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# Self-employment against employment or unemployment: Markov transitions across the business cycle

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**Abstract** In this paper we study labor market transitions among self-employment, gainful employment, and unemployment across the business cycle comparing the performance of migrants and natives and controlling for individual characteristics. The Markov chain specification we use is an appropriate representation for our employment transition setting. Based on 19 waves of individual panel data the state probabilities for immigrants and Germans are the highest for paid-employment. While for Germans the next higher state is self-employment, for immigrants it is unemployment. The transition probabilities are highest for staying in the current state for both immigrants and natives. Germans are three times more likely to transition to self-employment from unemployment than immigrants. Good or bad times in the economy, however, do not have a significantly differential effect on any of the transitions related to self-employment for immigrants. In contrast, the business cycle affects Germans' self-employment probabilities. During the upswing, they leave unemployment to go into self-employment; they also leave self-

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employment to go back to paid-employment. Both immigrants and Germans use self-employment to transition in and out of the other employment states. They especially use it to escape unemployment and this is a relevant and applicable strategy.

# 1 Introduction

The dominant strand of the literature on entrepreneurship deals with the matter from the side of the firm as the unit of analysis and its role in economic growth. Baumol (1990, 2010) advanced the idea that it is the small entrepreneurial firms that account for major innovations; large firms advance these breakthroughs only gradually. Not only entrepreneurship should be viewed as a distinct factor of production, but it is the interaction of small entrepreneurs with large firms that is at the center of technological growth and promotes economic growth. The author acknowledges, however, that innovative entrepreneurs are rather rare and most entrepreneurs are replicators. Baumol's (1990) arguments about productive, unproductive and destructive entrepreneurship were further researched and tested by several economists. The idea being that entrepreneurship out of necessity due to unemployment is destructive and destined to fail while opportunity-motivated and innovative entrepreneurship is productive and leads to job creation and economic growth.

Baumol's concept of the "defensive entrepreneur" and the "escape from unemployment or necessity entrepreneur" as drivers of new firms' entry are studied by Santarelli and Vivarelli (2007). In their survey paper, the authors acknowledge macro and micro determinants to self-employment entry as well as non-economic factors that simultaneously and significantly affect entry motives and chances of survival. Among the macro determinants, both "progressive" and "regressive" factors are important (promising economic perspectives and the fear of becoming unemployed, respectively). They caution that this diverseness of reasons combines innovative entrepreneurs and passive followers, over-optimist gamblers and even escapees from unemployment together. To the pronounced heterogeneity of the founders' characteristics, the authors add those who make "entry mistakes" and are doomed to fail. Vivarelli (2013) revisits the concept of entrepreneurship and discusses the type of "creative destruction" (when new firms displace obsolescent ones) versus simple "turbulence" (when new firms are pushed out of business shortly after formation and create turbulence in the industry). The author also discusses the progressive and regressive drivers, the ex-ante characteristics of the founder and post-entry performance of the new firm. Examining the role of unemployment in the formation of new firms, Storey (1991) concludes that time-series studies find a positive association, while cross-sectional, or pooled cross-sectional studies indicate the opposite. In his South Africa company panel, Ligthelm

([2011](#)) identified the human factor in small businesses as the strongest predictors of survival of new firms.

In this paper, we focus on the debate from the angle of the individual actor seeking work across the business cycle, and hence adjusting to macro conditions given his or her characteristics. At this level, we consider two types of entrepreneurship: First, there are those individuals who freely choose an independent profession that enables them to materialize their visions (the productive innovators). They face risky choices, but this is part of their success strategy; they are pulled or attracted by the lucrative facets of self-employment. Second, there are those forced to go into self-employment at their own risk because nobody else wants to take the risk to employ them. The latter are often either the former unemployed or immigrants and ethnic minorities, who use this activity as a channel of circumventing or escaping from long-term unemployment or as a means to climb the employment ladder into regular employment. Forced or defensive self-employment,[1] however, does not exclude the fact that these individuals are industrious and venturesome. It is important to note that these push–pull scenarios in the occupational choices of individuals depend on the phase of the business cycle. Empirically, it is difficult to separate these two types of self-employed individuals in a static data setting due to lack of appropriate panel data.

The objective of this paper is to contribute to this under-researched area by investigating the dynamics of self-employment using a rich panel of microdata for Germany. While the performance of immigrants and natives in relation to the business cycle is equally under-researched, there is no literature about the link between transitions among the three main states in the labor market (self-employment, paid-employment, and unemployment)[2] and the business cycle by ethnic groups. To the best of our knowledge this is the first study that jointly investigates the behavior of more recent immigrants and those who still carry a foreign passport and compare them with natives' dynamic behavior in the labor market when confronted with the business cycle's ups and downs.

The prevalence of self-employment among immigrants, ethnic groups in general and natives in the labor market has been researched and documented by many studies in the United States. However, research on entrepreneurship—especially immigrant or ethnic entrepreneurship—has been somewhat scant in Europe, particularly in Germany. Recent surveys on the rising empirical literature on self-employment in a comparative setting investigating research in immigrant countries include Le ([1999](#)), Blanchflower et al. ([2001](#)), Blanchflower ([2004](#)), Audretsch ([2002](#)), Audretsch et al. ([2002](#)) and Audretsch ([2010](#)). These mostly cross-sectional studies identify relevant determinants of self-employment such as the role of managerial and other individual abilities, gender, education, family background, occupational status, financial constraints, the nature of work, and ethnic enclaves, among other factors.

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[1] In this group we can include those workers in the salaried sector who feel discriminated against and see self-employment as a way of being independent and in control.

[2] Throughout this study, we use the terms employment, salaried employment and paid-employment interchangeably.

In the United States, the probability of migrant self-employment increases with years since migration, more recent immigrant cohorts have higher self-employment rates than earlier cohorts, living in enclaves increases self-employment probabilities, and compared to similarly skilled native-borns, immigrants are more likely to be self-employed and the likelihood varies by ethnicity (Borjas, 1986). Fairlie and Meyer's (1996) comprehensive study of ethnic/racial groups by gender provides evidence that individuals are pulled by high relative returns rather than pushed into self-employment because of discrimination or language difficulties in the salaried sector. However, a panel study on black and white men in the US shows that blacks are severely underrepresented in self-employment, and the self-employment ratio between blacks and whites has been constant over the last 80 years at one to three (Fairlie, 1999). The paper calculates dynamic transition probabilities between self-employment and paid-employment, both for entry and exit; transition rates differ substantially by race. By decomposing the racial gap in the transition rate in and out of self-employment the study finds that education, assets, and fathers' self-employment explain part of the racial gap in entry but not in exit rates.

There is only scarce evidence regarding migrant entrepreneurs in Europe, especially in Germany. Self-employment is a way out for immigrants facing discrimination in paid-employment in Great Britain (Clark and Drinkwater 1998) as wage work pays less well for ethnic minorities when compared to natives, and the difference has increased over time. The increase in the earnings disadvantage is correlated with a rise in self-employment of ethnic minorities. Although there are higher self-employment rates for non-whites than for whites, one nevertheless observes a substantive variance among the ethnic groups. Most ethnic minorities also earn less in self-employment than similar self-employed whites do.

For Germany, Constant and Zimmermann (2006) find that migrant self-employment is not significantly affected by time spent in Germany or by human capital. However, this occupational choice has a very strong intergenerational link and relates to homeownership and financial worries. While individuals are strongly pulled into self-employment if it offers higher earnings, immigrants are additionally pushed into self-employment when they feel discriminated against. Married immigrants are more likely to go into self-employment, but less likely to when they have young children. Immigrants with foreign passports living in ethnic households are more likely to be self-employed than native Germans. The earnings of self-employed men increase with time in the country, hours worked and occupational prestige; they decrease with high regional unemployment to vacancies ratios. Ceteris paribus, the earnings of self-employed Germans do not greatly differ from those of self-employed immigrants, including those who have become German citizens. Immigrants suffer a strong earnings penalty if they feel discriminated against, while they receive a premium if they are German-educated.

A comparative study between Germany and Denmark shows that in Germany, self-employment rates among ethnic groups vary widely with ethnicity and sex, and many refugees are in self-employment (Constant and Schultz-Nielsen 2004). Self-employed immigrants in Germany are self-selected with respect to human capital, age, years since migration, family background, homeownership, and enclave living. Iranians and Lebanese are more entrepreneurial than Turks. Self-employed

immigrants also earn twice as much as immigrants in paid-employment, while immigrant entrepreneurs of a younger age, who own a larger sized business and live outside ethnic enclaves, have even higher earnings. In contrast, in Denmark, only males and those with disabilities self-select into self-employment. While Iranians are still more entrepreneurial than Turks, ex-Yugoslavs are not. Overall, in Denmark, immigrant entrepreneurs earn less than immigrants in paid-employment. The study observes that maybe some countries are not conducive to self-employment and that self-employed immigrants in Denmark would find a better match for their talents if they were to move to Germany.

The literature on the business cycle effects on self-employment around the world uses unemployment rates as a proxy for the business cycle, and produces rather conflicting evidence. Some studies find that self-employment is inversely related to business fluctuations and it lags in response to recession (see Aronson 1991 for a review). In a panel study on the OECD countries, Blanchflower (2000) also finds a negative relationship between self-employment and unemployment rates. In contrast, Evans and Leighton (1989) in their longitudinal study on white men in the US find a positive relationship between self-employment entry and unemployment rates, supporting the push theory. Using longitudinal data for men in Spain, Carrasco (1999) also finds that the unemployed are more likely to switch into self-employment, and this likelihood increases with the availability of assets, more education, and older age. The switch is more attractive for the unemployed when the economic situation improves.

Moore and Mueller (2002), however, show that self-employment decisions are independent of the situation in the labor market as measured by the unemployment rate. Still, their results are more consistent with the push theory. Yet, Robson's (1998) study, based on various sources of aggregate data in the UK, finds no "recession push". Another panel study on males in Denmark concurs on the very different labor market transition patterns between natives and immigrants, and finds strong differences among the immigrant groups; immigrants from less developed countries are marginalized self-employed who use the self-employment option as a last resort (Blume et al. 2005). A more recent study on 22 OECD countries finds that entrepreneurship Granger-causes the cycles of the world economy and the entrepreneurial cycle is positively affected by the national unemployment cycle (Koellinger and Thurik 2012). The study suggests that entrepreneurship can play an important role in economic recovery from recessions. Based on data about college graduates in Iowa, Yu et al. (2014) find that those who graduate during a recession are severely impacted and cannot start a business for more than a decade after graduation.

