Labor Market Integration of German Immigrants and their Children : Does Personality Matter?

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Abstract

The aim of this paper is to contribute to research on the determinants of labor market integration of immigrants. Educational attainment, length of stay, differences in national background and language skills play an acknowledged important role. But integration is also a social process, which suggests psychological factors are relevant. The paper explores whether and to what extent immigrants and their children need to believe in their ability to control their own success, in other words their sense of control.

To quantify this personal trait we use a measure of an individual's sense of control over outcomes in life - such as finding a job. This measure is known in psychology as "the locus of control". We first estimate an exogenous measure. Then we address the problem that this measure is actually endogeneous in a labor market outcome equation by employing a model in which the sense of control is an endogenized latent factor in a simultaneous equation model. The determinants of this sense of control as well as its effect on the probability of being employed are examined. The model is estimated using an implemented Bayesian Monte Carlo Markov Chain algorithm.

Results with endogenized personality indicate that, on average, immigrants believe less than natives in being able to control outcomes in life, but children of immigrants have already a stronger sense of control than their parents. The paper also finds that sense of control over life's outcomes positively contributes to the probability of being employed. This means that immigrants and their children face a double disadvantage on the labor market: they are disadvantaged because of their status as an immigrant and they have a lower sense of being able to control their situation, which is a personality trait that matters on the labour market.

1 Introduction

Does personality matter for integration of immigrants into the labor market? Intuition and common sense suggest a positive answer, but scientifically it is not as straightforward to tell, especially for the economist. This paper does not invent a new immigrant "homo oeconomicus" with a mathematically modelled personality, feelings, culture and other human features. Instead, it suggests a starting point to include an aspect of personality, a noncognitive skill, into an econometric model of labor market integration for immigrants. Measures of noncognitive skills and their inclusion into economic models have recently been studied in the economic literature - theoretically as well as empirically. This body of literature is still small but since it follows the trend of derationalizing the "homo oeconomicus", it is promising. Studies of the role of noncognitive skills have been undertaken for natives and there is a small literature on noncognitive skills for immigrants. The aim of this paper is to enrich this small body of literature by using an elaborated statistical tool to address problems of measurement error and endogeneity, which are very evident when working with measures of psychological concepts, such as noncognitive skills. This tool allows to endogenize measurement of noncognitive skills by taking into account its determinants. It additionally allows construction of a measure out of an informative set of measures of the noncognitive skill. This is an advantage since psychological concepts are more complex to measure than a naturally quantitative variable such as age or years of schooling.

The personality aspect, or noncognitive skill, we consider is called in psychological terms "locus of control", developed by Rotter (1966). We follow Heckman, Stixrud & Urzua (2005) in this approach. The locus of control is a measure for the degree to which an individual believes he (or she - it matters for both genders) has control over the happenings in his life[1]. It is represented as a scale reaching from "external" to "internal". A high *external* locus of control indicates that the individual believes that his life is controlled by forces outside of his own influence and he or she does not have a high feeling of controlling his life. A high *internal* locus of control however indicates that the individual believes strongly in his ability to control his life. One hypothesis of this paper is that an immigrant, who believes in controlling his outcomes has a higher incentive to provide the effort to integrate. The locus of control is strongly linked to the concept of "motivation": if individuals feel they have control over their lives, they believe in a causality between their actions and outcomes and this will motivate them to take actions.

[1] Osborne and Groves (2006) have already used this measure, see Heckman, Stixrud and Urzua (2005)

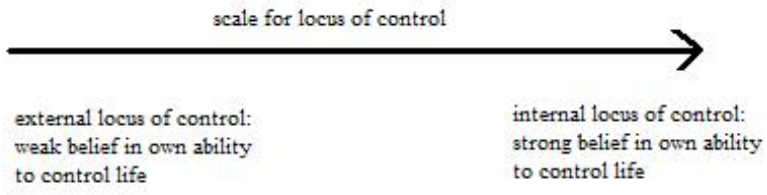

Figure 1: Measuring Personality - the Locus of Control

The locus of control of an individual develops over time, with foundations being laid in childhood and adolescence. Education, family background, maybe religion and also their personal immigration history - such as the arrival date in the host country - can play a role to determine an individual's locus of control. This is why we use a statistical tool, which allows to construct a measure of the locus of control, that depends on its determinants. In this way we address endogeneity problems of some variables, which could be included as controls in the employment equation and be correlated to the measure of the locus of control. This tool is based on work by Fahrmeir & Raach (2006).

This paper finds that a more *internal* locus of control has a positive effect on the probability of being employed. We find that being an immigrant has a significantly negative effect on having a more *internal* locus of control. Immigrants have on average a more *external* index of control. The same is true for the second generation, but the effect is not significant.

The paper is structured as follows. Section 2 gives an overview over the existing literature on labor market integration of immigrants and their children, and in particular in Germany, and over the use of psychological concepts in economics and in the literature on labor market integration. In section 3 I introduce the data I use and describe the main variable definitions of the model. Section 4 presents the model. In section 5 I analyze the empirical results and section 6 contains conclusions.

2 Labor Market Integration of Immigrants and Their Children

The theoretical and empirical study of economic integration of immigrants was initiated by a seminal paper by Chiswick (1978), in which he shows that a catch-

up process of "assimilation" of immigrants' earnings to those of the indigenous population takes place. This assimilation depends positively and crucially on the time spent in the host country. Among the first, Borjas (1985) shows that assimilation depends not only on the duration of stay but differs across cohorts. Borjas (1987) shows, that this cohort effect can be due to a change in the mix of countries-of-origin among the immigrant population.

A debate on how to study integration of immigrants economically commenced and a search for the main determinants of labour market integration began among mainly labour economists. A body of literature is concerned about different measures of integration, such as LaLonde & Topel (1992), Baker & Dwayne (1994) and Eckstein & Weiss (2002). Skills are considered as main factor of labour market integration, such as language acquisition in assimilation. A prominent example is work by Chiswick & Miller (1998). Human capital investment and transferability of skills as an important factor is, for example, studied by Duleep & Regrets (1999). Cultural Factors are studied by a smaller body of economic literature, but ethnic differences in immigrants' performance are acknowledged, for example by Chiswick (1988).

This literature mainly covers the United States and Australia. There is a recently developing body considering the German case, acknowledging the difference in labour market structure and immigration history with respect to the US. In particular, Dustmann & Schmitt (2000) study for example wage performance of immigrant women in Germany. Dustmann (1993) shows, that the status as a temporary vs permanent migrant has an effect on earnings adjustment. Constant, Zimmermann & Zimmermann (2006) examine the role ethnic self-identification. A comparative study of integration in Germany and Denmark by Hinte and Zimmermann (2005) provides a valuable overview over findings in the field.

