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Personnel Economics: An Economic Approach to Human Resource Management**

The theoretical idea of personnel economics is to apply simple economic principles to the field of human resources management. Personnel economics as a research field has grown rapidly since the first text book on "Personnel Economics" was published in 1998. The development is driven by new theoretical insights based on institutional and behavioural economics and new empirical methods and data sets. Those new theoretical insights are very fruitful to analyze reasons and consequences of various human resource management practices, to understand what actually drives and motivates employees, and what causes organisations to be successful or to fail. With the new data sets and econometric methods the theories that have been laid out in personnel economics either many years ago or very recently can now be tested thoroughly. And the evidence produced by the new data and methods is strongly supportive, which is not only reassuring for researchers, but it also suggests that practitioners can actually rely on the ideas because they are born out in the data. So, personnel economics is not only a vivid research field, but also of great value for human resource managers, particularly for those taking strategic HR decisions. The fruitfulness of personnel economics is demonstrated with four examples: training strategies of companies, recruiting in tight labour markets, career incentives, team size and effort, and entrepreneurial signalling towards employees and creditors.

Key words: **Personnel Economics, Strategic Human Resource Management, Training Strategies, Hiring, Career Incentives, Effort in Teams, Entrepreneurial Signalling**

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1. Introduction

Personnel economics is the application of simple economic principles to the field of human resources management. The goal of personnel economics is to find underlying economic principles of human resource management strategies under varying institutional and competitive environments. Personnel economics is not only a promising research field, but it can also serve as a guideline or manual for practitioners because it gives reliable rules, predictions and prescriptions for human resource management. Personnel economics as a research field has rapidly grown over the last one or two decades and several factors have fostered and initiated this development (cf. Backes-Gellner 1996; Lazear 1995; Lazear 1998).

First, there are the inherent shortcomings of traditional, often eclectic research on human resources management. The questions that have been asked in traditional human resource management were always very interesting and central to business, but the answers were often vague or nebulous and theoretically not convincing but unsatisfactory. One of the consequences was that personnel managers traditionally did not play a central role among high level managers – despite the fact that modern companies always proclaimed that human resources management is the most important part of their business because people are the most important asset of the organisation. As a result people coming from human resources very rarely ended up being the CEO of a company – they come from finance, marketing, or any other field, but almost never from human resources (Backes-Gellner/Krings 1997; Lazear 2001). One of the reasons is that traditional human resources management has not given a solid theoretical and/or empirical foundation for the rules and strategies of personnel managers. It was too vague and too speculative. Contrarily, personnel economics is rigorous in its theoretical analysis and much more precise, and personnel economics is backed up heavily by empirical analyses, using advanced econometric tools that allow to disentangle all kinds of interfering effects of various human resource policies.

Second, in the last decade, there have been important developments and breakthroughs within the field of personnel economics, which have made personnel economics a much more attractive field for researchers analyzing human resource management. New theories based on institutional and behavioural economics and new empirical methods and data sets are now available. Today, there are better ways to theoretically analyze reasons and consequences of various human resource management practices, to understand what it actually is that drives and motivates employees, and what it is that causes organisations to be successful or to fail. Also, there are now excellent data sets available to test the theories that often have been laid out many years ago. And the evidence produced by the new data and methods is strongly supportive of the hypotheses that have been derived from personnel economics. This is not only reassuring for researchers, but it also suggests that practitioners can actually rely on the ideas because they are born out in the data (Lazear 2001).

To demonstrate how personnel economics analyzes human resource management issues and what the theoretical and empirical results look like, it is enlightening to look at some examples. Of course, this can only be done very briefly, due to restrictions of

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space. So, for detailed information the interested reader has to consult the original papers and further literature (cf. Lazear 2003).

2. Training Strategies of Companies in an International Comparison – the Role of National Institutions and Strategic Decisions

