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Differences in the labor market behavior between temporary and permanent migrant women

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Abstract

This paper analyzes labor market behavior of married migrant women. The theoretical analysis shows that migrants who intend to remain only temporarily in the host country are likely to exhibit a different labor market behavior than migrants who wish to stay permanently. The reason is that temporary migrants condition their behavior in the host country on the future expected economic situation in their home countries. In the empirical section, labor market participation behavior of married female migrants is analyzed, using data which allows differentiation between individuals who intend to remain permanently and individuals who intend to remain temporarily only.

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Keywords: International migration; Labor supply

1. Introduction

Over the last three decades, the percentage of migrant workers in the work force of most industrialized countries has steadily increased. [1] This development

[1] In 1990, 8.3 percent of the work force in Germany was of foreign nationality; for France, the respective number for the same year is 6.8 percent. In a recent study, the DIW (1993) forecasts that in the year 2000 15–20 percent of the German work force will be of foreign nationality.

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has motivated considerable research activities on the economics of migration. The labor market performance of migrant workers in particular has been analyzed extensively. Chiswick (1978) was the first to investigate the economic assimilation of migrants to the US labor market. His finding that migrants to the US, after starting off with lower wages, have not only steeper earnings profiles than native workers, but even overcome earnings of natives after about one and a half decades, has launched an extensive research for different countries and migration populations. Chiswick's findings were subsequently replicated by some studies, but rejected by others. [2]

Little research, however, has been devoted to explain the motivation behind certain economic behavior of migrant workers. But for successful labor market policies, it is important to understand the cause for specific behavioral patterns. Migrants may have had different motives for migration. They stem from different countries and societies, exhibit different consumption patterns, and may wish to stay permanently or only temporarily in the host country. These differences in motives, habits and intentions are likely to carry over to their labor market behavior in the host country. If this is the case, then these differences may help to explain the behavior of migrants. Furthermore, they may serve as a basis to design successful migration policies.

This paper emphasizes one factor which is likely to be to some extent responsible for behavioral differences: plans about the future. Migrants may want either to stay during their entire productive period in the host country, or to return to their home country before reaching retirement age. Both forms of migration, one being of a permanent and the other of a temporary character, are observable. [3] Return migrants often intend to participate again in the labor markets of their home countries after a return. As a consequence, when setting up their life-cycle plans these migrants have to consider the economic situation not only of the host country, but also of their home country. Accordingly, and if expectations about the future affect current labor market behavior, otherwise identical temporary and permanent migrants should exhibit a different labor market behavior if the expected future economic conditions differed considerably between host- and home countries.

In the first part of this paper, a two-period model is developed which illustrates in which way a return may influence labor market behavior. To keep the analysis simple, it is assumed that the return decision is exogenous. To test the implications

[2] See, for instance, Borjas (1985, 1987), Carliner (1980) and Dustmann (1993).

[3] Two forms of temporary migration may be distinguished: Migrations where migrants are free to choose their return time, and migrations where migrants are forced to return after a temporary working permit has expired. A typical example for the first case is guest worker migration into Germany, starting in the late 1950s; an example for the second case is contract migration from Asia to countries of the Middle East.

of the theory, data on a migrant population with both migrants who stay permanently and migrants who intend to return before retirement age is required. This information is available in the German Socio-Economic Panel. Using information on married female migrants, the empirical analysis investigates whether the intention to remain permanently or only temporarily matters for the labor force participation decision.

2. Labor–leisure choice and return

Divide the active lifetime of a migrant into two periods. At the beginning and during the first period she resides in the host country. After the first period she may either return to the home country, or remain in the host country. In each period, decisions are made about consumption and labor supply. To focus the analysis, it is assumed that the decision whether to return in period 2 is taken outside the model. [4] One way to look at this is that migrants enter the host country with a fixed, temporary working contract.

The migrant maximizes a lifetime utility function, defined over consumption C and leisure L and additively separable between periods as well as arguments, which takes the following form: [5]

$$u = v^1(C_1) + \Gamma^1 \frac{L_1^\delta}{\delta} + \frac{1}{(1+\rho)}\left[v^2(C_2) + \Gamma^2 \frac{L_2^\delta}{\delta}\right], \tag{1}$$

where the parameter ρ is the rate of time preference, $\delta \in (0,1)$, and the functions v^i, $i = 1,2$, are strictly concave. The variables Γ^i are taste parameters. The migrant maximizes Eq. (1) subject to the following two-period budget constraint:

$$(1-L_1)w_1 + \frac{1}{(1+r)}(1-L_2)w_2 + A_1 + \frac{1}{(1+r)}A_2 - C_1 - \frac{1}{(1+r)}pC_2 = 0, \tag{2}$$

where w_1 and w_2 are wages in the first and in the second period, respectively, and r is the rate of interest. A_1 and A_2 are non-labor incomes in period 1 and period 2. The relative price level between first and second period is given by p. All

[4] Djajic (1989) analyzes the behavior of guest workers in a similar framework, emphasizing the difference between real and nominal wage differentials on migrants' decisions. Galor and Stark (1991) analyze migrants' performance in the host country, assuming that migrants condition their life-cycle planing on an exogenous return probability. Dustmann (1995) provides an analysis where the return point is endogenous.