Our paper is unique in that it uses a rich panel dataset that allows following individuals' employment and unemployment paths and identifying their status over long enough periods to capture business-cycle effects. The dataset employed is from the first 19 years of the German Socio-Economic Panel (GSOEP) with detailed information on both natives and immigrants. The perceived employment, self-employment and unemployment history, individual economic performance indicators and the macroeconomic conditions in general are used to determine the status of forced self-employment. This is modeled against the genuine entrepreneur type,

who is identified by ethnic status, parental entrepreneurial human capital, state-dependence, and individual educational performance. We use the gross national product (GNP) growth instead of macro unemployment rates to identify business cycles because unemployment rates in Germany vary asymmetrically.

We concentrate on males who are in the active labor force. Hence, the core employment states are employed, self-employed, or unemployed. Unlike most other studies, we include the registered as unemployed as an empirically distinct state in the labor market.[3] At any time, there is a transition matrix describing the conditional probabilities of moving from the current to the next period's state vector. We explore the short-run and the long-run versions of the transition probability matrix that capture the core employment dynamics.[4] We model the transition probabilities using rich panel data that capture individual behavior and merged information on the macro business cycle. We expect business cycles to generate adjustment processes that lead to fluctuations between employment and self-employment, either directly or through unemployment status. Migrants or ethnic groups are more likely to be sensitive to adjustment pressures than natives, since they have less stable jobs and more often choose self- employment to avoid periods of unemployment. Hence, we want to understand how ethnicity and business-cycle effects act and interact with employment transition probabilities.

The paper is organized as follows: In Sect. 2 we outline the Markov modeling strategy of transitions between the core employment states—namely employment, unemployment or self-employment—and the empirical estimation of the respective transition probabilities through multinomial logit models. In Sect. 3 we explain the dataset, describe the construction of the variables employed, and present the basic hypotheses for our empirical study. In Sect. 4 we present the business cycle and self-employment trends over the last 20 years in Germany, the characteristics of the sample used, and explore the cyclicality of the transition probabilities. Section 5 examines the econometric evidence on the dynamics between the core employment states. Lastly, Sect. 6 summarizes the paper and concludes.

# 2 Model specification

## 2.1 A Markovian modeling framework

We assume that the occupational choices of individuals, namely, self-employment, paid-employment and unemployment are three employment states in the labor market. Depending on individual and socioeconomic characteristics as well as on the business cycle, individuals transition from one state to another. We model these movements by a discrete-time discrete-space Markov process. We assume that the employment status of the individual at any period $t$ is described by a stochastic

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[3] The registered as unemployed behave differently than the not employed, who are not attached to the labor force. While there are significant transitions from unemployment to employment, the transition from no employment to employment is very low (Flinn and Heckman, 1982).

[4] Such a computable Markov chain model has recently been proposed and applied by Constant and Zimmermann (2012) to issues of circular migration in Germany. Here, we follow this concept closely.

process {Et} that takes values in a finite discrete state space $S = \{0, 1, 2\}$. A Markov chain is a sequence of random values whose probabilities at a time interval depend upon the value of the number at the previous time (Papoulis 1984). We embody the idea that if an individual knows the current state, it is only this current state that influences the probabilities of the future state. At each time, the Markov chain restarts anew using the current state as the new initial state. We assume that this Markov chain has three states, 0, 1, and 2 indicating that an individual is employed, unemployed or self-employed respectively. The vector containing the long-term probabilities, denoted by $\pi$, is called the steady-state vector of the Markov chain.

The state probability (row) vector is:

$$\pi = [\pi_0, \pi_1, \pi_2] \tag{1}$$

where $\pi_0, \pi_1, \pi_2$ are the probabilities that a person is in regular employment, unemployment, or self-employment. Under the assumption that the system converges and is in steady-state, the state probabilities do not depend on the year of observation. This is the stationary distribution of the chain and satisfies the following equation:

$$\pi = \pi * P \tag{2}$$

where

$$P = \begin{pmatrix} p_{00} & p_{01} & p_{02} \\ p_{10} & p_{11} & p_{12} \\ p_{20} & p_{21} & p_{22} \end{pmatrix} \tag{3}$$

is the transition probability matrix with $p_{00} + p_{01} + p_{02} = p_{10} + p_{11} + p_{12} = p_{20} + p_{21} + p_{22} = 1$. $p_{00}$ is the probability that a person who is employed in the current year would tend to stay in this category of employment in the next year, while $p_{01}$ is the probability that a person who is employed in the current year would tend to move to unemployment in the next year, and $p_{02}$ is the probability that a person who is employed in the current year would tend to move to self-employment in the next year, and so on.

A transition probability is the commanding factor in a Markov chain. It is a conditional probability that the system will move to state 0, 1 or 2 in the next time period, given that it is currently in state 0; it will move to state 0, 1 or 2 in the next time period, given that it is currently in state 1; and it will move to state 0, 1 or 2 in the next time period, given that it is currently in state 2. The Markov chain obtains the much-desired efficient estimates when the transition probabilities are properly determined. Even if the system converges in the long-run, the Markov chain equation does not need to hold in the short-run. However, if this equation is closely applicable with real data, it indicates that the Markov assumption is useful in describing reality.

We assume that individuals have a myopic but pragmatic foresight (taking it one step at a time) and maximize their utility at every period, given their current state. We assume a discrete time process in which a person's status is a random

process in time. The Markov approach is, then, an appropriate representation of the behavioral process structure of individuals who move between employment states. This model's key feature is that the future state depends solely on the current state.

Specifically, the transition probabilities of an individual $m$ from one state to the other or to the same state depend only on the current state, and the socioeconomic characteristics of the individual, $X_m$. These independent variables are expected to affect the individual's probability of being in a given state. We consider six distinct outcomes that describe the transitions. Transitions to the same state, that is, from state 0–0, 1–1, or 2–2, are not considered here. This is convenient since the summing-up restrictions of conditional probabilities allow us to exclude three conditional probabilities, and we concentrate on transitions to different types of employment.

## 2.2 Modeling the steady state transition probabilities

To estimate the transition probabilities as they are explained by the individual and macroeconomic characteristics, $X$, we employ three multinomial logits conventionally specified as:

$$p_{ij} = \frac{e^{\beta'_{ij} x_t}}{\sum_{m=0}^{2} \sum_{n=0}^{2} e^{\beta'_{mn} x_t}} \quad 0 \le i,j \le 2 \tag{4}$$

The idea is that individuals have three choices depending on their current state. We estimate a multinomial logit on the probability to go into unemployment or self-employment, given that the individual is currently in paid-employment. Second, we estimate the probability to go into paid-employment or self-employment, given that the individual is currently in unemployment. Third, we estimate the probability to go into paid-employment or unemployment, given that the individual is currently in self-employment.

The closed form for the probability that a person will move from one state to the other from time $t$ to $t + 1$ is:

$$P(Y = j|X) = \frac{e^{\beta_j X_i}}{1 + \sum_{k=0}^{K-1} e^{\beta_k X_i}} \tag{5}$$

where $i$ indexes the individuals, and $j$ indexes the alternative transitions: $j = 0, 1, 2$, which are three nominal, unordered outcomes. To identify the model, we impose the normalization $\beta_0 = 0$. The characteristics in $X$ will help explain how a person evolved into a specific state and how his or her choice influences the next transition. Lastly, we calculate the steady state probability vector ($\pi$) to find the probability that an individual is in a certain state.

## 3 Data source, variables and hypotheses

### 3.1 The GSOEP and construction of the sample

For the empirical analysis, we employ the GSOEP, a nationally representative annual survey that started in 1984 in the former Federal Republic of Germany with a sample of about 12,000 respondents, of whom 3,000 were legal immigrants. The latter were those living in a household whose head was from Italy, Greece, Spain, Yugoslavia, or Turkey—the migrants and descendants from the so-called guestworker regime. Under this regime individuals comparable to German blue collar workers were recruited by German representatives in the sending countries based on international treaties (see also Zimmermann 1996). They were labeled guestworkers because they were expected to stay for a pre-specified period and then return, when the German economy would not need them. The GSOEP is an ongoing longitudinal database that interviews a representative set of all Germany—based persons aged 16 or older. It contains rich socioeconomic information on both native Germans and legal immigrants. It actually oversamples guestworkers and, additionally, provides excellent information on their pre-immigration experiences. In this long-term analysis, we do not include the collected data on East Germany after unification and the other various refreshment samples created since then. We concentrate on native West Germans and legal immigrants in West Germany (or guestworkers) who have been living side by side in the former West Germany for more than 30 years.

We use 19 waves of West German data during the period 1984–2002. This is an important period excluding the years of heavy German labor market reforms starting in 2003 as well as the Great Recession afterwards, which have likely caused changes in adjustment behaviors. This later period has been recently studied by Rinne and Zimmermann (2012, 2013). We furthermore focus on the male subsample because men are characterized by a strong labor market attachment, and their employment transitions are more cleanly related to labor market structures and the business cycle. Our sample contains all males over 16 years of age who were successfully interviewed and available in a transition between two consecutive years in the states employed, unemployed or self-employed. The upper cut-off age is 60 to avoid any spurious effects due to retirement decisions. We also exclude those in the military, students, and civil servants. This longitudinal sample contains 7,652 individuals, of whom 2,462 are immigrants and 5,190 are native West Germans. Table 1 presents the yearly sample observations and the final longitudinal sample by ethnicity.

