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## Circular Migration: Counts of Exits and Years away from the Host Country

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**40**

**Amelie Constant**  
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**Circular Migration: Counts of Exits  
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# CIRCULAR MIGRATION: COUNTS OF EXITS AND YEARS AWAY FROM THE HOST COUNTRY

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## Abstract

The economic literature has largely overlooked the importance of repeat and circular migration. The paper studies this behavior by analyzing the number of exits and the total number of years away from the host country using count data models and panel data from Germany. More than 60% of migrants from the guestworker countries are indeed repeat or circular migrants. Migrants from European Union member countries, those not owning a dwelling in Germany, the younger and the older (excluding the middle ages), are significantly more likely to engage in repeat migration and to stay out for longer. Males and those migrants with German passports exit more frequently, while those with higher education exit less; there are no differences with time spent out. Migrants with family in the home country remain out longer, and those closely attached to the labor market remain less; they are not leaving the country more frequently.

*Keywords:* Repeat migration, circular migration, guestworkers, minorities, count data  
*JEL classification:* F22; J15; J61; C 25

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At a time of rising labor market globalization, migrants no longer make once and for all migratory decisions. Global workers return, move on, or become circular movers: they are repeat labor migrants. Policymakers seek ways to regulate migration pressures and to balance demand for human capital with world-wide supply. For that purpose, the nature of repeat and circular migration needs better understanding. For instance, the United States has recently discussed the European guestworker model in the context of a comprehensive immigration bill. The experiences of the German guestworker population can, therefore, be of much value to the migration issues of the United States and the proposed legislation. As we know now, far more than two thirds of the original guestworker generation left the country and returned home, while the rest basically chose Germany as their place of residence executing a frequent out-mobility. The paper, therefore, uses German data to examine repeat and circular migration against the experience with the guestworker population.

For the traditional immigration countries, migration has often been perceived as a one time discrete move from the home to the host country, and return migration has been regarded as a move from the host back to the home country. These movements have attracted substantial research. An overview of this literature and some key research papers on the migration and return migration decisions are contained in Zimmermann and Bauer (2002). Unfortunately, the literature on multiple moves, or repeat and circular migration, in an international setting is rather scarce. An early contribution by DaVanzo (1983) is an examination of internal repeat migration in the United States. Most other contributions are from sociology. For instance, Massey and Espinosa (1997) have established that Mexicans moving into the United States are indeed circular migrants. They have shown that this phenomenon is even more common than return or onward migration. Using the example of Puerto Ricans, Tienda and Diaz (1987) have argued that circular migration (to the United States) can be disastrous for families, employment and income, when return migrants face

high unemployment in the home country and are forced to migrate again. They suggest that circular migration might have contributed to a rapid increase in female-headed families, high school dropout rates, and a lack of training and work experience.

Porter (2003) has clarified that circular migration is even an issue for illegal migrants. The ability to go back and forth between the home and the host country and its consequences for both economies is discussed in the context of Mexican migration to the United States. Originally, this was a temporary, male dominated workforce going home regularly to support the family with money earned abroad. Many communities especially in California enjoyed the advantages of cheap labor without experiencing the problems with entrenched communities of low-income workers and their families. Now with the much stricter border controls the behavior of Mexican migrants has changed. While this has not stopped people from coming, it has made migrants much less inclined to circularly return, and more likely to bring their families. While in the early 1980s an undocumented Mexican worker stayed for about three years on average, the duration of stay has increased to nine years in the late 1990s.

That restrictive migration policies can turn out to be rather counter-productive has been observed before. A quite similar problem appeared in major European countries including Germany, when in 1973, in the face of rising unemployment, the labor hiring regime was abolished abruptly (Zimmermann 1996). As a consequence, many migrants from the guestworker generation stopped going back home and induced a substantial rise in family reunifications in Germany. Now, only a smaller portion of the migrants work, they exhibit high unemployment rates and substantial take-ups of social assistance.

Hence, the issue of how circular migration develops and how those migrants adjust to the host country is of substantial importance for employers and policymakers. The way migrants attach themselves to the labor force and to society largely depends on their moving strategy. However,

there is hardly any empirical literature on this new type of migration. To fill this gap, the paper aims to answer the following questions: What are the determinants of circular migration and what are the socioeconomic characteristics of the immigrants who practice it? What explains the frequency of exits and what determines the total years away from the host country? How can we separate between the decision to be mobile and the intensity of the mobility?

### **The Economics of Circular Migration**

The literature on migration has established that return migration is considerable and highly selective (Borjas 1989, Dustmann 1996, and Constant and Massey 2002, 2003). Moreover, once a move has taken place, immigrants are more prone to move again. Each move builds the momentum of a self-sustaining circular migration through the accumulation of “migration-specific capital” (Massey and Espinosa 1997), and hence, circular migration develops. However, little is known empirically about it, mainly due to the non availability of suitable longitudinal data (for a recent exception see Constant and Zimmermann 2003).