[5] Results of the analysis do not change for non-separable intra-period utility functions as long as both consumption and leisure are normal goods.

available time in either period is normalized to 1 and may be divided between two activities only, work and leisure.

This is a standard problem, and demand functions for consumption and leisure are easily derived. To analyze the effect of a return on migrant's behavior in period 1, define a variable γ, with

$$\gamma = \begin{cases} 0: & \text{stay}, \\ 1: & \text{return}. \end{cases} \tag{3}$$

The economic situation the migrant faces in period 2 is characterized by three variables: the wage rate w_2, other income A_2, and the price level p. For simplicity, let other income, wages and price levels be equal in both periods in the host country. In the case of a permanent migration the migrant faces identical economic conditions in both periods. In the case of a return, however, period 2 wages, other income and prices may differ:

$$w_2 = w_1 + \gamma \Delta w, \tag{4a}$$

$$A_2 = A_1 + \gamma \Delta A, \tag{4b}$$

$$p = 1 + \gamma \Delta p. \tag{4c}$$

Here Δw, ΔA and Δp are the differences between second-period wages, other income and price levels in home- and host country. Sign and magnitude of these parameters depend on the difference in economic conditions in period 2 between the two countries. [6]

Consider now the effect of a return on the individual's participation behavior. It follows from the first-order conditions that she will participate if the index $J^* > 0$, with J^*:

$$J^* = \ln w^1 + \ln \pi - \ln \Gamma^1 = \ln w^1 - \ln w^*, \tag{5}$$

where π is the marginal utility of wealth and w^* is the log shadow wage of the individual at zero hours of work. The parameter π depends on all parameters in the migrant's lifetime budget constraint (see Ghez and Becker, 1975; MaCurdy, 1981; Heckman and MaCurdy, 1980). In particular, it links the participation decision in the host country to the variables A_2, w_2 and p. The marginal utility of wealth π can be shown to be higher for migrants who return than for permanent migrants if $\Delta w < 0$ and/or $\Delta A < 0$, for $\Delta p = 0$. [7] In this case, the shadow wage

[6] This formulation is easily extended to situations with uncertainty about future job prospects, or to situations where individuals have no intention to work after a return. It is easy to show that, even for similar wage situations in emigration- and immigration country, high employment uncertainty and low benefit levels in the home country labor market cause a negative expected wage differential.

[7] Comparative statics are obtained by substituting the demand functions for C^i and L^i, $i = 1, 2$, into the budget constraint (2) and applying the implicit function theorem.

w^* is lower for returners. Accordingly, migrants who return and who expect a relatively unfavorable economic situation in the home country should have a higher propensity to participate in the labor market of the host country than migrants who will remain permanently. Furthermore, even if perceived future economic conditions are the same in both countries, participation behavior may still be different if relative prices differ ($\Delta p \neq 0$). However, while for wage differences income- and substitution effects point in the same direction, this is not the case for price differences. The effect of differences in relative prices on π is therefore ambiguous.

This simple result is very relevant for migration policies. Consider a country which has a large population of contract migrants with only temporary working permits (for instance, Switzerland). Let the migrants' home countries be characterized by considerably poorer economic conditions than the host country. Then a liberalization of migration policy by releasing duration restrictions will have an impact on the shadow wages of the migrant population, if migrants stay longer in this case. More concretely, it will increase migrants' shadow wages and reduce their participation probabilities and labor supply. In a strictly neoclassical framework, this will shift the labor supply schedule to the right, raise the equilibrium wage, but decrease equilibrium employment.

3. Empirical analysis

To test the implications of the model, data is required for a migrant population where some individuals return and some individuals remain permanently in the host country. Some immigration countries have different regulations regarding the length of stay, with different rules applying to individuals of different origin. With such data, it is difficult to distinguish the effect of return plans from the effect of different origin and pre-migration experience. The data used in this analysis stem from the German Socio-Economic Panel (GSOEP) and largely avoid this problem in that they refer to a migrant population which is heterogeneous in return plans and observed characteristics, but quite homogeneous otherwise.

Besides information on 4500 households of German nationality, the GSOEP contains information on 1500 households with a household head of Turkish, Italian, Greek, Spanish or Yugoslavian nationality. These migrants came to Germany following the strong economic post-war boom which started in the mid 1950s, creating a severe shortage of labor. Special agreements with the countries of emigration ensure these migrants equal rights in the labor market. More importantly, they are free to remain in Germany as long as they wish to. [8] The

[8] See Dustmann (1996) for details on migration policies in Europe during this period.

data used for the present analysis stems from the first wave of the panel in 1984. Although the panel is organized on a household basis, all persons in a given household above the age of 16 are personally interviewed.