International comparisons of training strategies often concentrate on formal training and observe significant and stable differences between companies operating in different countries. Well known is the discussion about the determinants and the consequences of the so called low-skill equilibrium in England as opposed to the high-skill equilibrium in Germany (Finegold/Soskice 1988; Marsden/Ryan 1991).[1] The reason for such differences is seen in varying national regulations of initial vocational education and training systems. The German dual system of vocational education seems to guarantee high company investments in initial vocational training. The English Training "System" did not seem to encourage high company investments (Steedman/ Wagner 1989; Green/Steedman 1997; Walsh 1997).[2] On the other hand, product markets and production technologies become more and more globalized. Therefore, one would expect converging human capital investments of companies even in different countries in order to remain competitive on globalized markets. Backes-Gellner (1995) introduces an economic model of a company's training decision and shows how the institutional environment as well as product market characteristics and production strategies determine a single company's training decision. She uses data from an in-depth-study of 82 companies in four industries and four countries to test the model and its implications. It can be shown that companies following flexible specialization strategies develop significantly higher training activities than companies with mass production. Companies competing under spot market conditions develop significantly higher training activities than companies embedded in idiosyncratic product market relations. As regards formal initial training activities the empirical results confirm well known results of previous studies: German companies employ the highest share of apprentices per employee, followed by British and then French companies. A comparison of the share of skilled workers among all workers leads to a contradictory picture: the share of skilled workers is highest in French companies, followed by English and German Companies. The share of workers participating in further training in French and to a lesser extent in English companies, is significantly higher than in German companies. The results are similar for systematic job rotation. Obviously, there is not only one (the German) way, to "produce" skilled workers, but there seem to be effective alternatives. Further training seems to be a functional equivalent to initial training. As regards the share of workers who are able to carry out a specified list of vocational skills, there are no national differences. However, significant differences exist between companies with varying market conditions and varying production strategies. Overall, the results support the hypothesis that economic models are ade-

1 Prais (1981: 47) even quotes Marshall (1919: 130) saying "All the world has much to learn from German methods of education".

2 However, Wagner/O'Mahony/Paulssen (1997) see already first signs for a rapidly improving level of qualifications in British companies.

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quate to describe companies' training decisions. Such models have the advantage that they clearly show how institutional influences and market forces as well as strategic decisions act together to produce a specific training strategy. This in turn helps to find out how e.g. politically induced changes in a vocational training system will influence the amount and the kind of companies training activities. From an international perspective it is clearly shown that different training measures are functionally equivalent to working with a skilled workforce. Therefore, international comparisons should no longer look at formal or certified training activities only. They should pursue a broader view in order to get a realistic picture of the competitiveness of companies. Furthermore, political discussions should no longer concentrate on improving initial vocational education. Surely, the well regulated German dual system once more proved to be competitive. However, the (more or less voluntary) further training strategies of French companies proved to be successful as well. In a world where technological innovations and skills become obsolete ever quicker, the competence to repair skill deficiencies and thereby to cope with constant change and ever changing skill requirements may become a competitive advantage. If companies like French companies, have already developed routines to compensate for all kinds of occurring skill deficiencies they should be well prepared for those future challenges. Furthermore, one can expect that their employees will also have only few problems in accepting ongoing change and constant further training requirements and will probably easier adjust to the needs of lifelong learning. French workers for example are used to go through ongoing training to become a skilled worker, whereas for German workers the successful completion of an apprenticeship was more or less a guarantee for a lifelong skilled works position. Therefore, the main challenge for German vocational education and training institutions is to motivate companies as well as employees to rethink. Dual Vocational Education is still a major success factor and should be preserved. However, it will no longer be sufficient to rely on initial training. In future, significantly more emphasis should be laid on building up a similarly successful institutional framework for further training (Backes-Gellner 1995).

3. Recruiting of Employees, Employer Signaling and Labour Shortage

Skilled employees have always been important for the competitive advantage of firms, but even more so in the last decades. Globalization and ongoing technological innovation foster the substitution of unskilled labour by skilled labour. Thus, there is an ever increasing demand for skilled labour while at the same time supply decreases steadily. In the year 2001 approximately twenty per cent of the job offers for skilled workers in Germany remained vacant and forecasts for the years to come are even worse (Schmidtke 2001a; Kölling 2001: 512). Given these developments, recruitment and retention of skilled workers will be one of the major challenges for human resources management. However, the ability to fill job vacancies is not evenly distributed among firms. Empirical studies on a disaggregated level show that there are substantial and stable variations across firms (Holzer 1994: 17ff; Schmidtke 2001a: 10), but there is a notable lack of theoretical or empirical work to explain such patterns.[3] Firm-level

[3] See Schmidtke (2001b: 21ff) for details.