Return migration might occur ex-post due to the realization of sub-optimal decisions as a corrective mechanism or due to ex-ante predetermined and preplanned decisions to return. Accordingly, return migration is viewed as a one-time event. Circular migration, however, while it has the appearance of an indecisive perpetual move, it might be a way of optimizing or re-optimizing one’s economic, social, and personal situation at every period. Put differently, circular migration might be a way of taking advantage of opportunities as they appear in both the host and home country. It might be a way of minimizing psychic costs due to long separations from family members. Circular migration might also denote strong preferences for frequent locational changes in maximizing utility.



In a way, circular migration helps to keep the migrant's options open for both the host and the home countries, and reduces the risks of a long term commitment. Recurrent immigrant movement back and forth across the border is, indeed, a common strategy among Mexicans in the United States. Further, while the initial move to the host country is governed by uncertainty, circular migration decisions are operating under a more complete information set, thereby reducing search, relocation, and psychic costs. Multiple movers have the comparative advantage of building and accumulating location-specific capital.

Circular migratory moves might also include temporary motives: students who go to the home country to attend college, young adults who return to join the army for the obligatory service, and immigrants who go to the home country to find a spouse. There is also the case of employment or intra-company transfers, i.e. taking advantage of promotions and upward mobility, and the issue of the circular moves of retirees.

In this paper we study the determinants of the number of exits of the guestworker population in Germany as well as the total years away from the host country within a given period of time. We seek to answer the following questions: What are the socioeconomic characteristics of the individuals who practice circular migration? Does circular migration occur mainly during the younger years or does it persist throughout the immigrant's life? We control for gender differences, human capital, country of origin, and employment characteristics. We further compare the stayers (immigrants who stay in the host country without interruption) with the circular movers.

Few studies have examined the phenomenon of circular migration between the host and the home countries, and little is known about the characteristics of these migrants. Among the first to study the phenomenon of perpetuating migration between the United States and Mexico, is Massey (1987). Investigating the frequency of trips from Mexico to the United States and back he established that the progression from one trip to the next is determined by variables connected with

the migrant experience itself, while social networks play an important role in undertaking an additional trip. In contrast, age, education, marital status, presence of children, and land ownership are unrelated to the likelihood of making an additional trip. Looking at repeated illegal trips by Mexican immigrants to the United States the Donato, Durand and Massey (1992) study shows that older immigrants are less likely to undertake a second illegal trip, but the likelihood of an additional trip increases with the number of previous trips. While the 1986 Immigration Reform and Control Act had no effect in deterring recurrent illegal migration, they also find that even apprehension does not deter migration. In fact, immigrants who have embarked on a career of recurrent migration to the United States are less likely to alter their behavior.

In a later study, Massey and Espinosa (1997) examine the odds of taking an additional trip to the United States, for both documented and undocumented migrants, given that at least one trip had already occurred. They find that immigrants who practice circular migration display significantly different characteristics. The odds of circular migration progressively increase with experience, occupational achievement, and prior trips in the United States, suggesting a self-perpetuating nature of migration. The likelihood of taking another trip to the United States is also reinforced by social capital that is created through circular migration. However, they show that controlling for migration-specific human and social capital, the variables that are of the essence in determining initial migration become less important in forecasting circular migration. Nevertheless, among undocumented immigrants, amnesty to a family member, increases the odds of taking an additional trip.

Whereas it has been argued that for the Puerto Ricans, for example, circular migration has hampered them from moving up economically and establishing roots in one country (Tienda and Diaz 1987), no empirical studies have proven this argument. Many immigrants continue to

maintain businesses, homes, and families in Mexico while they are moving back and forth seasonally (Durand and Massey 1992).

### **Data, Variables and Methods**

Our empirical analysis uses data from Germany, the largest European immigration country, employing the German Socioeconomic Panel (GSOEP), a nationally representative survey with outstanding quality and reputation provided by DIW Berlin, the German Institute for Economic Research (SOEP Group, 2001). This study includes the first 14 waves from 1984 - 1997. We concentrate on migrants from the so-called guestworker countries, in particular Italy, Greece, Spain, ex-Yugoslavia and Turkey. Individuals from these countries are typically in Germany for quite a long time and also for long in the GSOEP. By the nature of the data collection, these are only legal migrants with a longer commitment to the host country, who no longer face the restrictions of the guestworker program. We only deal with individuals who at the time of an annual interview were not in the military and were over 16 years of age. Our sample contains 4,613 migrants, 2,231 of them are females. Re-migration in the sample is substantial: 2,857 individuals have exited Germany at least once during the period 1984 - 1997. They constitute 62% of all individuals in our sample. Further, 1,994 or 43% have never left the country, and 2,619 or 57% were out of the country at the end of the sample period.

The GSOEP is especially suited for analyzing emigration probabilities because it has a good record of following individuals who move within Germany, and a good record of tracking immigrants who return back to Germany after they had gone to their homeland. Temporary drop-outs or persons who could not be successfully interviewed in a given year are followed until there are two consecutive temporary drop-outs of all household members or a final refusal. Return

migrants are re-interviewed about their situation and background characteristics when they re-return to Germany. Our sample consists of the *complete sample*, the current movers, the returned movers, and the stayers. Even if migrants have not returned back to Germany by the end of the sample period, they are still in the sample.