To implement the event history analysis we restructured the GSOEP data into "person-years," which became the effective unit of our analysis. A person-year is a 1-year fraction of a person's life during which the event in question (a move to another employment status) may or may not occur. Each yearly fraction of a person's life is treated as a distinct observation. The person-year file contains information about the occurrence or nonoccurrence of the event, as well as the values of relevant independent micro- and macroeconomic variables (with or without temporal variation); it is the life history of each person. However, it is not

**Table 1** Yearly observations by ethnicity

| Wave | Year | Entire sample | Germans | Immigrants |
|------|------|---------------|---------|------------|
| 1 | 1984 | 4,555 | 2,997 | 1,558 |
| 2 | 1985 | 4,121 | 2,796 | 1,325 |
| 3 | 1986 | 3,965 | 2,673 | 1,292 |
| 4 | 1987 | 3,889 | 2,598 | 1,291 |
| 5 | 1988 | 3,635 | 2,440 | 1,195 |
| 6 | 1989 | 3,522 | 2,365 | 1,157 |
| 7 | 1990 | 3,466 | 2,294 | 1,172 |
| 8 | 1991 | 3,424 | 2,304 | 1,120 |
| 9 | 1992 | 3,366 | 2,230 | 1,136 |
| 10 | 1993 | 3,330 | 2,221 | 1,109 |
| 11 | 1994 | 3,236 | 2,181 | 1,055 |
| 12 | 1995 | 3,145 | 2,170 | 975 |
| 13 | 1996 | 3,084 | 2,154 | 930 |
| 14 | 1997 | 3,010 | 2,101 | 909 |
| 15 | 1998 | 2,857 | 2,021 | 836 |
| 16 | 1999 | 2,752 | 1,971 | 781 |
| 17 | 2000 | 2,611 | 1,883 | 728 |
| 18 | 2001 | 2,460 | 1,790 | 670 |
| 19 | 2002 | 2,352 | 1,732 | 620 |
| All 19 waves (individuals) | | 7,652 | 5,190 | 2,462 |
| Person year observations | | 62,780 | 42,921 | 19,859 |

*Source:* own calculations from GSOEP 1984–2002

necessary that every person experience the event. In our analysis, however, we only consider complete transitions from one state to another. The Markov modeling rationale keeps those individuals who are out of the labor force out of the analysis. This implies a two-stage decision process where the first stage models the probability to enter the labor force, whereas the second stage deals with the probability of entering one of the three states (employment, unemployment and self-employment).

The person-year file has 62,780 observations, representing detailed longitudinal histories of the individuals' experiences and behavior from the moment they enter the sample until exit, death, or the final survey date. The variables we employ in our analysis may be either fixed or time varying. The variables that change from year to year include age, years since first arrival in Germany and GNP growth rates. We use GNP growth instead of macro unemployment rates as in the literature in order to identify business cycles since unemployment rates in Germany vary asymmetrically across the cycle. Those variables that refer to fixed characteristics, such as education before migration and ethnicity, remain constant over person-years.

To capture all transitions in the most accurate manner, we initially consider and keep the individuals who are not in the labor force in any current state because they might change and enter the labor force in the future state. After we calculate the

complete transitions, we delete the not employed and continue our analysis with those in the labor force. The final person-year file has 47,961 observations with 32,880 native West Germans and 15,081 immigrants.

## 3.2 Variables and hypotheses

To effectively capture the cyclical dynamics of our transition probabilities, we control for both micro- and macroeconomic variables. First, we control for the standard forms of human capital, family characteristics, intergenerational links, demographics, and ethnicity. We augment the model with the GNP growth rates and an interaction variable between GNP and ethnicity.

For immigrants, we separately control for human capital acquired in Germany and in the home country. Besides formal schooling, we employ vocational training (both pre- and post-migration) because this is a unique feature of the German educational system and makes a difference in the labor market placement and opportunities. For formal schooling in Germany, we consider three categories: (1) no schooling degree, which is the reference category (2) primary or lower secondary schooling, and (3) high school and beyond. Graduating with vocational training in Germany is a separate dummy variable. We also create two additional dummy variables for pre-migration formal schooling and vocational training. We expect that individuals with more schooling and vocational training will have lower chances in going into unemployment if they are working, and higher chances of moving into employment or self-employment when they are unemployed. As a proxy for the individual's health status (a vital form of human capital), we create a dummy variable from the occupational disability question.

The age and years since migration variables capture experience, savviness, and labor market know-how; they are entered as quadratics. In principle, these variables should have a differential impact on all three employment choices. Regarding age, we expect that older individuals are more likely to go into self-employment from employment, because older workers have more experience, know the market better and face lower liquidity constraints. For years since migration, we expect that immigrants who are newcomers to Germany will be more likely to go into unemployment because they are in a more precarious condition. On the other hand, the longer immigrants are in Germany the more likely they are to go into self-employment or paid-employment.

Marital status and young children in the household can also affect labor market choices and sorting. Married men and men with young children, as income earners and household providers, will be less likely to go into unemployment and more likely to stay employed in either paid- or self-employment. Homeownership is expected to affect the employment transitions as well. Individuals who own their house will be more likely to stay employed. Self-employed fathers can pass on an invaluable lore to their children. According to the literature, there is a strong intergenerational link from fathers to sons, especially in the self-employment sector (Dunn and Holtz-Eakin 2000). We, thus, control for the father being self-employed. We expect that men whose father is self-employed will be more likely to go into

self-employment from other employment states, and to choose self-employment as their steady absorbing state.

The next group of independent variables refers to nationality status. We distinguish individuals as native West Germans and immigrants. Within the immigrants, we differentiate among Turks, individuals from the former Yugoslavia, Greeks, Italians, and Spaniards. Because the low number of observations of self-employed Spaniards rendered our model inestimable, we regrouped the ethnicity variables of Greeks, Italians, and Spaniards into the "EU Citizen" variable, since all these groups have been part of the European Union for a long time and share a common legal status in Germany. We expect that different nationalities have different labor market paths. Some groups for example, may be more entrepreneurial than others, some have long traditions in self-employment, and some may be more affected by structural changes. The reference category is native West German men.

Lastly, we control for the business cycle. Employment transitions could be pro- or countercyclical, as well as a-cyclical. Unlike other studies, we employ GNP growth rates as the capstone of the business cycle statistics. For the analysis on the entire sample, we also create an interaction variable between GNP growth rates and ethnicity to see whether the business cycle affects immigrants from different countries differently. This variable also reflects the asymmetrical effects created by the business cycle. We finally adjust the econometric model using robust standard errors. Because immigrants may differ from natives, we repeat this exercise for immigrants only. In this analysis, the Turks are the reference ethnic group. Empty cells problems forced us to exclude the "disability" and "father self-employed" variables from the self-employment estimation.

## 4 Business cycle, sample characteristics and transition probabilities

### 4.1 Self-employment trends and the business cycle

All countries experience business cycles or economic fluctuations due to economic disturbances of various sorts. In general, a business cycle has four phases: The downturn (recession or contraction), the trough, the upturn (boom or expansion), and the peak. Contrary to the word "cycle" these phases are not always regular in their periodicity, amplitude, duration and timing. While there is some consensus on the business cycle's effects on employment (for example, during a recession employment falls and unemployment rises while during an expansion employment rises and unemployment falls), the business cycle's effects on self-employment are not as clear-cut.

In general, the arguments can be summarized as follows. Individuals can be either pushed or pulled into self-employment depending on the business cycle phase. Those who are unemployed or not employed and cannot easily find paid-employment during a recession phase could use the self-employment option as a means of circumventing unemployment and hardship in the labor market. In that case, one would expect self-employment rates to increase during the downturn and

individuals to be pushed into forced self-employment or self-employment out of necessity. However, the success and longevity of a business is rather low during the downturn, which in turn, can also act as a deterrent to self-employment start-ups.

During the expansion phase, individuals who are unemployed or not employed can easily find paid-employment. They may thus be more likely to choose the more "secure" avenue of paid-employment rather than self-employment. At the same time, self-employed individuals may also close their business[5] and find a better and "secure" job by working for somebody else in the expansion phase. It is thus possible that self-employment rates are lower during a boom. On the other hand, many individuals can be pulled into self-employment during the expansion phase because it is easier to establish or expand a business and increase profits. Self-employment becomes less risky in this case. We would therefore expect that self-employment rates increase during a boom.

Using official statistics (Sachverstaendigenrat 2003) we calculate the growth rates for GNP from 1983 to 2003, encompassing the entire period of our sample. Similarly, we calculate the growth rates for self-employment in Germany during that same period. We plot the results of these aggregate statistics in Fig. 1. This figure shows that GNP was on a downturn from 1984 to 1987, when it reached its trough. This downward trend was severely amplified in the self-employment trend, which—after reaching its peak in 1984—dipped to its lowest and negative level in 1986. However, self-employment increased dramatically in 1987, although GNP was decreasing.

From 1987 to 1990 there was an overall uptrend and GNP was growing. The peak of the German expansion phase occurred in 1990. The corresponding self-employment growth rates show that they closely followed and matched the GNP growth rates, but only when the latter followed a sustained growth. For short-period bumps and dips, self-employment rates exhibit a countercyclical pattern. Nonetheless, self-employment growth rates stayed below GNP growth rates.

After the German reunification in 1990, GNP started declining with a pronounced precipitous and severe drop after 1991. GNP reached a trough with negative levels in 1993. While self-employment rates match the precipitous decline of the GNP in the beginning, especially during the period 1988–1992, and mimic every GNP move from below, they bounce back in 1992 in a procyclical manner, overshooting the GNP growth rates.

The recovery period of the business cycle started after 1993, and GNP reached positive levels again in 1994. With the exception of a small dip in 1996, GNP kept growing to reach another peak in 2000. Up until 1998 during this recovery and expansionary period, self-employment rates exhibited strong procyclical patterns and remained at positive levels, always above those of the GNP. After 2000, GNP started its downturn, and self-employment followed the same route from below. As can be seen in Fig. 1, the self-employment growth rates largely follow the GNP growth rates, although not always closely.

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[5] If the business does not take off the way entrepreneurs want it to, it is easier for them to close it and move into paid-employment.

**Fig. 1** GNP and self-employment growth rates: aggregate levels

## 4.2 Characteristics of the sample population

In Table 2, we present the means of the relevant individual characteristics by the three employment states and nationality. On average, the youngest workers are in paid-employment, while the oldest are in self-employment. The average self-employed German in our dataset is 42 and the average immigrant is 39 years old. For immigrants, we also report their length of stay in Germany. Overall, for every state, immigrants have been living in Germany for more than 20 years. Table 2 shows that the longer the immigrants are in the host country, the more likely they are to be in the self-employment category, whereas those present for less time are more likely to be in paid-employment.

