

Cohorts and Competition

Transitions from school to work in the context of economic and demographic change

Paper prepared for the Conference

*Market Expansion, Welfare State Retrenchment
and their Impact on Social Stratification*

organised by

International Sociological Association - Research Committee on Social Stratification (RC28)

Mannheim, April 2001

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Abstract

This paper investigates the extent to which patterns of individual transitions between school, vocational training, and work in West Germany have been influenced by macro-social change and how this relates to institutional characteristics.

Applying a simple model, one can recognise of two major steps in individual life-courses between school and employment in Germany: firstly, access to vocational training and secondly, access to employment after the successful completion of vocational training. The main empirical question is whether relative chances of successive cohorts and different social groups of mastering these steps differ significantly with respect to their historical (economic and demographic) situation. The main theoretical question is the extent to which the two steps are inter-dependent and how institutional features can explain these effects.

For analyses of time series, the paper draws on data from the German employment register between 1976 and 1995. These analyses are supplemented by analyses for the birth cohorts 1964 and 1971.

Transitions at the two ‘hurdles’ of the German vocational training system

In international comparisons, the process of transition to the labour market in Germany has proved repeatedly to be highly institutionalised in terms of standardised routes of access (cf. Lynch 1994; Mayer 1996; Hillmert 2001). The model of an extended phase of vocational training before starting employment is central to the structure of the system of education and training of the labour market as well as and individual life planning. It is, therefore, plausible that the public is relatively sensitive about problems concerning the transition to the employment system.

During the 1980s and 1990s, various ‘crises’ were debated in the training market and the labour market regarding people leaving vocational training. They have been repeatedly traced back to a number of different causes: general economic conditions, large birth cohorts (Schober 1985), changes in educational preferences and unsatisfactory skills of the applicants for training places, lack of willingness of firms to provide training (Bellmann/Dietrich 1998) etc. Since quantitative evidence or a balanced consideration of these causes during a longer period of observation is normally missing, there are marked research deficits: in what way have there been (relatively short-term) crises? How can they be explained?

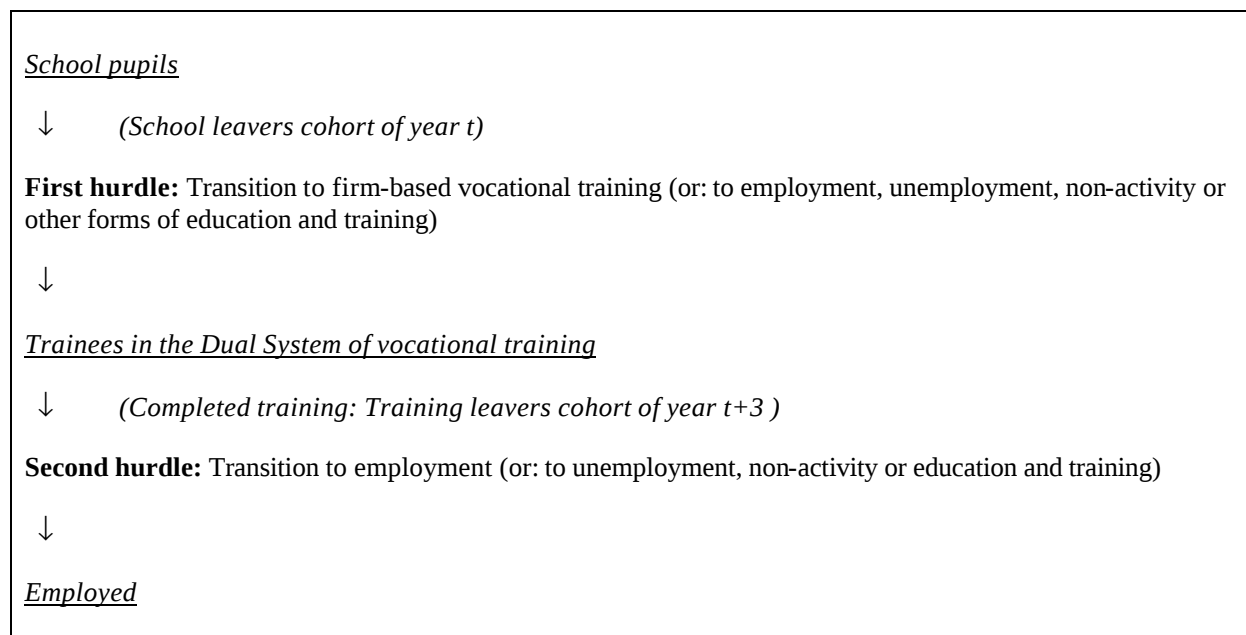
At the same time, however, there is in fact empirical evidence that reveals a trend towards longer phases of transition and increasingly complex patterns of training and employment careers (cf. Parmentier et al. 1994). Normally, only very detailed life-history analyses can deal with this empirical complexity. The model used for systematising (macro-) analyses for the school-to-work transition on the basis of official statistics, however, is often the so called ‘Two-Hurdle-Model’ (*Zwei-Schwellen-Modell*) (cf. Mertens/Parmentier 1988). It distinguishes between two separate, ordered transitions: firstly, the transition to vocational training and secondly, the transition to employment after successfully completing vocational training. Like any model, this is a simplification which allows aggregate changes for single transitions to be calculated. Empirical patterns of life-courses cannot necessarily be inferred from that. Although there have been empirical changes in life-course patterns, the model can still be used well as an analytical tool for ordering aggregate data. In any case, this model is probably still a normative standard for many entrants into the labour market (and also potential employers).

The model will also be used in this paper to systematise the analyses. Not all forms of training, however, will be analysed: only transitions to and out of vocational training in the form of the *dual system* will be studied. This training is made up of a combination of training locations: whilst the majority of training is firm-based, the rest take place in vocational schools. In the German system, this is the most frequent form of training¹. On the other hand, however, restricting the analysis to a particular case also allows one to reduce empirical complexity. Finally, this restriction is due to the content of available data (see below). Bearing these restrictions in mind, various definitions for cohorts² can be deduced from the Two-Hurdle-Model (see fig. 1).

¹ In the early 1990s, more than 60% of a cohort of school leavers began vocational training (cf. Reinberg/Hummel 1999, 31).

² A cohort is formally defined as a group of people that have experienced a certain event at a particular point in time. This event can be a variety of things, but the most frequent case is probably different birth cohorts.

Fig. 1: Simplified Two-Hurdle-Model and different definitions of cohorts of leavers



Ideal-type assumptions: School leavers from general secondary schools only; no exits and interruptions during vocational training; mean duration of vocational training 3 years (also in reality, there is a relatively high degree of age homogeneity and temporal standardisation in the dual system of vocational training, see below.).

The empirically oriented literature on processes of transition at the two hurdles has concentrated on selected aspects:

on the one hand, the studies concentrated on differences between the relative chances of transition of various social categories (men/women, Germans/Non-Germans, etc.). These groups can be compared on the basis of simple mean differences as well as effects in multivariate analyses.

It proved that their rates of (direct) transition are by no means equal. This can also be seen in table 1, second column, whereby educational groups are distinguished by the level of their secondary school degree: higher (*Abitur*), intermediate (*Realschule*) and lower secondary school (*Hauptschule*).

These differences are due, to some extent, to institutional characteristics and different occupational choice: for a number of occupations there is no firm-based training and these occupations are chosen, for example, by men and women to a different extent.

In the dual system, vocational training is an attractive way into qualified work (often in the same firm where training has taken place). It is, therefore, reasonable to interpret social differences in participation as a form of social inequality - at least excepting those, whose school degree enables them to reach even higher (academic) qualifications. In this case, low rates of participation in vocational training do not necessarily reflect disadvantage.

Tab. 1: Description of the rates of direct transition³ into (firm-based) vocational training after leaving general school education 1975-1995

Category	Mean (all observation years) in %	Linear trend (average yearly change)
All	43.6	-0.4
Men	47.6	-0.9
Women	39.3	0.1
Abitur (higher secondary school)	14.2 ⁴	0.8
Realschule	50.6	-0.1
Hauptschule	51.3	-0.6
together: Non-Abitur	51.3	-0.4

Own calculations. Data: IAB-Bildungsgesamtrechnung for West Germany
The linear trend is estimated by simple regression.

