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Circular and Repeat Migration: Counts of Exits and Years Away from the Host Country

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Abstract The importance of repeat and circular migration starts receiving rising recognition. 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 the German guestworker experience. Beyond the myth, more than 60% of migrants in the sample from the guestworker countries living in Germany 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-aged), 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

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Introduction

At a time of ongoing labor market globalization, migrants no longer make permanent migratory decisions. Global workers return, move on, or become circular movers: they are repeat labor migrants. Policymakers are seeking ways to regulate migration pressures and to balance demand for human capital with world-wide supply. For that purpose, the nature and mechanics of repeat and circular migration need better understanding. This can be a valuable source of insight when designing a migration program. As many countries start considering temporary rather than permanent migration, circular migration can be the link that aligns migrants, home, and host countries; it could even mitigate brain drain from depleted third world countries. In fact, "brain circulation" could alleviate some of the negative consequences of the economic crisis and partially compensate for demographic decline.

However, not many countries have recorded their experiences with circular migration. Over the last few years, the U.S.—a prototypical migration nation—has been discussing the European guestworker model[1] in the context of a comprehensive immigration bill. While this bill has been stalled, the need for temporary skilled and unskilled workers is satisfied by temporary visas such as the H-1B and the H-2B visas. The experiences of the German guestworker population can, therefore, be of much value to the migration debate in the U.S. and to the proposed legislation. The need for guestworker programs is found in other, lesser known migration countries, such as Saudi Arabia and the Asia–Pacific region. As we know now, far more than two thirds of the original guestworker generation left Germany and returned home, while the rest essentially chose Germany as their place of residence, thus executing a frequent out-mobility. This paper uses German data to examine repeat and circular migration using the guestworker population experience.

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, known as "repeat and circular migration," that occur in an international setting is rather scarce. An early contribution by DaVanzo (1983) examines internal repeat migration in the U.S. Most other contributions are from sociology. For instance, Massey and Espinosa (1997) establish that Mexicans moving into the U.S. are indeed

[1] The European guestworker model refers to the temporary recruitment of workers who are needed to alleviate labor shortages in the host country. While the German model was not enforcing return migration, the Swiss model, in fact, was designed to follow the "rotationsprinzip" or rotation principle, where temporary migrants were replaced after some time. Both systems are different from a circular labor migration scheme where workers freely move: workers are hired by the host country's employers as needed, they return back to their origin countries when they are not needed and come back to the host country again in the future if there is excess demand of labor that cannot be satisfied by the native population.

circular migrants. They show that this phenomenon is even more common than return or onward migration. Using the example of Puerto Ricans, Tienda and Diaz (1987) argue that circular migration to the U.S. mainland can be disastrous for families, employment and income, when return migrants face high unemployment in Puerto Rico 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) clarifies 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 U.S. Originally, this was a temporary, male-dominated workforce regularly returning home to support the family with money earned abroad. Many communities, especially in California, enjoyed the advantages of cheap labor without experiencing the problems associated with entrenched communities of low-income workers and their families. Now, with much stricter border controls, the behavior of Mexican migrants has changed. While this has not stopped people from entering the country, it has made migrants much less inclined to circularly return and more likely to bring their families and stay in the U.S. While in the early 1980s an undocumented Mexican worker stayed for an average of approximately three years, by the late 1990s the duration of this type of stay had increased to nine years.

It has been observed before that restrictive migration policies can be rather counter-productive. When major European countries including Germany faced rising unemployment as in the early 1970s, the labor hiring regime was abruptly abolished (Zimmermann 1996). Consequently, many migrants from the guestworker generation stopped going back home, which induced a substantial rise in family reunifications in Germany. Currently, with only a smaller number working, migrants exhibit high unemployment rates and substantial increases in social assistance use.