Main findings on determinants of labour market integration in Germany are that formal education is particularly important since on the German labour market a high importance is attached to formal educational qualifications. Fertig & Schmidt (2001) argue that in the European context, discrimination might play a more considerable role for immigrants' earnings than in the US case.

In this research, I agree to the importance of the factors identified as main determinants. However, in line with a body of research on the role played by personality as a determinant for earnings, I propose to investigate on the importance of personality in form of non-cognitive, or "soft" skills for the labour market performance of immigrants.

2.1 Integration in Germany

In July 2006 the German Integration summit was held and was supposed to be the starting point for a national plan of an integration process. Preceding the summit was the ratification of a new integration policy, the Immigration Act of 2005. This is a nationwide policy program to integrate permanent migrants. These events provide evidence for the fact that German policy makers acknowledge the status of Germany as a country of positive net immigration.

Main goal of the national integration plan is to address language and educational deficits because of the high importance attached to formal degrees on the German labor market[2]. This is partly in line with policy recommendations of an OECD report[3] on the issue. However, the OECD recommendations stress the importance of vocational training, access to self-employment, improved organization of temporary work agencies and early language training. Additionally, anti-discrimination policies and initiatives should be introduced.

Germany has acceepted immigrants since 1954. The rapid economic recovery after the war demanded a work force and contracts were made with those countries that provided workers – mainly Mediterranean. Even after the oil crisis in 1973, a large proportion of immigrants and their families, some of whom came under family re-unification policies, stayed on and became permanent residents. This phenomenon is a main origin for a second-generation of migrants, born in Germany of foreign parents. Between 1988 and 1993 another wave of immigrants, asylum seekers and ethnic Germans, came to Germany. The two waves of different types immigration add complexity in the assessment of integration if immigrants in Germany.

Up to the 1908s integration worked well, but declined because of increasing inflows and the slow down of the postwar economic recovery. Fewer workers were needed. These developments caused negative attitudes towards immigrants in the native population. Policy makers needed to act to promote and monitor integration of immigrants.

An integration policy has become necessary. Experts suggest language promotion, equality of chances and social integration as measures of integration. How successful can these measures be? Again the necessity of a model to study the determinants of labour market integration becomes evident.

2.2 Labor Market Outcomes and Psychological Factors in Economics

The so-called bell-curve argument started by Herrnstein and Murray in the 1990s with their statement, that IQ - or cognitive abilities - matters for socioeconomic success. They also argue that IQ is genetically inherited and is distributed across the population in form of a bell-curve and that some groups are marginalized in society due to their position at the tails of this bell-curve. A response to this discussion was given by Bowles and Gintis also in the 1990s, who claim that not only the cognitive skills matter but also personal traits. In 2001 Bowles, Gintis and Osborne - (henceforth BGO) - produced a paper providing models and empirical evidence for their statement.

BGO state that there are four puzzles in the wage determination literature: (1) earnings differences among observationally equivalent individuals, (2) there is something passed on to children by their parents which improves performance on the labor market, (3) there are apparently irrelevant personality traits (such

[2] see for example Gang, Zimmermann (1999)

[3] see Liebig (2007)

as home cleanliness) that matter for wage determination and (4) why do school resources have such different impact? The authors see personality traits as the answer to all these puzzles and give evidence of this in their paper.

There are many personality traits and it is a complex task to determine those most relevant for labor market returns. BGO summarize this literature to some extent and find, that the traits that matter, are motivation as opposed to fatalism - measured in this paper by the locus of control, communication skills, attitudes, self-esteem and conscientiousness. A preference for challenge and fear of failure have an effect and can be seen as the risk attitude of an individual. Borghans, Duckworth, Heckman, terWeel (2008) have written an exhaustive account of the connection between personality psychology and economics and examine the explanatory power and interpretation of personality traits in economic models. They extensively review the relevant literature. The Five -Factor model on the five major dimensions of personality can also be an indicator of which noncognitive skills or personality traits to use. This literature claims that the five traits of extraversion, agreeableness, conscientiousness, emotional stability and openness constitute a personality. Farkas (2003) argues that additionally to the five factors, leadership, sociability and social sensitivity have an effect on socioeconomic success of individuals.

Motivation, measured in this paper by the locus of control, is a trait studied widely among researchers on the relationship between labor market success and non-cognitive traits. Duncan and Dunifon (1998) for instance have written a study of the long-run effects of motivation on labor market success.

The literature seems to agree that social background in turn plays a role in determining the personal traits affecting socioeconomic success and that noncognitive skills develop over time Cunha & Heckman (2007) and Cunha, Heckman & Schennach (2007) develop a framework to the change in noncognitive skill over time.

In the literature on immigration and integration of immigrants, (and especially in the psychological literature), acculturation and identity strategies are seen as key factors for integration (see Berry(2001)). Sociability is also studied as a key factor for integration by dePalo,Faini,Venturini (2006). Fertig (2004) analyses the differences in leisure-time activities and attitudes of foreign immigrants, ethnic Germans and different generations and finds that both generations have differences in attitudes compared to Germans. Second generation immigrants seem to be the most fatalist and pessimist.

This paper enriches the literature on psychological determinants in economic models for immigrants by studying the effect of the locus of control on immigrants' labor market outcomes.

3 The Model

3.1 Measuring Personality: The Locus of Control

Personality measures have been developed by personality psychologists using self reported questionnaires with so-called psychometric questions. They found five factors - openness to experience, conscientiousness, extraversion, agreableness, neuroticism. Motivation can be allocated to conscientiousness, which includes the facet "striving to achievement"[4]. Personality psychologists have found that personality is partly inherited and partly determined by the environment.