There has, however, been research on long-term trends (cf. Konietzka 1999). This includes increasing or decreasing participation in firm-based vocational training for various categories of persons. School leavers with *Abitur*, for example, have shown an increasing participation since the mid-1970s, leavers from lower secondary schools decreasing participation (cf. tab. 1).

The general trend for the rate of direct transitions from school to vocational training has been downward. From there, however, it does not necessarily follow that the dual-system vocational training becomes less important. During the last two decades, the paths of entry into vocational training have changed, and the direct transition from general secondary schools has lost substantial amount of importance (Reinberg/Hummel 1999, S. 37)⁵. Until recently, the lack of adequate data restricted dynamic analyses of transition processes that thoroughly account for historical developments. Palamidis/Schwarze (1989), for example analysed the selectivity of transition processes at the first and second hurdle on the basis of pooled datasets. It turned out that inter-group differences at the second hurdle were relatively low (cf. similar tendencies in tab. 2).

³ The IAB-Bildungsgesamtrechnung compares states at the beginning and at the end of a calendar year.

⁴ The proportion of those who *ever* begin vocational training, is much higher in this group in particular. Many (male) school leavers with *Abitur* start compulsory military or civil service immediately after leaving school.

⁵ This refers to a basic problem of historical causal analyses (a special case of the general Problem of heterogeneity). In order to estimate effects for single variables, one has to assume that the relationships that are analysed are valid for a particular time interval. The broader this interval, the better the statistical estimation. On the other hand, however, broader intervals raise increasing doubts as to whether the mean is still valid for all parts of the interval or not.

**Tab. 2: Description of transition rates after first completed vocational training 1976-1994
(in % of all transitions of training leavers)**

Category	Transition to unemployment		Transition to employment (with social security contributions)		N=
	Mean (all observation years) in %	Linear trend (average yearly change)	Mean (all observation years) in %	Linear trend (average yearly change)	
All	13.0	0.4	79.4	-0.3	77871
Men	12.0	0.5	80.3	-0.3	42770
Women	14.2	0.4	78.4	-0.3	35101
Germans	12.9	0.4	79.6	-0.3	75330
Non-Germans	14.0	0.8	75.4	-0.9	2346
Abitur	8.6	0.2	76.1	1.1	3742
Non-Abitur	13.2	0.5	79.4	-0.4	74129

Own calculations; Data: IAB-Beschäftigtenstichprobe. Observation period (cohorts of training leavers) 1976-1994. The linear trend is estimated by simple regression.

The third category besides (registered) unemployment and employment (with social security contributions) are transitions into other forms of employment, non-registered unemployment, education and training and non-activity.

This can be explained by both a homogenising effect of vocational training and selection at the first hurdle: here, the proportion of people from problem groups of the labour market have obviously been reduced already. On the other hand, the groups that are distinguished in this table tend to be trained in occupations which correspond to differential chances in the labour market. If one also distinguishes between occupations more closely, then one indeed finds larger differences (cf. Hofbauer/Nagel 1987).

Still, relatively little is known about the following aspects:

There is a lack of information about the extent of relatively short-term changes (e.g., business cycle effects) in overall rates of transition and in the structure of inequality, i.e. changes in relative transition rates for different groups of persons beyond long-term trends. If there are any, what determines these fluctuations? Sometimes, particular problems of large birth cohorts are mentioned (cf. already Noll 1983), although these effects are normally not quantified. Also, the general economic situation is used in the calculations rather as a control variable besides individual characteristics of persons or training places (cf. Büchel/Weißhuhn 1995; Franz/Zimmermann 1999).

There is, however, a well-established tradition of economic demography which has developed following Easterlin (1968) in particular and which focuses on the labour-market effect of demographic change (cf. Berger 1989; Zimmermann 1991; Macunovich 1999). Another exception is the General Educational Accounts (*Bildungsgesamtrechnung*) of the governmental institute IAB, where both stocks and flows in education, training and labour

market states are calculated. There have also been some attempts to estimate economic determinants of transition behaviour⁶ (see Tessaring et al. 1990: 195-204 in particular).

For a detailed analysis, one should be able to separate short-term developments from long-term historical trends and to attribute them to specific causes. This is especially important for long-term comparisons across cohorts, where only selected birth cohorts are analysed and hence short- and long-term period effects cannot be distinguished on this basis alone.

On the other hand, inherent relationships between characteristics of transition processes at the first and at the second hurdle of vocational training have rarely been studied. Official statistics are normally cross-sectional and, therefore, do not allow for a combination of the two events on the level of cohorts or individuals. Moreover, the two transitions are normally looked at separately also in regard to theory.

Yet another perspective emerges from the analysis of whole birth cohorts. Here it may be possible, for example, for particular individuals to make single transitions several times. What is necessary, therefore, are detailed longitudinal descriptions of single cohorts. It would also be necessary, however, to look at short- and long-term effects for whole time series of cohorts.

This paper concentrates on the following issues:

- (1) firstly, changes in the size and the social differentiation of transitions at the first hurdle on the basis of the historical development between the mid-1970s and the mid-1990s in West Germany.
- (2) secondly, changes in the extent and selectivity of transitions at the second hurdle for the same historical period.
- (3) simultaneously - although this is even more important- a combination of transitions at the second hurdle with (selection) processes at the first hurdle.
- (4) finally, the analyses of time series will be supplemented by the example of two single birth cohorts, i.e. persons born in 1964 and 1971. For these birth cohorts detailed life-history data will soon be available (cf. Corsten/Hillmert 2000) and it is these very different cohorts that can demonstrate the general relationships well. On the other hand, the time-series data allow the position of these cohorts within the long-term development to be found.

In order to clarify basic determinants and relationships of transition processes and to create more detailed empirical analyses, general and relatively simple considerations about how the labour market functions will be used in that which follows.

⁶ For transitions at the first hurdle, Althoff (1999) looked at changes in the relative transition rates and tried to confirm a close connection to fluctuations in supply and demand. In my view, these empirical analyses should be supplemented by an account for long-term trends and an acknowledgement of the exact sequence of cohorts that leave school and enter vocational training.

Theoretical relationships between supply and demand on the training market and the labour market

Both the training market and the labour market are determined in their general development by the principles of supply and demand. Hence, the crucial parameters are the supply of applicants for training places and jobs and the demand for trainees and workers.

The actual *supply* of potential trainees and potential workers will be closely tied to demographic developments – particularly in the case of ‘hurdles’ that are relatively standardised in time. A relatively small supply of applicants will result in relatively better chances of transition and vice versa. Whilst potential trainees *compete* mainly with members of their own cohort (of school leavers), however, potential workers also compete – at least theoretically – with people who are already in employment.

For a relatively short-term perspective, there is also the question concerning the adaptive capacity of the training system and the employment system with regard to changes in these factors. As people leave school and vocational training in particular months, short-term changes can well be relevant.

In addition to which, there are changes in individual educational and training behaviour. These include changes in general preferences (educational aspirations, ‘value change’), that also influence educational behaviour and the probability of entering vocational training at the first hurdle. One can reasonably assume, however, that such changes in the attraction of training develop gradually and in so far can be treated as a long term trend⁷.

The *demand* for trainees and workers who have completed their training will correlate greatly with the economic situation of the firms, which do or do not require workers or at least have sufficient capacities (for training). This relationship will also hold true for the aggregate, i.e. for the whole economy. Such effects on employment, however, also depend upon a number of other factors. The situation in the labour market will, therefore, be used as an indicator. As the demand for workers can hardly be measured exactly, the general unemployment rate will be used. This rate is an indicator of how balanced the general labour market is.

Apart from that, the internal differentiation of the labour market has to be acknowledged. In particular, the chances of different categories of applicants will differ. This inequality can rest on functional criteria (‘formal qualification level/human capital’, and their relations can be expressed in the form of a queue of jobs or applicants (cf. Thurow 1975)). On the other hand, it can be related to non-functional criteria (this can be regarded as ‘discrimination’).