The Columns of the entire sample ("All") across the three employment states show that the largest share of individuals with no schooling degree is among the unemployed (15 %). Those individuals have a much lower share among the employed (9 %) and among the self-employed (4 %). Among the unemployed, more than a quarter of the immigrants have no schooling degree in Germany. Since this variable is not conditional on age, the high non-schooling rates of immigrants could be due to their entry at an older age. The smallest share of uneducated men is in the self-employment category (1 %). For immigrants, we find almost equal fractions of the individuals with high school and beyond in self-employment (58 %), unemployment (51 %) and employment categories (54 %). For Germans, the fractions of individuals with high school and beyond are 53 % in the self-employed category, 41 % among the employed and 25 % in unemployment. Similarly, we find that individuals with vocational training in Germany have a high presence in the work categories: 68 % of the self-employed and 67 % of those in paid-employment in the entire sample have a vocational training degree. Among the unemployed immigrants, only 33 % have vocational training, while more than 40 % have such a degree in the employment and self-employment categories. Migrants with pre-migration schooling are more equally dispersed across the categories;

**Table 2** Selected mean characteristics by employment state

| Characteristics | Employed | | | Unemployed | | | Self-employed | | |
|---|---|---|---|---|---|---|---|---|---|
| | All | Immigrants | Germans | All | Immigrants | Germans | All | Immigrants | Germans |
| Age | 38.925 | 38.566 | 39.095 | 39.868 | 40.036 | 39.731 | 41.714 | 39.419 | 42.167 |
| Years since migration[a] | – | 20.598 | – | – | 21.552 | – | – | 22.934 | – |
| No schooling degree in Germ. | 0.088 | 0.228 | 0.022 | 0.146 | 0.260 | 0.052 | 0.041 | 0.181 | 0.014 |
| Primary/secondary school in Germ. | 0.464 | 0.231 | 0.564 | 0.492 | 0.236 | 0.701 | 0.422 | 0.247 | 0.456 |
| High school and beyond in Germ. | 0.451 | 0.543 | 0.408 | 0.366 | 0.506 | 0.252 | 0.539 | 0.576 | 0.531 |
| Vocational training in Germ. | 0.671 | 0.431 | 0.784 | 0.520 | 0.331 | 0.675 | 0.683 | 0.452 | 0.728 |
| Schooling in home country[a] | – | 0.503 | – | – | 0.476 | – | – | 0.503 | – |
| Vocational training in home[a] | – | 0.301 | – | – | 0.253 | – | – | 0.353 | – |
| Disability | 0.063 | 0.046 | 0.071 | 0.150 | 0.078 | 0.177 | 0.043 | 0.026 | 0.046 |
| Home ownership | 0.375 | 0.125 | 0.493 | 0.220 | 0.078 | 0.337 | 0.568 | 0.246 | 0.632 |
| Married | 0.739 | 0.808 | 0.707 | 0.631 | 0.741 | 0.542 | 0.764 | 0.820 | 0.753 |
| Children <16 in household | 0.490 | 0.593 | 0.441 | 0.425 | 0.531 | 0.337 | 0.476 | 0.518 | 0.468 |
| Germans | 0.679 | – | 1.00 | 0.550 | – | 1.00 | 0.835 | – | 1.00 |
| Immigrants | 0.321 | – | – | 0.450 | – | – | 0.165 | – | – |
| Turks | 0.115 | 0.360 | – | 0.242 | 0.538 | – | 0.041 | 0.250 | – |
| Ex-yugoslavs | 0.065 | 0.202 | – | 0.072 | 0.159 | – | 0.030 | 0.180 | – |
| EU citizens | 0.141 | 0.439 | – | 0.136 | 0.302 | – | 0.094 | 0.570 | – |
| N. of Obs. | 40,162 | 12,890 | 27,272 | 3,180 | 1,430 | 1,750 | 4,619 | 761 | 3,858 |

These statistics are not weighted

[a] Based on immigrant observations only

about 50 % of the employed and the self-employed have some schooling degree from their home countries, but only 48 % of the group of the unemployed. Similarly, 30 % of the employed and the self-employed have vocational training in their home country, but only 25 % of unemployed migrants.

We find that individuals with impaired health statuses have the strongest presence in the unemployment category; it is lower among employed men and lowest among the self-employed. Overall, immigrants in all groups exhibit a lower share of individuals with a disability status than Germans. Homeowners are strongest in the self-employment category (57 % in the entire sample, 63 % of the natives and 25 % of the immigrants). Among the employed, 49 % of the Germans own their home, but only 13 % of the employed immigrants do. Still 34 % of the unemployed Germans own a home, but only 8 % of the unemployed immigrants are homeowners.

Immigrants have more family presence among all three states than natives. In the unemployment category, immigrants and Germans have lower shares of individuals with family characteristics than in the other two states. These findings are consistent with the well-established facts that being married or having young children create a positive impact on economic performance for men.

From the entire sample columns, statistics by country of origin show that German men have the strongest presence in the self-employment category (84 %), a good presence in the salaried sector (68 %) and a lower rate among the unemployed (55 %). In contrast to Germans, immigrants as a group have lower shares in self-employment (17 %) and in paid-employment (32 %), and high shares in the unemployment state (45 %). Turks have both the highest share in the unemployment category (24 %) and the highest unemployment share among all immigrants (54 %). While 12 % of those in paid-employment are Turks, their share in the self-employment category is only 4 %. In the self-employed group, immigrants from the former Yugoslavia have a rate of 3 %, their share being 7 % among the unemployed and those in paid-employment. The three nationalities that compose the EU immigrants exhibit a comparatively higher share among the self-employed than the other immigrants (9 %). About 14 % of the immigrants in paid-employment and unemployment nationals are from the EU.

### 4.3 Transition and state probabilities

In Table 3, we present the average transition probabilities calculated experimentally from the raw data for the entire sample. The probability of the transition from employment to unemployment is 3 %, while the transition to self-employment is at a low 1 %. The probability of transitioning from unemployment to employment is a high 33 %, while the move from unemployment to self-employment is only 2.5 %. Conditional on being unemployed, the transition probability into self-employment is 2.5 times higher than into being employed. The probability to move from self-employment to employment is at a high 7 %, while the transition probability from self-employment to unemployment is at a very low 1 %.

Calculated from the raw data, we find that the average initial state distribution vector $\pi$, is $\pi = [\pi_0, \pi_1, \pi_2] = [0.837 \ 0.066 \ 0.096]$. Applying the Markov chain

**Table 3** Calculated transition probabilities matrix: entire sample

| State (t) | State (t + 1) | | |
|---|---|---|---|
| | Employment | Unemployment | Self-employment |
| Employment | 0.9555 | 0.0331 | 0.0114 |
| Unemployment | 0.3286 | 0.6469 | 0.0245 |
| Self-employment | 0.0706 | 0.0089 | 0.9206 |

*Source*: own calculations from raw data, GSOEP 1984–2002

equation the calculated estimates of the steady state probabilities after the transition are: $\pi^* = [0.829 \ 0.072 \ 0.100]$; this is nothing else than the average state probabilities from the raw data after the transition. These numbers are sufficiently close to $\pi$ to make us believe that the Markov chain specification is an appropriate representation for our employment transition setting.

In Table 4, we present the average transition probabilities calculated separately for immigrants and Germans. The highest transition probabilities are to stay in the same employment state (from employment to employment, from unemployment to unemployment, and from self-employment to self-employment). For immigrants, the lowest transition probability (0.8 %) is from employment to self-employment indicating that immigrants are not leaving their jobs in the salaried sector to move into self-employment often. The probability from self-employment to employment is high at 10 %. That is, the exit probabilities are 10 times higher than are the entry ones. The probability from unemployment to employment is 32 % while the probability to self-employment is only 1 %; migrants seem to prefer paid-employment over self-employment. The state probability estimations for the immigrant sample are as follows: $\pi = [\pi_0, \pi_1, \pi_2] = [0.854 \ 0.095 \ 0.051]$ and $\pi^* = [0.844 \ 0.104 \ 0.053]$. We can safely say that $\pi$ and $\pi^*$ are sufficiently close. They indicate that the probability to find immigrants in paid-employment is the highest state probability; next is the probability to find them in unemployment and last is the probability to find them in self-employment.

For Germans, Table 4 shows that they move less strongly (than immigrants) from employment to unemployment. Their transition probabilities from unemployment to self-employment (3 %) are about three times as large as those of the immigrants. And the transitions from self-employment to employment (7 %) and to unemployment (0.7 %) are less strong (than immigrants); Germans use self-employment much more than immigrants. The corresponding estimation of the state probabilities for the German sample is as follows: $\pi = [\pi_0, \pi_1, \pi_2] = [0.830 \ 0.053 \ 0.117]$ and $\pi^* = [0.822 \ 0.057 \ 0.121]$. Once again, these numbers encourage us to believe that the Markov approach is a good model for our data. These state probabilities are the highest for a German to be in paid-employment; they are lower for self-employment and the lowest for unemployment.

The state probabilities reflect a different pattern between migrants and natives. While both ethnic groups cluster in paid-employment, the two other categories exhibit not the same hierarchy. Immigrants are more present in unemployment, and

**Table 4** Calculated transition probabilities matrix: immigrants and Germans

| State (t) | State (t + 1) | | | | | |
|---|---|---|---|---|---|---|
| | Employment | | Unemployment | | Self-employment | |
| | Immigrants | Germans | Immigrants | Germans | Immigrants | Germans |
| Employment | 0.9460 | 0.9610 | 0.0458 | 0.0271 | 0.0082 | 0.0129 |
| Unemployment | 0.3203 | 0.3354 | 0.6664 | 0.6309 | 0.0133 | 0.0337 |
| Self-employment | 0.0958 | 0.0656 | 0.0210 | 0.0065 | 0.8832 | 0.9279 |

*Source:* own calculations from raw data, GSOEP 1984–2002

Germans are more probable in self-employment. Hence, in Germany natives are more entrepreneurial than the migrants.

In Table 5, we present the correlation coefficients of the transition probabilities among themselves as well as with the business cycle over time. This analysis examines how the transition probabilities move along with the economy's ups and downs over time and how they interact with each other. The first row pertains to the entire sample, the lower triangle shows the immigrant sample and the upper triangle conveys the German sample. For the entire sample, the highest positive correlation is clearly between the business cycle (GNP) and the transition from unemployment to paid-employment ($p_{10}$). This confirms the expected outcome that in an expansion phase, workers leave unemployment; however, their preferred state is paid-employment rather than self-employment, given that they are unemployed. Nevertheless, there is some positive correlation between the business cycle and the transition from unemployment to self-employment: The better the economic situation, the more the unemployed are willing to become self-employed. The positive correlation between the business cycle and the transition from self-employment to employment is also high. This indicates that during the upswing, workers leave self-employment for paid-employment.