The psychometric questions to measure the locus of control are based on measures formulated by Rotter (1966). They are chosen from the following set of questions, present in the 1999 sample of the German Socioeconomic Panel:

1. How my life goes depends on me
2. Compared to other people, I have not achieved what I deserve
3. What a person achieves in life is above all a question of fate or luck
4. If a person is socially or politically active, he/she can have an effect on social conditions
5. I frequently have the experience that other people have a controlling influence over my life
6. One has to work hard in order to succeed
7. If I run up against difficulties in life, I often doubt my own abilities
8. The opportunities that I have in life are determined by the social conditions
9. Inborn abilities are more important than any efforts one can make
10. I have little control over the things that happen in my life

The answers can be "totally disagree", "slightly disagree", "slightly agree", "totally agree". I merge the first two categories to improve identification of the model, since the first two categories are characterized by low frequencies. The questions are chosen using the correlation matrix of the ten items. Five items display bivariate correlations with each other above 0.3, which is considered sufficiently large in this context. These five items are

2. Compared to other people, I have not achieved what I deserve
3. What a person achieves in life is above all a question of fate or luck
5. I frequently have the experience that other people have a controlling influence over my life
7. If I run up against difficulties in life, I often doubt my own abilities
10. I have little control over the things that happen in my life

3.1.1 Economic Content of the Personality Measures

In this section I seek to convince the reader of the economic content and relevance of the five psychometric questions above. For the questions 2 and 7, I refer to a working paper by Eeckhout and Weng (2009). In their labor learning model, neither workers nor firms know the worker's type, but they learn it by

[4] see Borghans, Duckworth, Heckman, terWeel

the wages a worker receives over time. Workers and firms can observe all wages received of all workers across time. This outcome process depends on a random error term. Such a model can explain why an individual would assume his abilities are of a low type if he receives only low wages. In question 7, "running up against difficulties in life", can be understood as receiving only lower wages. The fact that every worker can see the outcome of all other workers can explain why workers might think that others have achieved more than they, given their beliefs about their own abilities.

Questions 3,5 and 10 all concern a belief about the importance of random happenings in life. To rationalize this belief by common economic models, I envisage a signalling model with a noisy signal. In this model workers would signal their ability by effort. But this effort arrives with noise at the firm. If individuals experience repeatedly a large noise for their signal and their true effort is not known by the firm, they would start believing that they cannot control their outcomes.

3.2 Exogenous Personality : Two step estimation procedure

3.2.1 The Personality Model

As a first step, we estimate two models separately. The first model is a classic factor model. Factor models have been developed in psychology to measure intelligence[5]. Later factor models were also used to measure other personality traits, in political science for measuring concepts and in financial economics to measure latent concepts which influence financial markets.

The main idea of factor models is to use a set of measures for the concept "intelligence", "discipline","peace" or "beliefs on the stock market" and to divide the joint variation among these measures into a common part θ and a random part ε and to estimate the common part θ and its effect on the measures, indicated by α. θ indicates in this paper the locus of control, which is measured using a set of questions related to the locus of control[6]. The model is a simultaneous equation model of the five psychometric questions above. Each psychometric question is modelled as an ordered probit model. All five questions are assumed to depend on a latent factor θ, the locus of control, and an independent random error term ε^M. The psychometric questions all depend differently on the latent factor - each question has a different factor loading α^M,which can be interpreted as a coefficient of the latent factor in the regression of M on θ.The model is estimated with a maximum likelihood methodology, implemented in

[5] see Spearman

[6] these questions have been developed by Rotter (1966)

STATA. The model takes the form:

$$\begin{aligned} M_1 &= \{1,2,3\} \\ M_1^* &= \alpha^{M_1}\theta + \varepsilon^{M_1} \\ M_2 &= \{1,2,3\} \\ M_2^* &= \alpha^{M_2}\theta + \varepsilon^{M_2} \\ M_3 &= \{1,2,3\} \\ M_3^* &= \alpha^{M_3}\theta + \varepsilon^{M_3} \\ M_4 &= \{1,2,3\} \\ M_4^* &= \alpha^{M_4}\theta + \varepsilon^{M_4} \\ M_5 &= \{1,2,3\} \\ M_5^* &= \alpha^{M_5}\theta + \varepsilon^{M_5} \end{aligned}$$

Parametric Identification of Factor Models Here I give a brief outline of the identification of factor models. Factor models take the form of the measurement equation above:

$$M^* = \alpha^M\theta + \varepsilon^M$$

Consider M^* to be computable.

The identification of factor models is based on the covariance matrix of the items:

$$cov(M^*) = \Lambda\Sigma_f\Lambda' + \Omega_e$$

where

$$\begin{aligned} \theta &\perp \varepsilon^M \\ \varepsilon^M &\sim N(0,1) \end{aligned}$$

Λ - matrix of factor loadings α^M
Σ_f - variance-covariance matrix of the factors
Ω_e - diagonal matrix of "uniqueness"-variances of ε^M
K - number of factors θ
L - number of items M

The goal is to identify KxL factor loadings Λ and K variances of factors Σ_f . The elements of $cov(M)$ are observable and the elements of Ω_e are determined by our distributional assumption on ε^M. So we can identify the unobservable elements Λ and Σ with the $(L(L-1)/2)$ observable off-diagonal elements of $cov(M)$.So,we need that

$$L(L-1)/2 \geq (L \times K) + K.$$

The number of unique terms in $cov(M)$ needs to be equal to or larger than the number of factor variances and factors. In our case $K = 1$ and $L = 5$. So we have

$$\begin{aligned} 5 * 4/2 &\geq 5 + 1 \\ 10 &\geq 6 \end{aligned}$$

3.2.2 The Employment Model

The second model is an employment model. The latent factor θ, estimated through the model above, is treated as an additional explanatory variable in the employment equation. The model takes the form:

$$\begin{aligned} D &= \{0, 1\} \\ D^* &= \beta_0^D + \alpha^D \theta + \beta^D X + \varepsilon^D \end{aligned}$$

3.3 Endogenizing Personality: Simultaneous Equation Model

The models above treats the personality measure, the locus of control, as exogenous. As a next step, we endogenize the locus of control - firstly to address its endogeneity in an employment equation and secondly to find out, how the locus of control is determined. Especially, we are interested in whether immigrants and their children have different positions on the locus of control scale. Additionally, the methodology, we use for this, allows to estimate all parameters and the locus of control at the same time. This avoids treating the measure of the locus of control as an observed quantity as we did above.

The model is a linear parametric simultaneous equation model with an embedded factor model structure, as described above. The simultaneous equation model contains the equations for the economic outcome D and for the measures M. In this paper the latent concept "locus of control" is endogenized and so I add another equation in the simultaneous equation model to determine θ

The model then takes the following form:

$$\begin{aligned} D &= \{0, 1\} \\ D^* &= \beta_0^D + \alpha^D \theta + \beta^D X + \varepsilon^D \\ M &= \{1, 2, 3\} \\ M^* &= \alpha^M \theta + \varepsilon^M \\ \theta &= \gamma W + \varepsilon^\theta \end{aligned}$$

where D is an employment indicator, M signifies psychometric measures for the locus of control. Since M and D are categorical variables we need to impose a probit structure on the variables, so D^* and M^* indicate the latent underlying variables for the probit models for M and D. X comprises the observable

variables (called *direct effects*). W comprises the observable variables (called *indirect effects*) "age", "gender", "immigrant", "religion important" (how important is religion,belief for your wellbeing?), "father upper secondary education", "mother upper secondary education", "father education missing", "mother education missing", "employment in 99", "still in education in 99".