From these simple considerations, a number of expectations regarding historical changes and social differentiation in the transitions at the two hurdles can already be deducted:

(1) First hurdle: Transition to (first) vocational training

The general chances of transition of a particular cohort of school leavers will probably be positively associated with the situation of the general labour market at this point in time. In

⁷ Short-term cyclical effects, for example, can of course influence individual preferences – like changes on the macro level never do directly, although when mediated by a variety of processes, they transform themselves into the actions of the individual actors. What is important here is that there are also other causes, which have long-term consequences.

addition to this, relatively small cohorts of school leavers will have higher chances of transition than larger cohorts.

With respect to particular social categories, higher qualified school leavers will be affected to a minor extent in their transition behaviour by the present economic situation (or they can choose to follow their own preferences), as they are preferred in the selection procedures of potential training firms. Therefore, school leavers with *Abitur* will have relatively easy access to training places under difficult circumstances and lower qualified school leavers may be displaced by them. It follows from this that the structure of inequality will also be related to the factors that determine the general economic development. This may add to the long-term trend that is already problematic for the lower qualified – relatively more school leavers with *Abitur* compete with other school leavers for training places.

For particular groups of persons (like women or non-Germans), there may additionally be non-functional disadvantages. This kind of discrimination (or self-selection) determines the consequences: if such ascriptive characteristics form the basis for a queue of applicants, then the same applies here as for the qualification groups; if firms display this behaviour independently of demand, then there should be no cyclical effects.

(2) Second hurdle: Transition to employment after completing vocational training

At the second hurdle, there are similar effects of supply and demand. Larger cohorts of training leavers and higher general rates of unemployment will - *ceteris paribus* – negatively affect the chances of training leavers in the labour market. If the state of the economy is assumed to be constant, smaller cohorts (of training leavers) will experience better conditions. The overall chances of employment at the second hurdle will, therefore, correlate negatively with cohort size and inequality at this point of time will correlate positively with cohort size. The reason for this is that in larger cohorts, leavers are subject to selection to a higher degree and the 'better' training leavers will be hired first.

These effects, however, will be relatively small as the cohort of training leavers contributes relatively little to the overall supply in the labour market (though there is probably something like a 'labour market for beginners').

Also at the second hurdle, for some groups of people there might be an additional effect of possible discrimination that would again be subject to cyclical change. On the other hand, the training system (which is not just an institution of selection!) will have a moderating effect that leads to smaller changes in the employment chances of training leavers. This can, on the one hand, be explained by the standardised contents of training and, on the other hand, by the standardised certificates which tend to equalise the 'market value' of training leavers at the second hurdle. (This effect, however, will again be reduced by different achievements of the trainees, the hierarchy of occupations which are chosen by these groups to a varying degree etc.

Up to this point, these expectations tend to represent conventional knowledge. (Still, they have never really been empirically 'tested' with more than a number of 'cases', i.e. cohorts, let alone quantified.)

Now a major innovation emerges: what do processes at the first hurdle have to do with processes at the second hurdle?

(3) Combination of the first and second hurdle

While the general labour market will only be influenced by the development of single cohorts to a small extent - the demand for labour is associated rather with the development of the economy as a whole or the business cycle - the size of the cohort of training leavers in a particular year is largely determined by the entry cohorts (into training) of the previous years - especially that of the year $(t-3)$, i.e. the median duration of training. So far, there is a connection between processes of selection at the first and at the second hurdle.

This is not just due to quantitative reasons. If (smaller) training cohorts have resulted from an enforced process of selection, i.e. a higher degree of *selectivity* – at least in terms of their qualification - then they will have better chances of employment when they finish training (in so far as the demand is elastic and it can offer ‘better’ applicants more employment than ‘worse’ applicants). Maybe, there is even a kind of *trade off* between processes of selection at the first and second hurdle – a strong selection at the first hurdle then leads to relatively little selection at the second hurdle and vice versa.

Possible relationships between the first and second hurdle can not only result from characteristics of applicants, but also those of training places. For example, one could expect the quality of training places that have been additionally created in times of a large supply of applicants to be relatively low. At least, these places may not play a role in the future perspectives of employment in this particular firm⁸.

If this is the case, then there might also be another relationship with low selectivity of applicants implying an (overall) reduction of the quality of training places, while as much of them as necessary are created within a short period of time. If, on the other hand, high standards of training remain valid also in times of increasing demand, then a lot of applicants might not be able to enter training. If the selection process then bases mainly upon achievement, this would mean that the new cohort of trainees is rather more qualified than other cohorts.

(4) Short-term and long-term effects for whole birth cohorts

For effects in a particular birth cohort, there are similar determining factors, i.e. particularly the relative size of the cohort and the situation at the (‘median’) time of the respective transition. The transitions are more or less bound to certain ages, but this is not completely standardised. Therefore, the factors of influence will interfere over time with each other and will decrease in their overall explanatory power.

A special dimension emerges with processes of immigration, particularly if it takes place at ages where transition to training and employment normally occur.

Apart from the simplified model, there are some other qualifications. School leavers with *Abitur* in particular have alternatives (of education and training) beyond the two hurdles of the dual vocational training system. In general, transitions can be deferred in time and people that at first fail might later make the transition when the situation has improved. Hence, single transitions more or less vary with respect to age. Again, this will be different for different social groups. This temporal structure is created not least by institutions. Particular episodes of training have certain minimum durations and times of waiting, and their sequence can, therefore, be endogenous.

⁸ A similar relationship has been mentioned by Heinz (1990: 41).

Data and techniques of analysis

There is no single data that cover all the questions that have been raised so far. Therefore, this paper draws on two different data sources:

- official statistics on population, education and training (aggregate data) and
- a 1%-sample of the employment register (*IAB-Beschäftigtenstichprobe*; micro data)

The calculation of transition rates at the first hurdle and covariates draws on official statistics (cf. the appendix). A drawback of this data is that inter-group differences are normally only displayed uni-dimensionally and not for combination of variables. This is also the case for measurements that are based upon this data. A comprehensive collection, standardisation and detailed documentation of various data sources has been done in the *IAB-Bildungsgesamtrechnung* (Tessaring et al. 1990; Reinberg/Hummel 1999). This data is also used in this paper. These numbers, however, do not distinguish the nationality of persons.

The main data source for transitions at the second hurdle of the vocational training system is micro data from the *IAB-Beschäftigtenstichprobe* (cf. Bender et al. 1996) for the years 1976 to 1995 in West Germany⁹. For this period, there is information on approximately 103000 beginners of first vocational training.

In the *Beschäftigtenstichprobe*, there is information on (parts of) firm-based vocational training, but only on jobs where social security contributions were paid and on registered unemployment with entitlement to payments (i.e., no information on other forms of training, non-activity, other forms of unemployment, minor jobs without contributions and on civil servants and self-employed). Some variables do not differentiate a great deal; for example, school degree distinguishes only between ‚Abitur‘ and ‚non-Abitur‘¹⁰.

The calculations only used episodes of training for occupations where there is formal firm-based training. This excludes, for example practical parts of school-based training or internships in other occupations. Completed training (second hurdle) can only be discovered by a change in the value of the variable of ‘highest degree achieved so far’ (sometimes in the next data episode¹¹).

States like non-activity can only be recognised by gaps in the dataset. If a third such category (apart from employment and unemployment) tended to be underestimated, changes in the proportion of unemployment and employment would (per definition) tend to correlate negatively. As long as this underestimation is constant, however, it should actually be unproblematic.

The central dependent variables are the yearly rates of transition to and out of firm-based vocational training for the whole sample as well as for particular groups, e.g. the proportion of those female school leavers in a particular year that begin vocational training during this year.

⁹ The data for the year 1975 is not used, mainly because of possible effects of left-censoring in the data.

¹⁰ In many cases, this information is also not clear. This is probably due to the fact that this information – in contrast to other variables – is rather unimportant in the process of reporting the social security data upon which the employment register is based. In general, the number of school leavers with *Abitur* is probably underestimated.

¹¹ The event vocational training is often reported in the following episode of employment or unemployment. For some analyses, the data for the year 1995 was not used as, especially in this case, the necessary information probably lies outside of the observation window of the sample. In any case, it is often unclear as to whether an episode of training was successfully completed or not, if this episode is the last entry in the data. Some cases (with the combination ‚Employment before training‘ and ‘training as the last episode’) were excluded from analyses on the second hurdle because of problematic information. In general, the second hurdle may not be identified (and, therefore, under-estimated) for many of those who have completed another form of training before firm-based training, as the variable on ‘highest degree achieved’ does not distinguish between firm-based training and other vocational degrees.