Crucial for this analysis is some unique information about the migrant's return plans. Migrants are asked whether they wish to remain permanently in Germany, or to return to their home countries at some time in the future. Therefore, differentiating from the simple theoretical model above, migrants in the sample do not condition on an exogenous return point. However, return decisions are likely to be long-term decisions which are taken at an early stage of the migrant's migration history, and they may often be irreversible at later stages. For instance, the migrant may have started to built a house in his home country, to buy property, or may have invested in business activities. Migrants then still condition their short-term decisions (like labor supply) on return plans, and the implications of the model should remain valid. Nevertheless, specifications are estimated which take account of the possibly simultaneous character of these decisions. The empirical analysis will concentrate on the labor participation behavior of female individuals. One reason is that married females are likely to condition their labor participation on the return plan of the husband, which justifies assuming this variable as exogenous. Another reason is that nearly all male migrants in the sample are in the labor force, and their behavior should be far less sensitive to return intentions than that of their partners. Accordingly, results of the analysis refer to that particular demographic group, and should be generalized with caution.

3.1. Empirical specification

To derive an estimable specification from Eq. (5), the market wage w_1, the taste parameter Γ^1 and the marginal utility of wealth π are parameterized. Let the logarithm of the wife's wage offer w_1 be a linear function of a vector of human capital variables X_1:

$$\ln w_1 = \alpha_0 + X_1' \alpha_1 + v, \tag{6}$$

where α_0 and α_1 are parameter (vectors) to be estimated, and v is a disturbance term. Furthermore, let $\ln \Gamma^1$ be a linear function of determinants of the value of the wife's time inside the household, summarized in the vector X_2, where δ_0 is a parameter, δ_1 a parameter vector and u a disturbance:

$$\ln \Gamma^1 = \delta_0 + X_2' \delta_1 + u. \tag{7}$$

The parameter π depends on w_1, A_1 (which is now other income including the husband's first period income) as well as ΔA, Δw and Δp in the case of a return. Only if ΔA, Δw or Δp are different from zero (different conditions in home- and host country), π differs between returners and permanent migrants. Denote therefore the difference in the marginal utility of wealth between a temporary and

a permanent migrant by $\ln \pi_t - \ln \pi_p = WT \cdot g(\Delta A, \Delta w, \Delta p)$, where γ has been replaced by WT, a dummy variable indicating whether the individual wants to return ($WT = 1$) or to stay ($WT = 0$). Furthermore, $g(0,0,0) = 0$ and the properties $g_{\Delta A}(0,0,0) < 0$, $g_{\Delta w}(0,0,0) < 0$ and $g_{\Delta p}(0,0,0) \gtreqless 0$, follow from the comparative statics. Combining Eq. (5) with Eqs. (6) and (7) yields an index function I^*:

$$I^* = Z'\beta + \xi WT + \epsilon, \tag{8}$$

where Z' contains X_1, X_2 and a constant term. The coefficient ξ corresponds to $g(\Delta A, \Delta w, \Delta p)$. Since ΔA, Δw and Δp are not observed, only ξ is estimable, and not the complete function g. In other words, only the combined effect of Δw, ΔA and Δp on π is identified, and not the separate effects. Assuming that ϵ is normally distributed with mean zero and variance one, results in the probit model. The probability that the wife participates is then given by $\Pr(I^* > 0)$. If, for instance, an individual returns at some future stage, and wages are lower at home than abroad ($\Delta w < 0$), her marginal utility of wealth should be higher than that of an individual who stays permanently. [9] Accordingly, her participation probability increases, which is reflected by a positive coefficient ξ.

The theoretical formulation assumes that return plans are exogenous to the participation choice of the wife. This assumption is justified by two reasonable arguments: first, and in accordance with the standard assumptions of labor supply models, the wife conditions her supply behavior not only on the income of the husband, but also on his return plans; secondly, return plans and supply behavior are likely to be sequential decisions, with return plans being long-term and, therefore, met before participation is decided upon. In both cases, the variable WT is weakly exogenous in the participation equation. However, it still seems advisable to test whether single estimation of the participation equation is appropriate. For instance, it may well be that unobservables affect both the return- and the participation choice.

For that purpose, the return intention is explicitly modeled. Define a latent variable WT^* which reflects the propensity of the individual to return. Let WT^* be a linear projection on a vector of exogenous variables Y with weights ψ and an orthogonal error term:

$$WT^* = Y'\psi + \zeta, \quad \zeta \sim \mathrm{N}(0,1), \tag{9}$$

where $WT = 1$ if $WT^* > 0$ and $WT = 0$ otherwise.