3.3.1 Identification Assumptions

The identification strategy is parametric and we need to make assumptions on the distributions of the error terms and of the latent concept.

$$\begin{aligned} \varepsilon_D &\sim N(0,1) \\ \varepsilon_M &\sim N(0,1) \\ \varepsilon_\theta &\sim N(0,1) \end{aligned}$$

We need to impose normalization conditions on D_i^* and M_i^*:
$V(D_i^*)$ is normalized to 1
$V(M_i^*)$ is normalized to 1
We additionally impose normality of θ, conditional on W.
Finally we need to impose conditional independence conditions:

$$\begin{aligned} \theta &\perp \varepsilon_M | W \\ \theta &\perp \varepsilon_D | W, X \\ X &\perp \theta | W \end{aligned}$$

For all tricategorical items the cutpoint between the first and the second category is $c_1 = 1$.

3.3.2 Estimation: The Gibbs Sampler

The model is estimated using a popular Monte Carlo Markov Chain method. It is explained in more detail in chapter one of my thesis. The likelihood function of a model with latent variables is an integral[7], which needs to be solved by numerical methods. Monte Carlo Markov Chain methods provide a way to sample from the integral and thereby estimate the parameters of interest. The main advantage of the Gibbs sampler is its relative computational ease.

The Gibbs sampler is a Bayesian method. The Bayesian paradigm specifies statistical models as a posterior distribution, composed of the two elements prior distribution and likelihood function. The prior distribution contains the beliefs of the researcher about the parameters before taking into account the information in the data. The prior is combined with the likelihood function, which contains the information of the data. The Gibbs sampler is an algorithm

[7] The latent variable is treated as a parameter over which the likelihood function needs to be integrated.

taking repeated random samples from the full conditionals of the posterior distribution. The full conditionals are the conditional posterior distributions of each parameter of the model, conditional on all the remaining parameters of the model. After a sufficient amount of iterations, the algorithm converges and the sampled values are sampled from the true posterior[8]. The algorithm for the model in this paper, ran for 100 000 iterations.

The posterior joint distribution for individual i of the model can be written as

$$\begin{aligned} f(\beta^D, \alpha^M, \alpha^D, \gamma, \theta_i, M_i^*, D_i^*, c | M_i, D_i, X_i, W_i) &\propto \\ f(\beta)f(\alpha)f(\gamma)f(\theta)f(c)f(M_i^*|\alpha, \gamma, \theta, c, M, X, W)\{\sum_{k_M=1}^{K_M} 1(M_i &= k_M)1(c_{k_M-1} < M_i^* < c_{k_M})\} \\ f(D_i^*|\alpha, \beta, \gamma, \theta, D, X, W)\{\sum_{k_D=1}^{1} 1(D_i &= k_D)1(c_{k_D-1} < D_i^* < c_{k_D})\} \end{aligned}$$

where $f(\beta)f(\alpha)f(\gamma)f(\theta)f(c)$ are the priors. The likelihood function can factored out into $f(M_i^*|.)f(D_i^*|.)$ since we made the conditional independence assumptions above. Each factor of the likelihood function can be written in the same form as

$$\begin{aligned} f(M_i^*|\alpha, c, \theta, M, X, W) &= \int_\theta f(M_i^*|\alpha, \gamma, c, \theta, M, X)f(\theta|W)d(\theta|W) \\ f(D_i^*|\alpha, \beta, \theta, M, X, W) &= \int_\theta f(D_i^*|\alpha, \gamma, \beta, \theta, D, X)f(\theta|W)d(\theta|W) \end{aligned}$$

Since the values for θ are unknown we need to integrate them out.

In the following I show the full conditionals of the model, which the Gibbs sampler algorithm samples from.

3.3.3 Latent Underlying Variables

Albert and Chib (1993) proposed a data augmentation procedure to sample latent underlying variables in a threshold model. It follows from his work, that the full conditional for the latent underlying variable of the binary response is

$$\begin{aligned} f(D_i^*|\alpha, \beta, \theta, D, X) &\propto \\ \prod_{i=1}^{N} f(D_i^*|\beta^D X_i^D + \alpha^D \theta_i, 1)\{\sum_{k_D=1}^{1} 1(D_i &= k_D)1(c_{k_D-1} < D_i^* < c_{k_D})\} \end{aligned}$$

[8] For the theory MCMC algorithms and on the Gibbs sampler, see Robert and Casella (2004).

where $V(D_i^*)$ is normalized to 1. Due to the normality assumptions the latent underlying variable is drawn from the following truncated normal distributions

$$\begin{aligned} D_i^*|\alpha,\beta,\theta,D,X \tilde{} TN_{(-\infty,0)}(\beta^D X_i^D + \alpha^D\theta_i, 1) \text{ if } D_i &= 0 \\ D_i^*|\alpha,\beta,\theta,D,X \tilde{} TN_{(0,\infty)}(\beta^D X_i^D + \alpha^D\theta_i, 1) \text{ if } D_i &= 1 \end{aligned}$$

Similarly, the full conditionals for the polytomous variables are

$$\begin{aligned} f(M_i^*|\alpha,\theta,c,M,X) &\propto \\ \prod_{i=1}^{N} f(M_i^*|\alpha^M\theta_i,1)\{\sum_{k_M=1}^{K_M} 1(M_i &= k_M)1(c_{k_M-1} < M_i^* < c_{k_M})\} \\ M_i^*|\alpha,\theta,c,M,X &\sim TN_{(c_{k_M-1},c_{k_M})}(\alpha^M\theta_i,1) \end{aligned}$$