There has been scant treatment of circular migration in the economics literature save for a rare mention in international migration literature, most recently in the European context. However, there is some tradition for such research in the Asia–Pacific region. Notable articles like Hugo (2008, 2009) and Lidgard and Gilson (2002) draw upon the comprehensive nature of migration data in Australia and New Zealand to demonstrate the significance of non-permanent migration in south-north migration. Studying skilled Indian and Chinese migration to Australia, Hugo (2008, 2009) finds a complex migration system involving bi-directional flows as well as circularity, reciprocity, and remigration. He concludes that it is highly misleading to label the migration relationship between China or India and high-income countries to be of the "South-North" type.

The comprehensive study by Lidgard and Gilson (2002) documents intensive return migration to New Zealand since the 1960s. The authors find that in the 1970s migration was largely exchange-oriented, with return migration often being a substantial part of this exchange. In addition they find that the more recent labor migrants are rather pursuing transnational careers and maintaining multi-local lives. "For New Zealanders this may mean 'shuttling' backwards and forwards across the Tasman or 'circulating' through countries of the Northern Hemisphere (p. 101)." They judge the migration flow to be "brain exchange" or "brain circulation" rather than "brain drain."

Hugo (2009) discusses the polarization of the debate on circular migration, which may create benefits but it may also lead to migrant exploitation. Considering the sending countries, he outlines the creation of "development friendly" circular migration. Regarding the Chinese migration experience to North America and Australasia, one encounters the "astronaut" syndrome and the "parachute kid" syndrome (Skeldon 1998) as vivid illustrations of transnationalism. The first syndrome conveys the case of the typical male astronaut migrant who returns home for business while leaving his family in the host country. In the parachute kid syndrome, the migrant parents return home while leaving their kids with relatives established in the host countries.

A wealth of empirical knowledge and theoretical considerations of this topic exist in the context of internal migration. This literature has predominantly dealt with research about Africa, Asia, the Pacific and Latin America. Well-documented examples are provided in Beguy et al. (2010) for Africa; Deshingkar (2008) for India; and Deshingkar (2006) for Asia. A recent book edited by Wong and Rigg (2010) focuses on Asian Cities, contains rich material on low-skilled domestic migrants who stay closely related to their rural homes, as well as it studies highly skilled and professional transnational migrants, and legal and illegal international migrants.

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 in many parts of the world. Related issues on illegal migration are also of concern. The way migrants attach themselves to the labor market and to society largely depends on their moving strategy. However, there is hardly any empirical literature on this type of migration in the European context. The paper begins to fill this gap. We outline the economics of circular migration; present data, variables and methods; analyze descriptive statistics; discuss econometric issues; summarize empirical results; and discuss policy implications.

The Economics of Circular Migration

"Migration" has traditionally been perceived as a permanent move from the country of origin to a host country. Similarly, "return migration" has been defined as the final return of migrants back to their country of origin and the end of their migrant career. However, some migrants may frequently and repeatedly move to foreign countries. This type of migration or movement is referred to as "repeat migration." Similar to repeat migration, "circular migration" describes the systematic and regular movement of migrants between their homelands and foreign countries typically seeking work. Therefore, return, repeat, and circular migrations are related but are not necessarily identical.

Return migration is considerable and highly selective (Borjas 1989; Dustmann 1996; and Constant and Massey 2002, 2003). In addition, 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 and repeat migration develop. Circular migration applies to both skilled and unskilled

migrants, who practice circular migration voluntarily. Logic dictates that governments and employers would take advantage of this revealed preference of migrants and consider this behavior when they design a migration bill. With the exception of a few studies (Constant and Massey 2003), little is known empirically about circular migration; this is mainly due to the non availability of suitable longitudinal data.

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 in that literature as a one-time event. Regarding return migration to Albania, de Coulon and Piracha (2005) find that it is dominated by negative selection. That is, in their analysis, if those who decided to stay home had migrated abroad and subsequently came back, these individuals would earn more than twice the wages of the actual return migrants.