That means that what is calculated is not the actual composition of those who successfully make the transition, although there is probably some similarity in the results.

These transition rates were correlated with other time series in the form of a linear regression model whereby cohorts serve as cases¹².

For the independent variables, it is important to include both supply- and demand-side factors in order to be able to separate their respective effects. The long-term trends in all variables are eliminated by calculating simple differences to the values of the preceding year; in the following part, the notation for this is $d(\dots)$. Such a correction is necessary since most of these variables have more or less significant non-stationary long-term trends. Simple means of association, however, would basically be based upon the differences between values at the beginning and at the end of the time series, no matter what happens in between. Cyclical developments would not be measured for example. In contrast to this, the effects of demographic and economic changes measured in this paper are practically independent of any long-term trend in transition rates. These could, for example, be due to increasing or decreasing preferences of school leavers with regard to moving into vocational training or due to increasing or decreasing willingness of firms to provide vocational training.

Although there is individual-level data for the second hurdle, the following analyses are conducted in analogy to the first hurdle to allow for a direct comparison. By doing this, no assumptions for the functional form of the long-term trends are needed. This is important as the observation period is relatively short. A micro-level analysis would allow for multivariate inter-group comparisons, but would not add much information on the historical development.

Before calculating the multivariate analyses of time series, bivariate associations were checked. Significance tests, were not conducted, however, as the samples are quite small ($n=21$ years)¹³.

Empirical results

(1) First hurdle: transition to vocational training

The dependent variable here is the rate of transition to firm-based training, independent variables are the size of the whole cohort of school leavers from general secondary schools (which, over time and with a certain time-lag, correlates greatly with the development of birth cohorts); the general unemployment rate functions as a measure of the extent to which the general labour market is balanced¹⁴.

The transition rate to firm-based vocational training TR1 in the year t is calculated as:

¹² In the case of the *Beschäftigtenstichprobe*, statistical associations might decrease since there may have also been changes in the information on years as part of longitudinal anonymisation of the data (cf. Bender et al. 1996, S. 51-60).

¹³ It is anyway the question of what counts as 'case' or sample: for example, for simple inter-group differences in the data of official statistics (i.e., a totality) there is no such thing as the question of significance. In the case of yearly rates, one would need to assume that the selected years of observation are a sample taken from all possible observation years (for which the measured association shall be generalised). Another question concerns the validity of the calculated yearly rates. Due to the large sample of the *Beschäftigtenstichprobe*, it can be regarded as satisfactory. A simple calculation (a comparison of proportions) reveals that the normal cohort size of approximately 4000 training leavers per year in the sample differences between rates of 1.3 percent-points and greater normally count as significant (on a 0.05-level; one-tailed; conservative test with maximum sample variance). For single groups of persons, the quality of the estimates is naturally lower.

¹⁴ A direct measurement of supply and demand on the training market is difficult (cf. Noll 1983; Behringer/Ulrich 1997). Also for this paper, analyses based on official figures of registered training places and registered applicants have not led to better results.

$TR1(t) = (\text{Cohort of school leavers from general secondary schools, } t) / (n \text{ in the } \textit{Beschäftigtenstichprobe} \text{ who begin first firm-based vocational training in the year } t) * 100$

These rates are calculated for both the whole sample and the social groups that are here distinguished for all years¹⁵.

A list of the data used for these rates and all other data sources can be found in the appendix. The number of school leavers in West Germany increased from the mid-1970s, remained at a basically constant, high level during the first half of the 1980s and then consistently dropped until the early 1990s. The development of the general unemployment rate shows a marked upward trend between the mid-1970s and the mid-1990s. There were sharp increases at the beginning of the 1980s and during the first half of the 1990s, at the end of the 1980s there was a recovery.

Yearly changes in the values (compared to the preceding year) now enter the regression analyses. By doing this, long-term trends in the *level* of the transition rates are almost completely eliminated. These trends derive from long-term changes in the manners of entry into firm-based training or from changing inequality between educational groups.

According to the above considerations, the relationship between supply and demand can be formulated as follows (for cohorts of school leavers):

$$d(TR1, t) = a_1 * d(UE, t) + a_2 * d(\text{School}, t) + a_3$$

with UE=general unemployment rate (as an indicator for demand); School=size of the cohort of leavers from general secondary schools (supply of potential trainees)

This equation is applied to both the total population as well as to particular social groups.

On the basis of trend-corrected time-series data, the coefficients a_1 and a_2 (and the constant a_3) are now estimated. These indicate the effects of the general unemployment rate and the size of the cohort leaving school on the magnitude of the transition rate.

The following chart presents the empirical results for the total population as well as selected social groups. Due to differences in dimension, the regression coefficients of the unemployment rate and the cohort leaving school are not directly comparable¹⁶. Whilst the first coefficient represents a difference of one percent-point in the unemployment rate, the latter represents a change in the cohort leaving school in the steps of 25000 school leavers.

The regression analysis has the following results (cf. fig. 2):

As expected, the transition rates tend to decrease with increasing unemployment (a negative coefficient for the unemployment rate: $a_1 = -0.52$). *Ceteris paribus* - i.e., controlling for the size

¹⁵ To identify first trainings here, only cases were used where the persons did not have any vocational degree at this point in time. The reason for this is that left-censored training careers should be avoided, particularly in the first years of the observation window.

¹⁶ Standardised regression coefficients are not presented in the following part as the respective effects of standardisation in the various analyses are hard to duplicate, and therefore differences cannot be easily interpreted. In this analysis, for example, the standardised values for the total population are -0.24 for the effect of the unemployment rate and -0.05 for the effect of the size of the school cohort.

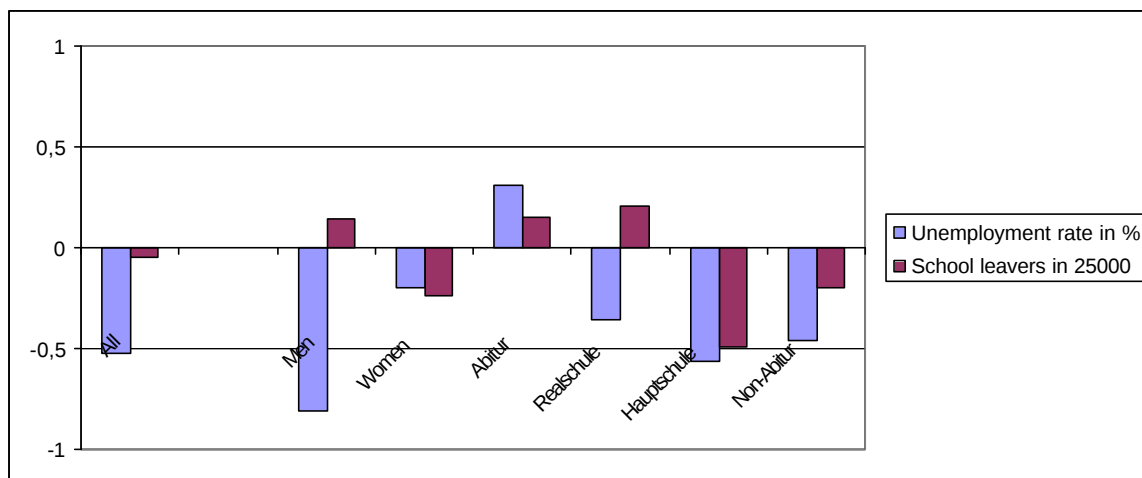
of the school cohort - the transition rate decreases by 0.5 percent points, if the unemployment in this year increases by one percent-point.

Contrary to expectations, the size of the cohort leaving school shows no considerable effect. If this cohort increases by 25000 school leavers, then the transition rate c.p. decreases by nearly 0.05 percent point. Compared to the absolute number of school leavers, this effect seems to be relatively small (see also the respective footnote on difference s in dimension).

This relationship is valid when ‘controlling for’ the unemployment rate, i.e. under the assumption of equal unemployment rates. In reality, parallel changes in both determinants may come together and therefore particularly enforce or ease the situation of a particular cohort.