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analyses of job vacancy rates have been almost non-existent. One rather obvious economic explanation would be that varying job vacancy rates are due to mismatches between skill requirements and workers' skills. Inter-firm variations in job vacancy rates would then be a result of systematic inter-firm differences in skill requirements. However, empirical results for Germany do not support such an explanation: even if the skill structure in job offers is held constant, there are still substantial differences in recruitment success (Schmidtke 2001b). Another rather simple economic explanation would be that differences in job vacancy rates are due to wage differentials, but here again the data do not seem to support the hypothesis: c.p. job vacancies are not only observed in low wage firms but also in high wage firms. So, there remains a puzzle which Schmidtke/Backes-Gellner (2002) try to solve. They present a new theoretical explanation and empirical evidence to explain inter-firm differences in job vacancy rates and show how single firms gain a competitive advantage when recruiting on tight labour markets. They reverse Michael Spence's (1973) original idea of labour market signaling to explain the relative recruitment success of firms. Where Spence argues that in job markets the employer is uninformed about the productive capabilities of an applicant and that his decision has to be modelled under uncertainty, they argue that the employee is faced with similar information problems when searching for a job and that his job choice decision may be fruitfully modelled within the same, but reversed framework. So, Schmidtke/Backes-Gellner (2002) use personnel economics theories to explain why labour shortage is unequally distributed among firms and what kind of firms will be more or less successful in getting their share of skilled labour. Whereas, a vast amount of psychological and marketing papers has shown that non-observable job and company characteristics are crucial for employees' choices of a particular workplace or firm, the question on how employees collect reliable information on these non-observable characteristics remained unsolved. Schmidtke/Backes-Gellner (2002) argue that employees use signals as a proxy for the unobservable characteristics. They test there hypotheses with a company data set of approximately 700 firms. The results of tobit estimates of job vacancy rates support their basic hypothesis: inter-firm differences in job vacancy rates can be explained by a reversed signaling model. Favourable job characteristics are communicated to potential employees via observable characteristics that are used by companies as reliable signals of the unobserved job quality. The advantage of explaining job vacancy rates with a reversed signaling model is that it helps to identify variables which would otherwise not be considered to be important or which would be assumed to have a different effect on job vacancies. The existence of apprenticeships for example does not seem to be important for the recruitment of skilled workers since they already finished an apprenticeship and cannot expect direct positive returns. However, with the reversed signaling model it is obvious why apprenticeships could still be important. Additionally, it is worth noting that those non-observable characteristics are more important than wages and fringe benefits since they have significant effects on job vacancy rates whereas wages and fringe benefits become insignificant as soon as the influence of the non-observable job attributes is controlled for. For human resources management this in turn means that those observable characteristics should not only be evaluated by the returns they generate within their own policy field (apprenticeships e.g. should not

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only be evaluated by the increased productivity of apprentices), but also by their effect within other personnel policy fields (i.e. by the reduction of the job vacancy rate due to an improved acceptance rate when recruiting on tight labour markets), which is dealt with in the so called complementarities literature (cf. Ichniowski/Shaw 2003, Ballot et al. 2001, Boning et al. 2001).

4. Career Incentives and Research Output: Publication Patterns of US and German Professors

Research productivity is not constant over the lifetime of a researcher. It fluctuates substantially and seems to follow a typical pattern. After the dissertation productivity first increases, then there is a first decline after a few years of work and another decline towards the end of the career. Lehmann (1953, 1958, 1966) was among the first to systematically analyze such patterns by using cross sectional data. He studied the relation between age and scientifc productivity and found that a sharp productivity increase at the beginning is followed by a decline in the rest of a researcher's career. The age of maximum output differs somewhat from discipline to discipline and is located at the age of 30 to 45 (for similar patterns across many disciplines cf. Cole (1979) and Dennis (1956)). Some recent studies also confirm these results for todays economists: productivity rises at the beginning and declines towards the end of the career (Kenny/Studley 1995; Hutchinson/Zivney 1995; Oster/Hamermesh 1998; Buchmueller/Dominitz/Hansen 1999). If one looks at organisational correlates, resp. human resource management strategies Goodwin/Sauer (1995) and Hutchinson/Zivney (1995) find a decline in publication output of researchers after tenure has been granted, and Mahoney/Ready (1997) find that tenured economists publish less articles in refereed journals and proceedings than economists without tenure. In a recent paper Coupe/Smeets/Warzynski (2003) show a correlation of promotion incentives and output of economists. They show that according to tournament theory effort of assistant and associate professors increase if the wage differentials between full professorship and associate professors are higher. Based on a sample of longitudinal data for 112 economists and business economist in the US and 189 in Germany they calculated lifecycle publication patterns and found again very similar patterns (cf. Schlinghoff-Backes-Gellner 2004). They argue that research productivity is driven by a combination of incentives and skills, both of which depend on institutional characteristics of national university systems and their respective career paths. The paper includes a theoretical model to explain varying shapes of lifecycle productivity profiles based on relative incentives to invest in skills or to produce output. It analyzes how these incentives differ with variations in the institutional environment of the researcher. They look at Germany with a traditional European career system for researchers and the US with its well-known tenure based career system. Although, these two systems look quite different in nature they still have some functional equivalents which are often overlooked but make them an ideal pair for comparison. Based on the theoretical model of Schlinghoff/Backes-Gellner (2004) and the institutional details of the two countries they derive empirically testable hypotheses on similarities and differences in individual productivity profiles within and across countries.

