

Willing to train, but not to employ?
–A Theoretical analysis of the unemployment after vocational training

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1 Introduction

The high youth unemployment in Europe contributes to the debate concerning the theoretical and political aspects of the labour market. Although the youth unemployment rate in Germany is relatively low in the international comparison, it has nevertheless increased. Particularly, the joblessness among the youth adults between 20 and 25 years, the age after finishing vocational training in Germany, is augmented during the past years. Thus, the rate was 13 % and exceed the overall unemployment rate by 2 percentage points, in 2004. This leads to a severe problem at the transition from the education to the entrance in the labour market (Rothe/Tinter 2007; Konietzka 2002). However, the public debate still focuses on the transition from school to vocational training and has paid little attention to this aspect. But exactly this successful transition from the vocational training to an employment determines the further job careers (Damelang/Haas 2006; Bender/Dietrich 2001). Some decades ago, the participation at the dual system provided security of entering the labour market successfully. Nowadays, this security does not exist anymore, because, each youth adults have a risk to have to search for a new job and/or firm (Rothe/Tinter 2007; Konietzka 2002). The decreasing take-over rates confirm this evolution. However, this contradicts the explanation of the motivation of the firm, to provide on-the-job-training. As they have net costs of training after the apprenticeship, their long-term interest is in employing the self-trained youths. In this way, firms generate returns on education and so, they amortise the remaining net training costs. Thus, this paper deals with the examination of the factors influencing the transition from training to employment. The question, which has to be answered, is: Do the determinants which cause a different motivation of firm training, influence the different take-over respectively the different interest of employment after apprenticeship and consequently also influence the different risk to get unemployed. Thus, the assumption emerges that varying firm characteristics have an impact of the conditions during, but also, after the vocational training. The paper is structured as follows: Chapter two describes the theoretical microeconomic reasons to provide on- the- job- training. These incentives, to train youth people, also determine the pattern of the take-over by the training firm and the probability of unemployment after the training. After a general theoretical presentation of this aspect, the pattern of take-over is applied to the firms participating in the German vocational training system. Chapter three provides a survey of studies on the transition process from the training system to labour market. This yields the result that there is a lack in analysing the influence of the firm conditions during the vocational training and its impact on the take-over and unemployment. Finally, further important aspects of future empirical research plans will be pointed out.

2 Aspects on the transition from apprenticeship system to the labour market

2.1 Theoretical framework of different on-the-job-training incentives

The human capital theory of Becker (1962) describes the firms' decision of providing on-the-job-training. Under the assumption of perfect competition, the firms will pay a wage which equals the productivity¹ of the employees (Becker 1962). As the training lasts several periods, in general the vocational training in Germany lasts three years, the firms only offer on-the-job training and consequently invest in training, if the sum of the wages occurring during of the training periods (W) equals the sum of the marginal products (MP). So the condition $MP_t = W_t$ has to be valuable, whereby t describes the number of periods the training lasts (Becker 1962: 11). No other costs exist. In addition, the workers are fully mobile. To take the net costs of training into account, the mentioned condition has to be extended to the discount factor which determines the present values of the cost and returns during the total training period. The condition of the decision is (Becker 1962):

$$(1) \sum_{t=0}^{n-1} \frac{R_t}{(1+i)^{t+1}} = \sum_{t=0}^{n-1} \frac{E_t}{(1+i)^{t+1}},$$

whereby R_t represents the revenues respectively the returns and E_t the expenditures in each period t of the training. The decision to provide training is taken at the beginning of the apprenticeship, so the returns of education and the expenditure of education have to be divided by the interest rate i . Becker assumes that firms can recover the returns of training after the youths have finished their apprenticeship. Thus, the equation represents the condition, which has to be valid after the training. Therefore, the firms realise benefits, if they continue employing the trained youth. However, this take-over depends on the kind of the provided human capital. Thus, the kind of human capital matters the decision to invest in training.

