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**Different higher education patterns of
topmanagers in the U.S., France, and Germany**

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A signaling approach

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ABSTRACT

The paper presents an economic explanation of country-specific higher education patterns among topmanagers based on a signaling approach. Starting from Arrow's hypothesis that higher education functions as a filter for human capital, we discuss three alternative filter-designs, which can be attributed to the higher education systems of the U.S., France and Germany. An empirical investigation of the educational paths of topmanagers in these countries reveals that these high potentials indeed behaved according to the signaling requirements following from the country-specific filter-design.

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1 Introduction

The identity and structure of business elites have been of interest to academic scholars from various disciplines since a long time. Starting with Tausig and Joselyn's (1932) study an extensive literature has developed on career patterns of topmanagers and pathways to corporate management. The role of educational credentials in this context seems to have changed dramatically over time. Whereas more than half of the managers in Tausig and Joselyn's sample never attended college, a number of recent studies suggest that this figure is now well under ten percent in developed countries (e.g., Canella and Lubatkin, 1993; Zajac and Westphal, 1996).

A comparison of higher education patterns in the U.S., France and Germany reveals considerable inter-national differences, though. A large fraction of U.S. topmanagers possesses a bachelors` degree from an elite college and/or a masters` degree from a leading program. The French business elite is dominated by the alumni of a few prestigious Grandes Écoles. In addition, many French business leaders have worked within state agencies before they moved on to the topmanagement of a large company. Among German topmanagers, on the other hand, the doctoral degree is widely spread, while the identity of the degree-granting university seems to be less important (Hartmann, 2000; Barsoux and Lawrence, 1990; Useem and Karabel, 1986; Bourdieu and DeSaint Martin, 1978).

Sociologists have addressed possible reasons for the existence and persistence of country-specific educational paths. Their findings reveal that a large fraction of corporate leaders originates from the social upper-class. Business elites share a similar social background and possess a set of common values - that is in part acquired and formed during periods of mutual elite education. A coherent socialisation may be especially valuable in a topmanagement setting that is characterised by decision-making under uncertainty. In such a setting topmanagers develop the climate required for co-operation and trust more easily among their equals (Kanter, 1977; Robinson and Garnier, 1985). In addition, similar social backgrounds may facilitate entry into powerful social networks and the acquisition of prestigious educational credentials (Temin, 1999).

Social background, social networks and past discrimination may indeed play an important role in explaining the selection of senior corporate management. However, we intend to present a complementary explanation of country-specific educational paths that is based on a signaling approach. This approach generates additional insights not only into the career paths of topmanagers but also into the functioning of higher education systems.

The remainder of our paper is organised as follows: In Chapter 2 we present career information on the topmanagers (Chief executive officers CEO, Présidents-directeurs généraux PDG and Vorstandsvorsitzende VV) of the one hun-

dred largest companies according to market capitalisation in the U.S., France and Germany. It turns out that indeed country-specific educational patterns prevail.

In chapter 3 we discuss the signaling role of higher education as a possible explanation for these differences. Since employers cannot assess the human capital of potential employees without cost, there is a substantial risk of adverse selection in employment decisions. In order to signal their partially hidden quality, potential employees pass filter systems that specialise in the assessment of human capital. To our knowledge Arrow (1973) was one of the first scholars to point to the importance of 'higher education as a filter' and educational credentials as signals in this context.

However, the functioning of such a filter system is rather complex. Employers who intend to overcome information asymmetries in the labour market by using university degrees as indicators for talent are situated outside the university system. In the absence of other mechanisms employers as outsiders should have serious difficulties to evaluate whether a certain university performs the selection and education of its students carefully. A problem of validation arises: Why should potential employers trust the filtering services of a certain university and associate the degree issued by this university with human capital of superior quality? Institutions of higher education have to signal their own quality too if the degrees conferred are to perform their signaling role in the labour market.