While circular migration may have the appearance of an indecisive perpetual move, it may actually 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 either in the host or home country. Additionally, 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. Bijwaard (2010) models migration flows; allowing for both permanent and temporary migratory moves for departing and returning, he suggests a framework for predicting the migration dynamics over the life-cycle.

In a way, circular migration helps to keep the migrant's options open in 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 Mexican immigrants in the U.S. 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 for obligatory military service, and immigrants who return to their home country to find a spouse. To the circular moves we can also add the case of employment transfers or intra-company transfers, i.e. taking advantage of promotions and upward mobility, as well as the cases of retirees and seasonal or non-seasonal low-wage labor.

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. Massey (1987) was among the first to study the phenomenon of perpetuating migration between the U.S. and Mexico. Investigating the frequency of trips from Mexico to the U.S. 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, the 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 U.S., Donato et al. (1992) show 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 embark on a career of recurrent migration to the U.S. 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 U.S. for both documented and undocumented migrants for whom 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 the number of prior trips in the U.S., thus suggesting a self-perpetuating nature of migration. The likelihood of taking another trip to the U.S. 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 essential in determining initial migration become less important in predicting 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 example, circular migration has hampered Puerto Ricans 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). Recently Newland et al. (2008) review experiences of and facts about circular migration. They document that circular migration conforms to the natural preferences of many migrants, especially when open borders allow it, as is the case between Australia and New Zealand or between Hong Kong and Canada. Therefore, flexible long term permits and dual nationality appear to increase circular flows. They also show how Spain has created innovative arrangements to encourage circular migration among less-skilled, non-seasonal workers.

Concerned about migration, the European Commission (2007) produced a document on circular migration and mobility partnerships between the European Union and third countries. The positive reaction from member states prompted the commission to start developing pilot mobility partnerships with some African countries. The 2009 Swedish presidency of the European Union revisited the circular migration and return migration issues, emphasizing that circular migration can contribute to a more efficient allocation of available resources and to economic growth. Zimmermann (2009) discussed the establishment of a policy agenda that facilitates a circular migration system consisting of programs, agreements, and more general legislative frameworks conductive to circularity, where both entry and exit incentives are provided.

Hugo (2009) drew attention to the fact that historically circular migration schemes have involved exploitation of migrants. Also, Skeldon (2010) urged caution in seeing circular migration as a silver bullet in the migration-development context, with policymakers needing to accept the consequences of policymaking on

migration without respect to whether migration is free or managed. According to Skeldon (2010) circular migration occurs most effectively when it is free or internal migration. Furthermore, circular migration fosters the bi-polar and multi-polar nature of migration, thus increasing the need to organize a dialogue between sending and receiving countries, as it happens with transit countries in managed migration regimes.

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 four questions: (1) what are the socioeconomic characteristics of the individuals who practice circular migration? (2) What explains the frequency of exits, and what determines the total years away from the host country? (3) How can we separate the decision to be mobile from the intensity of the mobility? (4) Does circular migration occur mainly during the younger years, or does it persist throughout the immigrant's life? In addressing these questions, 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.

Data, Variables and Methods

Our empirical analysis uses data from Germany, the largest European immigration country. The German Socio-Economic Panel (GSOEP), a nationally representative survey with outstanding quality and reputation, is provided by DIW Berlin, the German Institute for Economic Research (SOEP Group, 2001). GSOEP has a high degree of stability, maintaining good participation rates over time.[2] Using the first 14 waves from 1984 to 1997, we concentrate on migrants from the so-called guestworker countries. In particular, we study immigrants from Italy, Greece, Spain, the former Yugoslavia and Turkey; the latter dominates the group of migrants in the Germany even today. "Guestworkers" are individuals who were recruited in the 1960s on the basis of international contracts between Germany and the sending countries. They were hired to satisfy the particularly high excess demand for blue collar work in the German labor market at the time with the understanding of a temporary stay. A large number of these guestworkers stayed in Germany, but nevertheless continue to move in and out of the country from time to time. Individuals from these countries typically reside in Germany and are found in the GSOEP. These are legal migrants with a long commitment to the host country, who no longer face the restrictions of the guestworker program. Some of them are probably even (permanent) immigrants to Germany, but at the same time temporary emigrants from their home country. Other contemporary, fresh immigrants in Germany who come from non-guestworker source countries and arrive through different channels of entry, and are not the focus of this study.

