.071	0.425* (0.256) 0.135	-0.375** (0.098) -0.100	0.122 (0.095) 0.033	32.99 0.000	0.033
Overall attitude of the natives is negative	-0.025 (0.038) -0.007	0.022 (0.027) 0.006	-0.006 (0.049) -0.002	0.026 (0.088) 0.008	-0.242* (0.112) -0.073	0.294 (0.186) 0.101	-0.582* (0.325) -0.146	-0.108 (0.091) -0.034	0.184** (0.091) 0.058	18.20 0.033	0.016
Attitude of migrants towards natives is positive	-0.059 (0.038) -0.018	0.028 (0.027) 0.00	-0.091 (0.050) -0.028	-0.078 (0.088) -0.024	-0.113 (0.111) -0.034	0.063 (0.195) 0.019	0.149 (0.262) 0.048	-0.176* (0.092) -0.053	0.096 (0.092) 0.029	14.79 0.097	0.013

\* - significant at 10% \*\* - significant at 5%

Table 2. Attitudes towards Immigrants. Trivariate Probit Coefficients, Standard Errors for Coefficients in Parentheses, and Marginal Effects. *Acceptance Questions*

Dependent variable:	family members	friends	neighbours	microdistrict residents	city residents	work colleagues
Independent variable:						
Age	-0.074 (0.057) -0.005	-0.075* (0.040) -0.019	-0.085** (0.039) -0.026	-0.095** (0.036) -0.035	-0.121** (0.036) -0.046	-0.055 (0.038) -0.018
Age*Pensioner	0.093** (0.043) 0.006	0.050* (0.027) 0.013	0.049* (0.027) 0.015	0.070** (0.025) 0.026	0.079** (0.025) 0.030	0.041 (0.027) 0.0133
Education	0.026 (0.077) 0.002	0.091* (0.053) 0.024	0.040 (0.049) 0.013	0.016 (0.047) 0.005	-0.016 (0.047) -0.006	0.042 (0.049) 0.017
Gender	0.029 (0.142) 0.002	0.097 (0.095) 0.026	-0.021 (0.088) -0.006	-0.028 (0.084) -0.010	-0.017 (0.083) -0.006	-0.036 (0.088) -0.012
Private occupation	-0.203 (0.170) -0.015	-0.088 (0.114) -0.023	-0.098 (0.106) -0.031	-0.041 (0.098) -0.015	0.024 (0.097) 0.009	0.093 (0.105) 0.031
Unemployed	-3.412 (75.922) -0.249	-0.258 (0.235) -0.068	0.167 (0.187) 0.052	0.083 (0.177) 0.031	0.115 (0.175) 0.044	-0.006 (0.202) -0.002
Kiev<5	0.758** (0.312) 0.055	0.406* (0.251) 0.107	0.431* (0.248) 0.135	0.579** (0.248) 0.216	0.604** (0.251) 0.229	0.521* (0.251) 0.171
RD	-0.427 (0.321) -0.361	-0.745** (0.291) -0.196	-0.644** (0.275) -0.202	-0.969** (0.242) -0.361	-1.006** (0.235) -0.383	-0.378 (0.268) -0.124
LC	0.664** (0.184) 0.126	0.420** (0.155) 0.111	0.345** (0.161) 0.108	0.339** (0.168) 0.126	0.256 (0.169) 0.097	0.423** (0.169) 0.138
Intercept	-1.634 (0.258) 0.047	-0.826** (0.241) -0.217	-0.405* (0.225) -0.126	0.127 (0.212) 0.047	0.389* (0.208) 0.148	-0.621 (0.221) 0.203
Observations	964	964	964	964	964	964
Wald chi2 (25)	330.06	372.29	355.20	386.41	391.36	326.28
Prob>chi2	0.000	0.000	0.000	0.000	0.000	0.000

\* - significant at 10%

\*\* - significant at 5%

Table 2 (continued). Attitudes towards Immigrants. Trivariate Probit Coefficients, Standard Errors for Coefficients in Parentheses, and Marginal Effects