We discuss three different institutional arrangements of 'higher education as a filter', where each employs a different validation mechanism. As ideal types these arrangements can be associated with the higher education systems of the U.S., France and Germany. In the U.S., competition between universities (that is, the market) ultimately ensures the credibility of filtering services, whereas in France it is predominantly government control that performs this function. In Germany, on the other hand, the individual reputation of professors remains the sole basis for credible signaling since state regulation has eliminated most other options for the validation of filtering services. Section 4 reconsiders the data presented. We exclude founders, inheritors and topmanagers heading a foreign subsidiary from our analysis and thereby restrict the sample to native, salaried topmanagers only. These salaried topmanagers at some point of their careers should have had the problem of signaling their outstanding abilities to owners or other managers. We therefore expect the proposed model career paths to be most prevalent among this group. The paper concludes with some implications in section 5.

2 Educational patterns of topmanagers

2.1 The sample

To examine the educational patterns of topmanagers in the U.S., France and Germany we draw on systematic information compiled on the CEO, PDG and VV of the hundred largest companies in these three countries. The selection of the companies was conducted on the basis of market capitalisation data from April 24 2001.

Educational and career information has been obtained from various sources: From company homepages, from internet sites such as www.hoovers.com and from secondary literature such as different editions of 'Who is who' and 'Who is who in European business'. In some cases we were able to collect missing information by contacting the respective firms and universities directly.

As far as the U.S. are concerned, we were able to access complete information about all the CEOs in the 100 selected firms. With one double occupancy for the CEO position our dataset amounts to 101 candidates. In the case of France, we were not able to obtain educational and career information about the PDG of seven firms. In four cases there was a double occupancy. Thus, the dataset for France consists of 97 candidates. In Germany, educational and career information was not accessible for the topmanagement of two firms. Since there were five double occupancies of the VV-position we have data on 103 candidates.

2.2 Higher education degrees, doctoral degrees and state service

In the U.S. and France higher education is more modular than in Germany. Two or even more academic degrees may be awarded prior to the doctorate (for example a bachelor's and master's degree in the U.S.). In Germany at the time relevant for our analysis a single academic degree (Diplom, Magister or Staatsexamen) was awarded after completion of the entire 4-6 year higher education program. Taking into account for these differences our category 'higher education degrees' includes bachelor's and master's degrees for the U.S., *diplôme universitaire de technologie*, *license*, *maîtrise* and *diplôme d'ingénieur* for France, and *Diplom*, *Magister* and *Staatsexamen* for Germany.¹

In the U.S., 96,0 percent of the topmanagers in our sample hold a higher education degree according to this definition. For France and Germany the corresponding rates are 94,8 and 89,3 percent. These figures are quite comparable. The following numbers display remarkable differences, though: Whereas in the U.S. 6,9 percent of the CEO and in France 3,1 percent of the PDG in our sample hold a doctoral degree, in Germany no less than 52,4 percent of the VV do so. The category 'doctoral degrees' refers to the U.S.-American doctorate, the French doctorat and the German Doktor.

Table 1: Educational paths of topmanagers

| | USA | France | Germany |
|-------------------------|------------|---------------|----------------|
| | n = 101 | n = 97 | n = 103 |
| higher education degree | 96.0 | 94.8 | 89.3 |
| doctoral degree | 6.9 | 3.1 | 52.4 |
| state service | 1.0 | 36.1 | 2.9 |

Only one American CEO and three German VV have spent part of their careers in the government administration. In France, on the other hand, 36,1 percent of the topmanagers in our sample have worked for the state prior to their actual employment. About half of them (18,6 percent) have been with only two government institutions (Inspection de Finances and Corps de Mines).

2.3 Concentration of topmanagers on schools

In order to assess and compare the distribution of degrees among schools, a number of differences between the three countries had to be accounted for. In Germany it is common practice among students to change schools more than once until earning an official degree. This practice alone may indicate a uniform quality level in the university system, since otherwise such ‘tourism’ would collapse due to significant transaction costs. However, we do not intend to discuss the economics of this tourism here. We simply had to decide how to deal with the phenomenon prevalent also in the group of German VV, that they had studied in many different places without earning degrees. Only those schools on the educational path of a topmanager were considered, that in fact awarded a degree, since only a filter that has been passed may serve as a signal.