For immigrants specifically (lower triangle), we find a positive and very high correlation between the upswing of the business cycle (GNP) and the transition from unemployment into paid-employment ($p_{10}$). The high positive correlation between $p_{20}$ and $p_{10}$ suggests that immigrants gravitate jointly into paid-employment when they come from either unemployment or self-employment. On the other hand, the correlation between $p_{21}$ and $p_{20}$ indicates that the transition probabilities for immigrants from the self-employment state to paid-employment or unemployment move together over time. It is also interesting to note that the transition probabilities of moving from employment to unemployment ($p_{01}$) and from employment to self-employment ($p_{02}$) are strongly and positively correlated, which suggests that self-employment is an alternative to unemployment.

For Germans (upper triangle), we find a high negative correlation between GNP and the transition from employment to unemployment, suggesting that German workers are hit by the business cycle downturn and become unemployed. Similar to immigrant workers, the correlation between $p_{20}$ and $p_{10}$ is high, echoing gravitation

**Table 5** Pearson correlation coefficients

|  | GNP | $P_{01}$ | $P_{02}$ | $P_{10}$ | $P_{12}$ | $P_{20}$ | $P_{21}$ |
|---|---|---|---|---|---|---|---|
| GNP | 1.00000 | −0.38777 | −0.00754 | 0.55530 | 0.18125 | 0.42447 | −0.09621 |
| GNP | 1.00000 | −0.47858 | −0.07517 | 0.38641 | 0.35681 | 0.36716 | −0.12551 |
| $P_{01}$ | −0.22695 | 1.00000 | 0.60353 | 0.34152 | 0.14490 | 0.30775 | 0.29207 |
| $P_{02}$ | 0.18943 | 0.40892 | 1.00000 | 0.66261 | 0.26765 | 0.38033 | 0.11447 |
| $P_{10}$ | 0.61009 | 0.02692 | 0.19147 | 1.00000 | 0.24126 | 0.71724 | 0.05015 |
| $P_{12}$ | −0.24981 | 0.37974 | 0.31085 | −0.17529 | 1.00000 | 0.33850 | −0.18625 |
| $P_{20}$ | 0.27511 | 0.09023 | −0.19708 | 0.59638 | −0.24379 | 1.00000 | −0.04050 |
| $P_{21}$ | −0.00678 | 0.10622 | −0.19222 | 0.25742 | −0.29328 | 0.63760 | 1.00000 |

The first row pertains to the entire sample. The upper triangle pertains to the German sample. The lower triangle pertains to the immigrant sample. $P_{01}$ is the transition from employment to unemployment; $P_{02}$ is the transition from employment to self-employment; $P_{10}$ is the transition from unemployment to employment; $P_{12}$ is the transition from unemployment to self-employment; $P_{20}$ is the transition from self-employment to employment; and $P_{21}$ is the transition from self-employment to unemployment

towards paid-employment. Notable differences with immigrants relate to the correlation between $p_{01}$ and $p_{02}$ and between $p_{02}$ and $p_{10}$. The first indicates a strong transition out of employment, while the latter indicates a transition out of unemployment into self-employment through paid-employment.

In the Figures below, we plot the transition probabilities through time to illustrate the role of the business cycle on the movement from one employment state to the other, given the current state. For comparison purposes, we juxtapose the transition probabilities of immigrants and Germans by current state. Figures 2 and 3 clearly show that the probabilities to move to self-employment from paid-employment are very low and exhibit little variation with respect to the business cycle for both immigrants and Germans. In 1988, a year in the upswing of the economy, self-employment transitions for immigrants hit rock bottom. They started to increase again after that, but they remain low and much lower than those of Germans. Throughout the period of analysis, transition probabilities from paid- to self-employment are always somewhat higher for Germans than for immigrants and they fluctuate less. The transition probabilities to the unemployment state are a lot higher for both samples; in the 1990s they increase to higher levels for immigrants and become more dynamic for the Germans. The observed rise in the transition to unemployment is much stronger for migrants, however. This implies that the rise in the transitions from employment to unemployment is largely an issue for immigrants and not for natives.

Figures 4 and 5 illustrate the transitions to employment and self-employment when the current state in the labor market is unemployment. They verify that, although there is some strong movement between unemployment and employment, in the 1990s immigrants and Germans tended to enter employment much less than in the 1980s. This tendency is even more marked for immigrants, who appear to be less able to transition back to employment when they are unemployed.
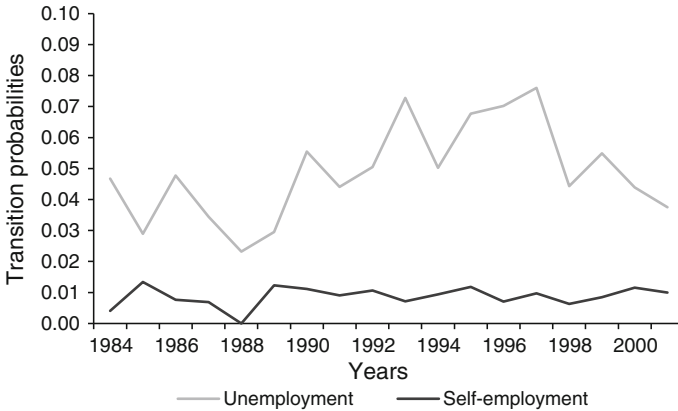
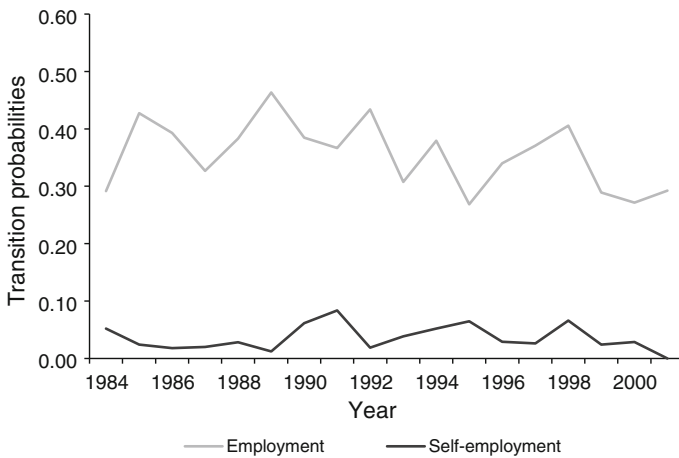Fig. 2 Immigrants' transition probabilities: current state is employed
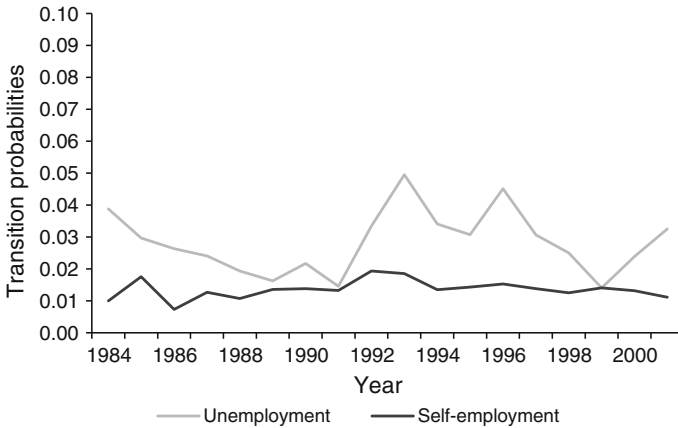


Fig. 3 Germans' transition probabilities: current state is employed

Concerning the transitions into self-employment, immigrants sometimes use self-employment as a way to circumvent unemployment but do no stay self-employed for long. The pronounced zigzag pattern suggests that immigrants use the self-employment state as a last resort but it is not a preferred long-run state for them. The analogous transition for Germans shows a much higher activity in self-employment, although this is not so much related to the business cycle. While Germans may also use self-employment to escape unemployment, they manage to reach high levels and stay self-employed for longer periods during the upswing of the business cycle.

Figures 6 and 7 display the transition probabilities from self-employment to either employment or unemployment. Once again, there is pronounced entry and exit between self-employment and paid-employment, although at a much higher level and amplitude for immigrants than for Germans. The intense zigzag pattern

**Fig. 4** Immigrants' transition probabilities: current state is unemployed



**Fig. 5** Germans' transition Probabilities: current State is unemployed

shows that immigrants gladly exit self-employment to go into paid-employment and stay in paid-employment for longer periods. While the zigzag pattern is also present in the native sample, the average size of the transition probability is much larger and the zigzag is much more marked for migrants compared to Germans. Overall, the transition probabilities are decreasing over the years. While the probabilities from self-employment to unemployment are lower, Figs. 6 and 7 shows that there is movement between the two states and immigrants fall into unemployment from self-employment more often than Germans. While between 1990 and 1992 transitions to unemployment for Germans were zero, immigrants still struggled in and out of unemployment. From 1991 to 1997, immigrants were stuck in unemployment unable to transition although the economy was booming between 1993 and 1995.

**Fig. 6** Immigrants' transition probabilities: current state is self-employed



**Fig. 7** Germans' transition probabilities: current state is self-employed

## 5 Econometric results

Before we present the results of conditional logit models about immigrants and Germans in detail, we show the ethnicity results based on the estimation of the entire sample in Tables 6, 7, and 8. All tables contain the parameter estimates, the marginal effects and the respective robust standard errors. These tables report the results by ethnicity. A negative coefficient suggests a small base transition probability, while a positive coefficient represents a large base transition probability. The reference alternative in these estimations is always the status of the individuals in the previous period. In Table 6, we present the transitions from paid-employment to unemployment and self-employment; the transition from employment to employment is the reference state. Table 7 provides the evidence of the

transitions into employment and self-employment from the status of being unemployed; staying unemployed is the reference state. Table 8 presents the probabilities of moving from self-employment to either employment or unemployment; staying in self-employment from one period to the next is the reference state.