3.3.4 Factor Loadings

The full conditional for the factor loadings for D can be written as

$$f(\alpha^D|\beta,\theta,D,X,D^*) \propto f(\alpha^D)\prod_{i=1}^{N} f(D_i^*|\beta^D X_i^D + \alpha^D\theta_i, 1)$$

where we choose normal priors $f(\alpha^D) = N(0,1)$ and $f(\alpha^D) = N(0,1)$.If we rewrite the equation for D^* as

$$D_i^* - \beta^D X_i^D = \alpha^D\theta_i + \varepsilon_i^D$$

we can treat it as a normal regression model and derive for M and D

$$\begin{aligned} \alpha^M|\theta,c,M,M^* &\sim N\left[(\theta_i'\theta_i+1)^{-1}\theta_i'(M_i^*),(\theta_i'\theta_i+1)^{-1}\right] \\ \alpha^D|\beta,\theta,D,X,D^* &\sim N\left[(\theta_i'\theta_i+1)^{-1}\theta_i'(D_i^*-\beta^D X_i^D),(\theta_i'\theta_i+1)^{-1}\right] \end{aligned}$$

3.3.5 Coefficients

Similarly to the procedure for the factor loadings, we can write the model as

$$D_i^* - \alpha^D\theta_i = \beta^D X_i^D + \varepsilon_i^D$$

For the coefficients, we choose to set diffuse priors as well. The full conditionals for the intercepts are, according to Albert and Chib (1993,p.671)

$$\beta^D|\alpha,\theta,c,D,X,D^* \sim N\left[(X_i'X_i)^{-1}X_i'(D_i^*-\alpha^D\theta_i^D),(X_i'X_i)^{-1}\right]$$

3.3.6 Cutpoints

We assume a uniform prior for the cutpoints and can write for the full conditionals for the polytomous responses

$$c^M|\alpha,\theta,M,X,M^* \sim unif \left[\begin{array}{c} \max\{\max\{M_i^* : M_i = k_M\}, c_{M-1}\}, \\ \min\{\min\{M_i^* : M_i = k_{M+1}\}, c_{M+1}\} \end{array} \right]$$

3.3.7 Latent Factors

Similarly as for the procedure for coefficients and factor loadings, we can rewrite the model as

$$\begin{aligned} D_i^* - \beta^D X_i^D &= \alpha^D \theta_i + \varepsilon_i^D \\ M_i^* &= \alpha^M \theta_i + \varepsilon_i^M \end{aligned}$$

and treat it as a normal regression model,where θ_i is the parameter to be estimated. In contrast to Carneiro, Hansen and Heckman (2003), we assume a normal prior for the latent factor $\theta_i \sim N(0,1)$. We can then derive the full conditional for the latent factor as:

$$\begin{aligned} & f(\theta|\beta,\alpha,c,\gamma,M,D,X,W,D^*,M^*) \\ \propto \quad & f(\theta)\prod_{i=1}^{N} f(M_i^*|\alpha^M\theta_i,1) f(D_i^*|\beta^D X_i^D + \alpha^D\theta_i,1) \end{aligned}$$

$$\begin{aligned} & \theta|\beta,\alpha,\gamma,\delta,c,M,D,X,W,D^*,M^* \\ \sim \quad & N\left[\begin{array}{c} \gamma W_i + (\alpha^{D\prime}(\alpha^D + \alpha^{M\prime}\alpha^M + 1)^{-1} \\ (1 + \alpha^{M\prime}(M_i^* - \alpha^{M\prime}\gamma W_i) + \alpha^D(D_i^* - \beta^D X_i^D - \alpha^D\gamma W_i)), \\ I - \alpha^{D\prime}(\alpha^{D\prime}\alpha^D + \alpha^{M\prime}\alpha^M + 1)^{-1}\alpha^D \\ -\alpha^{M'}(\alpha^{D\prime}\alpha^D + \alpha^{M\prime}\alpha^M + 1)^{-1}\alpha^M \end{array} \right] \end{aligned}$$

3.3.8 Indirect Coefficients

The posterior we sample from can be written as

$$\begin{aligned} & f(\gamma|\theta,W) \\ \propto \quad & f(\gamma) f(\theta|\gamma,W) \end{aligned}$$

The model for the latent variable is

$$\theta = \gamma W + \varepsilon_\theta$$

We assume a diffuse prior for the coefficient γ. Similar to the procedures above we get:

$$f(\gamma|\theta, W) \sim N((W'W)^{-1}W'\theta), (W'W)^{-1})$$

4 Data and Variable Definitions

We use data from the 2007 wave of the German Socioeconomic Panel. Despite some inaccuracies the GSOEP is a valuable dataset, especially rich through questions going beyond purely observable characteristics. It is particularly of interest for this study since it includes personality questions as well as migrant-related and detailed data on labor market returns and educational history of individuals. The sample consists of immigrants and natives aged 17-30 in 1999 (so 25-38 in 2007), not in education in 2007, with provided information on the dependent variables. Employment D, age and education are measured in 2007. Psychometric measures, importance of religion are measured in 1999. The sample size is 1812. There are 111 immigrants (6.1% of the sample) and 243 children of immigrants (13.4% of the sample). The German statistical office reports a percentage of 8.8% of "foreign population" (inhabitants of Germany with foreign nationality) in Germany in 2008 [9].

An immigrant is defined as *"foreign born with no German nationality",* immigrants' children ("second generation") are defined as *"born in Germany with no German nationality at birth".*

To measure education levels I constructed three categories according to the ISCED classification. ISCED 0-2 includes education up to the level of general elementary schooling and indicates a low education level, ISCED 3-4 includes "middle vocational schooling" and "vocational plus Abitur" and indicates a medium education level and ISCED 5-6 includes "higher vocational schooling" and "higher education" and indicates a high education level. Each category is controlled for by a dummy variable.

To take into account the different nationalities present in the sample I constructed three geopolitical nationality groups "EU15", "Central Europe and former Soviet Union" and "Turkey". Turkish immigrants are a large group among German non-nationals. A foreign language indicator takes the value one, if the only language spoken at home is the foreign language.

[9] see http://www.statistik-portal.de/Statistik-Portal/de_jb01_jahrtab2.asp

5 Results

5.1 Exogenous Personality

Results are represented in the tables in appendix A. Table 1 shows the results for a simple model of employment, adding a measure of the locus of control. They show that being an immigrant is a disadvantage on the labour market. The disadvantage is attenuated for the second generation. Having a more internal locus of control has a positive and significant effect on the labor market. In table 2, we add an interaction term for the locus of control for immigrants. The coefficient indicates that immigrants, which have a more internal locus of control have an additional labor market advantage over natives with a more internal locus of control.