In general, the vocational training system seems to be quite elastic with respect to changes in the number of applicants. This can probably be explained not just by the present demand for labour. In large cohorts, there rather seems to be training beyond demand (whereby, in general, training behaviour depends strongly upon occupations or sectors, cf. Neubäumer 1989).

Fig 2: Estimated rates of transition to vocational training: regression coefficients of the determinants in the time series, 1975-1995



Own calculations.

Data: Official statistics; IAB-Bildungsgesamtrechnung.

The changes in the transition rates are indeed different for the social groups distinguished here. In their transition behaviour, men are obviously far more affected by the general labour market situation than women, whose transition behaviour is more sensitive to changes in the number of school leavers (this could have something to do with - gender-specific - choice of training places, amongst other factors). Particularly significant are the effects for the different educational groups: for school leavers with *Abitur*, both regression coefficients are slightly positive. This means that they move (directly) even more into training in times of an unbalanced labour market. For leavers from *Realschulen*, there are different effects: while a

rising unemployment rate reduces the transition rate, a school cohort increases the transition rate. Finally, leavers from *Hauptschulen* are negatively affected by both rising unemployment and increasing numbers of school leavers. For the cohorts of school leavers where this is the case, this problem adds to the problem of long-term decreasing transition rates (see above). (As a reference for the following analyses, there is the additional category 'Non-Abitur', which includes leavers from *Hauptschulen* and *Realschulen*).

Parallel developments of these groups, however, might be due to different processes of choice and selection: the higher qualified, for example, might prefer vocational training more in times of an unbalanced labour market, whilst the lower qualified might still prefer this, but are only accepted to a minor extent.

The conclusion, therefore, is that the inequality between the distinguished social groups is a function of the collective situation. In general, however, the explanatory power of the regression models for the first hurdle is relatively small, i.e. changes in selection effects are rather small¹⁷. The exception is the leavers from *Hauptschule*: this is yet more evidence that this group is particularly dependent in its transition behaviour upon the present overall situation.

(2) Second hurdle: transition into the labour market

How do transition chances after completion of vocational training change over time? Dependent variables are now the direct transition to unemployment or employment (with social security contributions) after the first vocational training, measured within a period of three months and on the basis of sample data from the *Beschäftigtenstichprobe*. These variables give information on the labour market situation at the second hurdle.

The transition rates at the second hurdle are defined as follows:

$TR2Ue(t) = (\text{persons with a transition to unemployment after completing vocational training in the year } t) / (\text{all persons who complete first vocational training in year } t) * 100$

$TR2E(t) = (\text{persons with a transition to employment with social security contributions after completing vocational training in the year } t) / (\text{all persons who complete first vocational training in year } t) * 100$

(Equations in each case for the total sample and social groups)

Independent variables are unemployment in the year of completing vocational training and the size of the cohort of training leavers at this point in time. Again, changes against the preceding year enter the regression analyses.

The following equations are set up for the rates of transition from (firm-based) vocational training to unemployment (TR2Ue) and employment (TR2E) for any year t:

$$d(TR2Ue, t) = a_1 * d(UE, t) + a_2 * d(Train, t) + a_3$$

$$d(TR2E, t) = a_4 * d(UE, t) + a_5 * d(Train, t) + a_6$$

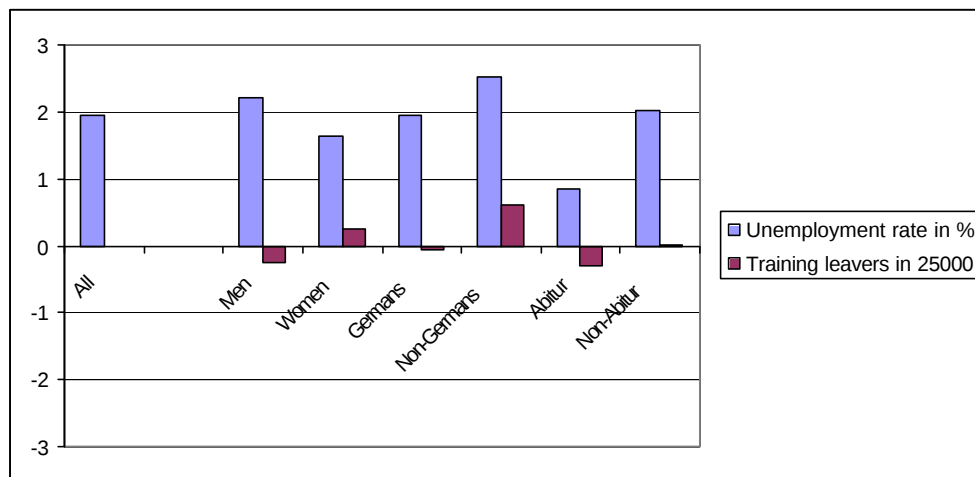
with UE=general unemployment rate; Train=size of the cohort of training leavers

(Equations in each case for the total sample and social groups)

¹⁷ In each case, it is below 10% (cf. appendix), in the case of leavers from *Hauptschule*, however, it is $R^2=0.18$.

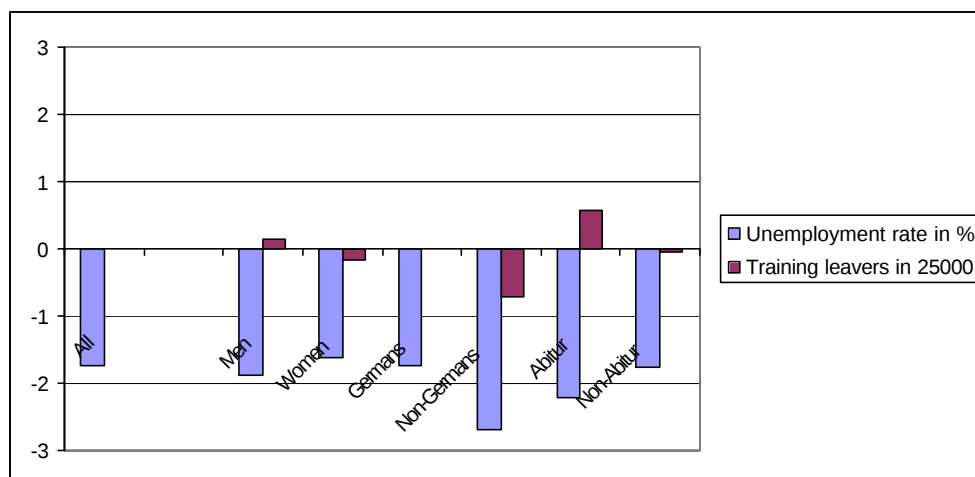
The absolute magnitude of the transition rates as they are measured here is somehow problematic as they base upon particular definitions and there might be specific under-estimation.: Hence, the magnitude of transitions to unemployment and employment might deviate from other figures. What counts in this paper, however, are rather relative changes over time.

Fig 3: Rates of transition to unemployment at the second hurdle: regression coefficients of the determinants in the time series



Own calculations. Observation period 1976-1994.
Data: Official statistics; IAB-Beschäftigtenstichprobe.

Fig. 4: Rates of transition to employment (with social security contributions) at the second hurdle: regression coefficients of the determinants in the time series



Own calculations. Observation period 1976-1994.
Data: Official statistics; IAB-Beschäftigtenstichprobe.

In the case of transition to unemployment, the determinants of supply and demand at the second hurdle show the expected effects. If the general unemployment rate increases by one percent-point, then the transition rate of training leavers to unemployment increases by, on average, nearly two percent-points¹⁸. This means that unemployment at the second hurdle reacts strongly against changes in general unemployment¹⁹. Leavers from vocational training obviously have a relatively insecure position in the general labour market.

The differences between the social groups are relatively small. This is astonishing as they tend to choose occupations that are subject to business-cycle effects to a different degree.

There are two exceptions anyway: firstly, non-Germans are particularly affected by a worsening of the general labour market situation. This group is the only one where the risk of transition to unemployment after leaving training increases considerably with an increasing number of training leavers. Secondly, the risk of training leavers with *Abitur* of moving into unemployment only slightly correlates with the general unemployment rate. Larger cohorts of training leavers seem to even help them to enter the labour market.

In general, the effect of the number of training leavers in a particular year is very small. This means that the size of the cohort of leavers *as such* appears to be no problem for this cohort in making a successful entry into the labour market. A combination with the first hurdle, however, shows that the *conditions*, which brought about the size of this cohort, may be important.