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Their results are that variations in research productivity over the lifecycle are driven by a combination of incentives and skills, both of which depend on institutional characteristics of national university systems and their respective career paths. On the one hand career publication patterns of US and German researchers are determined by the same basic mechanism: there are incentives to publish provided by promotion tournaments which results in increased publication outputs in time periods preceding a promotion and a decline in time periods after a promotion. On the other hand they identify some striking differences between US and German researchers which can be related to particular differences in the design of the career paths of researchers. Firstly, skill acquisition is more important for German researchers in the screening period since the first promotion decision is dominated by a qualification requirement, the so called *Habilitation*. Secondly, German researchers lack a second major career step in comparison to US researchers for whom the promotion to full professor is almost as important as the promotion to associate professor. Reappointments in the German university system offer comparatively low gains and are thereby not attractive enough to induce researchers to increase their effort significantly. For US researchers the situation is different. Their research output is significantly higher prior to a promotion to full professor indicating that this promotion provides an effective incentive to increase research output.

Researchers react to promotion criteria by adjusting their production and investment behaviour. For a promotion to a US full professor and for a first appointment to a German professor publications in the respective top journals were most important in the period studied. As a reaction researchers who compete in these tournaments have a strong incentive to produce publications in the respective top journals and this is exactly what is observed. Since in the last years the promotion criteria of German economists and business economists started to change substantially towards a greater importance of publications in international journals one should expect the publication behaviour of young researchers to adjust accordingly, meaning that one should expect a significantly higher amount of publications in international journals in the near future.

5. Team Size and Effort in Start-Up-Teams – a Consequence of Free-Riding and Peer Pressure in Partnerships

Start-Up-Teams are almost always small and very often consist of no more than three members. So the question arises why this is the case. Backes-Gellner/Mohnen/Werner (2004) argue that founders choose the size of their start-up-team in order to economize on the effort costs of teams. Based on personnel economics insights they develop a model to analyse the relationship between effort and team size. Economic theory states on the one hand that a person who partly owns a firm chooses the efficient effort level to maximise the value of his or her firm. (Jensen/Meckling 1976). On the other hand, partnerships like any other team may be faced with free-riding problems since partnerships use profit sharing plans to avoid shirking, but each partner only receives 1/N of the benefit created by their additional efforts. So the individual partner has an incentive to work less than the efficient level. However, Kandel/Lazear (1992) argue that free-riding may be successfully counterbalanced by peer pressure, i.e.

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an action taken by one of the partners that raises the cost of a reduction in individual effort to the other partners. Backes-Gellner/Mohnen/Werner (2004) argue, that for the joint effect of free-riding and peer pressure the number of partners is an important issue, because not only the free rider effect depends on *N* but also the peer pressure effect. While the effort level decreases in N due to the free-rider effect, it increases in N due to the peer pressure effect (given a few well specifiable circumstances). Analyzing the typical situation in start-ups they argue, that effort should be concave in N with a maximum at a relatively small team size. Although there is quite an extensive literature on peer pressure and free-riding in partnerships or on start-up teams, the joint effect of free-riding and peer pressure depending on partnership size has never been analysed – despite some rather obvious facts that should raise these questions. There are typical patterns in size of ownership teams, e.g. medical practices are usually small whereas consulting firms are very often large. In contrast, if one does not look at established companies but at newly founded firms, the teams are usually very small, independent of the industry sector. This should be particularly surprising since over and over again empirical analyses have shown that financial as well as working hour constraints are two of the major problem of start-ups. Both problems could easily be solved, with an increase in the number of partners. However, what one observes are small start-up teams, even in cases where those problems are severe. A first empirical result pointing at the problems of teams that might rise with size is found in the empirical study of Brüderl/Preisendörfer/Ziegler (1996: 188f.). They find that the proportion of start-up firms with strong interpersonal conflicts rises in *N* and they argue that it is due to personal conflicts about working hours. Cooper/Gascon/Javier (1995) find, that despite some very obvious advantages of team start-ups their survival is not higher then that of single person foundations. Personal conflicts again are assumed to be the reason. However, these personal conflicts do not suffice to explain the huge differences between the number of partners in start-up firms and established partnerships. Backes-Gellner/Mohnen/Werner (2004) assume that unlike established partnerships, founder teams are characterized by a particular communication structure between the team members and by a close and steady personal interaction. Founders in the service sector typically work in one or a few offices side by side; in manufacturing they may start in a garage, a big hall or small lab. Due to this spatial closeness and the requirement to continually take fast and often fundamental decisions, they constantly interact (informal, formal or random) and stay in close personal contact. Backes-Gellner/Mohnen/Werner (2004) build on this special feature of start-up teams and analyse its impact on peer pressure and the joint effect of peer pressure and free-riding depending on the size of start-up teams. Thus, it is argued that the strength of peer pressure depends on the "monitoring technology" used in teams. Unlike many established partnership, start-ups are characterized by close personal and frequent interactions which in turn lead to a strong peer pressure effect that heavily increases with the first additional partners added, levelling off with every additional partner very soon. Their aim is to analyze how peer pressure and free-riding influence the effort decisions in start-up teams, particularly with regard to the impact of team size on effort. Kandel/Lazear (1992) argue that free-riding may be counterbalanced by peer pressure. In their paper the level of peer pressure is exogenous and not dependent on *N*.