In our analysis we employ a standard set of human capital and socioeconomic status variables. Our main interest is in how these characteristics influence migrants to repeat migratory movements. Our dependent variables are the number of exits from Germany and the number of years away from Germany. An exit is defined as a measured absence from Germany in one year. Note that both variables are defined relative to the period 1985 - 1997. Hence, “number of years out of Germany” does not refer to a single spell, but to the *total number of years out* during the 1985 - 1997 period. Similarly, the “number of exits” is the number of times a person is out of the country, independent of whether he or she is back or not in 1997. Both variables are sensitive measures to capture the mobility of individuals over a period of nearly 1.5 decades. We use “number of years out of Germany” as a robustness check for the analysis of exits. The variable “number of exits” gives each exit equal weight, while “number of years out” gives more weight to long-term exits.

With regards to the independent variables, we capture human capital by education and language. The group of education variables includes both pre- and post-migration education. It also embodies vocational training. This is a good measure of human capital because in addition to formal education it includes the effect of training on occupational attainment. We capture experience by age and years of residence in Germany. For the labor market characteristics we include employment status - whether full or part time - and occupational prestige. We further control for remittances, since they are likely to induce repeat migration by strengthening attachment to the home country.

Lastly, we include variables that capture social and psychological ties to the respective countries. Namely, owning a house or dwelling in Germany would indicate a successful adaptation in Germany and will lower the likelihood of repeated moves. Likewise, if one's spouse and children are left in the home country this will increase the likelihood of circular moves. Although being a German citizen could indicate that the immigrant "feels at home" in Germany and would be reluctant to go back to the home country, at the same time German citizenship gives the opportunity to be able to travel back and forth without being subject to migration restrictions. The same rationale applies to European Union nationals, who enjoy free mobility. We expect them to exhibit a higher probability to circular moves, since they do not have the legal mobility constraints that migrants from Turkey and ex-Yugoslavia face.

To summarize, the independent variables in our sample are labeled and quantified as: (i) Age, years since migration and education in home country are measured in years; (ii) prestige of job in Germany, an index variable with scores ranging from the lowest prestige level of 16 to the highest of 78 following the Treiman scale; and (iii) all other covariates are (0, 1) - dummies (primary-secondary education in Germany, higher education in Germany, vocational training in Germany, speaking German fluently, employed in Germany, remit to home country, own a dwelling in Germany, German citizen, Turk, ex-Yugoslav, male, married, married spouse not in Germany, children less than 16 years old in the household, children in the home country).

In the empirical analysis, we execute a clear time - structure: The model is "number of times (or years) out of the country in the period 1985 – 1997" given the values of the regressors in 1984 (or the period before entry into the panel), and hence far in the past of the behavioral variable we seek to measure by the counts. The regressors are pre-determined, and hence exogenous in an assumed behavioral sense. But they are nevertheless not necessarily exogenous in a statistical sense,

although this is less likely to be expected. We, therefore, execute exogeneity tests for all critical variables and report about them in the empirical section.

The dependent variables in our analysis, the number of exits from Germany and the number of years spent out of Germany in the particular period, are counts. Hence, a count data framework (Cameron and Trivedi 1998; Winkelmann 2003) is appropriate. We employ robust Poisson regressions, and we examine more general alternatives like the robust Poisson-Logit Hurdle model. To control for the fact that some immigrants enter the sample later we normalize the observation period, by introducing two exposure variables as regressors in the count data estimation. An implication of this is that we enforce equal presence of the individuals. The exposure variable is the maximum number of possible exits for each particular individual in the case of the number of exits, and the maximum possible number of potential years out of the country in the case of the study of the total number of absent years from Germany.

## **Descriptive Statistics**

Table 1 presents the summary statistics (means and standard deviations) for the selected variables in our study. These statistics are tabulated separately for the entire sample, the migrants who never left Germany, the migrants who left at least once, and those migrants who are out at the end of the observed period. Measured at the entry into the panel, 52% of the migrants are male, 32 years old on average, and 15 years have passed since their first arrival in the country. They have 5 years of education from the home country; 18% have a primary or secondary German education and 10% a higher education in Germany, leaving 72% with no German educational degree. However, 17% have vocational training in Germany and 21% speak German fluently. Among the individuals, 58% have been employed with an average Treiman job prestige level of 32. (The

Treiman index varies from 16 for those not-employed to 78.) Further, 22% of the migrants remit home, and 7% own their dwelling. With respect to citizenship, 16% of the individuals are Germans, 32% Turks, 16% ex-Yugoslavs and 36% are European Union citizens (from Italy, Spain, and Greece). On family matters, 61% of the migrants are married and have children younger than 16 years old in the household. In only 3% of the cases the spouse is not in Germany, and 7% of the migrants have children in the home country. The average number of exits is 1, the average number of years out is 5 and the average number of years in the panel is 7.