Becker differentiates between general and specific human capital. Both kinds can be accumulated during the working process within the firm. Furthermore, these kinds of ability influence the job tenure at the training firm. So, „general training is useful in many firms in addition to the firms providing it” (Becker 1962: 12). If the general-qualified youths change the job and the firm, the general knowledge is not lost. The individual productivity is not be reduced by this change and simultaneously the total productivity of the new employer is increased (Becker 1962), in case, that the productivity of the externally recruited worker exceeds the average productivity of the firm. Therefore, general human capital is marketable. Because of the arising cost of training, the firms will not be willing to invest in general human

¹ The wage (W), representing the only training expenditures of the firm, need to equal the marginal product (MP). Therefore, the wage has to correspond to the returns which yields the formal condition $MP = W$.

capital, because trained workers will find a job in the labour market under identical conditions. The wage corresponds to the offered market wage. The wage within the training firm corresponding to the market wage has a negative impact on the generation of the educational returns, because the qualified workers are able to quit the firm after finishing the training without having any financial losses. Consequently, the trained workers draw all the return on education. The training firm cannot compensate the existing training expenditures. Thus, according to Becker, the firms are not willing to provide and to invest in general human capital (Becker 1962). In contrast to the general human capital (firm-) specific human capital will be financed by the firms. It is defined as [...] „training that increases productivity more in firms providing it [...]. Completely, specific training can be defined as training that has no effect on the productivity of trainees that would be useful in other firms” (Becker 1962: 17). In other words, the specific knowledge can only be applied in the firm, in which it is acquired. The trained workers lose the specific human capital if they quit the training firm. The providing of specific human capital augments the firm’s probability of generating the return on training. This yields a higher profitability caused by the specific feature of training. As the specific human capital can just be applied in the training firm, this firm has monopsony power concerning this kind of knowledge (Leuven/Oosterbeek 2001). Thus, the training firm and the trained workers benefit from the investments in specific human capital. Therefore, on the one hand, by providing this kind of knowledge, the firm reduces the probability that the trained workers quit. If a worker quits, the firm is not able to compensate the expenditures. On the other hand, the trained workers have no incentive to quit the firm, voluntarily, because the wage corresponds to the market wage which is below the wage paid by the training firm. Therefore, it can be said, that the returns on training are shared by the firm and the trained workers (Leuven/Oosterbeek 2001). Summing up, general human capital is accumulated, when the workers themselves invest in training, specific human capital is financed by the training firm.

However, the institutional framework which determines the vocational training system in Germany, enables the trained persons to apply their knowledge in every firm which offers the same or similar job the worker has trained. This implies an important role of the general component of the training programs (Acemoglu/Pischke 1999b, Harhoff/Kane 1997). The vocational training shows the features of human capital. Nevertheless, the training firm bears the cost of training. Therefore, other conditions have to be fulfilled, as the theory of human capital proposes, in order to guarantee the willingness to provide training. On the one hand, the firms will provide training, if the returns on training compensate the expenditures during the training period. It is assumed that the workers are productive from the beginning of the training period. They realise the same return of production as the other (unqualified) workers, but they are less expensive (by receiving a lower wage than the workers). Due to the higher worker productivity, training generates a rent which increases the probability that the net costs

of training within this firm equal zero respectively are even negative. The following equation presents the relation between productivity and training:

$$(2) \sum_{t=0}^{n-1} \frac{R_t}{(1+i)^{t+1}} \geq \sum_{t=0}^{n-1} \frac{E_t}{(1+i)^{t+1}}.$$

The offer of a training job is short-term orientated and motivated. Firms do not make any plans about the future need of qualified workers (Niederalt 2004: 84). This corresponds to the assumption of Lindley (1975), who presumes that the present production is independent from the future expected production. The firm does not focus on the planning beyond the training horizon. Consequently, the employment does not depend on the future need of qualified workers, but on the lack of (present) training in general.

On the other hand, firms are also willing to train, when the costs of training exceed the returns on training at the end of the training period. In comparison to the previous mentioned case, the returns only exist after the training period, when the trained persons continue working for the training firm. This means, that the firms, deciding to employ untrained workers for training, consider the future production. Hence, the firm is confronted to the following equation after the training period

$$(3): \sum_{t=0}^{n-1} \frac{R_t}{(1+i)^{t+1}} < \sum_{t=0}^{n-1} \frac{E_t}{(1+i)^{t+1}}$$

As the costs of training exceed the returns after the training period, the training firm focus on the planning beyond the end of training period. The number of trainees within these firms corresponds to the future necessity of trained workers.