Eq. (9) may be viewed as a reduced form equation for WT^*. If $\rho = \mathrm{Corr}(\epsilon, \zeta) \neq 0$, Eqs. (8) and (9) define a simultaneous system where only the bivariate

[9] In this case, an intended return decreases the wife's shadow wage $w^* = [\ln \Gamma 1^- \ln \pi]$.

outcomes are observed. Since the participation variable does not appear in the return equation, the system is statistically coherent. [10]

For ϵ and ζ being bivariate normally distributed, the likelihood function is given by the following expression:

$$L(\xi, \psi, \beta, \rho) = \prod_{i \in P,W} F[Y'\psi, Z'\beta + \xi, \rho] \prod_{i \in \bar{P},W} F[Y'\psi, -Z'\beta - \zeta, -\rho] \times \prod_{i \in P,\bar{W}} F[-Y'\psi, Z'\beta, -\rho] \prod_{i \in \bar{P},\bar{W}} F[-Y'\psi, -Z'\beta, \rho], \tag{10}$$

where F denotes the distribution function of a bivariate normal variable and P, $\bar{P}$ and W, $\bar{W}$ are the sets of participants, nonparticipants, returners and non-returners, respectively.

3.2. Data and variables

After excluding all observations with missings on relevant variables, the final sample used for this study consists of 676 women of foreign nationality, between 24 and 60 years old, who are married to a household head of the same nationality who is in full time or part time employment. [11] Table 1 explains the variables used for this analysis and provides some summary statistics on the whole sample and the subsamples of those who would like to remain permanently and those who wish to return. A migrant is considered a permanent migrant if she wishes to remain permanently, or to remain until after retirement age (64 years). The numbers in Table 1 indicate that only 27% of the female sample population want to remain permanently in Germany. On average, women in both subsamples do not differ very much with respect to their years of schooling. [12] Those with a permanent intention, however, have a better job-specific education. Years of labor market experience (*EXP*) refer to *actual* (measured) years of labor market experience, which allows to distinguish age effects and experience effects. Individuals in both groups are similar with respect to labor market experience, age and years of residence in the host country. Other income is only slightly higher for those who would like to remain permanently. Overall, 46% of the sample individuals participate in the labor market. However, only 39% of those who intend to remain permanently participate, but 49% of those who intend to return do.

[10] See Blundell and Smith (1989, 1993) and Van Soest et al. (1993) on coherency conditions in such models.

[11] Only 0.7 percent of the overall female sample in that age group are married to a household head of German nationality. These individuals are excluded.

[12] The variables *TRAIN*, *SCH* and *EXP* are constructed using information from a biographical scheme which reports lifetime activities only after the age of 14.

Table 1
Descriptive statistics [a]

Variable	Description	All		Permanent		Temporary	
		Mean	Std. er.	Mean	Std. er.	Mean	Std. er.
SCH	Wife's years of schooling *	0.74	1.62	0.72	1.55	0.75	1.65
TRAIN	Wife's years of job-specific education *	0.48	1.33	0.61	1.61	0.43	1.21
AGE	Wife's age	38.0	9.30	38.2	9.20	38.0	9.30
EX	Wife's actual labor market experience *	10.5	9.60	10.4	10.4	10.5	9.30
YSM	Wife's years since migration	13.7	5.60	14.4	6.20	13.4	5.40
OTHER	Net monthly earnings husband + monthly revenues from assets + monthly revenue from income property	1932	560	1980	469	1915	588
C1	Dummy; one child younger than 6	0.25		0.18		0.27	
C2	Dummy; more than one child younger than 6	0.09		0.13		0.08	
C3	Dummy; children above 6	0.57		0.64		0.54	
C4	Dummy; children above and below 6	0.20		0.19		0.20	
WT	Dummy; wife intends to stay only temporarily	0.73		0.00		1.00	
WPHT	Dummy; wife permanently, husband temporarily	0.05		0.19		0.00	
WTHP	Dummy; wife temporarily, husband permanently	0.02		0.00		0.04	
PART	Dummy; wife participates	0.46		0.39		0.49	
SP	Spanish Nationality	0.15		0.18		0.15	
TUR	Turkish Nationality	0.32		0.28		0.33	
YUG	Yugoslavian Nationality	0.21		0.25		0.19	
GR	Greek Nationality	0.14		0.11		0.16	
ITA	Italian Nationality	0.18		0.18		0.17	
HDSP1	Husband speaks German well or very well	0.36		0.47		0.33	
HUNNO	Number of times husband was unemployed in past 10 years	0.28		0.36		0.25	
HYSM	Husband's years since migration	16.2	4.70	16.7	5.00	16.0	4.60
HAGE	Husband's age	41.7	8.90	41.7	8.40	41.7	9.10
HTRAIN	Husband's years of job-specific education *	1.22	2.07	1.39	2.55	1.16	1.87
HSCH	Husband's years of schooling *	1.11	2.27	1.06	1.71	1.14	2.44
HTRAIN	Husband's years of training *	1.22	2.07	1.16	1.87	1.39	2.55
N. Obs.		676		176		500	

[a] Variables marked with * are constructed from a biographical scheme which records lifetime activities after the age of 14.