In this study, we only examine individuals who were not in the military and were over 16 years of age at the time of an annual interview. Our sample contains 4,613

[2] Rendtel (2002) shows that the attrition rate is 5.6%.

migrants, of which 2,231 are female. Re-migration in the sample is substantial: 2,857 individuals have exited Germany at least once during the period spanning 1984–1997. These re-immigrants constitute 62% of all the 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 identifying and tracking immigrants who return to Germany after a spell in 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. A caveat however relevant in studying circular migration is that we cannot follow individuals across countries.

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 engage in 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 of 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 in Germany or not in 1997. Both variables are sensitive measures capturing the mobility of individuals over a period of 14 years. 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 because they may be correlated with repeat migration, as migrants who care about their country of origin both remit and frequently return home (see Hugo 2009).

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 would lower the likelihood of repeated moves. Likewise, if migrants leave their spouse and children behind in the home country, the likelihood of them practicing circular moves should increase. Becoming 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,

however German citizenship gives immigrants a tremendous opportunity to be able to travel back and forth without being subject to migration restrictions. This rationale applies to all European Union nationals, who enjoy free mobility within the EU territory. Accordingly, we expect EU nationals and other EU naturalized immigrants to exhibit a higher probability to engage in circular moves, since they do not face the legal mobility constraints that migrants from Turkey and the former Yugoslavia face, for example.

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)—binary 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 thus exogenous in an assumed behavioral sense; 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 and discuss the results 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 an 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

Table 1 Selected sample characteristics

Variables	Entire sample		Stayers (never left Germany)		Movers (left at least once)		Movers (out in the last year)	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Male	0.516	0.500	0.505	0.500	0.523	0.500	0.522	0.500
Age (in years)	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 a 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	

have been in Germany for an average of 15 years since their first arrival. They also have 5 years of education from their home country. Regarding their post-migration education, 18% have a primary or secondary German education, and 10% have received higher education in Germany, leaving 72% with no German educational degree. However, 17% have vocational training in Germany and 21% speak German fluently. The large number of migrants educated in the host country indicates that a significant share of the immigrants in our sample is second generation migrants.

Among the immigrants in our sample, 58% are employed with an average Treiman job prestige score of 32. Recall that the Treiman index varies from 16 for those not-employed to 78. Further, 22% of the migrants send remittances home, and 7% own their dwelling. With respect to citizenship, 16% of the individuals are Germans, 32% are Turks, 16% are ex-Yugoslavs and 36% are EU citizens

originating from Italy, Spain, and Greece.[3] As to 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 we find the spouse not in Germany, and in 7% of the cases 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.

Not surprisingly, there are some differences between the group of the movers and the group of the stayers (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 German 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 their home country (in accordance with Hugo 2009), they tend not to own a dwelling in Germany, and they tend not to acquire the German citizenship. Among repeat migrants, 41% are from EU 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 back 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 any different from the total set 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 dependent variables that we analyzed 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.

[3] While these three countries are part of the original five guestworker sending countries, they have joined the EU in 1958, 1981 and 1986 respectively.