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Backes-Gellner/Mohnen/Werner (2004) in contrast argue in their paper that peer pressure depends on *N*. Therefore, effort depends on *N*, i.e. the individual effort of each member of the team is a function of *N*. To analyze the effect of free-riding as opposed to peer pressure, they first regard the simple case of a single person venture: neither a free-rider effect nor a peer pressure effect exists. Then they look at a venture with two or more partners: both effects exist and interact and result in an optimal effort for each partner. Absent specific assumptions taking into account the typical situation in start-ups it is not obvious whether peer pressure dominates free-riding or vice versa. Thus, Backes-Gellner/Mohnen/Werner (2004) introduce several start-up-assumptions and thereby model the two diverging effects of team size on the effort of partners in start-up teams. They test their theoretical implications based on an empirical study of 790 start ups in and around Cologne. They use several econometric models to analyse the relationship between effort and team size. As a dependent variable they use the actual weekly working hours a founder works in his or her start-up. The major explanatory variable in our model is a start-up's team size, which was operationalised by the number of partners who founded the new venture. The results clearly show a significant concave relationship between team size and individual effort, i.e. effort *increases* with the number of founders up to a particular team size but then *decreases* with additional founders. A maximum level of effort is observed with approximately three individuals founding a new business. To conclude, Kandel/Lazear (1992) showed that free-riding and peer pressure have a counterbalancing effect on the effort level in partnerships. However, the magnitude of both effects was unclear as well as the overall effect on individual effort. Backes-Gellner/Mohnen/Werner (2004) assume that the magnitude of both effects depends on the size of the team and present a model to analyze the joint effect of freeriding and peer pressure in start-up teams. They show that given the particular mutual monitoring technology in start-up-teams there should be an optimal team size with regard to effort. Unlike many established partnerships, start-ups are characterized by close personal relationships and frequent interactions which in turn lead to a strong peer pressure effect that increases with the first additional partners added, but levelling off with every additional partner very soon. They test their model based on a large data set on start-up-teams in and around Cologne and find that individual effort of founders varies significantly with team size and that effort is concave in N. And they clearly identify a maximum effort which is on average given with three team members.

6. Entrepreneurial Signaling: Success Factor for Innovative Start-Ups

Innovative start-ups and their respective market partners are faced with severe problems of asymmetric information due to their lack of prior production history and reputation. Backes-Gellner/Werner (2004) study whether entrepreneurial signaling can help solve these problems and thereby increase the potential success of innovative start-ups. They concentrate their analysis on the credit and labour market because they are crucial for the success of innovative start-ups and focus on the role of educational signals. They argue that entrepreneurs signal their quality to potential employees and creditors with certain characteristics of their educational history. According to their theoretical considerations they expect potential employees to use an entrepreneur's

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university degree as a quality signal when deciding whether to accept a job at an innovative start-up. And they expect banks to use a more precise indicator, namely the actual length of study in relation to a standard length, as a signal when deciding upon credits for an *innovative* founder. However, since asymmetric information problems and skill requirements are different for traditional start-ups they do not expect employees or banks to use the same signals for *traditional* start-ups. They empirically test their implications based on a dataset of more than 700 German start-ups collected in 1998/99.