Dependent variable:	Crime victim	Crime participant	Government action: pro-immigrant	Attitudes of natives: neg	Attitudes of migrants: pos
Independent variable:					
Age	-0.017 (0.048)	-0.011 (0.035)	-0.094** (0.041)	-0.034 (0.038)	-0.043 (0.037)
	-0.003	-0.004	-0.026	-0.011	-0.014
Age*Pensioner	0.028 (0.034)	-0.031 (0.025)	0.035 (0.030)	0.003 (0.027)	0.018 (0.026)
	0.005	-0.012	0.009	0.001	0.006
Education	0.111* (0.061)	0.009 (0.047)	0.027 (0.053)	0.019 (0.050)	-0.045 (0.049)
	0.019	0.003	0.007	0.006	-0.015
Gender	-0.025 (0.113)	0.091 (0.082)	-0.074 (0.094)	0.067 (0.088)	-0.024 (0.087)
	-0.004	0.036	-0.021	0.022	-0.007
Private occupation	0.024 (0.137)	-0.027 (0.100)	0.022 (0.113)	-0.979* (0.111)	-0.101 (0.101)
	0.004	-0.005	0.006	-0.063	-0.033
Unemployed	0.447 (0.221)	-0.290 (0.184)	0.201 (0.202)	0.215 (0.185)	0.001 (0.181)
	0.079	-0.115	0.055	0.069	0.001
Kiev<5	-0.275 (0.386)	-0.033 (0.250)	0.473* (0.261)	-0.547* (0.331)	0.195 (0.254)
	-0.049	-0.013	0.131	-0.175	0.064
RD	-0.536** (0.264)	0.421* (0.252)	-0.432 (0.290)	-0.273 (0.240)	-0.962** (0.268)
	-0.095	0.167	-0.120	-0.087	-0.313
LC	-0.045 (0.208)	-0.195 (0.174)	0.033 (0.197)	-0.357** (0.169)	-0.332* (0.268)
	-0.008	-0.077	0.009	-0.114	-0.108
Intercept	-1.304 (0.276)	-0.118 (0.208)	-0.438 (0.236)	-0.311 (0.224)	0.192 (0.224)
	-0.232	-0.047	-0.121	-0.100	0.063
Observations	964	964	964	964	964
Wald chi2 (25)	300.78	312.26	303.99	330.06	350.25
Prob>chi2	0.000	0.000	0.000	0.000	0.000

\* - significant at 10%

\*\* - significant at 5%

Table 3. Attitudes towards Immigrants: Additional Independent Variables. Trivariate Probit Coefficients, Marginal Effects, Standard Errors for Marginal Effects in Parentheses

Dependent variable:	family members	friends	neighbours	microdistrict residents	city residents	work colleagues
Indep. variable:						
No prior Communication	-0.093 (0.144) -0.007	-0.261** (0.098) -0.066	-0.124 (0.093) -0.038	0.005 (0.081) 0.002	0.067 (0.081) 0.025	-0.095 (0.091) -0.031
Reason: study	0.211 (0.143) 0.015	0.113 (0.101) 0.028	0.264** (0.094) 0.081	0.105 (0.082) 0.039	0.138* (0.082) 0.053	0.177* (0.092) 0.058
Age	-0.069 (0.057) -0.005	-0.080* (0.041) -0.020	-0.084** (0.039) -0.026	-0.081** (0.035) -0.030	-0.105** (0.035) -0.040	-0.048 (0.037) -0.016
Age*Pensioner	0.097** (0.042) 0.007	0.049* (0.029) 0.012	0.045* (0.027) 0.014	0.059** (0.024) 0.022	0.065** (0.024) 0.025	0.038 (0.027) 0.013
Education	0.030 (0.077) 0.002	0.097* (0.054) 0.025	0.038 (0.050) 0.012	0.027 (0.046) 0.011	-0.001 (0.045) -0.0004	0.048 (0.049) 0.016
Gender	0.041 (0.139) 0.003	0.077 (0.096) 0.019	-0.054 (0.089) -0.017	-0.033 (0.081) -0.012	-0.026 (0.081) -0.010	-0.046 (0.087) -0.015
Private occupation	-0.196 (0.168) -0.014	-0.079 (0.117) -0.020	-0.104 (0.108) -0.032	-0.064 (0.094) -0.024	0.001 (0.094) 0.001	0.085 (0.104) 0.028
Unemployed	-3.357 (4.749) -0.247	-0.276 (0.245) -0.070	0.154 (0.192) 0.047	0.061 (0.170) 0.023	0.087 (0.168) 0.033	-0.013 (0.197) -0.004
Kiev<5	0.689** (0.317) 0.051	0.394 (0.267) 0.100	0.371 (0.253) 0.114	0.549** (0.248) 0.205	0.562** (0.249) 0.215	0.487** (0.249) 0.160
RD	-0.473** (0.242) -0.034	-0.488** (0.180) -0.124	-0.499** (0.188) -0.154	-1.147** (0.146) -0.430	-1.186** (0.142) -0.453	-0.580** (0.192) -0.191
LC	0.649** (0.198) 0.047	0.349** (0.158) 0.088	0.285* (0.162) 0.088	0.207 (0.153) 0.078	0.119 (0.151) 0.045	0.285* (0.166) 0.094
Intercept	-1.651** (0.316) -0.121	-0.789** (0.222) -0.201	-0.438** (0.216) -0.135	0.178 (0.195) 0.067	0.376 (0.194) 0.144	-0.495* (0.217) -0.163
Wald chi2 (25)	409.18	429.64	424.48	565.70	588.81	412.95
Prob>chi2	0.000	0.000	0.000	0.000	0.000	0.000