3.3. Results

The vector X_1 contains linear terms of the variables for schooling (*SCH*) and job-specific education (*TRAIN*) and a second-order polynomial in the experience variable (*EXP*, *EXPSQ*). Since the experience variable measures *actual*, not potential years of labor market experience, experience effects are identified. After experimenting with different specifications, age is introduced as a third order polynomial (*AGE*, *AGESQ*, *AGECU*). The variable *YSM*, which measures the years of residence of the migrant in the host country, controls both for possible behavioral changes in the migrant's behavior over her migration history and for acquired country specific human capital. Variables which explain the wife's shadow wage are different dummies for children (*C1*, *C2*, *C3*, *C4*), and other income (*OTHER*).

Previous labor market experience is often found to be endogenous in labor participation equations (see, for instance, Heckman, 1980; Wright and Ermisch, 1991). This reflects that the work history of the wife is determined by unobservables which also affect her participation choice. A Wu–Hausman type of exogeneity test (Hausman (1978), Wu (1973); see Smith and Blundell (1986) for these tests in simultaneous systems with discrete or limited dependent variables) leads to the conclusion that the null hypothesis of exogeneity cannot be rejected. [13] Therefore, the experience variables remain in the probit equation. [14]

Results of probit parameter estimates are reported in Table 2. The marginal effects of respective variables on the participation probability as reported below are calculated for a reference woman who has the following characteristics: one year of schooling and job-specific education after the age of 14, 38 years old, 10 years of labor market experience, 16 years of residence in Germany, no children, and other income equal to 1900 German marks. Furthermore, she and her partner both wish to remain permanently in Germany. The participation probability of this

[13] To test for endogeneity of the experience variables in the participation equation, experience (*EXP*) and experience squared (*EXPSQ*) are regressed on all exogenous variables and instruments, where polynomials and interaction variables of husband's age, husband's years since migration, and husband's education are used as instruments. The set of instruments is jointly significant at the 1 percent level in both equations, with R^2's in the linear and quadratic regression of 0.27 and 0.24, respectively. To test for endogeneity amounts then to introducing the residuals of these regressions as additional variables in the probit equation and testing their joint significance.

[14] Based on Monte Carlo experiments for a linear model, Nakamura and Nakamura (1985) illustrate that the power of the Wu–Hausman test can be quite low for large values of the bias and for small numbers of observations. The power of the test rises with the correlation between the error terms, and the rate of the rise depends on the R^2 in the auxiliary regression. To the extent that their results are transferable, the power of the test performed here should be acceptable: For an R^2 of 0.2 and 500 observations, their percentage rejection rates range between 72.5 percent and 100 percent, depending on the size of the bias and the correlation between the error terms.

Table 2
Probit estimation

Variable	I		II		III		IV	
	Coeff	*t*-ratio	Coeff	*t*-ratio	Coeff	*t*-ratio	Coeff	*t*-ratio
Constant	−0.285	−0.081	0.055	0.016	0.109	0.031	0.489	0.136
SCH	0.027	0.713	0.025	0.662	0.025	0.653	0.026	0.676
TRAIN	0.094	2.188	0.102	2.343	0.105	2.383	0.111	2.447
AGE	1.822	0.637	1.347	0.466	1.241	0.428	0.853	0.293
AGESQ	−7.503	−1.011	−6.291	−0.840	−6.055	−0.806	−5.675	−0.751
AGECU	0.737	1.184	0.637	1.016	0.620	0.986	0.629	0.993
EXP	2.329	11.549	2.321	11.439	2.335	11.437	2.475	11.650
EXPSQ	−0.411	−7.160	−0.407	−7.048	−0.411	−7.085	−0.434	−7.377
YSM	−0.385	−2.463	−0.371	−2.360	−0.360	−2.286	−0.239	−1.454
C1	−1.290	−5.000	−1.333	−5.116	−1.335	−5.105	−1.384	−5.198
C2	−1.368	−4.542	−1.371	−4.525	−1.397	−4.567	−1.429	−4.586
C3	−0.166	−0.943	−0.146	−0.826	−0.144	−0.819	−0.134	−0.747
C4	0.446	1.591	0.471	1.671	0.460	1.622	0.436	1.523
OTHER	−0.388	−3.117	−0.385	−3.084	−0.380	−3.055	−0.405	−3.195
WT			0.290	1.979	0.371	2.280	0.392	2.378
WPHT					0.311	0.999	0.343	1.090
WTHP					−0.354	−0.940	−0.350	−0.907
TUR							0.438	2.003
YUG							0.315	1.435
GR							−0.096	−0.422
ITA							0.048	0.217
Log-lik.	−268.47		−266.50		−265.56		−261.09	
R^2	0.19		0.20		0.20		0.20	
N. Obs.	676		676		676		676	

reference woman is 70 percent. The asymptotic variance of the marginal effects are derived from a first-order Taylor expansion around the marginal effects, evaluated for a reference individual with the above characteristics. If marginal effects are reported, the corresponding *t*-statistics are given in parentheses. The R^2's reported are those suggested by McKelvey and Zavoina (1975). [15] They indicate a relatively good fit of the model, which is supported by the high percentage of correct predictions (for instance, 82 percent for the basic specification in column 1).