According to personnel economics theories Backes-Gellner/Werner (2004) argue that for innovative start-ups, compared to traditional start-ups, there is no prior history on similar production or business processes; so their *ex ante* default risk is higher than for traditional enterprises; and there is no reputation due to company history or prior ties. As a result, innovative start-ups, and their respective market partners are faced with severe asymmetric information problems. Backes-Gellner/Werner (2004) focus on whether and what kind of entrepreneurial signaling can help solve or substantially reduce these information problems and thereby increase the potential success of innovative start-ups. As in the standard labour market-signaling model developed by Spence (1973), they focus on educational signals and assume that not only employees but also entrepreneurs credibly signal their quality with certain characteristics of their educational history. However, as Spence shows, educational characteristics must meet certain conditions to become a valid and credible signal. Therefore, it has to be analyzed firstly what kinds of capabilities are particularly required to run an innovative start-up and what kind of educational career requires these same capabilities (first condition). In a second step, it has to be analyzed what aspect of an educational career guarantees a sufficiently negative correlation between the cost of acquiring the signal and the quality of the innovative founder so as to guarantee a separating equilibrium (second condition). Finally, the kind of information that is available to the market partners has to be studied. Backes-Gellner/Werner (2004) conclude that potential employees will use a university degree as a quality signal if they have to decide whether to accept a job at an innovative start-up, and banks will use a more precise indicator, namely the length of study, as a credible signal when deciding upon credit for an innovative founder. Additionally, banks will use the patents a founder holds as a signal for the quality of his or her innovative start-up. Furthermore, since asymmetric information and skill requirements are different for traditional start-ups, they do not expect employees or banks to use the same signals when deciding upon a job or credit in a traditional start-up. They test their assumptions using a dataset of more than 700 start-ups in and around Cologne collected in 1998/99. Consistent with what they expected, they find that innovative – and only innovative – founders holding a university degree have a lower percentage of overloaded workers, indicating that they have fewer problems attracting enough qualified employees. Also consistent with their theoretical model, they find that innovative – and only innovative – founders experience fewer problems obtaining the credit they initially need to start their venture if they finished their university degree in less than a standard number of years. Furthermore, if an innovative founder holds a patent, it also makes it easier for them to obtain credit. Since holding a patent does not reduce credit problems for traditional start-ups, one can

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conclude that patents are not a matter of property rights and market protection, but more a signal for the founder's overall entrepreneurial capabilities, particularly in an innovative environment.

To conclude, Backes-Gellner/Werner (2004) show that entrepreneurial signaling is obviously a powerful instrument in overcoming typical problems of asymmetric information for innovative start-ups, which has so far hardly been studied. The dearth of studies is mostly due to a lack of adequate data. They present a unique database covering not only a wide variety of variables on the newly founded enterprises but also on the founder and his or her educational, labour market, and personal history. The database allows to empirically study the effects of entrepreneurial signaling. One of the main results is that a university degree and length of study are important signals, particularly for innovative founders. Therefore, contrary to what popular discussion might suggest, finishing an education with a degree is necessary especially for innovative founders. During the boom years of the new market, many students in Germany (and elsewhere) considered it a waste of time to finish their studies and work for a degree. New innovative businesses did not seem to require or honor traditional education, and students dropped out en masse, many of them with the aim of becoming one of the new stars on the glamorous innovative start-up-horizon. However, the empirical results of Backes-Gellner/Werner (2004) indicate that traditional educational patterns and values, such as finishing an education and meeting a time target, are even more important for innovative markets than for traditional markets, where other credible quality indicators might be available.

7. Conclusions

As the examples in the previous chapter show, personnel economics is a powerful tool to analyze a variety of human resource management strategies. Training strategies, recruiting processes, career incentives, team problems and even entrepreneurial problems have been analyzed successfully with personnel economics theories. Furthermore, the theories and the respective empirical implications have all been tested empirically and are born out well in the data. Of course, personnel economics is only one perspective to analyze these topics. And it is a perspective that disregards on purpose many aspects in order to get a clearer picture of causalities and interdependencies.

In contrast to personnel economics, the more behavioural or psychological approaches to human resource management catch more details. Theorists from these approaches are certainly better observers of human behaviour. Economists are not as good when it comes to details, but they are better at focusing on what is essential. Thus, taking notice of each others results may lead to the best of both worlds. Personnel economists should read the literature from traditional human resource management, distil the interesting issues and figure out the best way to explain what is observed and to focus on relevant patterns (Lazear 2001). Thereby, personnel economists eliminate all the details and focus on what is essential. This is not the kind of picture traditional human resource management would draw. Their analysis goes much more into detail and covers a much broader range of issues, but at the same time they are more likely to miss the essential point. So the different approaches to human resource management should really be viewed as complementary.

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References

Adams, C. (2002): Does Size Really Matter? Empirical Evidence on group incentives. FTC-SSRN-Working Paper.

Aghion, de B.A. (1999): On the design of a credit agreement with peer monitoring. In: Journal of Development Economics, 60: 99-104.