\* - significance of triprobit coefficients at 10% \*\* - significance of triprobit coefficients at 5%

Table 3 (continued). Attitudes towards Immigrants: Additional Independent Variables. Trivariate Probit Coefficients, Marginal Effects, Standard Errors for Marginal Effects in Parentheses

Dependent variable:	Crime victim	Crime participant	Government action: pro-immigrant	Attitudes of natives: neg	Attitudes of migrants: pos
Indep. variable:					
No prior Communication	-0.274** (0.013) -0.049	-0.041 (0.087) -0.016	-0.097 (0.096) -0.027	-0.275** (0.088) -0.088	0.035 (0.069) 0.011
Reason: study	-0.177 (0.136) -0.032	-0.083 (0.087) -0.033	0.171* (0.098) 0.048	-0.210** (0.092) -0.067	0.091 (0.092) 0.029
Age	-0.018 (0.714) -0.003	-0.013 (0.035) -0.005	-0.077** (0.039) -0.022	-0.042 (0.037) -0.013	-0.051 (0.038) -0.016
Age*Pensioner	0.037 (0.268) 0.006	-0.029 (0.253) -0.012	0.029 (0.029) 0.008	0.009 (0.027) 0.003	0.016 (0.027) 0.005
Education	0.121** (0.047) 0.022	0.002 (0.047) 0.001	0.046 (0.052) 0.013	0.020 (0.050) 0.006	-0.051 (0.050) -0.016
Gender	-0.007 (0.950) -0.001	0.093 (0.082) 0.037	-0.074 (0.091) -0.021	0.084 (0.088) 0.027	-0.058 (0.087) -0.019
Private occupation	0.026 (0.847) 0.005	-0.013 (0.100) -0.005	-0.009 (0.111) -0.003	-0.209* (0.113) -0.067	-0.102 (0.107) -0.032
Unemployed	0.451 (0.042) 0.081	-0.284 (0.184) -0.0113	0.175 (0.199) 0.049	0.215 (0.186) 0.068	-0.015 (0.192) -0.005
Kiev<5	-0.215 (0.580) -0.038	-0.016 (0.250) -0.007	0.434* (0.026) 0.123	-0.506 (0.337) -0.162	0.163 (0.262) 0.052
RD	-0.652** (0.005) -0.116	0.586** (0.192) 0.233	-0.772** (0.218) -0.219	-0.269 (0.192) -0.086	-0.586** (0.188) -0.186
LC	-0.150 (0.478) -0.026	-0.106 (0.169) -0.042	-0.074 (0.184) -0.021	-0.409** (0.156) -0.131	-0.400** (0.182) -0.127
Intercept	-1.000 (0.287) -0.180	-0.145 (0.207) -0.057	-0.315 (0.215) -0.089	-0.027 (0.223) -0.009	0.044 (0.217) 0.014
Wald chi2 (25)	387.41	395.46	414.50	423.97	410.31
Prob>chi2	0.000	0.000	0.000	0.000	0.000

Table 4. Correlation Coefficients and their Standard Errors, Basic Model

	Rho12 (Attitude/RD)	Rho13 (Attitude/LM)	Rho23 (RD/LM)	LR Test Rho12=Rho13=Rho23=0 P-value
Acceptance: as family member	0.126 0.186	-0.280** 0.116	-0.228** 0.055	19.614 0.000
Friend	0.434** 0.190	-0.266** 0.099	-0.219** 0.053	22.349 0.000
Neighbour	0.390* 1.75	-0.236* 0.105	-0.223** 0.055	22.107 0.000
Microdistrict resident	0.441** 0.158	-0.214* 0.106	-0.231** 0.056	27.22 0.000
City resident	0.440** 0.154	-0.185* 0.106	-0.232** 0.056	27.23 0.000
Work colleague	0.154 0.168	-0.212* 0.109	-0.224** 0.056	19.444 0.000
Crime victim	0.033 0.151	0.221* 0.127	-0.226** 0.055	20.431 0.000
Crime participant	-0.059 0.158	0.131 0.113	-0.237** 0.057	18.036 0.000
Government: pro-immigrant	0.038* 0.016	0.051 0.129	-0.229** 0.055	16.54 0.000
Attitudes of natives: bad	0.061 0.149	0.399** 0.107	-0.230** 0.057	28.800 0.000
Attitudes of migrants: good	0.476** 0.177	0.186* 0.110	-0.230** 0.056	24.969 0.000

\* - significance at 5%, \*\* - significance at 1%

Table 5. Extended Trivariate Probit Model. Dependent Variable: Willingness to Accept Immigrants as Friends. Coefficients and Standard Errors.