In table 3, we add nationalities and an indicator of whether German is spoken at home. Being an immigrant or immigrants' offspring no longer has a significant effect. Not speaking German at home, on the other hand, has a negative significant effect. Among the nationalities only EU15 has a positive significant effect. The coefficient of the locus of control indicates that having a more internal locus of control has a positive and significant effect. In table 4 we add the interaction term for the locus of control of immigrants. When controlling for different nationalities and language habits, the immigrants' additional advantage of immigrants with a more internal locus of control compared to natives is no longer significant.

5.2 Endogenized Personality

Tables 5-8 show results for a basic model. Results are very similar to the model with exogenous personality. Table 1 and table 5 show results for a small model of employment, estimated by the standard maximum likelihood method, treating the locus of control as exogenous and, in table 5, estimated by MCMC treating the locus of control as endogenous, and we can see the same results for the estimated coefficients. The same is true for table 3 and table 10.

The interest of nevertheless using MCMC with endogenized factors is twofold - on the one hand we are interested in the determinants of the locus of control, and on the other hand, it is difficult to defend the locus of control, the sense of control over the outcomes in life, as detached from experiences and early childhood determinants.

Results for the endogenous personality model show again that being an immigrant is a disadvantage on the labour market. The disadvantage is attenuated for the second generation. When we add the measure for the locus of control, as in the model presented in table 2, we see that the estimated coefficients stay mainly unchanged, although the estimated migrant disadvantage becomes slightly less, both for immigrants and the second generation. The locus of control has a significantly positive effect for everyone. We can also see that an immigrant needs about 2.5 σ motivation units to overcome his disadvantage on the labour market. A second generation immigrant needs about 1 σ motiva-

tion units to compensate the disadvantage. Instead of by more motivation, the gap for an immigrant could also be overcome by having a high education level instead of a medium one.

In table 3 we show the effects of the latent factor on the psychometric questions. They are all positive and significant. Table 4 shows the estimated effects of the determinants of the locus of control. Immigrants have less motivation than natives and so do the second generation immigrants, but again the negative effect is attenuated for the second generation. This means that immigrants catch up on motivation by generation. Being a Turkish immigrant decreases motivation even further, whereas being a Central European immigrant have a locus of control closer to that of natives. Immigrants from the EU15 countries have a slightly higher motivation.

These results suggest that motivation matters for everyone and that immigrants can overcome their gap by motivation. But immigrants have a *double disadvantage* since they have less motivation than natives and more motivation would actually help them find a job.

Turning to tables 5-8 we see the results for an extended model including ethnic origin and whether German is spoken at home as direct determinants of employment. In table 5, we see that the immigrant-native gap and also the second generation-native gap are reduced and no longer significant. The effect of speaking not speaking German at home is negative and significant. Adding the locus of control to this extended model, as in table 6, attenuates the estimated immigrant-native gap and the second generation-native gap further. The locus of control also diminishes the disadvantage on the labor market due to not speaking German at home. The disadvantage of being Turkish is also slightly reduced. The locus of control has a positive and significant effect on the labour market, it is slightly less than in the model without controlling for the usual language spoken and the ethnic origin. We can see that again 2.5 σ locus of control units can compensate for being an immigrant and 1 for being a second generation immigrants. 4 σ locus of control units can compensate for not speaking German at home.

Table 7 displays again the effects of the latent factor on the psychometric measures. They are all positive and significant. Table 8 displays the determinants of the locus of control. Since the ethnic origin variables and the language variable are endogenous in the employment equation they are included as determinants in the locus of control equation. The results in table 7 indicate again that immigrants have a significantly more external locus of control than natives and again this is the same for the second generation, but the disadvantage is attenuated for the second generation. Religion has a negative insignificant effect. The negative effect can be explained by a certain trust in the world, and outcomes in life, being controlled by a higher power, rather than by oneself. We do not find a significant effect for the different ethnic origins, nor for speaking only the foreign language at home on the probability of a more external locus of control.

The results of the extended model suggest that immigrants and their children have a more external locus of control. They have a weakly significant

disadvantage on the labor market if they do not speak German at home. A more internal locus of control matters on the labor market and an immigrant who is by four σ on the locus of control distribution more internal, will undo this disadvantage.

The graphs in appendix A show that a more internal locus of control has a positive for everyone - for immigrants, natives, for children of immigrants and for men and women. They also indicate an apparent gap between immigrants and natives and a smaller gap between children of immigrants and natives.

6 Conclusion

This paper set out to examine whether personality traits, soft skills, matter for the labour market performance of immigrants to Germany, using the example of the locus of control - the belief of an individual in their own ability to control their lifecourse. We find that a strong belief in control over one's life has a positive effect on the probability of being employed. Immigrants have a more external locus of control than natives, which means that they believe that their lives are more controlled by external circumstances than by themselves. The second generation also has a more external locus of control than natives, but it is already more internal than that of immigrants. This is evidence for a generational convergence of migrants' locus of control towards that of natives. Immigrants have a double disadvantage on the labour market : they are disadvantaged by lower employment chances because of their status and they are additionally disadvantaged due to having a lower sense of being able to control their life and this sense of control positively matters for the probability of being employed.

There seems to be a barrier in the German labour market towards immigrants, which can be overcome by self-confidence, belief in success, personal dedication and commitment. To a certain degree, an effort to adjust to the new country can be expected of an immigrant. But the German labour market should be of such a structure, that this effort should not be necessary to overcome discrimination, but only to start an adjustment process. German integration policies should include some measures to enhance a stronger belief in immigrants, that they will be able to manage their situation. The paper provides evidence for the success and appropriateness of policies or behavior towards migrants, which encourage their belief in their success.

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7 Appendix

7.1 Appendix A: Tables

	β^D	strd errors
sex	-0.55	0.07
age	0.04	0.01
birthcountry	-0.35	0.14
second	-0.11	0.10
edulow	-0.39	0.10
eduhigh	0.30	0.09
edumiss	0.20	0.24
marital	0.07	0.08
kids	0.29	0.08
locus of control	0.12	0.04
Intercept	-0.59	0.34

Table 1: Estimates of the Employment Equation $D^* = \beta X + \varepsilon_D$, estimated by Maximum Likelihood

	β^D	strd errors
sex	-0.55	0.07
age	0.04	0.01
birthcountry	-0.25	0.16
second	-0.12	0.10
edulow	-0.39	0.10
eduhigh	0.30	0.09
edumiss	0.21	0.24
marital	0.07	0.08
kids	0.29	0.08
locus of control	0.10	0.04
locus of control immigrants	0.29	0.16
Intercept	-0.60	0.34

Table 2: Estimates of the Employment Equation $D^* = \beta X + \varepsilon_D$, estimated by Maximum Likelihood