According to Acemoglu and Pischke (1997; 1999a; 1999b), under these existing conditions, firms are only willing to provide training and, therefore, pay for general skills, if existing labour market frictions compress the wage structure. A wage compression is characterized by the wage being below the productivity of each single worker who is trained by the firm. This means $w(\tau) < f(\tau)$ in the formal way. This condition is necessary that wage compression exists. Firms can benefit from their position in paying the trainees a wage which does not cover their productivity (Acemoglu/Pischke 1999a). The sufficient feature is more important: The wage function is increasing in the level of training less steeply than productivity, so the gap between the productivity and the wage is higher at greater levels of skills. This means $w'(\tau) < f'(\tau)$. Because of the increasing difference between productivity and wage in skills, the firm incentive to provide general human capital increases, too. (Acemoglu/Pischke 1999a;

1999b). However, in order to reduce the worker mobility, the wage paid by the training firm has to exceed the market wage. In order to generate wage compression, labour market imperfections are necessary which are caused for example by asymmetric information.

Existing asymmetric information augments the firm incentive to invest in general skills.² It implies that the acquired human capital is general, but an external firm or a potential employer do not know about the human capital respectively the ability, the trained worker disposes of. In addition, the ability to apply the acquired skills is unknown. Hence, the training firm has more information about its workers than other employers. However, qualified workers are not able to signal their abilities in the external labour market neither. So, if the trained workers quit their training firm, their labour market position will deteriorate. This implies a market wage which is below the wage of the training firm. Therefore, the trained workers have any incentives to quit their training firm. Hence, the long-term employment yields to returns on training. The training expenditures are compensated in this way.

Finally, because of the important role of the firms within the vocational training system in Germany, the share of specific skills must not be neglected. The existence of the specific component in the training program also increases the firms' willingness to invest in general human capital. Thereby, the two kinds of human capital have to be considered as complements. Thus, the willing to provide training increases, when the level of human capital is high. Then, the trainees can acquire specific skills more easily. The level of the total skill indicates productivity v_2 in the training period which is defined as (Kessler/Lülfelmann 2002: 5):

$$(4) v_2(s, g, \theta) = v^S(s; \theta) + v^G(g; \theta).$$

The productivity of the trained person depends on the specific (s) and on the general (g) component. Moreover, the parameter θ influences the output. It describes e.g. the individual ability or an exogenous shock. However, this parameter is only known after the training period. In this model, the firms are able to provide only specific training. Hence, the productivity after the training is defined by the level of the specific human capital v^S and vice versa (Kessler/Lülfelmann 2002: 6). Finally, the existing complementarity between specific and general human capital yields a loss of the specific component, too, when the trained worker quits the firm. The productivity of the person decreases. This means a lower wage paid by the new employer. Therefore, the higher the specific component is, the higher the losses after quitting the training firm are. Finally, the incentive to quit reduces.

² Institutions, like trade unions, transaction cost, minimum wage which has an impact on a low educational attainment, cause wage compression.

In conclusion, the human capital provided by the training firms respectively accumulated by the trainees and the costs of training determine the willingness to train youths. The following chapter focuses on the impact of these factors on the transition from the training system to work.

2.2 Impacts of the different motivation to train on the unemployment

2.2.1 Theoretical influences on the transition after training

In general, the firms are willing to train, if the expenditures equal the returns. Mostly, the firms recover the returns arising from a longer employment after the training period (Franz/Zimmermann 2001). By reducing the fluctuation after apprenticeship, the probability of providing training rises. This indicates that there is no voluntary lay-off of the training firms. According to the human capital theory, an exogenous disturbance causes lay-offs. However, these lay-offs depend on the accumulated kind of human capital. The decision of accumulating a kind of human capital is the precondition for the pattern of take-over after apprenticeship which is needed to consider. Thus, the decision to train, taken at the transition from school to the training system, influences the transition from training system to work, differently. This aspect depends on the accumulation of the kind of human capital which is focused on during the training. According to Becker, who describes the different financings of the skills, the share of the investment has an impact on the transition from apprenticeship training and labour market, too. As the training firms invest in the specific skills, the graduates have lower probability of laying-off than graduates with general skill, if an exogenous disturbance occurs. Although a disturbance reduces the production/ output, the training firms have an interest to hold their self-trained persons, because they augment the probability to recover the returns of training, nevertheless. However, if an exogenous disturbance occurs and the firms hold the specific skilled workers, their marginal product decreases after a disturbance, nevertheless (Becker 1962). Finally, the firms rather take-over graduates who accumulate specific human capital as workers with more general human capital. Indeed, according to Becker, this kind of pattern at the transition from training to work is only valid, if disturbance occurs in the short-run. However, if the disturbance lasts longer, all graduates, it does not matter which kind of human capital they have accumulated during the training period, have the same probability of being laid off.