Controlling for all aforementioned characteristics, employed Turks are more likely to move from employment to unemployment compared to natives. They are also more likely to move from unemployment to self-employment when unemployed. Once self-employed, Turks have an increased probability to then switch to paid-employment, as well as show an enormously high probability to become unemployed. This probably indicates that while Turks are trying to stay in the labor force through self-employment, the success rate of their businesses is low. Other immigrant groups (EU citizens and ex-Yugoslavs) are not different than Germans in their transitions from employment to unemployment or self-employment. However, they are much more likely than natives to move into employment, especially self-employment (except ex-Yugoslavs), when previously unemployed. The ex-Yugoslavs also change more often between self-employment and employment than Germans. Immigrants from other EU countries move in a very strong way from self-employment to unemployment when compared to natives. Hence, migrants comprise a significant part of the fluctuations observed between the various employment states with Turks experiencing the most transitions, ex-Yugoslavs being in stable paid-employment and EU citizens in between.

The results further indicate that the employment state vector is moving considerably with waves in the macro economy. Transitions from employment to unemployment are strongly reduced in periods of high growth rates; in expansion periods, the previously unemployed move strongly out of unemployment into paid- or self-employment; a boom allows self-employed individuals to move back into employment. Furthermore, during good economic periods, there is a significant increase in the transition from unemployment to employment, which is substantially larger for immigrants than for natives.

These findings are rather stable when we disaggregate the sample into Germans and immigrants. Tables 9, 10, and 11 present the corresponding results on immigrants and Tables 12, 13, and 14 the results for Germans. Note that the constants in the logit regressions represent the independent parts in the transition probabilities. Simple $\chi^2$ tests of sample separation suggest that the parsimonious specifications in Tables 6, 7, 8 are not less powerful than these general specifications. The interaction variable between GNP growth and the immigration dummy in Tables 6, 7, 8 mimic well the differences between immigrants and Germans in Tables 9, 10, 11 and Tables 12, 13,14 respectively.

For immigrants, age and age squared have a significant impact on most of the elements of the transition matrix, and the findings are rather plausible. The inflow into unemployment from employment is U-shaped, being high for lower and higher age levels. The outflow from unemployment into paid- or self-employment is increasing with age at a slowing speed. While with age individuals are more likely to move into employment or self-employment from unemployment, this increase becomes smaller and smaller through time. However, the transition from self-employment to paid-employment is U-shaped, implying that middle-aged

**Table 6** Multinominal logit results of the entire sample; transitions of the employed

| Variables | From employment to unemployment | | From employment to self-employment | |
|---|---|---|---|---|
| | Coefficients (standard errors) | Marginal effects (standard errors) | Coefficients (standard errors) | Marginal effects (standard errors) |
| Turks | 0.428* (0.197) | 0.011* (0.005) | 0.066 (0.374) | 0.001 (0.004) |
| Ex-Yugoslavs | 0.195 (0.215) | 0.005 (0.006) | 0.260 (0.412) | 0.003 (0.004) |
| EU Citizens | −0.093 (0.207) | −0.002 (0.005) | 0.218 (0.377) | 0.002 (0.004) |
| GNP | −12.304* (2.005) | −0.320* (0.052) | −1.910 (3.204) | −0.016 (0.032) |
| GNP × ethnicity interaction | 5.693 (3.163) | 0.147 (0.082) | 5.460 (6.666) | 0.052 (0.066) |
| LogLikelihood | −7,945.912 | | | |
| $\chi^2$ | 768.098 | | | |
| N. of Obs. | 40,162 | | | |

* Implies $p < 0.05$, two-sided test. Reference category is stay in employment and the reference ethnicity group is the native Germans; standard errors are robust standard errors. The model controls for age and its square, disability status, primary/secondary school in Germany, high school and beyond in Germany, vocational training in Germany, vocational training in home country, schooling in home country, homeownership, marital status, children, self-employed father, years since migration and its square

**Table 7** Multinominal logit results of the entire sample; transitions of the unemployed

| Variables | From unemployment to employment | | From unemployment to self-employment | |
|---|---|---|---|---|
| | Coefficients (standard errors) | Marginal effects (standard errors) | Coefficients (standard errors) | Marginal effects (standard errors) |
| Turks | 0.474 (0.290) | 0.091 (0.059) | 1.529* (0.663) | 0.018* (0.009) |
| Ex-Yugoslavs | 1.345* (0.332) | 0.269* (0.067) | 1.475 (0.930) | 0.014 (0.012) |
| EU citizens | 1.064* (0.310) | 0.211* (0.063) | 1.791* (0.830) | 0.019 (0.010) |
| GNP | 14.134* (3.604) | 2.815* (0.731) | 19.834* (9.825) | 0.203 (0.127) |
| GNP × ethnicity interaction | 12.948* (5.585) | 2.720* (1.135) | −19.316 (17.674) | −0.298 (0.229) |
| LogLikelihood | −1,994.322 | | | |
| $\chi^2$ | 707.872 | | | |
| N. of Obs. | 3,180 | | | |

See Table 6; the reference category here is stay in unemployment

**Table 8** Multinomminal logit results of the entire sample; transitions of the self-employed

| Variables | From self-employment to employment | | From self-employment to unemployment | |
|---|---|---|---|---|
| | Coefficients (standard errors) | Marginal effects (Standard Errors) | Coefficients (standard errors) | Marginal effects (standard errors) |
| Turks | 1.031* (0.523) | 0.058* (0.029) | 2.239* (0.723) | 0.013* (0.005) |
| Ex-Yugoslavs | 1.244* (0.570) | 0.070* (0.032) | 1.001 (1.234) | 0.006 (0.007) |
| EU citizens | 0.908 (0.535) | 0.051 (0.030) | 1.791* (0.722) | 0.010* (0.004) |
| GNP | 7.859* (3.743) | 0.447* (0.213) | −3.610 (8.847) | −0.025 (0.054) |
| GNP × ethnicity interaction | 7.431 (8.831) | 0.419 (0.501) | 7.972 (16.550) | 0.045 (0.101) |
| LogLikelihood | −1,325.053 | | | |
| $\chi^2$ | 169.804 | | | |
| N. of Obs. | 4,619 | | | |

See Table 6; the reference category here is stay in self-employment

**Table 9** Multinomial logit results for immigrants; transitions of the employed

| Variables | From employment to unemployment | | From employment to self-employment | |
|---|---|---|---|---|
| | Coefficients (standard errors) | Marginal effects (standard errors) | Coefficients (standard errors) | Marginal effects (standard errors) |
| Constant | 2.601* (0.550) | 0.101* (0.020) | −5.642* (1.579) | −0.040* (0.011) |
| Age | −0.254* (0.033) | −0.010* (0.001) | 0.054 (0.094) | 0.0005 (0.001) |
| $Age^2$ | 0.003* (0.0004) | 0.0001* (0.00002) | −0.001 (0.001) | −0.00001 (0.00001) |
| Disability | 0.471* (0.174) | 0.018* (0.007) | 0.100 (0.549) | 0.001 (0.004) |
| Primary/secondary school in Germany | −0.453* (0.172) | −0.017* (0.007) | 0.418 (0.369) | 0.003 (0.003) |
| High school and higher in Germany | −0.392* (0.193) | −0.015* (0.007) | 0.247 (0.455) | 0.002 (0.003) |
| Vocational training in Germany | −0.192 (0.107) | −0.007 (0.004) | −0.068 (0.243) | −0.0004 (0.002) |
| Vocational training in home country | −0.0003 (0.123) | 0.00002 (0.005) | −0.110 (0.316) | −0.001 (0.002) |
| Schooling in home country | 0.123 (0.173) | 0.005 (0.007) | −0.015 (0.398) | −0.0001 (0.003) |
| Homeownership | −0.453* (0.160) | −0.017* (0.006) | −0.484 (0.344) | −0.003 (0.002) |
| Married | −0.199 (0.127) | −0.008 (0.005) | 0.480 (0.279) | 0.003 (0.002) |
| Children <16 in household | −0.143 (0.097) | −0.005 (0.004) | −0.437* (0.219) | −0.003* (0.002) |
| Father is self−employed | 0.913* (0.298) | 0.034* (0.011) | 1.684* (0.443) | 0.012* (0.003) |
| Years since migration | −0.008 (0.018) | −0.0003 (0.001) | 0.010 (0.039) | 0.0001 (0.0003) |
| Years since migration$^2$ | 0.0003 (0.0003) | 0.00001 (0.00001) | 0.0001 (0.001) | 0.333E−06 (0.00001) |
| Ex-Yugoslavs | −0.269* (0.131) | −0.010* (0.005) | 0.233 (0.323) | 0.002 (0.002) |
| EU citizens | −0.546* (0.109) | −0.021* (0.004) | 0.173 (0.247) | 0.001 (0.002) |
| GNP | −6.168* (2.464) | −0.237* (0.094) | 3.963 (5.816) | 0.030 (0.041) |
| LogLikelihood | −2891.697 | | | |
| $\chi^2$ | 236.793 | | | |
| N. of Obs. | 12,890 | | | |

* Implies $p < 0.05$, two-sided test. E+nn or E−nn means multiply by 10 to + or −nn power. Reference category is stay in employment, and the Turks are the reference ethnic group; standard errors are robust standard errors