	β^D	strd errors
sex	-0.56	0.07
age	0.04	0.01
foreignlang	-0.44	0.23
turkey	-0.26	0.21
centeur	0.34	0.26
eu15	0.52	0.24
birthcountry	-0.31	0.24
second	-0.14	0.13
edulow	-0.35	0.10
eduhigh	0.29	0.09
edumiss	0.25	0.25
marital	0.09	0.08
kids	0.28	0.08
rotter_ml	0.10	0.04
Intercept	-0.63	0.34

Table 3: Estimates of the Employment Equation $D^* = \beta X + \varepsilon_D$, estimated by Maximum Likelihood

	β^D	strd errors
sex	-0.56	0.07
age	0.04	0.01
foreignlang	-0.40	0.23
turkey	-0.26	0.21
centeur	0.32	0.26
eu15	0.52	0.24
birthcountry	-0.24	0.25
second	-0.15	0.13
edulow	-0.36	0.10
eduhigh	0.29	0.09
edumiss	0.25	0.25
marital	0.08	0.08
kids	0.28	0.08
rotter_ml	0.09	0.04
rotterimm	0.20	0.17
Intercept	-0.64	0.34

Table 4: Estimates of the Employment Equation $D^* = \beta X + \varepsilon_D$, estimated by Maximum Likelihood

	β^D	strd errors
intercept	-1.00	0.50
age	0.03	0.01
gender	-0.56	0.07
immigrant	-0.40	0.14
second generation	-0.16	0.10
edulow	-0.40	0.10
eduhigh	0.31	0.09
marital	0.08	0.08
kids	0.23	0.08

Table 5: Estimates of the Employment Equation $D^* = \beta X + \varepsilon_D$, estimated by MCMC

	β^D, α^D	strd errors
intercept	-0.75	0.50
age	0.03	0.01
gender	-0.57	0.08
immigrant	-0.34	0.15
second generation	-0.11	0.10
edulow	-0.40	0.10
eduhigh	0.27	0.09
marital	0.02	0.08
kids	0.15	0.08
locus of control	0.13	0.04

Table 6: Estimates of the Employment Equation: $D^* = \alpha\theta + \beta X + \varepsilon_D$, estimated by MCMC

	α^M	strd errors
not achieved what I deserve	0.62	0.04
achivements are question of luck	0.44	0.03
other people influence my life	0.72	0.05
doubt my abilities	0.58	0.04
little control over my life	1.37	0.11

Table 7: Estimates of the Psychometric Question Equations: $M^* = \alpha\theta + \varepsilon_M$, estimated by MCMC

	γ	strd errors
age	0.04	0.01
gender	-0.03	0.06
immigrant	-0.80	0.32
second generation	-0.23	0.12
religion important	-0.03	0.07
edulow99	-0.03	0.07
eduhigh99	0.16	0.10
fatherhighedu	0.00	0.10
motherhighedu	0.35	0.13
employed99	0.14	0.09
ineducation99	0.22	0.10
turkey	-0.31	0.20
central europe	0.37	0.23
eu15	0.04	0.20
timestay	0.04	0.02

Table 8: Estimates of Determinants of the Locus of Control: $\theta = \gamma W + \varepsilon_\theta$, estimated by MCMC

	β^D	strd errors
intercept	-1.34	0.51
age	0.04	0.01
gender	-0.56	0.07
immigrant	-0.32	0.24
second generation	-0.18	0.13
edulow	-0.34	0.10
eduhigh	0.29	0.09
turkey	-0.29	0.22
eu15	0.52	0.23
central europe	0.38	0.26
marital	0.08	0.08
kids	0.26	0.08
foreignlang	-0.52	0.22

Table 9: Estimates of the Employment Equation: $D^* = \beta X + \varepsilon_D$, estimated by MCMC

	β^D,α^D	strd errors
intercept	-1.03	0.52
age	0.04	0.01
gender	-0.55	0.08
immigrant	-0.27	0.24
second	-0.14	0.13
edulow	-0.32	0.10
eduhigh	0.29	0.09
marital	0.03	0.08
kids	0.18	0.08
turkey	-0.30	0.22
eu15	0.51	0.24
central europe	0.32	0.26
foreignlang	-0.44	0.23
locus of control	0.11	0.04

Table 10: Estimates of the Employment Equation: $D^* = \alpha\theta + \beta X + \varepsilon_D$, estimated by MCMC

	α^M	strd errors
not achieved what I deserve	0.62	0.04
achivements are question of luck	0.43	0.03
other people influence my life	0.71	0.04
doubt my abilities	0.57	0.04
little control over my life	1.39	0.13

Table 11: Estimates of the Psychometric Question Equations: $M^* = \alpha\theta + \varepsilon_M$, estimated by MCMC

	γ	strd errors
age	0.04	0.01
gender	-0.02	0.06
immigrant	-0.73	0.33
second generation	-0.22	0.12
religion important	-0.04	0.07
edulow99	-0.01	0.07
eduhigh99	0.17	0.10
fatherhighedu	0.00	0.10
motherhighedu	0.37	0.13
employed99	0.11	0.08
ineducation99	0.19	0.09
turkey	-0.26	0.20
central europe	0.36	0.23
eu15	0.02	0.20
timestay	0.03	0.02
foreignlang99	-0.23	0.20

Table 12: Estimates of Determinants of the Locus of Control: $\theta = \gamma W + \varepsilon_\theta$, estimated by MCMC

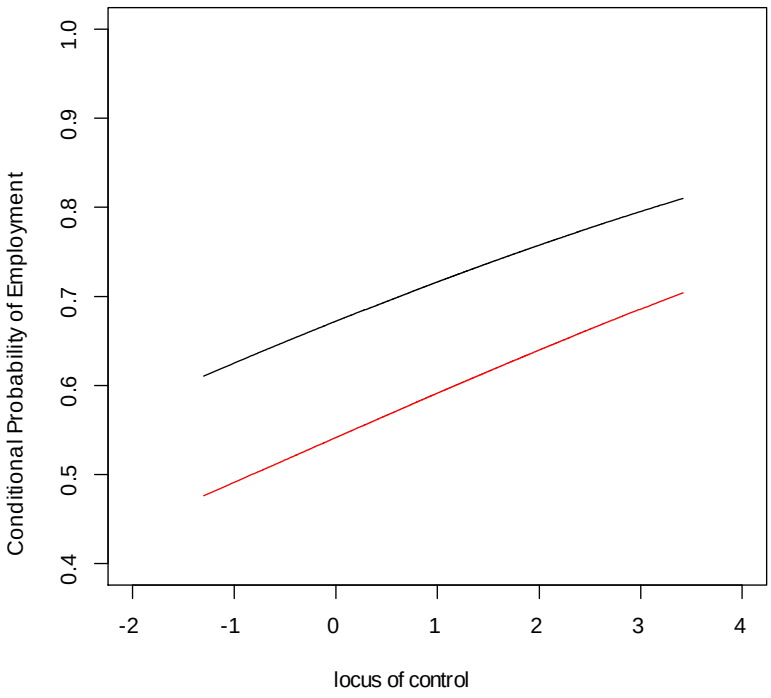

Figure 1: Figure 1: The Conditional Probability of Being Employed for Natives vs Immigrants (32 year old, medium educated, married men with children)