In consideration of the accumulation of general human capital, a similar pattern of take-over after vocational training, as mentioned in the previous paragraph, can be analysed. Under the assumption that training firms are able to recover the training costs during the period of apprenticeship, these firms only have little interest to hold the graduates in the long-run. The basis explaining the causality is the model of Lindley (1975). The possible immediate participation at the process of production produces net returns. The role of the trainee can be

considered as a supplement worker respectively un-skilled worker, but not as a person who is in a training process. Therefore, according to this theoretical model, the trainees are substitutes for other workers (Neubäumer 1999). Thus, they do the same work as the other employees, but are paid less than the other. According to Neubäumer (1999; 1997), this yields training which exceed the future need of skilled worker. This means that the training firm disposes of an offer of training jobs which exceeds the number of jobs for skilled workers. Consequently, the training firm is not able to take- over all of its graduates. This means a high fluctuation after the apprenticeship period. Moreover, the training firm has a little interest, because the trainees are less expensive. Thus, by taking- over the graduates the production is more expensive than employing other trainees. Consequently, the take-over rate of graduates who finished their training in a firm with little or negative net costs of training, is rather low. Therefore, it can be conclude, that the reason for training young people influence the probability of a further employment after training negatively.

Furthermore, there are training firms, which have an interest to employ their graduates in the long- run. These firms are characterized by high costs of training after the apprenticeship. These high expenditures occur, because the vocational training is more sophisticated. The working process and the facilities show a higher complexity. This indicates that the trainees cannot immediately participate at the production, because the explanation of the firm-specific work organisation needs a longer time. Therefore, the net costs arising during the training process can be recovered by a take-over and a further employment of the graduates. However, it is also possible that firms generating net costs of training do not take- over their graduate. Hereby, existing asymmetric information is assumed. On the one hand, this assumption is necessary to guarantee training. On the other hand, this assumption also has an impact on the pattern after the apprenticeship training. Thus, the training process can be characterized as process in which the firm gains information about their trainees (Franz/Soskice 1995). Further, it is assumed that heterogeneity exists among the workers respectively the trainees concerning their quality. Therefore, training might serve screening purposes and might be performed to distinguish good from bad matches and sort out the bad ones (Garloff/Kuckulenz 2006). This defined task of the training is a precondition of providing training, but also a necessity for the decision having to be taken at the transition from training to work. The starting point is, that asymmetric information already exists at the transition from schooling to apprenticeship. The training firms are only able to observe the formal skills and abilities at the beginning of the employment respectively the training. The informal skills are not known. This means, the firms can choose their trainees according to certificates, or in other words, to the formal human capital which can be signalled by the youths. Information about the informal human capital, such as the ability of interpreting causality, reliability or ability to work in team etc. is not given. Consequently, there is no information about the exact productivity and abilities of the trainees at the beginning of the apprenticeship

(Acemoglu/Pischke 1997; 1999a; 1999b), but the training firm gains information about the informal human capital during the training period. According to the (product) market position and the targets of the firm, demands are defined, the graduates have to attain at least. . Thus, these demands are determined by the needed level of formal and informal human capital. Moreover, the level of these demands are influenced by the situation and the offer of skilled workers in the external labour market, too. According to Franz/Soskice (1995), the decision of providing depends on the condition of the external labour market. These conditions have an impact on the determination of the minimum demand which has to be valid for the level of qualifications. The demands influence the pattern of take-over after the apprenticeship. Therefore, graduates who do not reach the minimum demands have a lower probability to be hold after the training period than graduates who reach or even exceed the minimum level of demand. Moreover, the position of the less able graduates deteriorates if there are good skilled worker in the external labour market. This accumulation of different human capital and the different cost structures yield the different probabilities of unemployment, explained by the variety of firm-specific frameworks in the training period.