<Table 1 about here>

Not surprisingly, there are some differences between the group of the stayers and the group of the movers (see columns 3 and 5 in Table 1). On average, circular migrants (the movers) are 4 years older than the stayers. While both groups have about 14 years of residence in Germany they have not accumulated much human capital. Overall, circular migrants have less education acquired in Germany and more education in the home country. Compared to the migrants who stay in Germany, a larger percentage of circular migrants never went to school in Germany, a smaller percentage of them acquired higher education, and a smaller percentage of them speak the German language fluently.

These raw statistics also show that a larger percentage of circular migrants are employed in Germany although their occupational prestige score is not very different from the occupational score of the stayers. Circular migrants tend to remit more to the home country, they tend not to own a dwelling in Germany, and not to acquire the German citizenship. Among repeat migrants, 41% are from European Union countries as opposed to 27% among the stayers. Moreover, the majority of circular migrants are married with a larger percentage having their spouse and children in the home country. Lastly, the average circular migrant has spent about 7 years out of Germany during the 14 year period under study, and has exited and returned more than once.

Movers who are out in the last year of the panel are hardly different from the total of movers (compare column 7 of Table 1 to column 5). For instance, for movers out of the host country, both education of all types in Germany and vocational training in Germany is somewhat lower, while education from the home country is somewhat higher. However, the differences are small.

### **Econometric Issues**

The variables to analyze are the number of exits or the number years out of Germany in our particular period. Our count data analysis of those processes presented in Table 2 involves the estimation of standard Poisson regression models (see columns 1 and 5) and Poisson-Logit Hurdle models (see columns 2 - 4 and 6 - 8). These models are discussed in Cameron and Trivedi (1998), Greene (2003) and Winkelmann (2003). This section explains why and how we have used these models and with what econometric issues we have dealt in the analysis. The Poisson model is a natural starting point for count data processes since it provides a very robust approximation even for more generalized approaches. More general alternatives in the class of the one-step estimators like the Negative Binomial regression model or the Gamma model were not found to be appropriate.

<Table 2 about here>

An attractive two-step alternative, however, is the hurdle model, which allows decomposing and separating the probability to move from the actual number of exits or number of years out of the country. We employ here a Poisson-Logit Hurdle model, which assumes a Logistic distribution for the probability to cross the hurdle, and a Poisson (truncated-at-zero) process for the count part. The hurdle model is also useful to examine whether those who are out of the country at the end of the observed period differ from those who were out but have returned until the end of the period. We,



therefore, allow the constant to shift for the two groups, with the variable “not in Germany at the end of the period” being equal to 1 if the individual has not yet returned at the end of the period, and equal to 0 otherwise.

Table 2 contains the estimates from the count data regressions for the covariates as they predict the frequency of exits and years out. To conserve space, we present only the marginal effects and not the parameter estimates because they are easier to interpret. In the Poisson model, the marginals are the product of the parameter estimates times the Poisson parameter (which is equal to the mean and the variance). We have calculated this parameter at the level of the individual and then obtained the marginals reported as the average of the individual marginals. In the Poisson-Logit Hurdle model, the derivatives are technically more complex. We provide the derivatives for the binary and the count part, and their sum.

To evaluate the validity of Poisson models, one may employ simple overdispersion tests using the residuals of the estimated models to examine the departure from the standard Poisson assumption of the equality of the mean and the variance. However, these tests only deal with particular forms of dispersions. The approach chosen here is to rely on the fact that the Poisson parameter estimates are consistent under a wider class of count data models. However, standard errors are too low (too high) in the case of overdispersion (underdispersion). To avoid a potential bias, we calculate robust standard errors (using the so-called sandwich estimator of the covariance matrix), which deals with any kind of dispersion. The hurdle model may induce over- or underdispersion in the empirical distribution in a non constant fashion depending on the concrete underlying processes, and hence is able to deal with the issue of dispersion in an endogenous way. We, nevertheless, also rely on the sandwich estimator also for the covariance-matrix of the Poisson-Logit Hurdle model.

There is a potential that some of the regressors are endogenous, which would lead to biased estimation output. To rule that possibility out, we execute a series of exogeneity tests for the Poisson models estimated following Wooldridge (2002, pp. 663-666). The ten variables, all (0,1)-dummies, under potential endogeneity suspicion that we have examined are: “primary-secondary education in Germany,” “higher education in Germany,” “vocational training in Germany,” “speaking German fluently,” “employed in Germany,” “remit to home country,” “own dwelling in Germany,” “German citizen,” “married spouse not in Germany” and “children in native country.” The test employed is based on a two-step quasi-likelihood method that regresses the residuals of the Poisson model under study on the residuals of the ten regressions, where the potentially endogenous covariates are explained by the truly exogenous variables of the Poisson model and a number of extra exogenous variables to satisfy the rank condition for identification. The  $\chi^2(10)$  of a joint likelihood-ratio test of all slopes to be zero is 0.8 for the exits and 0.4 for the years out indicating strongly that the examined variables are exogenous in a statistical sense. Hence, we proceed by treating our regressors as exogenous for all employed models.