To get a first impression of the concentration of topmanagers at particular schools, we calculated the percentage of educated topmanagers who earned a degree at the school that was most frequently chosen by their peers.² It turns out that 22,7 percent of the CEO with a higher education degree in our sample possess a degree from Harvard University, 26,1 percent of the educated PDG in our sample earned a degree from the École Polytechnique, and 8,4 percent of the educated German VV in our sample graduated from the Ludwig-Maximilians-Universität (LMU) München. In the following steps we extended the group of schools by adding the school that finished next in every country as ‘producer’ of degrees for the topmanagers in our sample and asked how many

topmanagers have earned a degree from at least one of these schools. The results for the five most frequented schools are depicted in Table 2.

Table 2: Percentages of educated topmanagers holding a degree from the most frequented schools

| | USA | France | Germany |
|-----------|------------|---------------|----------------|
| | n = 97 | n = 92 | n = 92 |
| 1 school | 22,7 | 26,1 | 8,4 |
| 2 schools | 27,8 | 47,8 | 15,2 |
| 3 schools | 32,0 | 55,4 | 21,7 |
| 4 schools | 36,1 | 62,0 | 27,2 |
| 5 schools | 39,2 | 66,3 | 32,6 |

Of course, these figures may be distorted by different sizes of the respective institutions and different student populations in the respective countries. School size and student population both are factors influencing the fraction of graduates a particular school accounts for in its country. In order to assess a school's relative size we divided its number of graduates by the total number of graduates in its home country for the academic year 2000-2001.³

Only 0,29 percent of the U.S.-American higher education graduates obtained their degree at Harvard University in the academic year 2000-2001, but 22,7 percent of the CEO in our sample did so. Compared to the whole population of graduates this particular school is over-represented among topmanagers by a factor of 77,5. In France the École Polytechnique accounted for 0,14 percent of the French graduates, but for 26,1 percent of the PDG in our sample. The corresponding 'concentration factor' is 180,7.

If we compare the German figures with those for France and the U.S., the concentration of German topmanagers on a limited number of schools is clearly less strong. LMU München hosted about 2,3 percent of the German graduate population and 8,4 percent of the VV in our sample. The LMU München is thereby attended more often among topmanagers in our sample by a factor of 3,6. The figures for the five most frequented schools are given in table 3.

Table 3: Concentration factors for the most frequented schools

| | USA | France | Germany |
|-----------|------------|---------------|----------------|
| 1 school | 77,5 | 180,7 | 3,6 |
| 2 schools | 52,0 | 135,7 | 4,4 |
| 3 schools | 34,3 | 103,6 | 4,7 |
| 4 schools | 31,3 | 77,1 | 4,4 |
| 5 schools | 26,9 | 70,7 | 4,8 |

3 Filter models in higher education

Potential employers are situated outside the university and are not able to fully observe or evaluate the education and filtering processes that ultimately lead to degrees. Why should employers thus trust the filtering services of a certain university and associate a particular university degree with human capital of superior quality? This question draws attention to the fact, that universities, too, need to communicate their quality within the market for filtering services. The signaling of above-average human capital to potential employers via education presupposes a successful signaling of the degree-awarding institution. What kind of starting points for such a ‘meta-signaling’ of universities can be identified?

The production process of higher education is determined to a high degree by the input it receives – that is, by human capital. Talented and motivated students and professors play a crucial role in teaching and research. Strong peer effects increase the importance of human capital (Astin, 1993; Pascarella and Terenzini, 1991). In a group of talented and motivated students (and professors), nobody wants to fall behind. All benefit from each others’ motivation and abilities. Winston (1999, 17) speaks of a ‘customer-based production technology’ to stress the dominant role of the students (the customers) themselves regarding the quality of a university. Universities performing a better selection with respect to this dominant input will also produce better results, especially in the face of strong peer effects.

Under these ‘technological’ conditions universities could for example signal high quality output by selecting only outstanding applicants (students and academics). However, at this point we must ask how a high degree of selectivity can be communicated. Low admission quotas, for instance, are self-communicating since a university denying access to many applicants automati-

cally produces the experience of rejection among the segment of potential applicants. Presumably, however, the information of admission quotas does not reach far enough.