Equations:	1) Attitude	2) LM confidence	3) RD group
Variables:			
No prior communication	-0.261** (0.098)	-	-
Reason: study	0.113 (0.101)	-	-
Age	-0.080* (0.041)	-0.001 (0.039)	0.013 (0.029)
Pensioner	-	-0.155 (0.165)	-
Age*Pensioner	0.049* (0.029)	-	-
Education	0.097* (0.054)	-0.019 (0.052)	0.021 (0.048)
Gender	0.077 (0.096)	0.051 (0.092)	0.068 (0.085)
Private occupation	-0.079 (0.117)	0.128 (0.109)	-
Unemployed	-0.276 (0.245)	-0.219 (0.213)	-
Kiev<5	0.394 (0.267)	-0.139 (0.292)	0.022 (0.266)
RD	-0.488** (0.180)	-	-
LC	0.349** (0.158)	-	-
Real income difference	-	-	-0.380** (0.043)
Reason: better life	-	-	0.155* (0.087)
Real employment difference	-	0.694** (0.048)	-
Problems: finding work	-	0.471** (0.098)	-
Education of immigrant	-	-0.013 (0.144)	-
Length of stay, 1 <sup>st</sup> wave	-	0.116** (0.041)	0.201** (0.038)
Length of stay, 2 <sup>d</sup> wave	-	-0.032 (0.031)	-0.018 (0.026)
Length of stay, 3 <sup>d</sup> wave	-	0.022* (0.012)	0.072** (0.014)
Correlation Coeff:	(1,2): 0.253 0.106	(1,3): -0.191 0.107	(2,3) -0.261 0.054
Wald chi2 (33) = 429.64 Prob > chi2 = 0.000. Log likelihood = -1493.386			

Table 6. Correlations Between Attitudinal Responses

	Fam	Fr	Neighb	Area	City	Coll	Vict	Part	Gov	Nat	Imm
Family	1.00										
Friend	0.43	1.00									
Neighbour	0.39	0.59	1.00								
Area Resid	0.27	0.46	0.63	1.00							
City Resid	0.26	0.45	0.59	0.88	1.00						
Colleague	0.31	0.55	0.70	0.68	0.65	1.00					
Crime victim	0.03	0.07	0.07	0.09	0.09	0.12	1.00				
Crime partic	-0.11	-0.11	-0.12	-0.12	-0.12	-0.12	-0.33	1.00			
Gov: pro	0.22	0.29	0.33	0.36	0.36	0.35	0.12	-0.17	1.00		
Natives: neg	-0.02	-0.09	-0.10	-0.07	-0.08	-0.09	0.08	0.07	-0.07	1.00	
Migrants: pos	0.13	0.19	0.23	0.26	0.28	0.20	0.11	-0.10	0.21	0.02	1.00

Table 7. Principal Components: Eigenvalues

Factor	1	2	3	4	5	6	7	8	9	10	11
Eigenvalue	4.13	1.31	1.1	0.94	0.8	0.72	0.65	0.54	0.39	0.28	0.11
Difference	2.82	0.21	0.16	0.13	0.08	0.06	0.11	0.14	0.11	0.17	-
Proportion	0.37	0.11	0.1	0.08	0.07	0.06	0.05	0.04	0.03	0.02	0.01
Cumulative	0.37	0.49	0.59	0.68	0.75	0.81	0.87	0.92	0.96	0.98	1

Table 6. Attitudes towards Immigrants. First Principal Component as a Dependent Variable. Coefficients and Standard Errors

Model:	OLS (robust s.e.) Basic model	Tree-Stage OLS Basic model	Tree-Stage OLS Extended model
Independent variable:			
Age	-0.189** 0.055	-0.156** 0.058	-0.153** 0.058
Age*Pensioner	0.106** 0.039	0.121** 0.040	0.119** 0.039
Education	0.017 0.072	0.075 0.079	0.073 0.079
Gender	-0.057 0.127	0.004 0.138	-0.024 0.138
Kiev<5	1.104** 0.444	1.247** 0.417	1.169** 0.422
Private occupation	-0.003 0.127	-0.114 0.162	-0.103 0.158
Unemployed	0.100 0.268	0.131 0.286	0.108 0.283
RD	-0.504** 0.128	-2.639** 0.475	-2.655** 0.346
LC	0.404** 0.136	0.448* 0.211	0.338* 0.206
No prior communication	-	-	-0.172 0.136
Reason: study	-	-	0.338** 0.136
Intercept	0.568 0.284	1.171 0.378	1.213 0.346
F (chi2)	(9, 980)= 5.53	(9, 964) = 76.90	(9, 964) = 91.26
Prob>F (chi2)	0.000	0.000	0.000
Root MSE	1.982	2.231	2.201

\* - significance at 5%,

\*\* - significance at 1%