Austen-Smith, D. (2002): Peer Pressure and Job Market Signaling; No. 1352 Discussion Papers from Northwestern University, Center for Mathematical Studies in Economics and Management Science.

Backes-Gellner, Uschi / Werner, Arndt (2004): Entrepreneurial Signaling: Success Factor for Innovative Start-Ups. Zurich, Institute for Strategy and Business Economics, March 2003

Backes-Gellner, Uschi / Mohnen, Alwine / Werner, Arndt (2004): Team Size and Effort in Start-Up-Teams – Another Consequence of Free-Riding and Peer Pressure in Partnerships. Working Paper, Zurich, March 2004.

Backes-Gellner, Uschi / Schmidtke, Corinna (2002): Interfirm Differences in Job Vacancy Rates and Employer Signaling. Working Paper, Cologne May 2002.

Backes-Gellner, Uschi (1996): Betriebliche Bildungs- und Wettbewerbsstrategien im deutsch-britischen Vergleich. München und Mering: Hampp 1996.

Backes-Gellner, Uschi (1995): The Role of Regulation for Corporate Training Strategies. In: Mulder, Martin / Nijhof, Wim J. / Brinkerhoff, Robert O. (1995) (Hrsg.): Corporate Training for Effective Performance. Boston, Dordrecht, London: Kluwer: 33-47.

Backes-Gellner, Uschi / Krings, Achim (1997): Zur relativen Vorteilhaftigkeit eines personalökonomischen Studienprogramms für die Arbeitsmarktchanchen von Personalwirten. In: Auer, Manfred / Laske, Stephan (Hrsg.): Personalwirtschaftliche Ausbildung an Universitäten. Sonderheft der Zeitschrift für Personalforschung, München und Mering: Hampp: 27-47.

Ballot G. et al. (2001): Investissement en capital humain et R&D, formes de l'innovation, et exportations, Rapport final, Commissariat Général du Plan, Paris, Mars.

Barron, J.M. / Paulson Gjerde, K. (1997): Peer Pressure in an Agency Relationship. In: Journal of Labour Economics, 15; 234-254.

Barua, A. / Lee, C.-H.S. / Whinston, A.B. (1995): Incentives and Computing Systems for Team-based Organizations. In: Organisation Science, 6: 487-504.

Birley, S. / Stockley, S. (2000): Entrepreneurial Teams and Venture Growth. In: Sexton, D. L. / Landstrom, H. (Hrsg.): The Blackwell Handbook of Entrepreneurship. Oxford, UK: Blackwell Publishing: 107-127.

Boning, Brent / Ichniowski, Casey / Shaw, Kathryn (2001): Opportunity counts: teams and the effectivenenss of production incentives. NBER Working Paper Series, 8306.

Brüderl, J. / Preisendörfer, P. / Ziegler, R. (1998): Der Erfolg neugegründeter Betriebe: eine empirische Studie zu den Chancen und Risiken von Unternehmensgründungen. 2. Aufl., Berlin: Duncker und Humblot.

Buchmueller, Thomas C. / Dominitz, J. / Hansen, W. Lee (1999): Graduate Training and the Early Career Productivity of Ph.D. Economists. In: Economics of Education Review 14(1), 65-77.

Cole, Stephen (1979): Age and Scientific Performance. In: American Journal of Sociology 84(4), 958-977.

Coupe, Tom / Smeets, Valerie / Warzynski, Frederic (2002): Incentives in Economics Departments I: Dynamic Incentives of Top Economists. Brussels: mimeo.

Dennis, Wayne (1956): Age and Productivity among Scientists. In: Science 123(April), 724-725.

Finegold, David / Soskice, David (1988): The Failure of Training in Britain: Analysis and Prescription. Oxford Review of Economic Policy 4(3): 21-53.

Goodwin, Thomas H. / Sauer, Raymond D. (1995): Life Cycle Productivity in Academic Research: Evidence from Cumulative Publiaction Histories of Academic Economists. In: Southern Economic Journal 61(3): 728-743.

Green, Andy / Steedman, Hilary (1997): Into the Twenty First Century: an Assessment of British Skill Profiles and Prospects. Centre for Economic Performance, Special Report (March 1997).

Holzer, Harry J. (1994): Job Vacancy Rates in the Firm: An Empirical Analysis. In: Economica 61: 17-36.

Hutchinson, E. Bruce / Zivney, Terry L. (1995): The Publication Profile of Economists. In: Journal of Economic Education 26(1): 59-79.

https://doi.org/10.5771/0935-9915-2004-2-215 https://www.inlibra.com/de/page/agb - Open Access - (cc) BY

Ichniowski, Casey / Shaw, Kathryn (2003): Beyond Incentive Pay: Insiders' Estimates of the Value of Complementary Human Resource Management Practices. In: Journal of Economic Perspectives, 17(1): 155-180.