2.2.2 Theoretical aspect on the unemployment after apprenticeship

The different pattern of taking-over the graduates is caused by a variety of factors which indicate the different risks of unemployment after the training period, too. In general, the existing asymmetric information has to be considered which influences the period after which the graduates has not receive any job offer from his training firm (Garloff 2003, Pissarides/Mortensen 1994, Yashiv 2006). Firms which search for skilled workers do not exactly know the total qualification of the laid-off graduates. Furthermore, the framework respectively the structure of the training within a firm determines the different condition under which the laid-off graduates have to apply for a job in the external labour market. Therefore, the observed knowledge is not sufficient to occupy the free job adequately and immediately. Firstly, the different kinds of human capital are considered. On the one hand, graduates with specific accumulated skills have a lower probability to lay-off. On the other hand, if firms do not offer a job after training, the specific skilled workers are more likely to be unemployed than general skilled workers. It is more difficult for the former (specific skilled) to find a job with another employer, because the specific human capital cannot be used in another firm, but in which it has been accumulated. Therefore, the productivity is reduced in the new firm by the amount of the specific human capital (Becker 1962). Under the assumption of the human capital theory, these graduates are less productive than graduates with general skills.³ Therefore, the transition from the training system to work, you can also say the unemployment period, takes a longer time, when the worker is specific skilled than when the worker is general skilled. The productivity of the latter, on the one hand, augments the total

³ In the human capital theory, there is no direct link between specific and general human capital.

productivity in the labour market more than specific skilled workers will do when they have to change their employer. On the other hand, the new employer can generate higher return caused by higher productivity by employing general skilled workers than by employing specific skilled workers. This causality is based on the idea of the search theoretical model (Pissarides/Mortensen 1994; 1999), which assumes risk neutral firms which maximize their utility. This means that firms prefer, at given market wages, to occupy the vacant jobs with workers who are more productive than others are. In order to link the search theoretical aspect with the human capital aspect, this means, that general skilled workers dispose of a higher chance to be reemployed than workers with specific human capital do. The assumptions of the search model cause the duration of unemployment of the different trained workers.

Furthermore, the causality of the costs and of the providing of training can also affect the unemployment after apprenticeship. If the relation between costs and accumulation of specific or general human capital is given, then the causality between costs and unemployment can be considered. So, employers with little or even negative net costs of training use trainees as workers. This is possible, because the working process within the firms does not require a high level of human capital. According to the framework of the German vocational training, a certain level of minimum demands of specific and general human capital has to be reached by the trainees and has to be provided by the training firms. However, on the one hand, in firms with low net costs, the required level of human capital is guaranteed. On the other hand, as these firms have little (financial) resources, supplement skills and knowledge are not provided. After the training, the laid-off graduates dispose of a relatively high share of general human capital. Absolutely, the total amount of skills is low. However, this amount can completely be use with the new employer. In contrast to the described training situation, the graduates finishing their training within a firm with high net costs of training who are laid-off, are characterized by a higher level of skills. Because of the high firm expenditures, skills and knowledge, which exceed the minimum required level of human capital, can be provided, because of the existing resources within the firms. Furthermore, it is assumed, that higher investments in training yield an increasing share of specific human capital.

In order to explain the different risks of unemployment after the apprenticeship, the heterogeneity of the jobless graduates has to be considered. Therefore, graduates who already have little chance to receive a job offer after finishing apprenticeship at the beginning of the training meet graduates which do not reach the minimum of training firm demands, in the external labour market.⁴ In addition, there are graduates in the external labour market who

⁴ In the last years it can be observed in Germany, that firms which train with the expectation of rents after the apprenticeship, do not train to the same extent to their future employees need, but even more. This trend is especially to see in the banking sector. The reason can be found in the increasing competition pressure. Firms can only be competitive with high skilled workers. The firms will only take over the best graduates. So even

receive a job offer after apprenticeship, but who prefer to improve their work situation. They quit their training firm, voluntary. Therefore, these graduates are characterized by a high level of human capital and by a great ability. However, they wish to extend these abilities and their knowledge. Moreover, they want to gain information about their exact productivity. In conclusion, good and less able workers respectively voluntary and involuntary unemployed graduates compose the offer of the skilled workers (von Wachter/Bender 2004). The heterogeneity of skills yields a longer search period for firms which wish to occupy their vacant jobs, because the employers hesitate to recruit unemployed people. Firms need time to identify good and bad graduates. This process serves to reduce the probability of recruiting “lemons” (Akerlof 1970). Consequently, when the good graduates are identified, the firms will propose them a job, whilst the less able workers will not get a job offer and have to continue the job search. By employing workers with a high level of human capital, the firms dispose of a better competitive market position and are able to produce a better product quality (Neubäumer 1997). For that reason, the chances of the less able workers, to get employed, deteriorate, because the good graduates firstly receive job offers. Consequently, the graduates with a low level of human capital respectively with a worse quality of training have a higher probability of unemployment.