**Table 10** Multinomial logit results for immigrants; transitions of the unemployed

| Variables | From unemployment to employment | | From unemployment to self-employment | |
|---|---|---|---|---|
| | Coefficients (standard errors) | Marginal effects (standard errors) | Coefficients (standard errors) | Marginal effects (standard errors) |
| Constant | −1.175 (0.789) | −0.207 (0.150) | −20.075* (4.011) | −0.066 (0.035) |
| Age | 0.106* (0.047) | 0.019* (0.009) | 1.004* (0.246) | 0.003* (0.002) |
| Age² | −0.002* (0.001) | −0.0004* (0.0001) | −0.014* (0.003) | −0.00005* (0.00002) |
| Disability | −0.930* (0.281) | −0.178* (0.053) | −0.040 (0.708) | 0.001 (0.002) |
| Primary/secondary school in Germany | −0.314 (0.228) | −0.060 (0.043) | −0.081 (0.756) | 0.000001 (0.003) |
| High school and higher in Germany | 0.120 (0.269) | 0.024 (0.051) | −0.693 (1.039) | −0.002 (0.003) |
| Vocational training in Germany | 0.390* (0.164) | 0.074* (0.031) | 0.757 (0.500) | 0.002 (0.002) |
| Vocational training in home country | −0.030 (0.207) | −0.006 (0.039) | 0.016 (0.770) | 0.00008 (0.003) |
| Schooling in home country | −0.686* (0.262) | −0.131* (0.050) | 0.111 (1.087) | 0.001 (0.004) |
| Homeownership | 0.249 (0.269) | 0.047 (0.051) | 1.085 (0.704) | 0.003 (0.003) |
| Married | 0.042 (0.195) | 0.007 (0.037) | 0.895 (0.697) | 0.003 (0.003) |
| Children <16 in household | −0.093 (0.155) | −0.017 (0.030) | −1.327* (0.551) | −0.004 (0.003) |
| Father is self−employed | 0.514 (0.549) | 0.098 (0.105) | 0.311 (1.336) | 0.001 (0.005) |
| Years since migration | −0.032 (0.033) | −0.006 (0.006) | −0.021 (0.096) | −0.00004 (0.0003) |
| Years since migration² | −0.0002 (0.001) | −0.00004 (0.00002) | 0.001 (0.002) | 0.000003 (0.00001) |
| Ex-Yugoslavs | 0.854* (0.195) | 0.164* (0.037) | −0.199 (0.965) | −0.001 (0.003) |
| EU citizens | 0.576* (0.154) | 0.110* (0.029) | 0.329 (0.542) | 0.001 (0.002) |
| GNP | 27.939* (4.376) | 5.343* (0.829) | 2.643 (15.421) | −0.015 (0.051) |
| LogLikelihood | −794.505 | | | |
| χ² | 393.465 | | | |
| N. of Obs. | 1,430 | | | |

See Table 9, but the reference category here is stay in unemployment

**Table 11** Multinomial logit results for immigrants; transitions of the self-employed

| Variables | From self-employment to employment | | From self-employment to unemployment | |
|---|---|---|---|---|
| | Coefficients (standard errors) | Marginal effects (standard errors) | Coefficients (standard errors) | Marginal effects (standard errors) |
| Constant | 3.944* (2.005) | 0.317* (0.152) | −9.761 (5.723) | −0.116 (0.072) |
| Age | −0.269* (0.114) | −0.021* (0.009) | 0.078 (0.248) | 0.001 (0.003) |
| Age$^2$ | 0.003* (0.001) | 0.0002* (0.0001) | −0.0003 (0.003) | −0.00001 (0.00003) |
| Primary/secondary school in Germany | 0.118 (0.473) | 0.009 (0.037) | 0.212 (0.991) | 0.002 (0.012) |
| High school and higher in Germany | 0.136 (0.559) | 0.010 (0.044) | 0.895 (0.969) | 0.010 (0.012) |
| Vocational training in Germany | 0.307 (0.321) | 0.024 (0.025) | 0.068 (0.753) | 0.0005 (0.009) |
| Vocational training in home country | 0.070 (0.395) | 0.007 (0.031) | −1.195 (0.738) | −0.014 (0.009) |
| Schooling in home country | −0.027 (0.536) | −0.001(0.042) | −0.886 (0.810) | −0.010 (0.010) |
| Homeownership | −0.251 (0.348) | −0.019 (0.027) | −0.679 (0.829) | −0.008 (0.010) |
| Married | 0.276 (0.425) | 0.021(0.033) | 0.053 (1.197) | 0.0003 (0.014) |
| Children <16 in household | −0.021 (0.288) | −0.002 (0.022) | 0.400 (0.710) | 0.005 (0.008) |
| Years since migration | −0.094* (0.049) | −0.008* (0.004) | 0.416 (0.236) | 0.005* (0.002) |
| Years since migration$^2$ | 0.002* (0.001) | 0.0002* (0.0001) | −0.010 (0.006) | −0.0001* (0.0001) |
| Ex-Yugoslavs | 0.213 (0.430) | 0.018 (0.034) | −1.172 (1.076) | −0.014 (0.012) |
| EU citizens | −0.098 (0.343) | −0.007 (0.027) | −0.401 (0.708) | −0.005 (0.008) |
| GNP | 15.178 (8.171) | 1.181 (0.633) | 2.606 (13.759) | 0.015 (0.158) |
| LogLikelihood | −298.395 | | | |
| $\chi^2$ | 45.023 | | | |
| N. of Obs. | 761 | | | |

See Table 9, but the reference category here is stay in self-employment. The variables disability and father self-employed are omitted from the calculation

**Table 12** Multinomial logit results for Germans; transitions of the employed

| Variables | From Employment to Unemployment | | From Employment to Self-employment | |
|---|---|---|---|---|
| | Coefficients (Standard Errors) | Marginal Effects (Standard Errors) | Coefficients (Standard Errors) | Marginal Effects (Standard Errors) |
| Constant | 1.715* (0.544) | 0.037* (0.011) | −5.237* (0.894) | −0.059* (0.010) |
| Age | −0.233* (0.029) | −0.005* (0.001) | 0.0654 (0.045) | 0.001 (0.001) |
| Age$^2$ | 0.003* (0.0004) | 0.00007* (0.00001) | −0.001* (0.001) | −0.00001* (0.00001) |
| Disability | 0.527* (0.120) | 0.011* (0.003) | 0.0929 (0.238) | 0.001 (0.003) |
| Primary/ secondary school | −0.249 (0.209) | −0.005 (0.004) | −0.205 (0.399) | −0.002 (0.004) |
| High school and higher | −0.975* (0.214) | −0.021* (0.004) | 0.104 (0.398) | 0.001 (0.004) |
| Vocational training | −0.248* (0.092) | −0.005* (0.002) | 0.185 (0.135) | 0.002 (0.002) |
| Homeownership | −0.499* (0.079) | −0.011* (0.002) | 0.179 (0.112) | 0.002 (0.001) |
| Married | −0.654* (0.102) | −0.014* (0.002) | −0.075 (0.147) | −0.001 (0.002) |
| Children <16 in household | 0.169 (0.090) | 0.004 (0.002) | −0.099 (0.133) | −0.001 (0.001) |
| Father is self-employed | 0.226 (0.116) | 0.004 (0.002) | 1.013* (0.123) | 0.011* (0.001) |
| GNP | −12.424* (2.015) | −0.261* (0.042) | −1.662 (3.221) | −0.016 (0.036) |
| LogLikelihood | −5027.947 | | | |
| $\chi^2$ | 477.350 | | | |
| N. of Obs. | 27,272 | | | |

* Implies $p < 0.05$, two-sided test. Reference category is stay in employment; standard errors are robust standard errors

individuals are less likely to change from the self-employment to paid-employment status compared to younger and older individuals.

The impaired health status is significant only in the transitions from employment to unemployment and back. Both cases show that immigrant men with some disability have a higher probability to move into unemployment when they are employed, and a lower probability to move into employment when they are unemployed. This shows that those men with disabilities are more likely to become and remain unemployed. However, this does not affect the self-employment probabilities.

Education acquired in Germany exhibits only a rather limited impact on the transitions. Schooling in Germany compared to no schooling shields immigrants from falling into unemployment when they are employed. However, it does not have a significant effect on any other transition from any other state. Vocational training in Germany, on the other hand, helps immigrants to go back into paid-employment when they are unemployed. Schooling from the home country does not have a

**Table 13** Multinomial logit results for Germans; transitions of the unemployed

| Variables | From unemployment to employment | | From unemployment to self-employment | |
|---|---|---|---|---|
| | Coefficients (standard errors) | Marginal effects (standard errors) | Coefficients (standard errors) | Marginal effects (standard errors) |
| Constant | −1.608* (0.679) | −0.265 (0.145) | −12.440* (2.887) | −0.242* (0.046) |
| Age | 0.093* (0.037) | 0.017* (0.008) | 0.436* (0.125) | 0.008* (0.002) |
| Age$^2$ | −0.002* (0.0005) | −0.0004* (0.0001) | −0.006* (0.002) | −0.0001* (0.00003) |
| Disability | −0.822* (0.172) | −0.170* (0.036) | −0.929* (0.472) | −0.014 (0.010) |
| Primary/secondary school | −0.190 (0.248) | −0.049 (0.054) | 1.329 (1.455) | 0.028 (0.028) |
| High school and higher | −0.082 (0.260) | −0.034 (0.056) | 2.572 (1.450) | 0.053 (0.027) |
| Vocational training | 0.650* (0.125) | 0.138* (0.027) | 0.217 (0.294) | 0.0002 (0.006) |
| Homeownership | −0.019 (0.125) | −0.007 (0.027) | 0.508 (0.279) | 0.010 (0.005) |
| Married | 0.035 (0.134) | 0.007 (0.029) | 0.119 (0.364) | 0.002 (0.007) |
| Children <16 in household | 0.078 (0.131) | 0.018 (0.028) | −0.113 (0.342) | −0.003 (0.007) |
| Father is self-employed | −0.112 (0.186) | −0.029 (0.039) | 0.702* (0.339) | 0.015* (0.007) |
| GNP | 13.482* (3.581) | 2.771* (0.760) | 19.223* (9.706) | 0.303 (0.194) |
| LogLikelihood | −1193.024 | | | |
| $\chi^2$ | 312.682 | | | |
| N. of Obs. | 1,750 | | | |

* Implies $p < 0.05$, two-sided test. Reference category is stay in unemployment; standard errors are robust standard errors

significant impact except in the unemployment to paid-employment transition in which it effectively reduces it. This denotes a negative signal to the labor market, which is easily explained. Most immigrants educated in their home countries came to Germany at the early stages of their career under the guestworker regime. However, their particular education acquired is now no longer needed in the German labor market. Hence, the negative signaling effect. Interestingly, none of the schooling variables have a significant effect on the transitions to either paid-employment or unemployment once immigrants are self-employed.

Immigrants who own their dwelling are less likely to become unemployed when they are in paid-employment. Marital status and the presence of young children are not of much relevance for the transitions. Having children reduces the probability to become self-employed once in paid-employment and naturally so as paid-employment provides a more secure form of employment.

