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MAP Social Sciences

Volume 4

MAP Social Sciences (MAPSS) is an international, multi-disciplinary, peer-reviewed journal by **MAP** - *Multidisciplinary Academic Publishing*. The journal is a platform for publication of advanced academic research in the field of social sciences.

E-ISSN: **2744-2454**

ORIGINAL RESEARCH PAPER

IS A PHD AN ENTRANCE TICKET FOR AN EXECUTIVE BOARD POSITION?

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ABSTRACT

This article deals with the question of whether many years of academic training can be the foundation for a successful management career. An analysis of all ATX, DAX and SMI-listed companies was carried out and the highest level of education of all executive board members was analysed. Statistical analyses were used to establish the connection between education and the position and function on an executive board. In addition, it was also analysed whether there is a statistical correlation between the composition of the board of directors and gender. There is a relationship between an academic education and the likelihood of being able to pursue a career on an executive board. However, a PhD is not necessarily a guarantee. Currently, gender also has a significant influence on management careers. This article provides an in-depth insight into the main stock indices in the German-speaking world. It should also serve as motivation that a proper academic education is a solid basis for one of the most sought-after jobs in a public limited company.

Keywords: PhD, Doctor of Philosophy, executive board member, Index, Indexes, managerial career

MAP Multidisciplinary Academic Publishing

MAP SOCIAL SCIENCES

Volume 4

ISSN: 2744-2454/ © The Authors.
Published by **MAP** - *Multidisciplinary Academic Publishing.*

Article Submitted: **18 January 2024**
Article Accepted: **26 February 2024**
Article Published: **27 February 2024**

https://doi.org/10.53880/2744-2454.2024.4.149

MAP SOCIAL SCIENCES Volume 4

HOW TO CITE THIS ARTICLE

Rendl L., Just R. M. (2024). **Is a Phd an Entrance Ticket for an Executive Board Position?**. MAP Social Sciences, 4, 149-160. doi: https://doi.org/10.53880/2744-2454.2024.4.149

INTRODUCTION

a) Requirements for a successful management career

A question that many ambitious talents ask themselves at the beginning of their career revolves around the key factors for becoming a successful manager. This is a question that many ambitious talents ask themselves at the beginning of their career path, many times even earlier, when deciding on the best education for their desired career. No one is born as the perfect manager, if such a person even exists. Being a good and successful manager requires the same learning and practice as many other skills.

Furthermore, there is no perfect education for becoming a successful manager. Besides business administration, most academic programs do not teach management as a special skill (Malik, 2006, p. 68). Many real-life examples have proven that successful managers come from different paths or backgrounds.

The Harvard Business Review Magazine regularly publishes a list of the top-performing CEOs of the world. In 2014, unsurprisingly, the list was headed by Jeff Bezos, the founder, and by that time, CEO of Amazon (Ignatius, 2014). Although Bezos went to the famous and highly regarded Princeton University, he did not graduate in economics, he graduated with a Bachelor of Science in Engineering (Jackson, 2023).

Another famous example is Jack Welch, the former CEO of General Electric, who ranks as one of the most successful and influential managers of the twentieth century. He also has a technical background without many economic skills in his college education (Collingwood & Coutu, 2002). He graduated with a PhD in chemical engineering (Welch & Byrne, 2001, p. 15f.).

The ideal profile of a manager has been researched very precisely over the last decades (Malik, 2006, p. 33). As a result of this extensive research, one can also find a catalog of criteria to become a successful manager. Executive search consultants, recruiters, or employees of human resources management have a very clear idea of the required skills, knowledge, personal characteristics, competencies, etc. of managers (Malik, 2006, p. 34).

In the last few years, the working world has been changing constantly. The recent Corona pandemic has significantly increased the speed of establishing a new working environment. With the beginning of the pandemic and the start of the lockdowns, enterprises, even those with a more conservative approach, were forced to establish remote working almost over night (Wortmann & Böhrnsen, 2022).