All count regressions include the exposure variable to adjust for different entry years of the migrants into the sample. This normalization of the observation period would require to also restricting the parameter estimate for this variable in the standard Poisson model to 1. While the Poisson estimates reported in columns 1 and 5 in Table 2 are unrestricted, we have carried out such restricted estimates. Restricted estimation leads to a rejection of overdispersion, but also to substantially lower likelihood values. We, therefore, decided to leave the parameter of the exposure variable unrestricted for both the Poisson and Poisson-Logit Hurdle models relying on the robust standard errors and the hurdle specification.

In the Poisson-Logit hurdle model, we assume an equal process for all individuals until they become mobile, and then examine the potential difference between the groups afterwards

introducing the variable “not in Germany at the end of the period.” This variable matters in both hurdle models (see columns 3 and 7 in Table 2), but it is less relevant for the number of exits than for the number of years out. This difference is not surprising given the construction of these variables. The estimates of the combined partial derivatives of the hurdle equations with the variable being out are quite similar in sign and size to the marginal effects of the simple Poisson models without the variable being out (compare columns 1 to 4 and 5 to 8). This suggests that the presented results are very stable across specifications, and that the Poisson model delivers fairly robust findings.

## **Empirical Results**

Table 2 shows that both the Poisson and the Poisson-Logit Hurdle models deliver fairly similar results for the number of exits and the number of years out. The marginal effects for the number of years out are, when significant, somewhat larger in absolute size for a particular estimation method than for the number of exits. The age pattern is U-shaped, with marginals that are practically identical across the estimation methods. Younger immigrants are less likely to engage in circular migration or to stay out for more years, but as they grow older they are more likely to go out more often and to stay out longer. While for years out this result is generated by both parts of the hurdle model, for the number of exits it solely stems from the binary part. Whereas years since migration does not affect at all the number of exits, it reduces the number of years out linearly. Overall, education and training plays no role in the mobility decisions. The exception is that higher education reduces the number of exits for both estimation techniques. Speaking German fluently leads migrants to spend fewer years out of Germany, at least according to the Poisson-Logit Hurdle model. The same is found for those previously employed in Germany, and this is supported by

both count data models. The prestige of the last job does not show any major effect, and neither does remittance behavior. Owning a dwelling in Germany consistently induces a lower number of exits and years out of the country for both estimation techniques, and this finding originates fully in the binary part of the hurdle model.

Country of origin plays an important role for out-mobility. The reference group here is migrants from the guestworker population that originate from a European Union member country, e.g. Italy, Greece or Spain. Migrants who have taken the German citizenship, whatever their country of origin, do not distinguish from the reference group in the total years out of Germany equation. They are, however, more frequently out, since they face no legal restrictions on their return move back to the host country. Turks and ex-Yugoslavs do not face the same freedom of mobility, and hence are less mobile both in terms of the frequency of exists and the number of years out of Germany. Turks and ex-Yugoslavs exit less mainly through the binary part of the hurdle model, and the overall hurdle marginals match closely the Poisson marginals. Likewise, Turks and ex-Yugoslavs spend a substantially lower number of years out of Germany; while this is fostered through both the binary and count part of the hurdle model for the ex-Yugoslavs, it is generated only through the binary part for the Turks. The lesson for policy here is that both free mobility and the possession of the citizenship of the host country induce outmigration so that, on average, fewer migrants stay in the host country.

Males and single migrants exit more frequently. Married individuals with a spouse in the host country are consistently less frequently out and spend fewer years outside of Germany as measured by both employed models. Both the binary and count part of the hurdle model contribute to this finding. Individuals spend more years outside of Germany when the spouse does not live in Germany and when there are young children in the household. The presence of children in the home country does not affect the mobility measures.

The effect of exposure in the sample is estimated unrestrictedly. Results portray a strong and vibrant picture across all measures and estimation techniques. The combined marginals from the Poisson-Logit Hurdle are smaller than the Poisson marginals, but close in size. Both the binary and count parts of the hurdle model contribute positively to mobility: in the case of exits it stems more from the binary part, and in the case of years out from the count part of the hurdle model.

### **Summary and Policy Discussion**

In this paper we analyze the phenomenon of repeat or circular migration as it is manifested by the number of exits and the total number of years away from the host country using count data models and panel data from Germany. Based on the guestworker population in the German Socio-Economic Panel (GSOEP), we estimate robust Poisson and Poisson-Logit Hurdle models to explain their international mobility in a novel feature. More than 60% of the migrants from the guestworker countries are indeed repeat migrants. The empirical findings on the determinants of out-mobility are rather stable across the estimation methods and in line with economic intuition. Migrants from European Union member countries, those not owning a dwelling in Germany, the younger and the older (excluding the middle ages), are significantly more likely to engage in repeat migration and to stay out of Germany for longer. Males and those migrants with a German passport exit more frequently, while those with higher education exit less. Males do not differ from females, and German nationals are not different than migrants from other European Union member countries with respect to their total years away from the host country. Migrants with family in the home country remain out longer, and those closely attached to the German labor market remain out of the host country for a shorter number of years. Family characteristics and labor market attachment do not induce more or less frequent exists.