However, according to Gibbon and Katz (1991) a process of adverse selection exists, too, which occurs by choosing trainees in order to be able to occupy the training jobs. This process describes the eventual longer duration of unemployment of the better skilled workers. Therefore, it is assumed, that, at the transition from schooling to the training system the youth with a low general (schooling) human capital receive training offers with bad prospects of a further employment (Büchel 2002). Therefore, this pattern has an impact on the eventual unemployment after apprenticeship. In order to explain the adverse selection the market wage has to be considered. The market wage is adjusted to the level of human capital of the less able workers (Acemoglu/Pischke 1997). Consequently a market wage results which is below the wage more able graduates would be paid. The position of the relatively good laid-off persons respectively the person voluntarily quitting the training firms deteriorates, because these graduates have to accept a market wage which is below their productivity. *When different market wages representing the different levels of productivity, exists, the more able workers search as long as they find an adequate job.* So, the period of unemployment of the better jobless graduates is longer than that one of the less able graduates. Moreover, the graduates with a high share of specific skills also have to accept the market wage below their productivity (in the training firm), because the specific component cannot be used in another firm (Acemoglu/Pischke 1997; 1999b).

some high-skilled graduates, who do not attain the high requirements of the training firms, will enter the external labour market.

Summing up, the graduates who complete their apprenticeship in a firm with net costs of training are more likely to be taken-over than those in firms with little or negative net costs of training. Indeed, the risk to get unemployed also increases, when graduates do not attain the level of the minimum demand in skills of the firms with net costs after the apprenticeship. In this case, under consideration of adverse selection, the unemployment period of skilled workers in a firm with net costs of training can be higher than the unemployment period of skilled workers in firms with little or no net costs (Kessler/Lülfelmann 2002; Acemoglu/Pischke 1999a; 1999b; 1997). At the same time, this indicates a low productivity and consequently low returns on training. Then, the graduates do not receive any job offer after the training period. According to Mortensen and Pissarides (1994), the lay-off is necessary, because the level of productivity of an existing job cannot be changed. Therefore, these jobs have to be occupied by workers with an adequate productivity. Consequently, the trainees who are laid-off have a higher probability to get unemployed than the graduate trainees taken-over, because they need to search for a new job. Furthermore, the laid-off graduates have to signal their productivity defined by the level of human capital. However, the signalling of the formal skills is only possible. The informal skills cannot be signalled and consequently the firms do not pay for it. Finally, the laid-off workers are worse off.

2.2.3 Consideration for vocational training

The considered theoretical factors determining the willing of the firms to provide vocational training can only explain the takeover of these apprentices and the probability of unemployment, partially. The basic model of Acemoglu/ Pischke considers only investments of the firm in general human capital, whilst Becker restricts the firm investments to specific human capital. Although the German vocational training is accepted by all the firms and is, therefore, characterised by providing rather general human capital (Acemoglu/Pischke 1997, 1999a; 1999b; Harhoff/Kane 1997), at the same time, specific human capital is provided, too. That is, because the apprentices attend the vocational school (Berufsschule) and work in the firm (Reichenbach 2001: 164; Booth/Zoega 2000; Neubäumer 1999). Moreover, it is difficult to make clear distinction between the general and specific human capital in the vocational training, as a high complementarities between these kinds of human capital can be suggested. The more general human capital is available, the more respectively *easier* specific human capital can be acquired.

Nevertheless, the link between costs and providing training in the theories are an important starting point to analyse the take-over of firms and the unemployment risk of the youths. According to the human capital theory of Becker, firms taking part in the vocational training, invest more in education, if the share of firm-specific human capital is high, because advantages in competition can be achieved. In contrast, firms, with a higher share of general human capital invest a smaller amount in education. Therefore, a distinction between firms

with little or negative costs of training and firms with positive costs of training is needed. Moreover it has to be distinguished between training jobs with a high share of general human capital and others with a higher share of (job-) specific human capital.

Therefore, in order to analyse the willing of firms to train and the transition from the vocational training to labour market the different features of firms, jobs and apprentices have to be considered. The precondition for the participation of firms in the vocational training is regulated by the “Berufsbildungsgesetz” of the year 2005. This regulation does not consider firm characteristics like turnover, competitiveness and so on by being allowed to train. Consequently, the firms with vocational training differ in characteristics which influence the persistence of the apprentices in the firm and their possibilities to successfully entry in the job market. Important features which determine the training costs of the firm and the kind of human capital they provide, are the firm size, trade unions, skill structure within the firm and technical progress. Therefore, the costs of training and the kind respectively the share of kind of human capital determine the firms decision of the take-over.