Column 1 of Table 2 gives results for the basic specification. The estimates indicate that years of schooling (*SCH*) do not have a significant impact on labor supply behavior, while each year of job-specific education (*TRAIN*) significantly

[15] Based on extensive Monte Carlo experiments, Veall and Zimmermann (1992) conclude that this measure is very accurate and best able to mimic the R^2 in the underlying continuous case.

increases the participation probability by 4.3 (2.39) percentage points. Conditional on age, the experience effect on participation probabilities is positive for the first 28 years, and negative thereafter.

The negative and significant coefficient of the variable *YSM* indicates that the participation probability of foreign women decreases by 1.3 (2.35) percentage points per year of residence. This negative effect, however, may be due to the fact that the data represent a self-selected sample, which over-represents those who want to stay permanently. Given the theoretical arguments above, this should bias downwards the effect of the variable *YSM*. [16]

The estimated coefficients of the age variables are jointly significant at the 1 percent level. To explore the effect of age on participation probabilities, some simple simulations are performed. Consider an individual which is 24 years old at immigration, and replace experience by its best linear prediction conditional on an age polynomial. For this individual, the participation probability increases first and peaks at age 29 (85 percent); it decreases thereafter and reaches the lowest probability at age 51 (55 percent). After age 51, participation probabilities are again slightly increasing.

Children have a strong impact on the participation probability: One child below the age of 6 (*C1*) decreases the participation probability by 44.6 (5.70) percentage points. Having more than one child in that age group (*C2*) has a slightly higher effect – a reduction by 47.3 (4.99) percentage points. Children above the age of 6 do not influence the participation probability significantly, as indicated by the coefficient on the variable *C3*. Following Nakamura et al. (1979), the interaction variable *C4* is introduced which is equal to one if the woman has children below and above the age of 6. This variable is meant to account for non-linearities in the time spent for an additional child below 6 if children above 6 are present, who may take care of younger children. This coefficient has the expected sign, but the marginal effect of this variable is significant only at the 10 percent level. If children below and above the age of 6 are present, the participation probability is about 10 percentage points higher than if only children below the age of 6 are present.

Other income of the household reduces, as expected, the wife's participation probability. An increase of 1000 marks in a household's income decreases the wife's participation probability by 13.4 (3.05) percentage points. In terms of elasticities, a 1 percent increase in other income decreases the participation probability by 0.4 percent.

[16] This explanation was suggested by a referee. This hypothesis is supported by a study by Velling (1994), who analyzes data on two recent migrant cohorts (1987/89 and 1990/91) and comes to opposite conclusions: he finds that a lower percentage of females in the more recent cohort participates in the labor market.

Column 2 shows results of the same specification, except that the variable WT is added as an additional regressor. The impact of this variable is significantly positive: if the wife expresses the intention to return to her home country at some point in the future, her participation probability increases significantly by 11.0 (1.85) percentage points. In terms of the model above, this indicates that an anticipated return increases the marginal utility of wealth and therefore *increases* the wife's participation propensity. Accordingly, those migrants who want to return anticipate a deterioration of their future economic situation. [17]

The numbers in Table 1 indicate that for 8 percent of the sample, return intentions differ between husband and wife. For 5.2 percent of the sample the wife wants to remain permanently, but the husband only temporarily (*WPHT*); for 2.8 percent of the sample, the opposite is the case (*WTHP*). It seems advisable to control for conflicting return plans between partners, so the variables *WPHT* and *WTHP* are introduced as additional regressors. The coefficient of the variable *WT* therefore estimates the effect of an anticipated return on labor supply for those wives who have the same return intentions as their partners. The variables *WPHT* and *WTHP* purge out eventual distortions which are a result of divergent opinions between partners. The results in column 3 show that the estimated coefficient of WT increases in sign and significance level. In families where both partners intend to stay temporarily, participation probabilities are 14.3 (2.12) percentage points higher than in families where both partners wish to remain permanently. Also interesting are the coefficients of the variables *WPHT* and *WTHP*. If the wife wishes to remain permanently, but the husband temporarily, the participation probability tends to be similar to situations where both partners wish to remain temporarily. On the other side, if the wife wants to stay temporarily, but the husband permanently, the participation probability is similar to that of couples where both partners have permanent intentions (the coefficients on WT and *WTHP* compensate each other). This suggests that indeed the husband's intentions are determining the wife's participation behavior. To test the hypothesis that only the husband's return plans matter amounts to a joint test of whether the coefficients of *WT* and *WPHT* are equal and the coefficient of WTHP equals zero. similarly, under the hypothesis that only wife's plans matter, the coefficients of *WT* and *WTHP* are equal and the coefficient of *WPHT* equals zero. The null hypothesis cannot be rejected in both cases, with a p-value of 0.82 for the first and 0.32 for the second hypothesis. This is due to the low precision of estimated parameters on *WPHT* and *WTHP*.