With the end of the pandemic, the working environment has changed profoundly. In this context, the term "the new normal" can often be found. The combination of working from the office and remotely, from home or sometimes from anywhere, is nowadays well established (Corpuz, 2021).

Besides this significant change in terms of how and where to work, there is also a significant shift in terms of generations and, therefore, requirements and expectations regarding skills, education, experience, attitude, and many more.

The general level of education in Austria, Germany and Switzerland has been researched very intensively and is the basis of regular statistics. For example, in Austria, "Statistik Austria", the national institute of statistics, publishes on an annual basis, very detailed statistics about the level of education in Austria.

Therefore, the number of students, their fields and the average duration of their studies has been under constant surveillance. It has been seen that since 1981, when 4.5% of the Austrian population held a university degree, this number had almost quadrupled in 2020 by which 19.1% of Austrians had finished their studies (Astleithner et al., 2023). Since all this data already exists, this article wishes to explore a possible correlation between holding an academic degree and having a successful career in management.

However, success is a term that is not easily defined. For the purpose of this research success is defined on the basis of the level of hierarchy achieved by an individual within a company. Naturally, there are many factors that influence a (managerial) career such as personal skills, attitude, networks but also education. An academic education certainly is a good start, but it remains to be seen whether the type of academic degree held influences the likelihood of a career in management.

In terms of academic education, there are significant differences between a bachelor's degree, a master's degree, and a doctoral degree. It starts with the requirements that are needed to

start a specific education, followed by the content and focus areas which are different, as well as the graduation conditions.

The aim of this paper is to research the composition of the Board of Directors of companies that are listed on the Austrian (ATX), German (DAX), and Swiss Stock Exchange (SMI) in terms of the academic degrees of its members to test the following hypotheses:

H1: There is a significant relationship between an academic degree of a PhD title and the probability of becoming a board member in a listed company in Austria, Germany, or Switzerland.

More specifically, not only whether there is a link between a PhD and a position on an executive board is examined, but whether there is a link between a PhD and the position of CEO.

H2: There is a significant relationship between an academic degree of a PhD title and the probability of becoming a CEO in a listed company in Austria, Germany or Switzerland.

b) Austrian Trade Index (ATX)

The Austrian Trade Index (ATX) is the most important stock index in Austria. It is the underlying value of many options and future contracts traded on the Vienna Stock Exchange and shows the price development of the Vienna Stock Exchange's blue chips in real time. It is a good indicator of the development of the Austrian market as a stock market barometer for the Vienna Stock Exchange.

The ATX contains the shares of the 20 largest Austrian companies that are listed on the stock exchange. Because the ATX is a price index, its price is determined by the prices of the 20 stocks included. As a result, dividends and other capital distributions are not included in the index. The ATX's price is, thus, determined solely by the price changes of the index members.

In March and September, the composition of the Austrian Traded Index and the weighting of the stocks it contains are checked and adjusted. Only shares from companies listed in the prime market segment are considered. To be included in the ATX, a share must be one of the top 25 most liquid shares in the prime market, as well as rank among the top 25 in terms of market capitalization. Each time the index is adjusted, a maximum of three shares can be exchanged. The shares included in the ATX are weighted based on their market capitalization in free float.

The ATX was launched on January 2nd, 1991, with a starting value of 1,000 points. Index levels are calculated retrospectively but are available through December 31, 1985 (*ATX aktuell*, 2023).

c) German Stock Index (DAX)

The German stock index DAX is the leading index of the German stock exchange. In its current form it debuted on the Frankfurt Stock Exchange in June 1988. The Hardy Index from 1959 and the Börsen-Zeitung-Index from 1981 were the index's forerunners. The initial price of 1,163.52 points resulted from defining the 1987 closing price as 1,000 points.