Strictly speaking, the lowest admission rate only indicates the access position of a university within the corresponding market segment of potential students. A university which can afford to reject the most applicants in a certain market segment of potential students has some priority over its rivals when checking the whole 'student supply'. Yet, the crucial question remains unanswered: Why should a favourable position in this pecking order in fact be used to select the most talented students? Or to put it differently: How can it be assured that universities using their superior access position to the detriment of their customers (other students and employers) – e.g. in not selecting according to talent and motivation, and thereby giving away peer effects – harm their own prospects?

Some additional disciplinary mechanism is required before indicators like the input selectivity just mentioned may work as credible quality signals. This problem of 'signal-validation' in our view is taken on differently in the U.S., in France, and in Germany.

3.1 Hierarchical education market in the U.S.

As an economic good higher education surely does not belong to the category of inspection goods. Before and even immediately after consumption, students face difficulties in evaluating it fairly.⁴ However, based on various social comparisons with colleagues, friends, peers or relatives, graduates will begin to gain a more precise understanding of the true value of their education and the degree they obtained in the course of their lives and careers.

U.S.-American universities use this slow quality revelation feature of higher education to build up a commitment mechanism. In offering their graduates the possibility to pay for their education when they have better learned about its true value, and according to how satisfied they are with it, these universities make themselves deliberately dependent on the future evaluation of their graduates.

At first sight, this seems to stand in contradiction to the payment of up-front tuition fees. In fact, however, tuition fees, as high as they may seem in the U.S., regularly cover only a fraction of the total cost of education. In general this ratio becomes smaller, the more renowned the schools are (Winston, 1999). Only the students of vocational schools at the lower end of the reputational spectrum fully pay for the expenses of their own education. Students at elite schools may pay higher fees, but they receive an education that costs, in some cases, five times as much as these fees. Generally, the calculated loss a university is willing to bear during the education period of a student augments, the more one moves to the top of the hierarchy among schools.

This observation is consistent to the commitment mechanism described above. The greater the ‘advance’ given to its students becomes the more the school is dependant on future income generated by its graduates. In a certain sense the university makes itself a financial hostage, which its students may release after the quality of its services has been revealed. Therefore, advances of this kind act as a validation mechanism for signals like the discussed input selectivity. A university taking the risk of such an initial loss is bound to perform education and the selection process according to its best knowledge in order to produce successful graduates and to recuperate for these losses later in time.

Within this commitment technology, the question of alumni compliance invites further explanation. In most cases the conditions of ‘releasing the hostage’ are not contracted for explicitly. Why should alumni respect the implicit agreement at all, and pay back the university as successful professionals?

Although alumni compliance in the sense of donations by successful graduates is an empirical fact in the U.S. (Baade and Sundberg, 1996; Okundade, 1996; Harrison et al., 1995), the narrow discussion of the phenomenon misses the point. In order for the described commitment mechanism to work, alumni do not necessarily have to make contributions from their private income in order to pay back their alma mater. Above-average success of graduates positively reacts upon U.S.-American universities in many ways. *Ceteris paribus* successful graduates can give more financial and other support to their alma mater not only as private persons but also as officers in firms or administrators in government and other state agencies. Moreover, they have a higher influence on third parties and institutions that act as sponsors of the education system. The willingness of sponsors to donate money to schools is augmented by the success of their graduates, firstly because success captures the attention of donors, and secondly because donors prefer institutions that prove to ‘make something’ out of their money (Weisbrod and Dominguez, 1986). In addition, above-average success of graduates captures the attention of firms, which may spur the demand of research and consulting services offered by the university and at the same time facilitate the job hunting process of current graduates considerably. Higher starting salaries for graduates consequently allow for higher tuition fees and yet higher educational cost, and so forth.