(3) Combination of the first and second hurdle

Dependent variables are again the direct transition to (registered) unemployment or employment (with social security contributions) after the first vocational training, measured in each case in an interval of three months.

Independent variables, however, are now variables with a time-lag. These refer to the point in time when the particular cohort of training leavers started vocational training (on average): the unemployment rate in the year (t-3) and the size of the cohort of school leavers in this year.

These variables determine the size and composition of this particular training cohort (selectivity at the first hurdle) and thus also influence transitions at the second hurdle.

The equations for the rates of transition from firm-based vocational training to unemployment (TR2Ue) and employment (TR2E) are set up as follows:

$$d(\text{TR2Ue}, t) = a_1 * d(\text{UE}, t-3) + a_2 * d(\text{School}, t-3) + a_3$$

$$d(\text{TR2E}, t) = a_4 * d(\text{UE}, t-3) + a_5 * d(\text{School}, t-3) + a_6$$

with UE=general unemployment rate; School=size of the cohort of leavers from general secondary schools

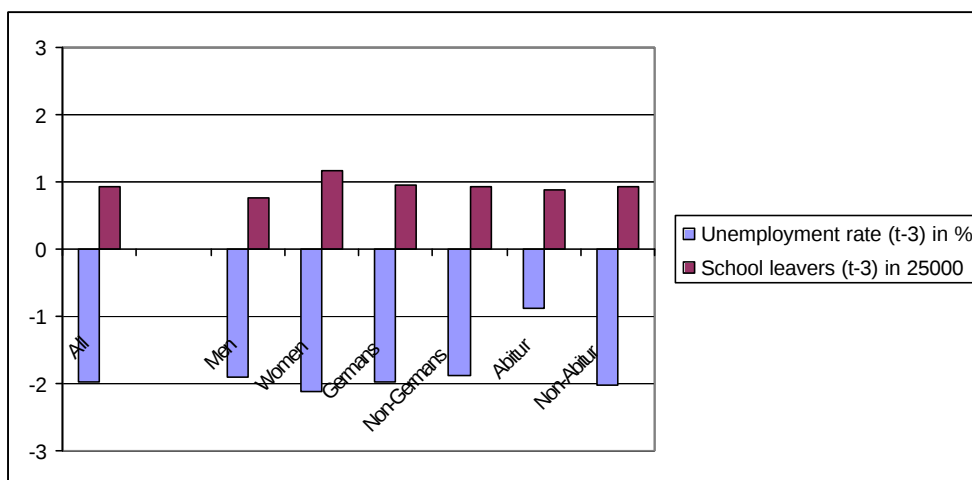
(Equations in each case for the total sample and social groups)

The following figures present the estimated regression coefficients for the time-lagged predictors.

¹⁸ In general, the explanatory power of the regression models is much greater than at the first hurdle ($R^2=0.31$ for the total sample).

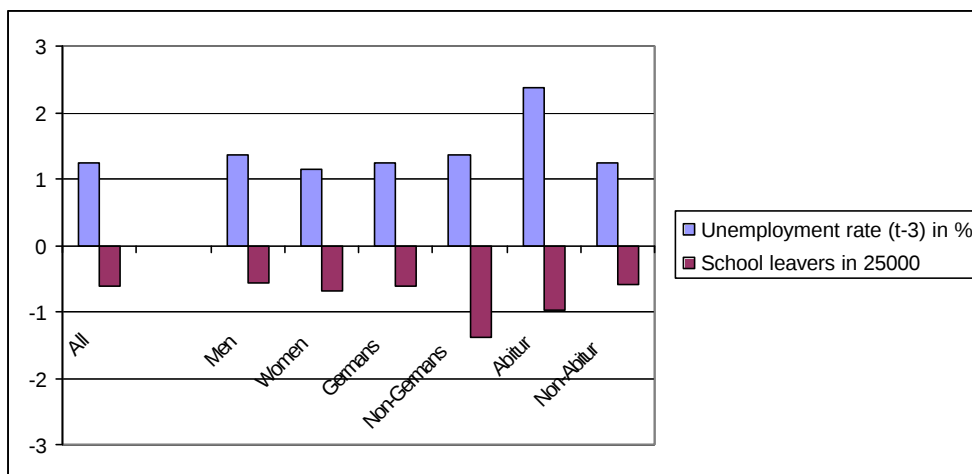
¹⁹ Transitions to unemployment at the second hurdle of course contribute (per definition) to general unemployment. This effect, however, can only be relatively small, as the absolute numbers indicate alone.

Fig. 5: Rates of transition to unemployment at the second hurdle: regression coefficients of the time-lagged determinants in the time series



Own calculations. Observation period 1976-1994.
Data: Official statistics; IAB-Beschäftigtenstichprobe.

Fig. 6: Rates of transition to employment (with social security contributions) at the second hurdle: regression coefficients of the time-lagged determinants in the time series



Own calculations. Observation period 1976-1994.
Data: Official statistics; IAB-Beschäftigtenstichprobe.

The determinants of the first hurdle are also important for the second hurdle. They seem to be even more important at least for transitions to unemployment than the present situation of the general labour market (whereby the effect of the unemployment rate has the opposite sign!)²⁰.

²⁰ Also, the explanatory power of the models is greater: $R^2=0.31$ for the total sample.

For the effect of the general unemployment rate, this means that the labour market chances of people leaving vocational training are influenced at least as strongly by the (bad) labour market situation at the beginning of training as by its situation at the end.

To put it simply: in order for a training cohort to have good chances at labour market entry, it is at least as important that the situation on the labour market was relatively *bad* when they started training, as that it is relatively *good* when they actually enter the labour market. Of course, this only holds true for those who succeeded in getting into the training system (also under difficult conditions).

This relationship can be partly explained by the (internal) *autocorrelation* of the unemployment rate. This means that relatively high unemployment rates in the year t tend to be followed by relatively low unemployment rates in the year $t+3$, as time-series data of the general unemployment rate for West Germany since the early 1970s shows. This relationship (which is not very strong anyway) cannot explain, however, why the time-lagged effects are that strong and sometimes even stronger than the present ones. There seem to indeed be mechanisms of selectivity, as they were described above.

For the size of the school leavers cohort, there is now a positive effect in terms of the transition to unemployment after completing vocational training. This means that larger cohorts of school leavers tend to have worse labour market chances at the second hurdle. This is obviously not least a consequence of the relatively high elasticity with respect to the number of applicants, i.e. only small selectivity at the first hurdle, which may imply a reduction of the quality of training places (see above).

For school leavers with *Abitur*, the general unemployment rate again shows only small effects on the risk of transition to unemployment after vocational training, although a relatively great (positive) effect on the transition to employment. People with *Abitur* seem to be largely unaffected by simple selection effects. Apart from that, the measured relationships apply more or less to all the social groups that are distinguished here.

In general, transitions to unemployment mirror, in their development, the transitions to employment - except for school leavers with *Abitur*.

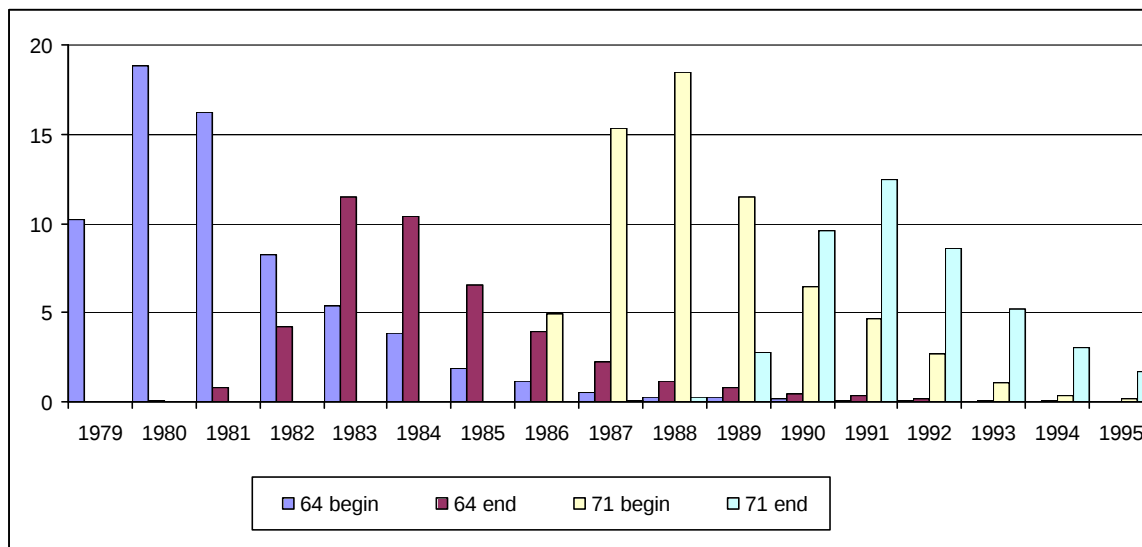
Large cohorts of school leavers master the transition to training with relatively minor problems, but are confronted with problems when they try to enter the labour market at the second hurdle. These results should not, however, lead one to the conclusion that vocational training beyond demand is principally unreasonable. What is measured here, are effects during a short interval in individual employment careers following the second hurdle. In contrast to this, vocational training and the qualifications that go with it may be relevant *in the long run* and maybe for their entire working life. Moreover, these analyses do not cover the labour market situation of people who do not enter vocational training.