The DAX 40 index represents and reflects the performance of the 40 largest German companies in terms of market capitalization and stock market turnover. As a result, it is regarded as an indicator of the overall development of the German stock market. The DAX contained 30 stocks until September 17, 2021, when the number of stocks included was increased to 40. The DAX stock selection and weighting are reviewed twice a year (in March and September) and updated as needed.

Listing on the Frankfurt Stock Exchange's Regulated Market, where companies must meet specific international transparency requirements, is required for inclusion in the DAX. This includes the submission of quarterly reports, the holding of an annual analyst conference, and the publication of ad hoc announcements in English, among other things.

Every trading day, the German stock index is calculated during Xetra trading hours between 9.00 a.m. and 5.30 p.m. Following the end of Xetra trading, the price will be based on the Frankfurt Stock Exchange floor prices between 5.00 p.m. and 8.00 p.m. in the L-DAX (Late DAX) and 8.00 a.m. to 9.00 a.m. in the L/E-DAX (Late/Early DAX) (*DAX heute aktuell*, 2023).

d) Swiss Market Index (SMI)

The SMI (Swiss Market Index) is the most important stock index in Switzerland. The SMI was established on June 30, 1988. Its starting point at the time was 1,500 points. The SMI has only had a fixed number of 20 stocks since 2007. Prior to that, the number of stocks listed in it could vary greatly.

The SMI is Switzerland's blue-chip index, consisting of the 20 most liquid Swiss companies, which also correspond to the SMI's 20 largest companies. The companies listed in the SMI account for approximately 85 percent of the market capitalization traded on the Swiss stock exchange. As a result, the SMI and its performance are regarded as indicators for the entire Swiss stock market. The SMI, like the Dow Jones, is a price index. As a result, the index level represents the average price of the stocks it contains. Dividend payments are not included in the index. The index is also available as a dividend-adjusted performance index known as SMIC.

A share must meet certain criteria to be included in the SMI. Securities listed in the SMI must have a large market capitalization as well as a high trading volume. Market capitalization and trading turnover are weighted equally, and a ranking of stocks in the SMI is created based on these two criteria. The SMI includes the titles that hold the highest positions in the ranking. The composition of the SMI is reviewed twice a year and, if necessary, adjusted. The adjustments are made after trading has ended on the third Friday of March and September.

Every trading day between 9.00 a.m. and 5.30 p.m., the SMI is traded, and the index level is recalculated in real time every second. At 5.20 p.m., the final auction will take place. The preliminary opening occurs between 6.00 a.m. and 9.00 a.m. Trading before the market opens serves to determine the theoretical opening price, but orders are only collected and not yet executed. After-hours trading occurs between 5.30 p.m. and 10.00 p.m., when orders can be entered but not executed (*SMI aktuell*, 2023).

After establishing the basic information regarding the indices used in this study, the next section explores the differences between the types of degrees included in this research.

e) Bachelor's Degree

A bachelor's degree can be obtained by completing a bachelor's degree program at a public university, a private university, a theological college, a course of study at a university of education, a university of applied sciences or a bachelor's degree program at a technical college. The bachelor's degree is a complete course of study that lasts at least six semesters, requires 180 – 240 ECTS points, and culminates in graduation.

The exact names of bachelor's degrees (for example, "Bachelor of Science") are determined by the universities or colleges. The title obtained by a bachelor's degree is appended to the end of the name (*Akademische Grade in Österreich*, 2022).

f) Master's Degree

A master's degree is obtained by completing a master's degree program at one of Austria's public universities, private universities, universities of education, or universities of applied sciences.

The master's program is a complete course of study that typically lasts at least four semesters, requires 90 to 120 ECTS points (minimum 60 ECTS points), and culminates in graduation. A bachelor's degree is required for admission to a master's program.

The exact names of master's degrees (for example, "Master of Science") are determined by the respective institution. The title obtained by a master's degree is also appended to the end of the name (*Akademische Grade in Österreich*, 2022).

g) Master of Business Administration (MBA)

Master's degrees in further education occupy a unique place among master's degrees**.** They are academic degrees that are earned after completing specialized training or additional education with a strong professional focus. A completed bachelor's degree, diploma degree, or master's degree, or an equivalent qualification, is required for admission. In terms of professional law, master's degrees in further education can be a professional requirement for admission to certain commercial activities and lead to a special academic professional qualification for the private labor market in some cases.