The described commitment mechanism sheds light on a range of quality indicators that are routinely applied in ratings of U.S. colleges and universities. Selectivity regarding the human capital input is attested by low admission quotas and high test scores of accepted applicants in the standardised tests such as SAT and GMAT. Other popular indicators include starting salaries and placement statistics of graduates, as well as the university’s endowment and alumni-givings. All these indicators fit into the described signaling-logic.

The signaling process is subject to significant path-dependencies, as can be shown in the context of selectivity. As soon as some university gains the repu-

tation to produce graduates with above-average human capital, a positive feedback loop is triggered. Highly talented and motivated students recognise that they can only communicate their superior human capital to potential employers if they also study at this school. To be rated as second category in the labour market is particularly unattractive for those students talented enough to make it through the elite school. Due to a larger pool of highly talented and motivated applicants, the elite school can perform a more rigid selection and thereby further improve its input quality. Via lower ratios of applicants to admissions, the university can at the same time signal the superior quality of its output. The reputation of the institution rises, and in return its opportunity for selectivity is further increased. Unsatisfied student demand and reputation correlate.

This argument can be easily extended to other factors than selectivity, which may play an additional signaling role (Franck and Schönfelder, 2000, 226-229). However, the basic mechanism remains the same. According to Frank and Cook (1995, p. 36) in higher education ‘success breeds success’:

‘A group of perhaps three dozen schools consistently dominates the ranking in college guides and news magazines. The evidence suggests that the perceived quality of a university is closely related to the achievement levels of its faculty, students and alumni. This means that any initial improvement in quality, whatever its source, will make it easier to attract top students and faculty, which in turn will yield still further improvements in reputation.’

Path-dependencies lead to a differentiated and rather stable hierarchy of universities and colleges, which Winston (1999, p. 13) refers to as ‘hierarchical market’. Only a few universities may achieve the reputation to be an elite school, independently of how high the average quality and total number of institutions may be. Just like in every tournament, the top places are limited by definition. In addition, the same suppliers have long-time reservations on these top places since it takes a long time until the signaling mechanism of contenders can function properly. Second-tier schools wishing to attract talented students and faculty would have to compensate them for losses in signaling value. Why should they for example be able to pay large salary premiums to professors over long periods of time if elite schools have amassed much bigger endowments?

Now let us return to the focus of our analysis. Assume that there are high potentials with management ambitions and that they wish to use higher education as an instrument to signal superior talent and ambition to potential employers. Which recommendations can be given to them considering the existence of a hierarchical education market as it has been described? The obvious advice is to ‘throw’ themselves into the most selective filter they can pass, hence to enrol at one of the few universities ranked as elite schools. These in-

stitutions have most effectively committed themselves to maximise graduate success. Documenting a positive evaluation of the applicants' abilities and knowledge their degree will convince best in the labour market.

In a country with institutions of higher education that are hierarchically segmented into different reputation layers school attendance decisions have clear signaling consequences. Highly talented and motivated students recognise that they can best communicate their superior human capital to potential employers if they attend one of the highly selective schools. Since selectivity is a relative criterion the number of elite schools suited for signaling purposes is restricted by definition. As in every contest the top places are limited by the very nature of the game.

3.2 State-validated education hierarchy in France

France, too, has a hierarchical system of higher education (Barsoux and Lawrence 1990). However, the allocation of schools to different layers of reputation is much less the result of competitive processes in a higher education market, but more of deliberate design by the French state. Elite education has a long tradition in France. Already at the end of the 18th century, the first *Grandes Écoles* were founded with the mission to educate candidates for top positions in government and administration. Until today a small group of prestigious *Grandes Écoles* stands at the top of the French higher education system, which is, apart from only a few exceptions, almost entirely publicly financed.

The validation of the French hierarchy of schools through market processes, as it can be observed in the U.S., is therefore constrained. In general, institutions of higher education cannot make themselves dependent on the future success of their graduates in the same sense as this is the case in the U.S., and therefore cannot reap the fruits of their efforts in the longer run. In France, state monitoring substitutes the disciplinary effects of competition described in the last subsection. Ultimately, admission procedures, education policies and the allocation of resources within the French system of higher education are in control of the French state.