Small firms have mostly a short-term interest in training, as they are too short in capital in order to invest heavily in training. Moreover, the working processes are clearly arranged and less complex, so some general human capital is sufficient to employ apprentices as productive workers after a short period of explanation the firm working process (Neubäumer 1999). On the other hand, the resources restrict the providing of additional knowledge, especially specific human capital. In contrast, large firms have complex working processes, which require a longer period of explaining the firms processes. Therefore, the productivity of the apprentices is, in general, lower than in small firms, so the firms usually have net costs of vocational training. Consequently, the probability of take-over of an apprentice is higher in larger firms than in smaller ones.

In Germany, trade union structure is organized by sectors. Employees in the same firm, regardless of their occupation, are represented through one trade union. Trade unions seek to decrease wage compression through negotiations. So, at the lower wage and education levels, the trainings firms generate only low wage compression and consequently no or little rents. This implies an incentive to invest in education. The level of education is correlated positively with the productivity, which increases more steeply than wages (Acemoglu/Pischke 1997; 1999a; 1999b; Beckmann 2002), which causes increasing rents by the level of training. Moreover, trade unions and firms negotiate obligation of taking-over the graduates. This aspect also yields an increasing probability of generating returns on training, because the results of the negotiation reduces workers mobility. These are often limited to about 6 to 12 months and vary among sectors. Hence, firms with collective bargaining show a higher take-

over possibility. Besides graduates have a lower employment risk, as they have a higher level of education and training quality in consequence of the trade union organisation.

In addition, the technology, used by the firm, is influenced by the skill structure and determines the training and take-over behaviour. According to Asplund (2004), the assumption, that the level of individual ability is influenced by the work environment, implies an incentive to train. Reason therefore is the dependence of the individual productivity on the total workers productivity in the firm. If the productivity of a firm is high, an incentive to train exists, as the apprentices are influenced positively by the specialists. Furthermore, the higher skill level of the worker is, the more the firm is able to introduce new capital-embodied technologies. This increases the productivity of the apprentices in the training firms but not their potential productivity in other firms, because the apprentices acquire the latest technological specific human capital. Eventually, this cannot be used in other firms with an older technology (Booth/Zoega 2000; Asplund 2004). Consequently, the firm yields higher returns on education. Moreover, if the graduates quit the training firm, the wage will be reduced and consequently, the productivity in the new firm, because the graduates cannot use all the acquired human capital. So, the labour market position of the worker deteriorates. Both, the firm and the worker benefit of a take-over. However, it has to be assumed that the apprentices have a rather high education level in the beginning of their apprenticeship; otherwise, they will not be able to handle with new technologies, effectively. Thus, these training firms will have higher training costs than others, because e.g. the workers explaining the processes to the trainees are more expensive, because of the higher productivity and the resulting deficit of production while the explanation. This increases the possibility of take-over. They have higher skills with their technological knowledge in comparison to other graduates, which increases their chances in the labour market, because in sum they dispose of a higher total skill level which increases the chances to be reemployed. In conclusion, the skill level of the trainee is an important characteristic for the entry in the labour market.

However, these factors influencing the take-over and transition to the labour market are not independent and interact simultaneously with each other. For example, large firms are, on the one hand, more often obliged to collective bargaining, but have, on the other hand, a high skilled personnel. However, some small firms also have a high-skilled personnel. In conclusion, these factors have to be examined separately, but their interdependence has to be considered in econometric estimations.

3 Survey of literature

The institutions „Federal Institut of Vocational Education and Training” (Bundesinstitut für berufliche Bildung) and “Ministry for Education and Research” (Bundesministerium für Bildung und Forschung) regularly publish data of unemployment after the vocational training

and take-over rates distinguishing between firm sizes and sectors (Granato/Dorau 2004; Berufsbildungsbericht 2007). Because of the low take-over rates and the long time period until the first fixed-term contract is signed, there is obviously a discontinuity of job careers, which is increasing in the last years. (Schaeper/Kühn/Witzel 2000: 81; Konietzka/Seibert 2001).

Many studies investigate the consequences of unemployment with the focus on sociological and personnel aspects (Steinmann 2000; Konietzka 2002). The main research is concentrated on the structure of job careers after an apprenticeship (Schaeper 1999; Schaeper/Kühn/Witzel 2000; Hillmert 2001; Falk et al. 2000). Falk et al. (2000) explore the conditions of university and apprenticeship graduates for a successful entry on the labour market in Eastern and Western Germany. The main result is that a long period of unemployment has negative consequences for the following job career, as this is interpreted as a negative signal by potential employers (Falk et al 2000).