Even though they share some terminology, master's degrees in further education are not the same as master's degrees in regular studies (master's studies). The MBA program is a full course of study that typically includes 120 ECTS points and lasts at least four semesters (*Akademische Grade in Österreich*, 2022).

h) PhD (doctoral degree)

A doctoral degree is the highest academic degree to be achieved. In Austria, Germany**,** and Switzerland there is even a habilitation possible which offers the "Venia Legendi" – the permission for a professorship in a specific field of studies.

A PhD/doctoral degree can only be obtained by completing a PhD/doctoral program at one of Austria's public or private universities. In general, a PhD/doctoral degree can only be started after completing a master's degree or a similar education. The PhD program lasts at least three years and includes a set number of ECTS points that must be earned. The number of ECTS points earned is determined by the public or private universities themselves.

A dissertation is required as part of a PhD/doctoral degree, in addition to taking individual courses. Furthermore, public or private universities may require the completion of an oral defense, also referred as Rigorosum or several partial Rigorosums, or a dissertation defense. Titles obtained through PhD degrees come after the name, whereas those following doctoral degrees are placed before the name (*Akademische Grade in Österreich*, 2022).

Having established the various degrees available, the relationship between such degrees and the holder's professional career is the focus of the next section.

i) Effects of specific academic degrees on a professional career

For many years, people with specific academic degrees have been awarded leadership positions in businesses. It was rather usual for someone with a PhD (doctoral) degree to hold the most desirable positions, such as Chief Executive Officer (CEO). It appeared that becoming a board member of an index-listed firm was difficult without appropriate academic degrees.

However, it seems that, especially in Austrian companies within the banking and finance sector, press releases and newspaper articles give the impression that many CEOs have a PhD title.

Higher education in the last years has been seen as an instrument to compete on a global level (McAlpine, 2017). Therefore, it is not surprising that especially listed companies have strongly focused on employees with higher education. The role of PhD titles for a scientific career has been researched, but not the specific effects on a practical career outside science. In the past, especially within the last 15 years, there has been an increase in the involvement of public authorities through national policies and research funding councils through a restructuring of doctoral funding models (Lee, 2013). As a result of these new models, especially in Germany and Austria, several doctoral centers of interdisciplinary excellence have been created.

A doctoral degree in its intentional background should be a preparation for an academic degree. But reality shows a different picture. Internationally, more than 50 percent of all doctoral graduates leave the higher education sector (McAlpine et al., 2013).

It can be seen that the availability of a range of academic degrees is not necessarily a guarantee for graduates obtaining an executive position in the economic sector. Therefore, this study examines the relationship between such degrees and the actual number of people who achieve management positions. Before results can be presented, the following chapter introduces the methodology used in this research.

DATA AND METHODS

a) Participants

For this research the authors have analyzed 20 companies of the ATX, 40 companies of the DAX, and 20 companies of the SMI, a total of 80 companies was analyzed (variable: **index**). In terms of board members, the authors have analyzed a total of 498 persons.

The education of the board members has been classified into the following categories:

- No academic degree
- Bachelor's degree
- Master's degree (incl. MBA)
- Doctoral Degree (PhD)

There are many different academic degrees, but for the purpose of this research they were limited to the greatest possible distinction between the different academic levels and summarized (variable: **edu_lev**).

The positions and, above all, their designations differ from company to company. However, one can extract three superordinate designations. The CEO, chief executive officer, is the head of the Executive Board. In some cases, they are also referred to as the speaker of the executive board. In principle, they are responsible for the overall strategic direction of the company. Another, no less

important function, is the CFO, chief financial officer, who is responsible for the company's entire finances. All other functions are summarized in this article as executive board members. These are, for example, COOs, chief operation officers, CTOs, chief technology officers, or many other functions. These depend very much on the actual company. The size and staffing of the board also depend heavily on the purpose of the company and its overall size. Anything is possible, from a sole board member to just one CEO with a strong first management level and a large board with more than 10 members, for example.