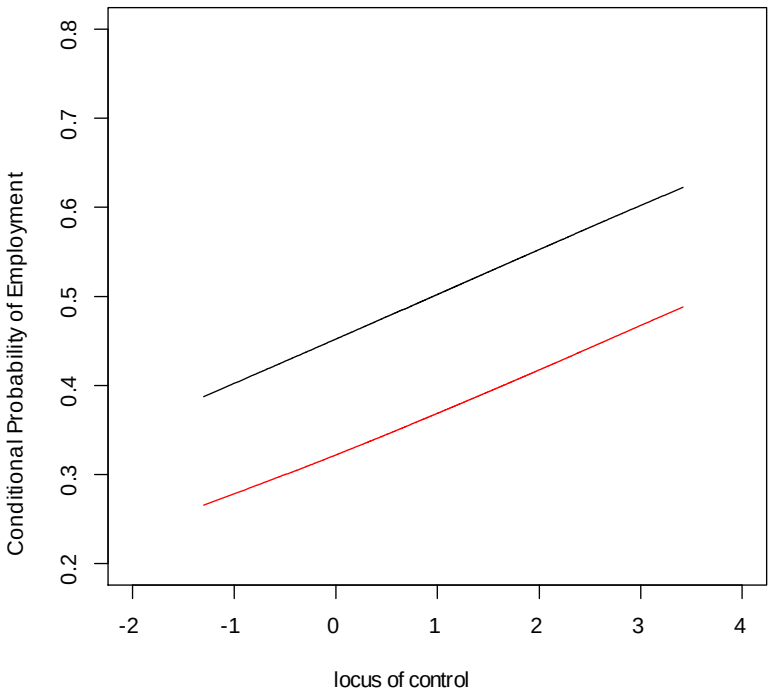

Figure 2: The Conditional Probability of Being Employed for Natives vs Immigrants (32 year old, medium educated, married women with children)

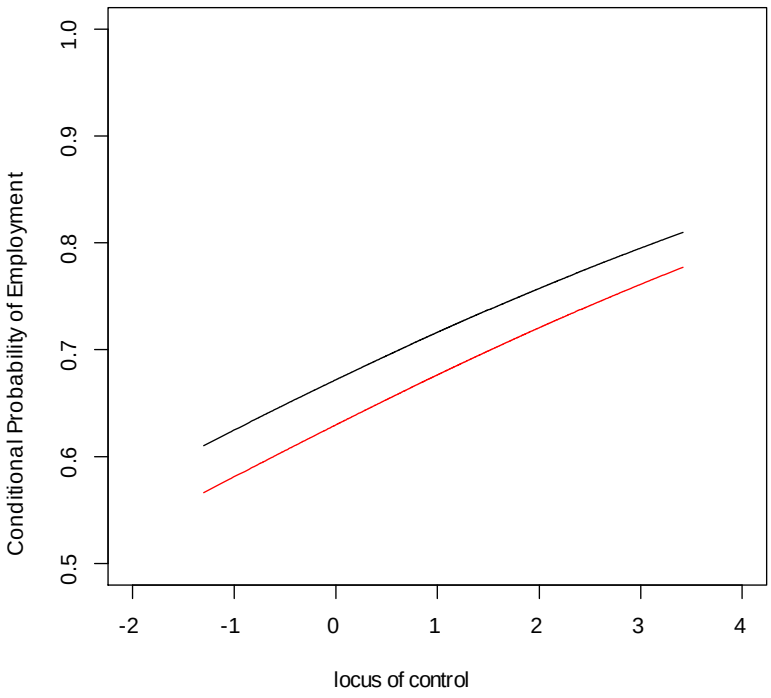

Figure 3: The Conditional Probability of Being Employed for Natives vs Second Generation (32 year old, medium educated, married men with children)

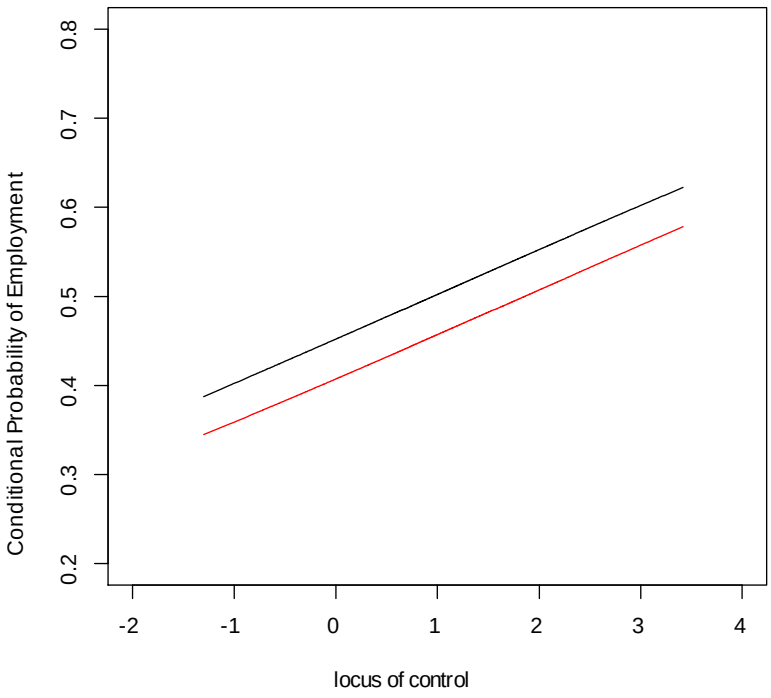

Figure 4: The Conditional Probability of Being Employed for Natives vs Second Generation (32 year old, medium educated, married women with children)