Labor migrants are known to be different from other migrants in that they exhibit a larger degree of circular and repeat migration behavior. The relevance of such international workers is expected to rise further with globalization. Repeat or circular migrants are attractive for employers and policymakers because they are less likely to be illegal and more willing to adjust to the temporary needs of the economy of the receiving country. For these reasons, the United States and the commission of the European Union consider the establishment of circular or repeat migration schemes.

That discussion can benefit from the experience reported in this paper of the German guestworker populations: The first lesson is that the easier and more facile mobility is, the more likely are migrants to execute repeat or circular migration. Migrants with the German passport are more mobile than European Union nationals, while Non-European Union nationals remain more likely in the country. Contrary to what is often perceived by the public and dominates the public debate, naturalization induces out-mobility. Second, family members left in the home country provide a strong motive to encourage repeat or circular migration, and temporary work programs should consider this element. Third, high education, home ownership and labor market attachment are decisive characteristics to induce a longer presence in the host country.

We conclude that repeat or circular migration is indeed an important phenomenon that should receive more attention among researchers, industrialists and policy-makers. In the mid-seventies, tighter constraints on labor mobility caused a decline in return migration to the home country among some guestworker groups in Germany, because they were unable to re-enter easily. Another unintended consequence was an increase in family reunion. Twenty years later, tighter controls at the United States-Mexican border also caused the odd result that more illegal migrants from Mexico stay for longer periods in the country and bring their families. If repeat or circular

migration is considered to be beneficial, such tight and restrictive policy measures appear to be counter-productive.

## REFERENCES

- Borjas, George J. 1989. "Immigrant and Emigrant Earnings: A Longitudinal Study." *Economic Inquiry*, Vol. 27, No. 1 (January), pp. 21-37.
- Cameron, Colin, and Pravin K. Trivedi. 1998. *Regression Analysis of Count Data*. Cambridge: Cambridge University Press.
- Constant, Amelie, and Douglas S. Massey. 2002. "Return Migration by German Guestworkers: Neoclassical versus New Economic Theories." *International Migration*, Vol. 40, No. 4 (September), pp. 5-38.
- . 2003. "Self-Selection, Earnings and Out-Migration: A Longitudinal Study of Immigrants." *Journal of Population Economics*, Vol. 16, No. 4 (November), pp. 630-653.
- Constant, Amelie, and Klaus F. Zimmermann. 2003. "The Dynamics of Repeat Migration: A Markov Chain Analysis." IZA Discussion Paper No. 885.
- DaVanzo, Julie. 1983. "Repeat migration in the United States: Who Moves Back and Who Moves On?" *Review of Economics and Statistics*, Vol. 65, No. 4 (November), pp. 552-559.
- Donato, Katharine M., Jorge Durand, and Douglas S. Massey. 1992. "Stemming the Tide? Assessing the Deterrent Effects of the Immigration Reform and Control Act." *Demography*, Vol. 29, No. 2 (May), pp. 139-157.
- Durand, Jorge, and Douglas S. Massey. 1992. "Mexican Migration to the United States: A Critical Review." *Latin American Research Review*, Vol. 27, No. 2 (Summer), pp. 3-42.
- Dustmann, Christian. 1996. "Return Migration: The European Experience." *Economic Policy*, Vol. 22 (April), pp. 214-250.
- Greene, William. 2003. *Econometric Analysis*, 5th ed. Upper Saddle River, New Jersey: Prentice Hall.
- Massey, Douglas S. 1987. "Understanding Mexican Migration to the United States." *American Journal of Sociology*, Vol. 92, No. 6 (May), pp. 1372-1403.
- Massey, Douglas S., and Karen E. Espinosa. 1997. "What's Driving Mexico-U.S. Migration? A Theoretical, Empirical, and Policy Analysis." *American Journal of Sociology*, Vol. 102, No. 4 (January), pp. 939-999.
- Porter, Eduardo. 2003. "Tighter Border Yields Odd Result: More Illegals Stay." *The Wall Street Journal*, October 10.
- SOEP Group. 2001. "The German Socio-Economic Panel (GSOEP) after more than 15 years - Overview." In Elke Host, Dean R. Lillard, and Thomas A. DiPrete, eds., *Proceedings of the 2000 Fourth International Conferences of German Socio-Economic Panel Study*



- Users (GSOEP 2000), *Quarterly Journal of Economic Research*, Vol. 70, No. 1, pp. 7-14.
- Tienda, Marta, and William Diaz. 1987. "Puerto Rican Circular Migration." *The New York Times*, August 28, p. A31.
- Winkelmann, Rainer. 2003. *Econometric Analysis of Count Data*, 4th ed. Berlin: Springer-Verlag.
- Wooldridge, Jeffrey. 2002. *Econometric Analysis of Cross Section and Panel Data*, Cambridge, Massachusetts, and London, England: The MIT Press.
- Zimmermann, Klaus F. 1996. "European Migration: Push and Pull." *International Regional Science Review*, Vol. 19, No. 1 (January), pp. 95-128.
- Zimmermann, Klaus F., and Thomas Bauer. 2002. *The Economics of Migration, Vol.1, The Migration Decision and Immigration Policy*. Cheltenham, UK: Edward Elgar.