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**	−0.020**	0.004	−0.016**	−0.157**	−0.088**	−0.045**	−0.133**
	(−2.992)	(−3.983)	(1.358)	(−2.750)	(−3.894)	(−3.688)	(−3.637)	(−4.913)
Age^2	0.0002**	0.0003**	−0.0001	0.0002**	0.002**	0.001**	0.001**	0.002**
	(3.499)	(4.532)	(−1.590)	(3.058)	(4.544)	(4.129)	(3.543)	(5.222)
Years since migration	−0.003	−0.003	0.0003	−0.003	−0.041	−0.014	−0.016**	−0.030**
	(−0.898)	(−1.253)	(0.181)	(−1.024)	(−1.629)	(−1.151)	(−2.073)	(−2.056)
Years since migration^2	0.0001	0.00003	0.00002	0.0001	0.001	0.0001	0.0003*	0.0004
	(0.877)	(0.466)	(0.788)	(0.765)	(1.231)	(0.386)	(1.885)	(1.372)
Education in the home country	−0.002	−0.001	0.0003	−0.002	0.015	−0.005	0.012*	0.007
	(−0.638)	(−0.457)	(−0.187)	(−0.492)	(0.556)	(−0.376)	(1.701)	(0.472)
Education in Germany								
No education (reference)								
Primary–secondary	−0.033	−0.006	−0.009	−0.015	−0.075	−0.017	−0.006	−0.023
	(−1.023)	(−0.247)	(−0.677)	(−0.538)	(−0.299)	(−0.156)	(−0.085)	(−0.177)
Higher education	−0.124**	−0.053	−0.025	−0.078**	−0.237	−0.192	0.034	−0.158
	(−2.746)	(−1.623)	(−1.271)	(−2.020)	(−0.660)	(−1.317)	(0.348)	(−0.891)
Vocational training in Germany	0.030	0.031	0.003	0.034	0.162	0.143	0.043	0.187
	(1.016)	(1.335)	(0.235)	(1.248)	(0.676)	(1.360)	(0.703)	(1.541)
Speaking German fluently	0.028	0.008	0.016	0.023	−0.276	−0.021	−0.154**	−0.175
	(0.992)	(0.361)	(1.534)	(0.990)	(−1.258)	(−0.217)	(−2.708)	(−1.586)
Employed in Germany	−0.026	−0.008	−0.012	−0.021	−0.301*	−0.036	−0.136**	−0.172*
	(−1.196)	(−0.458)	(−1.272)	(−0.994)	(−1.711)	(−0.444)	(−3.071)	(−1.861)

Table 2 continued

Dependent variables	Exits				Years out			
	Poisson	Poisson-logit hurdle			Poisson	Poisson-logit hurdle		
	Count	Binary	Count	Combined	Count	Binary	Count	Combined
Prestige of job in Germany	0.0003	0.0004	0.001*	0.0003	−0.005	−0.002	−0.0002	−0.002
	(0.293)	(−0.483)	(1.713)	(0.383)	(−0.693)	(−0.512)	(−0.095)	(−0.493)
Remit to home country	−0.012	0.001	−0.014	−0.013	0.012	0.004	−0.006	−0.001
	(−0.501)	(0.060)	(−1.202)	(−0.518)	(0.057)	(0.046)	(−0.123)	(−0.013)
Own a dwelling in Germany	−0.078*	−0.068**	0.005	−0.063*	−1.044**	−0.301**	−0.078	−0.379**
	(−1.754)	(−2.402)	(0.276)	(−1.921)	(−2.865)	(−2.321)	(−0.901)	(−2.419)
Nationality								
European union (reference)								
German citizen	0.098**	0.041	0.017	0.058*	0.180	0.201	−0.010	0.191
	(2.441)	(1.417)	(1.110)	(1.767)	(0.588)	(1.523)	(−0.105)	(1.193)
Turk	−0.062**	−0.077**	0.011	−0.066**	−0.498**	−0.346**	−0.003	−0.349**
	(−2.723)	(−3.986)	(1.134)	(−3.033)	(−2.740)	(−3.725)	(−0.069)	(−3.405)
ex-Yugoslav	−0.114**	−0.119**	0.006	−0.113**	−1.183**	−0.522**	−0.209**	−0.732**
	(−3.791)	(−5.104)	(0.462)	(−4.255)	(−4.622)	(−4.506)	(−3.733)	(−5.567)
Male	0.039**	0.003	0.030**	0.033*	−0.053	0.015	−0.058	−0.042
	(1.980)	(0.195)	(3.105)	(1.732)	(−0.332)	(0.209)	(−1.418)	(−0.515)
Married	−0.081**	−0.043*	−0.030**	−0.073**	−0.427*	−0.191*	−0.154**	−0.345**
	(−2.767)	(−1.816)	(−2.188)	(−2.644)	(−1.852)	(−1.771)	(−2.491)	(−2.789)
Married spouse not in Germany	0.076	0.118**	−0.030	0.088	0.925**	0.526**	0.323**	0.849**
	(1.599)	(2.338)	(−0.925)	(1.449)	(2.372)	(2.277)	(2.814)	(3.282)
Children <16 year old in the household	0.020	−0.001	0.017*	0.017	−0.406**	−0.010	−0.213**	−0.223**
	(1.002)	(−0.044)	(1.838)	(0.856)	(−2.483)	(−0.134)	(−4.987)	(−2.565)