Beside the specific academic degree that offers the best chances to get on the board of directors, there is currently an intensive discussion about the diversity of the composition of the managing board, also in terms of gender (Fleischer, 2022). Therefore, it is not surprising that the topic also caught the attention of empirical research in European countries as well as in countries overseas (Maida & Weber, 2022). Unfortunately, the number of women on the board of directors, at least in Austria, is still low (Mensi-Klarbach, 2017). Although there have been several initiatives, especially for companies with major state ownership, and the focus on this important topic is high, it seems that the number of women represented on management boards is growing very slowly and only marginally. It seems that ideas for the public sector, or at least for companies with major state ownership, do not find direct application within the private sector and the discussion about mandatory quotas is also no guarantee for success (Mensi-Klarbach & Seierstad, 2020).

To gain an up-to-date overview of the situation in Austria, Germany, and Switzerland, the gender of the board members was also recorded to see whether this also influences a management career (variable: **gender**).

b) Instruments

The main instrument used was the data collection of all relevant data/variables from the annual reports of the stock listed companies. These were collected manually in Excel. These were then formatted and coded in Excel. Finally, the data set was transferred into SPSS and analyzed.

c) Procedure for data collection

The analysis is based on the companies listed in the ATX, DAX, and SMI indices in 2022. All data was extracted directly from the annual reports, or the data published by the companies on their websites in the Investor Relations or Financial Reports sections. In total, more data was collected than was necessary to test the hypotheses and answer the research questions. This offers the opportunity to build on this research in the future.

d) Method of data analysis

At the beginning, the descriptive statistics and the frequency statistics were carried out. Due to the fact that the level of education of the executive (variable: **edu_lev**), is an ordinal variable and the executive member position (variable: **position**) is a nominal variable, a cross-tabulation analysis was performed as the best solution. As a post-hoc test, a Chi-Square test was performed to see if there were any dependencies.

RQ1: Does gender have a statistical influence to become an executive board member?

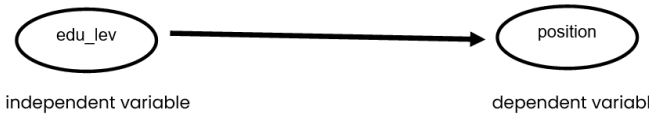
Table 1.
Variables overview of the research

name of variable	label	values	Type of variable
position	executive member position	1 = CEO 2 = CFO 3 = member	nominal
age	year of birth of the executive	scale	scale
gender	gender of the executive	1 = female 2 = male	nominal
edu_lev	level of education of the executive	1 = no academic degree 2 = Bachelor 3 = Master 4 = PhD	ordinal
charge	year since the executive is in charge	scale	scale
index	acronym of the index	1 = ATX 2 = DAX 3 = SMI	ordinal

In this research the dependent variable is always the executive position on the board, called "position".

Hypothesis I: *There is a significant relationship between an academic degree of a PhD title and the probability of becoming a board member in a listed company in Austria, Germany, or Switzerland.*

Figure 1.
Relationship between independent and dependent variable



Hypothesis II: *There is a significant relationship between an academic degree of a PhD title and the probability of becoming a CEO in a listed company in Austria, Germany, or Switzerland.*

Figure 2.
Relationship between independent and dependent variable

At the beginning, all the statistical frequency analyses for the categorical and ordinal variables were done.