The monitoring activities of the state, however, cannot be completely observed and evaluated by potential students and companies outside of the education system. It follows that the state, too, needs to send credible signals from which potential students and employers derive that it takes its monitoring job seriously and maintains the quality differences. In our perception the French state signals serious monitoring through a consistent employment policy. By systematically recruiting the graduates of a few *Grandes Écoles* for important positions in administration the state validates the degrees issued by these schools. Because failure to monitor effectively would be detrimental to the re-

spective part of the administration staffed with less talented graduates, the credibility of control mechanisms is assured.

Obviously, the state needs to dispose of a sufficient number of attractive jobs at any point in time in order to guarantee that this validation strategy works. It is therefore better suited for a centralised economic system with a pronounced government sector. The frequent migration of senior state officers into the topmanagement of large, state-controlled firms - called 'pantouflage' in France (Vaughan, 1981) - ensures that the administration is in constant demand of graduates from the respective *Grandes Écoles*. Thereby the state continuously performs its validation function. At the same time the state also legitimises the degrees of the other graduates of these schools, who take the direct route towards the private sector.

How should high potentials heading towards a topmanagement career behave in this setting? How should they use the French education system in order to signal their superior talent and ambition to potential employers? Obviously, the 'model educational path' for topmanagers in France should lead them through the selective filters of the state-defined elite schools and through periods of service in the state administration.

3.3 Egalitarian universities and reputation management by the individual professor in Germany

In Germany, the education politics of all governments after the Second World War have not been conducive to an explicit quality differentiation among institutions of higher education. Market mechanisms as they exist in the U.S. hardly work in Germany (Meyer, 1997). Until today the higher education sector is dominated by public universities. They do not have financial autonomy in any meaningful sense, neither are they able to collect tuition, nor to dispose freely of donations and manage their own assets. They are financed by annual allocations from the state which are specified in purpose and mostly not transferable to purposes outside their specification. Thus, there is no possibility for the universities – and no necessity either – to make themselves dependent on the future success of their graduates.

In this setting the production of quality signals is both difficult and superfluous. Many areas which could have served as signals, such as, for instance, selectivity are subject to rigid state regulation. With a few exceptions German public universities have to enrol all applicants with an 'Abitur' allocated by a centralised state agency on the basis of criteria like for example proximity to home. However, even if German universities were able to control their student input more independently, the question arises if that factor taken by itself would make a big difference. Why should universities spend time, money, and energy on input control, if the future success of graduates does not notably and in due time affect the university's resources?

Neither has the ‘French solution’ been considered a useful alternative to market differentiation in Germany. The state has not defined a group of elite schools whose quality is guaranteed through a continuing and specific demand for their graduates in order to occupy the top positions in the state administration. There is only one hierarchical element within the German system of higher education that is validated by the employment policy of the state. The distinction between ‘Universitäten’ and ‘Fachhochschulen’, were the latter are comparable to the British polytechnics, is stabilised by diverging career starts in the state administration. In addition, Fachhochschulen could not offer doctoral programs so far and their professors were paid on a somewhat lower scale. However, current German education politics clearly heads towards the gradual elimination of distinctive aspects between Universitäten and Fachhochschulen. Within the groups of Universitäten and Fachhochschulen, though, the state has never defined any elite school.

Focusing on filtering services, we would expect that it is less decisive which university a German high potential chooses. Consequently, the German university system should be less important in helping employers sorting applicants. Unlike as in France and in the U.S., German students cannot choose between filtering devices of different strength, which would enable the production of a more precise signal of their qualities. This egalitarian set-up seems to be well understood in the business world. In a recent survey among Germany’s largest 250 employers the importance of the school a graduate had completed ranked ninth out of ten categories influencing the employment decision: It followed behind criteria like internships with a company, language skills, final vote, stay in a foreign country and length of study and in front of the applicants age only (Leffers, 2003).

We believe that the German Doktor degree in return gains its importance due to the ‘imprecise’ filtering at the level of the diploma studies. The validity of the doctoral degree as a signal for talent stems directly from the German professors’ incentives for reputation management. We do not intend to say that American or French professors lack these incentives. Instead, we want to stress that German professors employed at Universitäten still have them despite an otherwise egalitarian regulatory environment.