[17] It is also tested whether the two groups differ not only in the intercept, but also in slope parameters. This hypothesis is rejected at the 1 percent level (using a likelihood ratio test). Consequently, one should conclude that an anticipated return induces a significant *structural shift* in the participation probit, but not a *structural change*.

Column 4 presents results where nationality dummies are additionally introduced. The base category are migrants of Spanish nationality. Only Turkish migrants have a significantly higher participation probability than the Spanish base group (16 percentage points). Introducing these dummies does not change the basic conclusion regarding the variable *WT*.

3.4. Return and participation

As discussed above, although it seems quite reasonable to assume that the return decision is weakly exogenous in the probit specification, it may still be that results are driven by a correlation of unobservables rather than structural interdependence. To test for this, independent estimation of return- and participation equation (Eqs. (8) and (9)) which assumes that $\mathrm{Corr}(\epsilon, \zeta) = 0$ (call this model M1) is tested against two alternatives: first, simultaneous estimation of Eqs. (8) and (9) assuming $\mathrm{Corr}(\epsilon, \zeta) \neq 0$ (model M2). Secondly, restricting ξ to zero, but allowing $\rho = \mathrm{Corr}(\epsilon, \zeta) \neq 0$ (M3). While model M2 nests model M1, and standard asymptotic tests can be applied, models M1 and M3 are strictly non-nested. To distinguish between these models, a test proposed by Vuong (1989) is used.

Table 3 presents results for all three specifications. Individuals with partners who have divergent opinions about a return are excluded, so that the number of observations reduces to 621. The first column presents model M1 for this restricted set of observations; the coefficient on the variable WT is similar to the results presented in Table 2, both in size and significance level. The second column presents estimates on model M2. The crucial problem is to find a set of valid instruments. Various characteristics of the husband are used, and a variety of different specifications are tried. All lead to the same conclusions, and estimates are similar to those displayed in Table 3: [18] the correlation coefficient has negative sign and is not significantly different from zero. The coefficient on the variable *WT* remains positive and increases in size. However, the estimate becomes imprecise. Both the likelihood ratio test and the Wald test do not reject model M1 in favor of model M2. However, the identifying restrictions are too weak to obtain precise estimates of ξ and ρ. For the reference individual, the difference in the probability to participate conditional on returning and conditional on staying is equal to 11.9 percent, which is similar to the marginal effect in model M1. [19]

[18] The variables *HTRAINAGE*, *HTRAINYSM* and *HSCHYSM* are interaction variables between husband's training and his age and years since immigration, and between his years of schooling and years since immigration, respectively. The full set of instruments is significant at the 5% level.

[19] This difference is calculated as $F[Y'\psi, Z'\beta + \xi_1, \rho]/\Phi(Z'\beta + \xi_1) - F[Y'\psi, -Z'\beta, -\rho]/\Phi(-Z'\beta)$, where F is the cumulative bivariate standard normal distribution and Φ is the cumulative univariate standard normal distribution. The vector Z is evaluated at sample means, and Y corresponds to the reference individual described above; β, ψ, ξ and ρ are set equal to parameter estimates.