*Table 1. Selected Sample Characteristics*

Variables	Entire Sample		Stayers (never left Germany)		Movers (left at least once)		Movers (out in the last year)	
	Mean	Std.Dev.	Mean	Std.Dev.	Mean	Std.Dev.	Mean	Std.Dev.
Male	0.516	0.500	0.505	0.500	0.523	0.500	0.522	0.500
Age	31.542	13.121	29.351	12.026	32.888	13.579	33.113	13.631
Years Since Migration	14.492	7.792	14.522	8.295	14.474	7.467	14.439	7.404
No Degree in Germany	0.723	0.448	0.683	0.466	0.747	0.435	0.755	0.430
Primary-Secondary Education in Germany	0.175	0.380	0.165	0.371	0.181	0.385	0.176	0.381
Higher Education in Germany	0.103	0.303	0.152	0.359	0.072	0.259	0.069	0.253
Vocational Training in Germany	0.166	0.372	0.162	0.369	0.168	0.374	0.164	0.371
Speaking German Fluently	0.209	0.407	0.236	0.425	0.193	0.395	0.187	0.390
Education in the Home Country	4.470	3.595	4.099	3.738	4.699	3.485	4.756	3.473
Employed in Germany	0.577	0.494	0.546	0.498	0.597	0.491	0.596	0.491
Prestige of Job in Germany	31.694	11.302	31.371	11.533	31.893	11.156	31.932	11.153
Remit to Home Country	0.217	0.412	0.180	0.384	0.239	0.427	0.242	0.428
Own Dwelling in Germany	0.070	0.255	0.088	0.284	0.059	0.235	0.054	0.226
German Citizen	0.163	0.370	0.216	0.412	0.131	0.337	0.127	0.333
Turk	0.324	0.468	0.330	0.470	0.321	0.467	0.323	0.468
ex-Yugoslav	0.156	0.363	0.182	0.386	0.140	0.347	0.136	0.343
EU Member State Citizen	0.356	0.479	0.272	0.445	0.408	0.492	0.415	0.493
Married	0.611	0.488	0.581	0.493	0.630	0.483	0.636	0.481
Married Spouse not in Germany	0.028	0.166	0.018	0.134	0.035	0.183	0.034	0.182
Children < 16 Years Old in the Household	0.605	0.489	0.601	0.490	0.608	0.488	0.609	0.488
Children in Native Country	0.070	0.256	0.058	0.234	0.078	0.268	0.076	0.265
Number of Years out of Germany	4.555	4.903			7.354	4.270	7.901	4.025
Number of Exits out of Germany	0.700	0.622			1.130	0.372	1.133	0.378
Time in the Panel	7.417	4.880	10.232	4.602	5.686	4.191	5.058	3.723
Sample Size	4,613		1,756		2,857		2,619	