Are entrepreneurial talents inherited? If the father has been self-employed, his son is more likely than others to move into self-employment from salaried employment. These results indicate that intergenerational transmission provides a positive thrust into self-employment, while it does not exert any influence in the exit

**Table 14** Multinomial logit results for Germans; Transitions of the self-employed

| Variables | Transition from self-employment to employment | | Transition from self-employment to unemployment | |
|---|---|---|---|---|
| | Coefficients (standard errors) | Marginal effects (standard errors) | Coefficients (standard errors) | Marginal effects (standard errors) |
| Constant | 2.395* (1.132) | 0.134* (0.060) | −23.866* (6.454) | −0.099* (0.027) |
| Age | −0.213* (0.054) | −0.012* (0.003) | 0.658* (0.295) | 0.003* (0.001) |
| $Age^2$ | 0.002* (0.001) | 0.0001* (0.00004) | −0.008* (0.003) | −0.00003* (0.00001) |
| Disability | −0.568 (0.423) | −0.030 (0.023) | −0.849 (0.650) | −0.003 (0.003) |
| Primary/secondary school | −0.011 (0.500) | −0.002 (0.027) | 6.334* (1.994) | 0.026* (0.009) |
| High school and higher | −0.263 (0.488) | −0.015 (0.026) | 6.162* (1.959) | 0.025* (0.009) |
| Vocational training | 0.361* (0.171) | 0.019* (0.009) | −0.054 (0.495) | −0.0003 (0.002) |
| Homeownership | −0.224 (0.152) | −0.012 (0.008) | −0.632 (0.434) | −0.003 (0.002) |
| Married | −0.342 (0.179) | −0.018 (0.010) | 0.410 (0.544) | 0.002 (0.002) |
| Children <16 in household | 0.056 (0.164) | 0.003 (0.009) | −0.878 (0.483) | −0.004 (0.002) |
| Father is self-employed | −0.141 (0.145) | −0.007 (0.008) | −0.732 (0.500) | −0.003 (0.002) |
| GNP | 7.902* (3.740) | 0.423* (0.200) | −3.219 (8.951) | −0.015 (0.037) |
| LogLikelihood | −1020.724 | | | |
| $\chi^2$ | 113.961 | | | |
| N. of Obs. | 3,858 | | | |

\* Implies $p < 0.05$, two-sided test. Reference category is stay in self-employment; standard errors are robust standard errors

from self-employment. However, self-employed fathers also increase the probability of making the transition from salaried employment to unemployment. The independence of self-employment may affect the engagement for dependent work negatively across generations culturally.

Years since immigration is of limited relevance, but important nonetheless. The cumulative effect of years of living in Germany is only significant for those who are self-employed and transition into paid-employment or unemployment. The relationship between years since immigration and a move from self-employment into paid-employment is U-shaped: This implies that immigrants begin as self-employed, but change soon after into paid-employment. With a longer stay in Germany, they first exhibit a decline in the transition probability from self-employment to paid-employment, which only rises again with longer durations in the country. Years since migration exert a positive impact on the transition to unemployment when immigrants are self-employed. However, this follows a declining rate.

Among immigrants, Tables 9,10, 11 show differences by country of origin. Both those from the former Yugoslavia and those who are EU citizens are significantly different from Turks (the reference group), namely, they are less likely to become unemployed when they are in paid-employment and more likely to go back to paid-employment when they are unemployed.

All things considered, when the economic times are good, immigrants are less likely to become unemployed if they are in the paid-employment state and more likely to go out of unemployment and into paid-employment when they are unemployed. Good or bad times in the economy, however, do not have a significantly differential effect on any of the transitions related to self-employment, a finding that has been robust also in the estimation of the interaction variable between growth and ethnicity in the entire sample.

Tables 12, 13, 14 present the detailed results about German men. Overall, the results are very similar. Here, we highlight the differences. Age and its square has an inverse-U effect on the transition from paid-employment to self-employment. This is a known finding in the literature as older individuals have easier access to credit and financial capital. However, older age also increases the probability to become unemployed if the current state is self-employment, albeit at a decreasing rate. When individuals are over a certain age it is not possible to enter paid-employment; failure in self-employment only leaves the unemployment route open. Having a high-school degree and higher education, as opposed to no schooling prevents Germans from falling into unemployment when they are in paid-employment. On the other hand, schooling has a positive impact on the transition to unemployment when Germans are self-employed. From employment or unemployment, schooling provides no impact in transitioning to self-employment; this suggests that such human capital is not worth much or will be soon depreciated since it is underused. Hence, it is not surprising that we observe this impact on unemployment. Vocational training, a distinct feature of the German educational system, decreases the probability to become unemployed when the current state is paid-employment and increases the probability to go into paid-employment when the current state is unemployment. In addition, and unlike the case of immigrants,

vocational training has a positive effect on the transition from self-employment to paid-employment.

Being married has a stronger moderating effect on the transition from employment to unemployment for the Germans in comparison to the immigrants; having young children is not significant for any transitions for Germans. While having a self-employed father has no significant impact on the transition from paid-employment to unemployment, it does increase the probability to go out of unemployment and into self-employment. In relation to the business cycle, Germans are different than immigrants when they are self-employed and face the transition to paid-employment. Our results show that the upswing actually increases the probability of the Germans to become self-employed and leave the salaried sector.

## 6 Summary and conclusions

This paper studies transitions among three possible states over time: Paid-employment, unemployment and self-employment. Our quest is to understand how business-cycle effects, ethnicity and other individual characteristics act and interact with employment transition probabilities in a dynamic setting. We compare and contrast the labor market behavior of immigrants and natives when they confront macroeconomic fluctuations.

We use a unique dataset constructed from 19 waves of the German Socio-Economic Panel transposed into person-years to better capture the labor market attachment of individuals through time. We analyze these transitions for immigrants and German natives separately. We find that a Markovian modeling framework suits the data well, and allows us to investigate the labor market dynamics. In particular, our transition probabilities matrix shows that Germans move less strongly (than immigrants) from paid-employment to unemployment; their transition probabilities from unemployment to self-employment are more than twice as large as those of the immigrants; and their transitions from self-employment to paid-employment and to unemployment are less strong (than immigrants).

Unlike other studies, we provide a link between these transitions and the business cycle and we control for a variety of individual characteristics according to theory and previous literature. We measure the business cycle by the Gross National Product growth rates from 1983 to 2003, years before the German labor market was affected by heavy labor policy reform measures and the big global recession.

Results from the multinomial logits of transition probabilities show that individual characteristics such as age, human capital, homeownership, family, the self-employment status of the father explain the data well. Age has a significant U-shaped effect when transitioning from paid-employment into unemployment; the probability is higher for those in lower and those at higher age levels. From unemployment into paid- or self-employment, however, age has an inverse-U effect, increasing with age at a decreasing rate. From self-employment to paid-employment age has again a U-shaped effect, implying that middle-aged individuals are less likely to change from the self-employment to paid-employment status compared to younger and older individuals. For Germans only, age has an inverse-U effect on the

transition from paid-employment to self-employment. Evidently, as Germans age and have more access to financial capital as well as more experience, they are more likely to be pulled into self-employment. Older age also increases the Germans' probability to become unemployed if the current state is self-employment, albeit at a decreasing rate. At an older age, it is more difficult for self-employed Germans to reenter paid-employment due to age discrimination and laws.

German education exhibits a rather limited impact on the transitions, but an intuitive one. Schooling in Germany compared to no schooling shields individuals from falling into unemployment when they are in paid-employment. While it does not have a significant effect on any other transitions for immigrants, it has an unexpected positive impact on the transition to unemployment when Germans are self-employed. Vocational training in Germany is a very valuable asset that helps immigrants and Germans go back to employment when they are unemployed. For Germans only, it also decreases the probability to become unemployed when the current state is paid-employment and increases the probability to become a wage-employee when the current state is self-employment. Schooling from the home country decreases the probability to go into paid-employment when immigrants are unemployed. Pre-migration education is known to not be recognized or needed in the host country, hence, the negative signaling effect.

Our results confirm strong entrepreneurial intergenerational transmissions for both immigrants and Germans. As expected, having a self-employed father increases the probability to move into self-employment from paid-employment for both. While for immigrants it increases the probability to transition to unemployment from salaried employment, it increases the probability to go out of unemployment and into self-employment for Germans.

For immigrants, the cumulative effect of years of living in Germany is only significant for those who are self-employed and transition into paid-employment or unemployment. From the state of self-employment, immigrants have a high probability to go into paid-employment within the first few years in Germany. With a longer stay in Germany, their transition probability from self-employment to paid-employment declines and it increases again with more years in Germany. Longer stay in Germany also exerts a positive impact on the transition to unemployment when immigrants are self-employed, albeit at a declining rate. This suggests that if immigrants stay in self-employment for many years, it is difficult to reenter paid-employment and their only option out of self-employment is unemployment.

Our results also demonstrate differences among immigrants. The ex-Yugoslavs and the EU citizens are significantly different from Turks. They are less likely to become unemployed when they are in paid-employment and more likely to go back to paid-employment when they are unemployed than the Turks.

The business cycle affects the employment transitions of immigrants and Germans. During the upswing, immigrants in paid-employment are less likely to become unemployed and more likely to go into paid-employment when they are unemployed. Good or bad times in the economy, however, do not have a significantly differential effect on any of the transitions related to self-employment for immigrants. When it comes to self-employment transitions, immigrants are impervious to the business cycle. Self-employment is not their preferred state, and

the ups and downs of the business cycle make no difference for them. In contrast, the business cycle affects Germans' self-employment probabilities. During the upswing, Germans leave unemployment and go into self-employment (as into employment); but they also move from self-employment to employment. Self-employment is more important for natives than for the immigrants. For instance, Germans are three times more likely to transition to self-employment from unemployment than immigrants.

Self-employment, which does not always coincide with entrepreneurship, is an important employment state and a serious occupational alternative to paid-employment. Overall, our results show that both immigrants and Germans use self-employment to transition in and out of the other employment states. They especially use it to escape unemployment; their transition probability is much higher than from employment to self-employment. This is a relevant and applicable strategy, although functioning to a smaller extent for immigrants. The outflow out of unemployment is more marked the stronger the economy grows. At the same time, there is a strong permanent outflow of people from self-employment into paid-employment. Here, migrants have a larger transition probability than natives.

Business cycles are expected to generate adjustment processes that lead to fluctuations between employment and self-employment, either directly or through unemployment status. Immigrants are more likely to be sensitive to adjustment pressures than natives, since they have less stable jobs and should more often choose self-employment to avoid periods of unemployment probabilities. In a nutshell our research presented in this article implies that immigrants in Germany are less, not more entrepreneurial or self-employed than the natives with no significant differences between the ethnic groups. Immigrants also use this occupational choice less than their German countrymen to adjust across the business cycle.

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