(4) The situation of the birth cohorts 1964 and 1971

Up to this point, the paper has looked at cohorts of entrants and leavers at the two hurdles of vocational training. The results cannot be directly transferred to birth cohorts. For single birth cohorts, there is considerable age dispersion at the two hurdles, so that various cyclical effects

may at least interfere with each other. The following graph presents the age distribution at the beginning of vocational training and at the second hurdle for the 1964 and 1971 birth cohorts. For both cohorts, both hurdles (in terms of first firm-based training) are obviously covered by the *Beschäftigtenstichprobe*, although for the 1971 cohort there may still be some cases of training being finished after 1995.

Abb. 7: Distribution of years of beginning first vocational training²¹ and of the years of finishing the first completed vocational training for the 1964 and 1971 birth cohorts (in % of the cohort size at age 15/16)



Own calculations. Observation period 1976-1995.

Data: IAB-*Beschäftigtenstichprobe*; official statistics.

The figures for age 15 are estimates (see below).

What determines the collective chances of training and employment of whole birth cohorts? In analogy to the analyses up to this point, the size of the particular birth cohort (which, with a certain time lag, correlates with the number of school leavers) and the labour market situation in the relevant years can be regarded as crucial determinants of supply and demand. Due to considerable immigration at young ages, the size of the cohort is not measured at birth, but at the age of 15/16. Also on the basis of this measurement, one can see the relative magnitude of the cohort 1964 (the largest birth cohort in the history of the Federal Republic of Germany) in comparison to the birth cohort 1971 which had already relatively few births.

The following table also presents estimated values for the proportion of persons of the respective birth cohort who made the transition to first firm-based vocational training at a certain age. These are contrasted with the general unemployment rate in this particular calendar year. In the cohort 1964, for example about 19% of the cohort started first vocational training at age 16 and approximately 67% began vocational training across all ages.

²¹ A direct transition from general secondary school is not necessary for this analysis.

Tab. 3: First hurdle: Estimated rates of transition to first vocational training by age (in % of the cohort size at age 15/16) - 1964 and 1971 birth cohorts

	1964 birth cohort			1971 birth cohort		
<i>Cohort size at age 15/16</i>		1069710 (Official statistics)			778627 (Official statistics)	
	<i>General unemployment rate</i>	Proportion of the cohort	<i>N= (sample)</i>	<i>General unemployment rate.</i>	Proportion of the cohort	<i>N= (sample)</i>
Age 15	3.8	10.2	1089	9.0	4.9	385
Age 16	3.8	18.8	2012	8.9	15.3	1191
Age 17	5.5	16.3	1741	8.7	18.5	1440
Age 18	7.5	8.3	886	7.9	11.5	896
Age 19	9.1	5.4	576	7.2	6.5	505
Age 20	9.1	3.8	408	6.3	4.6	360
Age 21	9.3	1.9	202	6.6	2.7	208
...						
Total		67.4	7207		65.7 ²²	5113

Own calculations. Observation period 1976-1995.

Data: IAB-*Beschäftigtenstichprobe*; official statistics.

The figures for age 15 (and hence the total numbers) are estimates²³.

When comparing the proportions of the two cohorts, one has to bear in mind that both cohorts, especially the 1971 birth cohort, however, experienced further immigration after age 15/16, i.e. in the ages that are relevant in this paper. This means that vocational training of people who were not yet in Germany at age 15 may be included in the proportions for later ages, and this may consequently lead to an over-estimation of the total proportion.

If all first vocational training is based, not upon the cohort size at age 15/16, but upon those, e.g., at age 19/20 (i.e., 1087981 and 832628 persons), then the values for the transition rate are 66.2% for the 1964 cohort and 61.4% for the 1971 cohort. In any case, the relatively large 1964 birth cohort is, in quantitative terms, not disadvantaged with regard to access to firm-based training.

The situation at the second hurdle is completely different. As the following table shows, the 1964 cohort experienced a significantly more problematic entry into the labour market after completing vocational training: the training leavers of this cohort were unemployed almost twice as often as the 1971 birth cohort.

²² Due to the limited observation window, a small increase of this rate because of training after 1995 can be expected.

²³ The data of the *Beschäftigtenstichprobe* contain no exact age information for persons who were under 16 years of age when their vocational training was reported (Bender et al. 1996: 38-41). All persons under 16, who began first vocational training in 1979 (1964 cohort) or 1986 (1971 cohort) were counted as age 15.

Tab. 4: Second hurdle: rates of transition to unemployment and employment after the first completed vocational training by age (in % of all training leavers of their cohort at this age - 1964 and 1971 birth cohorts)

	1964 birth cohort				1971 birth cohort			
	<i>General unemployment rate</i>	Into un-employment	Into employment	<i>N=</i>	<i>General unemployment rate</i>	Into un-employment	Into employment	<i>N=</i>
...								
Age 18	7.5	12.3	76.6	448	7.9	7.3	75.8	219
Age 19	9.1	21.0	73.8	1227	7.2	8.3	83.9	745
Age 20	9.1	24.2	70.1	1115	6.3	9.1	85.6	971
Age 21	9.3	21.1	73.2	698	6.6	13.5	80.8	673
Age 22	9.0	17.2	74.6	425	8.2	14.5	79.7	408
Age 23	8.9	20.5	72.4	239	9.2	14.0	80.4	235
...								
Total		19.8	73.2	4580		10.6	82.1	3279

Own calculations. Observation period 1976-1994.
Data: IAB-*Beschäftigtenstichprobe*; official statistics.

After the previous analyses, one can reasonably assume that conditions at the first hurdle affected the situation at the second hurdle.

The labour market entry of the 1964 cohort was, therefore, negatively affected in three respects: by a relatively large cohort size, by relatively bad conditions of the labour market at this point in time, but probably also by relatively good conditions when beginning vocational training.

All three factors led to a high proportion of problematic transition at the second hurdle. The members of this birth cohort could still enter vocational training to a great extent, but when they had finished training, these relatively large cohorts of training leavers faced a labour market situation which in the meantime had worsened significantly. For the 1971 cohort, these effects were rather the reverse - and they more than compensated for the long-term trend of increasing labour-market problems at the second hurdle.

Which mechanisms actually combine the situation at the first and second hurdle, still has to be investigated in more detail. The 1971 cohort might have had both (on average) 'better' - i.e., more selected - trainees and a better composition of training places²⁴.

With respect to inter-group differences at the second hurdle (fig. 5), the picture is similar to that of cohorts of training leavers, although the relations of inequality are not completely constant. In all categories, members of the 1964 cohort had greater difficulties when entering employment.

²⁴ Explorative analyses with the *Beschäftigtenstichprobe* show, for example, that in the 1964 cohort, a significantly higher proportion of trainees was trained in small firms (under 20 employees) where the probability of being employed afterwards is relatively low. This difference does not represent the long-term trend during the observation period.