Table 2. Count Data Regressions

Dependent Variables	Exits				Years Out			
	Poisson	Poisson-Logit Hurdle			Poisson	Poisson-Logit Hurdle		
	Count	Binary	Count	Combined	Count	Binary	Count	Combined
Age	-0.016** (-2.992)	-0.020** (-3.983)	0.004 (1.358)	-0.016** (-2.750)	-0.157** (-3.894)	-0.088** (-3.688)	-0.045** (-3.637)	-0.133** (-4.913)
Age <sup>2</sup>	0.0002** (3.499)	0.0003** (4.532)	-0.0001 (-1.590)	0.0002** (3.058)	0.002** (4.544)	0.001** (4.129)	0.001** (3.543)	0.002** (5.222)
Years since Migration	-0.003 (-0.898)	-0.003 (-1.253)	0.0003 (0.181)	-0.003 (-1.024)	-0.041 (-1.629)	-0.014 (-1.151)	-0.016** (-2.073)	-0.030** (-2.056)
Years since Migration <sup>5</sup>	0.0001 (0.877)	0.00003 (0.466)	0.00002 (0.788)	0.0001 (0.765)	0.001 (1.231)	0.0001 (0.386)	0.0003* (1.885)	0.0004 (1.372)
Education in the Home Country	-0.002 (-0.638)	-0.001 (-0.457)	0.0003 (-0.187)	-0.002 (-0.492)	0.015 (0.556)	-0.005 (-0.376)	0.012* (1.701)	0.007 (0.472)
Education in Germany								
No Education (reference)								
Primary-Secondary	-0.033 (-1.023)	-0.006 (-0.247)	-0.009 (-0.677)	-0.015 (-0.538)	-0.075 (-0.299)	-0.017 (-0.156)	-0.006 (-0.085)	-0.023 (-0.177)
Higher Education	-0.124** (-2.746)	-0.053 (-1.623)	-0.025 (-1.271)	-0.078** (-2.020)	-0.237 (-0.660)	-0.192 (-1.317)	0.034 (0.348)	-0.158 (-0.891)
Vocational Training in Germany	0.030 (1.016)	0.031 (1.335)	0.003 (0.235)	0.034 (1.248)	0.162 (0.676)	0.143 (1.360)	0.043 (0.703)	0.187 (1.541)
Speaking German Fluently	0.028 (0.992)	0.008 (0.361)	0.016 (1.534)	0.023 (0.990)	-0.276 (-1.258)	-0.021 (-0.217)	-0.154** (-2.708)	-0.175 (-1.586)
Employed in Germany	-0.026 (-1.196)	-0.008 (-0.458)	-0.012 (-1.272)	-0.021 (-0.994)	-0.301* (-1.711)	-0.036 (-0.444)	-0.136** (-3.071)	-0.172* (-1.861)
Prestige of Job in Germany	0.0003 (0.293)	0.0004 (-0.483)	0.001* (1.713)	0.0003 (0.383)	-0.005 (-0.693)	-0.002 (-0.512)	-0.0002 (-0.095)	-0.002 (-0.493)
Remit to Home Country	-0.012 (-0.501)	0.001 (0.060)	-0.014 (-1.202)	-0.013 (-0.518)	0.012 (0.057)	0.004 (0.046)	-0.006 (-0.123)	-0.001 (-0.013)
Own Dwelling in Germany	-0.078* (-1.754)	-0.068** (-2.402)	0.005 (0.276)	-0.063* (-1.921)	-1.044** (-2.865)	-0.301** (-2.321)	-0.078 (-0.901)	-0.379** (-2.419)

Table 2. Continued

	Exits				Years Out			
	Poisson	Poisson-Logit Hurdle			Poisson	Poisson-Logit Hurdle		
	Count	Binary	Count	Combined	Count	Binary	Count	Combined
Nationality								
European Union (reference)								
German Citizen	0.098** (2.441)	0.041 (1.417)	0.017 (1.110)	0.058* (1.767)	0.180 (0.588)	0.201 (1.523)	-0.010 (-0.105)	0.191 (1.193)
Turk	-0.062** (-2.723)	-0.077** (-3.986)	0.011 (1.134)	-0.066** (-3.033)	-0.498** (-2.740)	-0.346** (-3.725)	-0.003 (-0.069)	-0.349** (-3.405)
ex-Yugoslav	-0.114** (-3.791)	-0.119** (-5.104)	0.006 (0.462)	-0.113** (-4.255)	-1.183** (-4.622)	-0.522** (-4.506)	-0.209** (-3.733)	-0.732** (-5.567)
Male	0.039** (1.980)	0.003 (0.195)	0.030** (3.105)	0.033* (1.732)	-0.053 (-0.332)	0.015 (0.209)	-0.058 (-1.418)	-0.042 (-0.515)
Married	-0.081** (-2.767)	-0.043* (-1.816)	-0.030** (-2.188)	-0.073** (-2.644)	-0.427* (-1.852)	-0.191* (-1.771)	-0.154** (-2.491)	-0.345** (-2.789)
Married Spouse not in Germany	0.076 (1.599)	0.118** (2.338)	-0.030 (-0.925)	0.088 (1.449)	0.925** (2.372)	0.526** (2.277)	0.323** (2.814)	0.849** (3.282)
Children < 16 Year Old in the Household	0.020 (1.002)	-0.001 (-0.044)	0.017* (1.838)	0.017 (0.856)	-0.406** (-2.483)	-0.010 (-0.134)	-0.213** (-4.987)	-0.223** (-2.565)
Children in Native Country	0.029 (0.807)	0.015 (0.470)	0.016 (0.956)	0.031 (0.854)	0.040 (0.136)	0.061 (0.425)	0.043 (0.615)	0.103 (0.645)
Exposure in the Sample	0.157** (11.927)	0.097** (16.689)	0.016** (3.641)	0.113** (15.569)	1.080** (12.090)	0.232** (9.001)	0.498** (25.944)	0.730** (18.822)
Not Present in the Sample			0.033** (2.299)				8.194** (85.161)	
Constant	-0.870** (-8.154)	-0.036 (-0.471)	-0.328** (-7.082)	-0.364** (-4.028)	-1.750** (-2.396)	-0.177 (-0.513)	-6.354** (-28.049)	-6.531** (-16.080)
Log Likelihood Function	-4,477.3		-3,861.1		-16,216.8		-10,104.4	
Sample Size				4,613				

Notes:

Estimated results are marginal effects.

Robust t-statistics in parentheses. \* Statistically significant at the .10 level; \*\* at the .05.