Dietrich and Kleinert (2005) focus less on the consequences of unemployment, but more on the exit of unemployment. Thereby, factors are investigated which influence the transition from unemployment to employment, to labour market training to labour market inactivity. Significant factors are social background, gender, family status, and education. While e.g. children have a negative influence on the probability to start work, the skill level has a positive influence. Dietrich and Kleinert (2005) conclude in their research on unemployment duration after vocational training that a higher education level shortens the period of unemployment. However, research by Falk et al. (2000) indicates that higher educational attainment do not lead to a faster reemployment. Thereby, an important role is attributed to education and the educational system (Konietzka 2002; Albert 2007).

Franz und Zimmermann (1999) focus in their analyses the persistence of apprentice graduates in the training firm. This precludes a take-over of the graduates. The study results a significant impact of age and firm size. In complement, Neubäumer 1999, Neubäumer/Büchel (2001) explore the *employment change* after vocational training and the reasons therefore. The main focus lies on the (firm-specific) factors influencing the occupation of jobs with workers acquired an adequate training (for this job). A significant impact is attributed to the educational attainment and the sector of the training occupation (Neubäumer/Büchel 2001; Schaeper/Kühn/Witzel 2000). Finally, a voluntary unemployment after the vocational training raises the possibility to find an adequate occupation.

Hillmert (2001) looks at the transition from school to vocational training and vocational training to employment with two birth cohorts. In both transitions, the considered factors are education, gender, nationality and the labour market situation. He concludes that the factors

affecting the first transition also influence the transition from vocational training to job. Thereby, the personal factors have more significant impact than the actual labour market situation.

Summing up, there are some studies, analysing the transition from training system to work. However, these studies focus on a description of the state after the unemployment period respectively on the possibilities to leave the unemployment. In this context, the studies concentrate on the consequences of the unemployment for the further job career. Moreover, the different states occurring after the training are also analysed. However, the economic or firm specific reasons still have little importance.

4 Conclusion and research prospect

In this paper the theoretical assumptions guaranteeing on- the- job- training financed by the training, are analysed in the context of the patterns and meaning at the transition from the training system to the work. It results that the effects on the motivation to train influence the pattern on take-over or on lay-off of the graduates. Thus, trainees in firms with little or even negative net costs of training are more likely to being laid-off and consequently are more likely to get unemployed than trainees in firms with high net costs of training. Because of the low expenditures, these firms have little interest to employ their trainees after the apprenticeship. Moreover, a relation between the training costs and the level of human capital exists and is determined by the educational attainment which is relevant at the beginning of the training period. In addition, the firm size, the sector and structure of the level of skill within the training firm determine the framework of the apprenticeship and impact the patterns at the transition from the training system to labour market and of the unemployment period. Therefore, the theoretical analysis yields the result that the determinants causing the different motivations of firm training influence the different pattern of take- over after apprenticeship. As the overview of the present research shows, the economic, and particularly the firm specific, framework are less focused in the context of explaining unemployment after the apprenticeship. Therefore, it is necessary to analyse the factors influencing the patterns of taking-over the graduates and the unemployment after the training. Consequently, an econometric estimation is required to identify the significant causes explaining the unemployment. The results should depreciate economic- political measures. The estimation is conducted by the IAB-Employment Samples Version 1975 -2001 (IABS 1975-2001). It is a 2 % sampling of all employed persons subject to the social insurance contribution in Germany. The sampling is suitable for answering the research question, because it record all daily changes in the employment respectively unemployment state. Moreover, the IABS 1975-2001 disposes of information about firm structure. The impact of these firm- specific frameworks is estimated by the matching method. Hereby, it is assumed, that the precondition of unemployment is a lay-off after training. Econometrically, it means, that a lay-off increases

the probability to get unemployed. As the a graduate who is laid-off cannot be observed as the same person who is taken-over, graduates who have received a job offer after training with the same feature has to be found. Therefore, the group of graduates who receive a job offer of their training firms represents the control group, whilst the laid-off graduates represent the treatment group. Between the groups similar pairs, so called twins with identical features concerning the factors influencing the lay-off need to be found: The differences, explaining the unemployment can only be caused by the firm pattern after training. The estimations of the matching method is currently under progress. Results will be expected soon.

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