Professors with a good reputation will be more successful when applying for vacant positions at other schools. The official salary scale leaves room for several increases, which may be offered to professors along with other resources by the respective state ministry as incentive to change or stay. At the same time, the job market entails the option to choose one’s location. This free choice of location becomes increasingly relevant beyond attractive leisure opportunities, in the face of peer effects and secondary occupations outside the university. Professors thus capitalise their reputation in working out new contracts with the state as well as with the ‘customers’ who pay for their services (expert reports,

consulting or instruction) privately. Of course, reputation can also be satisfactory in itself, without being capitalised on secondary markets.

In order to understand how the reputation incentives of German professors validate the doctoral degree as a signal for talent we need to look at the employment relation between professors and their doctoral assistants. This employment relation is characterised by a considerable lack of restrictions with respect to how professors choose to employ their scientific staff. Decisions to accept a doctoral dissertation are characterised by the same degrees of freedom. Therefore, it is not completely exaggerated to portray the employment relation as a temporary ‘exploitation license’. Obviously, professors maximise the benefits of this license if they employ the most talented candidates. This is the case regardless if professors are interested in enhancing their own reputation within the research community or rather within the business world. For firms that employ graduates holding a doctoral degree, the sound scientific education of these candidates seems to play a minor role anyway. What counts, however, is the selection of the candidate by the professor. Employers anticipate that professors will select carefully and make use of the information advantage stemming from their position as insiders, since they can enhance their own level of benefits through the ‘exploitation license’. In fact, when selecting candidates and appointing his own staff the German professor for the first time benefits from using his superior information about the students he teaches. This holds, as mentioned already, for professors who are oriented towards research, as well as for those more interested in consulting or other activities in the business world. Talented and ambitious candidates maximise the value of the ‘exploitation license’ in both uses.

What does all of this mean for the expected ‘model educational path’ of topmanagers in Germany? Students should prefer Universitäten over Fachhochschulen, but at the university level, it should be less important at which school topmanagers graduate than in France and in the U.S. Instead of concentrating on a few universities German high potentials should rather signal their talent via the doctoral degree.

4 Reconsidering the data

The educational choices of topmanagers in our sample are consistent with these theoretical predictions derived from a signaling perspective. In particular we find: An outstanding importance of the doctoral degree for German topmanagers, a large fraction of French topmanagers that has spent part of their career with the state administration and a strong preference of U.S.-American and French topmanagers for a few elite schools.

The incentives to signal ability via educational credentials could differ significantly with the status of a topmanager, though. In a second step we ex-

cluded inheritors, founders as well as a group that may be termed as ‘foreign governors’ from the analysis.

In general, inheritors get to the top of a firm due to their property rights, and not because they were able to convince potential employers of their outstanding qualities as managers. Consequently, inheritors should have a reduced need to signal ability to outsiders. In the U.S. there was but one, in France 12, and in Germany there were four of such cases.

Another group that should be less focused on signaling managerial abilities to potential employers are founders. Founders typically had a business idea and built a firm around this idea. They started with a small firm as owner-entrepreneurs. Eventually, the firm became bigger and bigger and stock was issued to finance growth. Because founders are self-employed from the very beginning, they also do not need to signal managerial abilities to employers. There were ten founders in the U.S., seven in France, and 17 in Germany within the respective groups of topmanagers.

Finally, it is common practice that the topmanagers of subsidiaries abroad are appointed by the headquarters of the firm. These topmanagers are ‘foreign governors’ in their country of operation. We do not intend to say, that foreign governors did not have to signal their above-average human capital. Of course they did, but they did so in the countries responsible for their appointment. Obviously, these people can not be considered in an analysis of higher education as a filter in their host countries. At the time of our investigation there were no such cases among the American and German topmanagers in our data, whereas for France, four PDG belonged to this category.

All in all, we are thus dealing with a remaining dataset of 90 CEO, 74 PDG, and 82 VV. We assume that these salaried topmanagers at some point of their careers faced the problem of signaling their above-average human capital to potential employers. They should display the described patterns in a more pronounced way.