Table 2 continued

Dependent variables	Exits				Years out			
	Poisson	Poisson-logit hurdle			Poisson	Poisson-logit hurdle		
	Count	Binary	Count	Combined	Count	Binary	Count	Combined
Children in native country	0.029	0.015	0.016	0.031	0.040	0.061	0.043	0.103
	(0.807)	(0.470)	(0.956)	(0.854)	(0.136)	(0.425)	(0.615)	(0.645)
Exposure in the sample	0.157**	0.097**	0.016**	0.113**	1.080**	0.232**	0.498**	0.730**
	(11.927)	(16.689)	(3.641)	(15.569)	(12.090)	(9.001)	(25.944)	(18.822)
Not present in the sample	0.033**	8.194**	(2.299)	(85.161)				
Constant	−0.870**	−0.036	−0.328**	−0.364**	−1.750**	−0.177	−6.354**	−6.531**
	(−8.154)	(−0.471)	(−7.082)	(−4.028)	(−2.396)	(−0.513)	(−28.049)	(−16.080)
Log likelihood function	−4,477.3	−3,861.1			−16,216.8	−10,104.4		
Sample size	4,613							

Estimated results are marginal effects

Robust *t*-statistics in parentheses. * Statistically significant at the 0.10 level; ** at the 0.05

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.

The hurdle model is an attractive two-step alternative, however, which allows decomposing and separating the probability to move from the actual number of exits or number of years out of the country. Here we employ 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 for examining whether those who are out of the country at the end of the observed period differ from those who were out but have returned before 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 as well as 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. Here, we chose 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 overdispersion 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 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 binary dummies, under suspicion of potential endogeneity that we have examine 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 a 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 χ^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, strongly indicating 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 also require 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." While this variable matters in both hurdle models (see columns 3 and 7 in Table 2), it is less relevant for the number of exits model than it is 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 1–4 and 5–8). This suggests that the presented results are very stable across specifications, and that the Poisson model delivers fairly robust findings.

Empirical Results and Policy Implications

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. This means that 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 the years since migration variable does not affect the number of exits at all, it reduces the number of years out linearly. Overall, education and training plays no role in the international mobility decisions, probably because of the internal German potentials that human capital creates. It follows, then, that 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. This is consistent with the

human capital approach. Similarly, immigrants previously employed in Germany spend fewer years outside Germany. Naturally, employed immigrants find it more profitable to stay attached to the host country, and this is supported by both count data models. Owning a dwelling in Germany and therefore creating an attachment consistently induces a lower number of exits and years out of the country for both estimation techniques; this finding originates fully from the binary part of the hurdle model. The prestige of the last job does not show any significant effect, and neither does remittance behavior.