Table 3
Bivariate probit estimation

Variable	Model I		Model II		Model III	
	Coeff	*t*-ratio	Coeff	*t*-ratio	Coeff	*t*-ratio
Participation equation						
Constant	−1.050	−0.282	−0.5884	−0.132	−1.667	−0.406
WSCH	0.0179	0.449	0.0190	0.553	0.0163	0.483
WTRAIN	0.1126	2.504	0.1192	2.186	0.1012	2.147
AGE	2.267	0.750	1.674	0.434	3.050	0.929
AGESQ	−8.381	−1.073	−6.830	−0.688	−10.38	−1.238
AGECU	0.7884	1.209	0.6583	0.802	0.9543	1.379
EXP	2.312	10.998	2.277	8.283	2.318	9.975
EXPSQ	−0.4116	−6.919	−0.4019	−5.308	−0.4176	−6.371
YSM	−0.4388	−2.683	−0.4101	−2.081	−0.4700	−2.561
C1	−1.410	−5.235	−1.419	−4.766	−1.371	−4.701
C2	−1.579	−4.811	−1.550	−3.914	−1.588	−4.268
C3	−0.2392	−1.295	−0.2134	−0.974	−0.2704	−1.353
C4	0.5064	1.715	0.4981	1.561	0.5080	1.621
OTHER	−0.3959	−3.042	−0.3846	−3.232	−0.4045	−3.824
WTEMP	0.3652	2.233	0.6198	0.900		
Return equation						
Constant	−7.622	−2.151	−7.621	−1.972	−7.607	−1.947
WSCH	−0.0047	−0.120	−0.0050	−0.116	−0.0028	−0.067
WTRAIN	−0.0524	−1.249	−0.0519	−1.061	−0.0533	−1.060
AGE	8.278	2.822	8.190	2.664	8.374	2.692
AGESQ	−20.86	−2.777	−20.68	−2.621	−21.03	−2.641
AGECU	1.691	2.677	1.678	2.517	1.704	2.536
EXP	0.3785	2.164	0.3775	1.917	0.3788	1.926
EXPSQ	−0.1237	−2.221	−0.1225	−1.851	−0.1249	−1.898
YSM	−0.2102	−1.175	−0.2079	−1.133	−0.2142	−1.175
C1	0.3015	1.066	0.3061	0.944	0.2956	0.899
C2	−0.2533	−0.864	−0.2374	−0.737	−0.2731	−0.842
C3	−0.3028	−1.836	−0.2977	−1.656	−0.3080	−1.723
C4	−0.0257	−0.086	−0.0318	−0.095	−0.0171	−0.051
OTHER	−0.0725	−0.608	−0.0726	−0.468	−0.0713	−0.456
HAGE	−0.7350	−0.883	−0.6825	−0.835	−0.8027	−0.994
HAGESQ	1.031	1.056	0.9903	1.032	1.078	1.144
HYSM	−0.1808	−1.024	−0.1878	−0.955	−0.1711	−0.878
HTRAIN	0.3130	1.889	0.3215	1.736	0.2958	1.636
HSCH	−0.0422	−0.575	−0.0451	−0.473	−0.0384	−0.391
HTRAINAGE	−0.0577	−1.579	−0.0598	−1.233	−0.0538	−1.217
HTRAINYSM	−0.0702	−1.320	−0.0678	−1.024	−0.0724	−1.127
HSCHYSM	0.0529	0.968	0.0565	0.824	0.0477	0.683
HDSP1	−0.3151	−2.472	−0.3259	−2.354	−0.2936	−2.139
HUNNO	−0.1251	−1.910	−0.1229	−1.596	−0.1266	−1.596
RHO(1,2)		−0.1545	−0.379	0.2044	1.938	
Log-Lik.	−546.14		−546.10		−546.30	
N. Obs.	621		621		621	

The third column displays results for model M3 where interdependence between Eqs. (8) and (9) comes about only by the unsystematic part of the two equations. The correlation coefficient is now positive and significantly different from zero. The difference in conditional probabilities is equal to 12.07 percent, which is again similar to model M1. The calculated value of the Vuong test statistic is 2.98. [20] This indicates that model M3 should be rejected in favor of model M1.

4. Summary and conclusion

This paper analyzes whether return intentions of migrants affect their labor market behavior. A simple theoretical model is developed which shows that participation behavior between permanent and temporary migrants differs if expected future economic conditions differ between home- and host country. If the future economic situation facing a potential returner in the home country is worse than that in the host country, an intended return should increase the propensity of the migrant to participate in the host country's labor market.

The implications for migration policies are obvious. If migrants who stay in the host country only for a limited period of time have lower shadow wages and, consequently, accept lower paid jobs, then the enforcement of temporary durations may be considered as a policy tool to keep the price of migrant labor at a lower level. Of course, this necessitates that the economic conditions in the home countries are significantly worse than those in the host country. On the other hand, one possible consequence of a liberalization of migration policy in the way that former contract migrants are granted the right to decide upon return is an *increase* in overall wages, at least in those segments of the labor market where migrants constitute a large proportion of the work force.

The empirical analysis concentrates on the labor force participation behavior of married females. The results provide some evidence for the hypothesis that migrants' labor market behavior in the host country is indeed determined by future return plans. Those individuals who anticipate to remain only temporarily abroad have a significantly higher participation probability than those individuals who wish to stay permanently. In terms of the theoretical model, this tends to indicate that migrants who wish to return seem to anticipate a deterioration of their economic situation. Therefore, their shadow wages in the host country are lower than those of migrants with permanent intentions. The empirical results should be evaluated keeping in mind that they relate to a particular demographic group:

[20] For a test of size α, the two competing models are asymptotically equivalent if the test statistic $ST \in [c_{\alpha/2}, c_{\alpha/2}]$, where $c_{\alpha/2}$ are the critical values of the standard normal. If $ST > c_{\alpha/2}$, M1 should be preferred to M3; if $ST < c_{\alpha/2}$, M3 should be preferred to M1.

married females. It is likely, however, that reservation wages for males differ in a similar manner between those with temporary and permanent migration intentions, with smaller elasticities. To test labor supply responses of other demographic groups is a task for future research.

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