A difference to the analyses for cohorts of leavers can be found in the case of non-Germans who - measured by the risk of unemployment after completing vocational training - are relatively disadvantaged in the 1971 cohort. Again, the increased immigration from the late 1980s onwards may play a role here since the 1971 cohort was much more affected by this in the relevant ages.

In contrast to this, the situation for persons with *Abitur* is here similar to the above results. The labour market situation of these people proves to be relatively unaffected by changing macro parameters.

Tab. 5: Rates of transition to unemployment and employment after leaving the first completed vocational training in % of all persons of this group (all years) - 1964 and 1971 birth cohorts

	1964 birth cohort			1971 birth cohort		
	Into unemployment	Into employment	N=	Into unemployment	Into employment	N=
All	19.8	73.2	4580	10.6	82.1	3279
Men	19.6	73.2	2433	9.4	84.1	1699
Women	20.1	73.1	2147	12.0	79.9	1580
Germans	19.8	73.3	4457	10.3	82.6	3076
Non-Germans	21.6	67.2	116	15.0	74.1	193
Abitur	10.0	79.3	270	7.4	84.3	217
Non-Abitur	20.4	72.8	4310	10.9	81.9	3062

Own calculations. Observation period 1976-1994.
Data: IAB-*Beschäftigtenstichprobe*; official statistics.

Summary and conclusion

The empirical analyses have confirmed that macro-economic and demographic conditions are relevant for both hurdles of transition to the labour market. Processes of selection connect the situation at both hurdles.

- Short-term changes in the transition rates at both hurdles of the dual training system are determined rather by the general labour market situation than by the size of cohorts. The latter, however, may have long-term effects. Relevant for the mechanisms that work here may be the composition of applicants and the quality of training places.

- Inter-group differences can be characterised as follows: during the observation period, there were major differences in the *level* of the transition rates of men and women, Germans and Non-Germans and school leavers with or without *Abitur*. The effects of the macro-situation, however, is only visible at the first hurdle. For the transitions after vocational training, the

situation of the groups is quite similar. This means that the relative differences there - and hence, the relations of inequality – only follow a long-term trend, if any.

- The birth cohorts 1964 and 1971 that were described here differ mainly in the collective situation after finishing vocational training, not so much at entry into first vocational training. These differences can be attributed to specific period effects.

What are the remaining questions? First of all, the two-hurdle analysis of course cannot account for the real complexity of individual life-course patterns, where these hurdles may be passed several times. The selectivity can be analysed in much more detail, especially on the basis of life-course data. This includes a look at persons that do not make the transition to first vocational training.

Analyses like the ones presented here could be supplemented by a longer observation after the transition, especially at the second hurdle. Then, however, other causal factors may be increasingly relevant. For simple parameters, like the distribution of successful transitions to employment across groups of people, one might prefer short observation times, since most people will sooner or later enter employment. If one wants to account for individual delays, other forms of training, etc., one would need to use more detailed, duration-based forms of analysis.

Life courses not least contain endogenous elements. For example, if it turns out that in other analyses the experience of unemployment at the second hurdle is relevant for the further employment career, the short-term time-series effects that have shown up in the time series of this paper would perpetuate themselves in the life-courses. For the research programme of our project which also looks at the existence of structured ‘regimes’ of transitions and life-courses, this would also be an important result.

The results can already be interpreted with respect to the *institutions* of the German vocational training system, where normally (at least) one spell of vocational training precedes entry into the labour market²⁵.

Comparing the German vocational training system internationally, the biggest contrast will probably be a ‘*One-Hurdle-System*’, where entry into the labour market follows immediately after leaving the general school system. For such a system, one can assume that the chances of transition of successive school leaver cohorts (and – if the age at which one leaves school is standardised – successive birth cohorts) will closely follow the development of the general labour market situation at the time of leaving school, whereby relatively bad conditions of the general labour market imply bad chances for school leavers and vice versa.

In a ‘*Two-Hurdle-System*’ like the German one, the situation is obviously more complicated: here, one finds *time-lagged effects*, on the one hand, and *counter effects*, on the other hand. In other words, whoever has succeeded in gaining a training place under difficult labour market conditions, has probably already passed the most difficult hurdle for successful entry into the labour market. Whoever achieved this under good labour market conditions, however, will face major problems in the near future, especially, if he or she left school as part of a relatively large cohort.

²⁵ This characterisation of the German system is of course a simplification. The beginning of training is often a major step into the (inner-firm) labour market, particularly in firm-based forms of training.

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Appendix

Tab. 6: Estimates from the regression analyses

	Category	Regression coefficients				R ²		N=
First hurdle		Unempl oyment rate (%)	School leavers in 25000					20 yearly rates each Basis: Official statistics
	All	-0.52	-0.05			0.06		
	Men	-0.81	0.14			0.09		
	Women	-0.20	0.24			0.06		
	Abitur	0.31	0.15			0.07		
	Realschule	-0.36	0.21			0.03		
	Hauptschule	-0.56	-0.49			0.18		
	Non-Abitur	-0.46	-0.20			0.07		
Second hurdle		Into unemployment		Into employment		Into unemplo yment	Into employm ent	18 yearly rates each Basis: sample data
		Unempl oyment rate (in)	School leavers in 25000	Unemplo yment rate (in)	School leavers in 25000			
	All	1.95	-0.02	-1.74	-0.00	0.31	0.38	
	Men	2.22	-0.24	-1.87	0.14	0.38	0.32	
	Women	1.63	0.25	-1.63	-0.17	0.19	0.38	
	Germans	1.94	-0.05	-1.73	0.01	0.30	0.36	
	Non-German	2.51	0.62	-2.69	-0.71	0.42	0.34	
	Abitur	0.86	-0.31	-2.22	0.57	0.05	0.08	
	Non-Abitur	2.02	0.01	-1.77	-0.04	0.33	0.39	
Combination of first and second hurdle		Into unemployment		Into employment		Into unemplo yment	Into employm ent	18 yearly rates each Basis: sample data
		Unempl oyment rate(t-3; in %)	School leavers (t-3; in 25000)	Unemplo yment rate (t-3; in %)	School leavers (t-3; in 25000)			
	All	-1.98	0.94	1.24	-0.62	0.48	0.30	
	Men	-1.90	0.76	1.35	-0.57	0.39	0.24	
	Women	-2.13	1.16	1.14	-0.69	0.44	0.30	
	Germans	-1.97	0.95	1.23	-0.62	0.48	0.29	
	Non-Germans	-1.89	0.93	1.35	-1.38	0.25	0.23	
	Abitur	-0.88	0.89	2.37	-0.97	0.19	0.14	
	Non-Abitur	-2.03	0.94	1.25	-0.60	0.48	0.29	

Data sources (official statistics):

School leavers at the first hurdle (*Hauptschule*, *Realschule* and *Abitur*):

IAB-*Bildungsgesamtrechnung* for West Germany 1975-1995 (Reinberg/Hummel 1999, Appendix 1.3).

For the analyses of the second hurdle (3), the numbers of school leavers were calculated again, as data before 1975 was required and the time series should not be distorted by changing the data basis (the figures show minor deviations from those of the *Bildungsgesamtrechnung*):

Bundesministerium für Bildung und Wissenschaft (1981): Grund- und Strukturdaten 1981/82, Bad Honnef: Bock, 60f., 86f. (and following volumes)

In order to correct the figures for united Germany for those of East Germany and East Berlin, further information is needed (in the case of German and non-German school leavers, however, East Berlin is included since 1992):

Statistisches Bundesamt (ed.): *Bildung im Zahlenspiegel* 1997, Stuttgart: Metzler-Pöschel, 60-63.

Senatsverwaltung für Schule, Berufsbildung und Sport (1993): *Das Schuljahr 1992/1993 in Zahlen*. Berlin, 156-159 (and following volumes).

Training leavers:

IAB-*Bildungsgesamtrechnung* 1975-1995 (Reinberg/Hummel 1995, Appendix 1.3).

Unemployment rates:

Bundesanstalt für Arbeit (1981): *Amtliche Nachrichten der Bundesanstalt für Arbeit: Arbeitsstatistik 1980 - Jahreszahlen*. Nürnberg: Bundesanstalt für Arbeit, 9 (and following volumes).

Cohort sizes by age:

Statistisches Bundesamt (various years): *Statistisches Jahrbuch für die Bundesrepublik Deutschland*. Stuttgart.