Table 4: Educational paths of salaried topmanagers

| | USA | France | Germany |
|-------------------------|------------|---------------|----------------|
| | n = 90 | n = 74 | n = 82 |
| higher education degree | 97,8 | 97,3 | 95,1 |
| doctoral degree | 5,6 | 4,1 | 58,5 |
| state service | 1,1 | 44,6 | 2,4 |

For all three countries salaried topmanagers have a higher education rate as the other groups. French inheritors and German founders less often possess a higher education degree than salaried topmanagers. The fraction of doctoral degree holders among salaried topmanagers is higher in Germany and almost unchanged in the U.S. and France. In the latter countries the doctoral degree is not predominantly a signal for talent. In France, the percentage of state service is higher for salaried topmanagers. This is consistent since such an intermediate service is less attractive for the further career of inheritors and founders. Salaried topmanagers, on the other hand, have the perspective to migrate to the topmanagement position of a state-controlled firm. All these observations fit quite well into the described signaling logic. Of course, there are reasons to be prudent with far-reaching interpretations considering the relatively small number of observations we are dealing with.

The numbers for the percentages of educated topmanagers with a degree from the most frequented schools and the concentration factors are virtually the same for salaried and other topmanagers in the U.S. In France and Germany the numbers for salaried topmanagers are slightly higher but the relative picture still holds: Concentration is highest in France and lowest in Germany.

Finally, we look at whether the distinction between Fachhochschulen and Universitäten plays a role in the educational paths of German VV. 7,6 (7,7) percent of the educated German topmanagers (salaried topmanagers) hold a degree from a Fachhochschule as their highest degree. This small ratio cannot be explained by enrolment numbers alone. In the year 1975 Fachhochschulen accounted for 29,6 percent of the degrees awarded (Hochschul-Informationssystem GmbH, 2002, p. 221). German topmanagers obviously preferred Universitäten over Fachhochschulen. Signaling rents are one possible explanation for this choice.

5 Implications

Our analysis has implications at different policy levels.

At the individual level it contributes to explain why high potentials with an ambition for a topmanagement career should follow specific national education path if they intend to signal their outstanding abilities. At the company level, international employers should keep different national signaling mechanisms in mind and adjust their human resource policies accordingly if they want to identify and systematically attract the foreign employee-elite. State governments, finally, have to decide if their higher education system has an appropriate structure and employs an effective validation mechanism. In particular, German authorities must cautiously evaluate the benefits and disadvantages of an egalitarian compared to a hierarchical education system (Franck and Opitz, 2000). French authorities on the other hand may consider the market as an al-

ternative validation mechanism for their education hierarchy. With an ongoing deregulation of the French economy, state monitoring is likely to become less effective and less feasible. Similar developments may have contributed to the dramatic changes of the higher education systems in a number of central and east European countries. A withdrawing state monitor has given rise to a fast growing private sector that is now validated via the market (Gerger, 2000; Giesecke, 1999).

Endnotes

- 1 A further differentiation of degrees in different subjects was not possible due to data limitations. In particular, a great number of French topmanagers only named the school they had attended and did not specify their subjects.
- 2 There exists some variation in how countries count students and schools, and which students and schools they count. In France and Germany universities almost exclusively are single institutions that exist in only one place. For the U.S. we treated a university as a single institution and included her branch campuses and graduate schools.
- 3 Graduation figures for the different schools are head counts and were obtained from the school's statistical yearbooks. The total numbers of graduates for the three countries were retrieved from National Center For Education Statistics (2002, table 255), Ministère de l'Éducation Nationale (2003) and Statistisches Bundesamt (2003). This is a rough procedure since present topmanagers graduated some time ago and school sizes as well as student populations have changed over time. We originally intended to use the numbers for the year 1975, when the average age of the topmanagers in our sample was 22,3. Unfortunately, not for all schools in question 1975 graduation figures were existent and available.
- 4 For a detailed discussion see Franck and Schönfelder (2000).

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