Jensen, M.C. / Meckling, W.H. (1976): Theory of the Firm: Managerial Behaviour, Agency Costs and Ownership Structure. In: Journal of Financial Economics 1967(3): 305-360.

Kandel, E. / Lazear, E.P. (1992): Peer Pressure and Partnerships. In: Journal of Political Economics (100): 801-817.

Kenny, Lawrence W. / Studley, Roger E. (1995): Economists' Salaries and Lifetime Productivity. In: Southern Economic Journal 62(2): 382-393.

Kölling, Arnd (2001): Fachkräftebedarf und unbesetzte Stellen – Ergebnisse des IAB-Betriebspanels 2000. In: Personal 53(9): 512-517.

Lazear, E.P. (1995): Personnel Economics. Cambridge, MA and London.

Lazear, E.P. (1998): Personnel Economics for managers. New York et al.

Lazear, E.P. (2001): Personnel Economics for Managers. Interview in: CoPers/e-HR Personalarbeit/Personalökonomik 2001(4): I(2001): 33-35.

Lechner, T. / Gemünden, H.G. (2002): Gründerteams: Chancen und Risiken für den Unternehmenserfolg. Heidelberg: Physica.

Lehman, Harvey C. (1953): Age and Achievement. Princeton: Princeton University Press.

Lehman, Harvey C. (1958): The Chemist's Most Creative Years. In: Science 127(May): 1213-1222.

Lehman, Harvey C. (1966): The Psychologists Most Creative Years. In: American Psychologists 21: 363-369.

Levin, Jonathan / Tadelis, Steven (2004): Profit Sharing and the Role of Professional Partnerships. SSRN Working Paper 500322, February 2004.

Longterm Employment in Academia. In: Wallace, Joe / Dalzell, Tom / Delany, Bernard (Hrsg.): Continuity and Change in the Employment Relationship. Dublin: Oak Tree Press: 211-229.

Mahoney, Christine B. / Ready, Kathryn J. (1997): Tenure: The Process of Attaining.

Marsden, David / Paul Ryan (1991): Initial Training, Labour Market Structure and Public Policy: Intermediate Skills in British and German Industries. In: Ryan (1991): 251-285.

Marshall, Alfred (1919): Industry and Trade. London: Macmillan.

McDowell, John M. (1982): Obsolence of Knowledge and Career Publiaction Profiles: Some Evidence of Differences among Fields in Costs of Interrupted Careers. In: American Economic Review 72(4): 752-768.

Oster, Sharon M. / Hamermesh, Daniel S. (1998): Aging and Productivity among Economists. In: Review of Economics and Statistics 80(1): 154-156.

Prais, S. (1981). Vocational Qualifications of the Labour Force in Britain and Germany. In: National Institute Economic Review 98.

Schlinghoff, Axel / Backes-Gellner, Uschi (2002): Publication Patterns of US and German Economists – Career Incentives and Lifecycle Research Output. Zurich, Cologne, January 2004.

Schmidtke, Corinna (2001a): Der Mittelstand im Wettbewerb um Fachkräfte – Institutionenökonomisch fundiertes Personalmarketing als Lösungsansatz. In: Jahrbuch zur Mittelstandsforschung 1/2001. Institut für Mittelstandsforschung Bonn (ed.). Wiesbaden: 1-24.

Schmidtke, Corinna (2001b): Signaling im Personalmarketing: Eine theoretische und empirische Analyse des betrieblichen Rekrutierungserfolges. Mering: Hampp.

Schmidtke, Corinna / Backes-Gellner, Uschi (2002): Betriebliche Strategien gegen Fachkräftemangel. In: Beiträge aus der Arbeitsmarkt- und Berufsforschung (BeitrAB).

Spence, Michael (1973): Job Market Signaling. In: Quarterly Journal of Economics 87: 355-374.

Steedman, Hilary / Wagner, Karin (1989): Productivity, Machinery and Skills: Clothing Manufacturing in Britain and Germany. National Institute Economic Review (May 1989): 40-57.

Wagner, Karin / O'Mahony, Mary / Paulssen, Marcel (1997): Standortfaktor: Humankapital in Deutschland und die Aufholjagd der britischen Industrie. In: ZfB 67(9): 947-970.

Walsh, Richard (1997): Skill Needs in Britain: 1996 Report. In: Labour Market Trends (Feb.): 73-76:

Weber, W. (1996): Grundlagen der Personalökonomik. Wiesbaden.

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