Country of origin plays an important role for out-mobility. The reference group here is migrants from the three guestworker sending countries that are now EU members, e.g. Italy, Greece and Spain. Migrants who have taken the German citizenship regardless of their country of origin are not distinguishable from the reference group in the total years out of Germany equation. They are, however, more frequently out since they face no legal restrictions upon returning 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 fewer times 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 is that both free mobility and the possession of the citizenship of the host country induce out-migration so that, on average, fewer migrants stay in the host country. The likelihood of a circular migration pattern rises with the freedom to leave and with the right to return to Germany. This implies that granting citizenship or permanent residency to immigrants does not hurt the host country. To the contrary, our study shows that it may induce out-migration. On the other hand, naturalization does not automatically increase the attachment immigrants have for their new home country.

Our findings show that there are gender differences in circular migration and that family status matters: males and single migrants exit more frequently. Married individuals with a spouse in the host country are consistently both less frequently out of Germany and spend fewer years outside of Germany, as measured by our two 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. Naturally, existing family ties within the host country reduce circular migration, while they increase it when the ties are with the country of origin.

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. The longer

those individuals are in the sample, the more frequently they take the chance to leave the host country and the longer they stay abroad. This again suggests that practicing circular migration increases with a stronger connection and attachment to the host country.

In sum: Those immigrants who are the most mobile and open to circular migration are the middle-aged, male, and single migrants who are free to move either by virtue of having the German passport or an EU membership and those who have no particular profitable attachment (e.g., family, work, own a dwelling) to the host country. These factors are of value to consider when defining circular migration policies.

Summary and Policy Conclusion

In this paper we use count data models and panel data from Germany to analyze the phenomenon of repeat and circular migration as it is manifested by the number of exits and the total number of years away from the host country. 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 de facto repeat migrants. Indeed, they are a specific group: while originally they migrated to Germany through temporary labor schemes, they became permanent sojourners and using Germany as their base they now return back and forth repeatedly.

The empirical findings on the determinants of out-mobility are rather stable across the estimation methods and are 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-aged), are significantly more likely to engage in repeat migration and to stay out of Germany for longer periods. Males and those migrants with a German passport exit more frequently, while those with higher education exit less. With respect to the total years away from the host country model, we find that males do not differ from females, and German nationals are not different than migrants from other European Union member countries. Naturally, migrants with family left in the home country remain outside Germany 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 European Union Commission are considering the establishment of circular or repeat migration schemes.

This policy discussion can benefit from the experience and behavior of the German guestworker populations reported in this paper: The first lesson is that the easier and more facile mobility is, the more likely are migrants to engage in and practice repeat or circular migration. Interestingly, our study shows that migrants who have acquired the German passport are more mobile than European Union nationals; non-European Union nationals are more likely to remain in Germany and avoid mobility. Contrary to public perceptions, naturalization induces out-mobility. Second, family members left behind in the home country provide a strong motive that encourages repeat or circular migration, and thus temporary work programs should consider this element seriously. Third, higher education, home ownership and labor market attachments in the host country are decisive characteristics that induce and encourage 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 policymakers. In the early 1970s, tighter constraints on labor mobility caused a decline in return migration to the home country among some guestworker groups in Germany precisely because they were unable to re-enter Germany easily. Another unintended consequence of these measures was an increase in family reunification that took place in Germany. In the U.S., tighter controls and a longer wall at the U.S.-Mexican border also produced the odd result that more illegal migrants from Mexico are staying for longer periods in the country, eventually bringing their families in the U.S. If repeat or circular migration is considered to be beneficial, then such tight and restrictive policy measures appear to be counter-productive.

The successful policy agenda of circular migration should include, for example, access of immigrants to the global labor market. This policy agenda also should connect a migratory move to a job generated from the market system, thus rendering the labor market the filter for migration. The right to enter a country and the requirement to leave it should be linked to the availability of work. The basic principle of circular migration should be the right or the chance to return back to the host country and should even offer rewards to those return migrants who honored the return migration code. International standard settings should include giving minimum work contract standards, providing the means to preserve pension rights, facilitating the free circulation of remittances, and enabling the reunion of family members.

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