Table 2.
Frequency statistics of the research

index	N	%
ATX	85	17.1%
DAX	238	47.8%
SMI	175	35.1%
N Valid	498	100%
N Missing	0	0%
executive member position		
CEO	80	16.1%
CFO	68	13.7%
member	350	70.3%
N Valid	498	100%
N Missing	0	0%
gender of the executive		
female	103	20.7%
male	395	79.3%
N Valid	498	100%
N Missing	0	0%
level of education of the executive		
no academic degree	17	3.4%
Bachelor	40	8.0%
Master	301	60.4%
PhD	139	27.9%
Missing System	1	0.2%
N Valid	497	98.8%
N Missing	1	0.2%

For all scale variables, descriptive statistics were done.

Table 3.
Descriptive statistics of the research

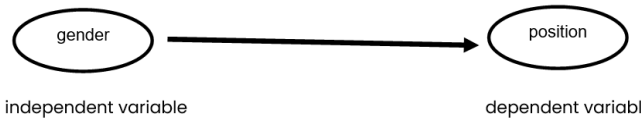
	N	Minimum	Maximum	Mean	Std. Deviation
year of birth of the executive	489	1951	1985	1968.85	5.566
year since the executive is in charge	498	1988	2023	2018.09	4.944
Valid N (listwise)	489				

To address the first hypothesis, *there is a significant relationship between an academic degree of a PhD title and the probability of becoming a board member in a listed company in Austria, Germany or Switzerland",* the independent variable level of education of the executive (variable: **edu_lev**), which is an ordinal variable, must be analyzed using crosstab analysis and a Chi-Square test because also the dependent variable executive member position (variable: **position**) is an ordinal variable.

The second hypothesis, "*there is a significant relationship between an academic degree of a PhD title and the probability of becoming a CEO in a listed company in Austria, Germany, or Switzerland",* requires the same analysis as the first hypothesis. The hypothesis is not formulated so openly but is specifically aimed at the position of CEO.

Research question I: *Does gender have a statistical influence on becoming an executive board member?*

Figure 3.
Relationship between independent and dependent variable



To answer the first research question, *"Does gender have a statistical influence on becoming an executive board member?"*, the method used was a crosstab analysis and a chi-square as a post hoc test. The independent variable gender of the executive member (variable: **gender**) is a nominal variable and the dependent variable executive member position (variable: **position**) is an ordinal variable.

RESULTS

Hypothesis I: *There is a significant relationship between an academic degree of a PhD title and the probability of becoming a board member in a listed company in Austria, Germany, or Switzerland.*

The cross-tables show that hypothesis 1 must be **rejected**. The p-value for the chi-square test was found to be p = 0.027.

Hypothesis II: *There is a significant relationship between an academic degree of a PhD title and the probability of becoming a CEO in a listed company in Austria, Germany, or Switzerland.*

The cross-tables show that hypothesis 2 must be **rejected**. The p-value for the chi-square test was found to be p = 0.027.

Research question I: *Does gender have a statistical influence on becoming an executive board member?*

Gender **has a statistical influence** on becoming an executive board member. The p-value for the chi-square test was found to be p = < 0.001.

DISCUSSION

It is impossible to predict whether many years of education will result in a well-paid position. This article examined the relationship between tertiary education and the position on the executive board of a public limited company in the German-speaking world. Some of the best-paid and most sought-after jobs are in index-listed companies.

Thus, the first hypothesis (H1) was formulated as follows: *There is a significant relationship between an academic degree of a PhD title and the probability of becoming a board member in a listed company in Austria, Germany, or Switzerland.*

Table 4.
Executive member position and level of education of the executive Crosstabulation

			level of education of the executive				Total
			no academic degree	Bachelor	Master	PhD	
executive member position	CEO	Count	6	3	41	30	80
		% within executive member position	7.5%	3.8%	51.2%	37.5%	100.0%
		% within level of education of the executive	35.3%	7.5%	13.6%	21.6%	16.1%
	CFO	Count	0	4	46	18	68
		% within executive member position	0.0%	5.9%	67.6%	26.5%	100.0%
		% within level of education of the executive	0.0%	10.0%	15.3%	12.9%	13.7%
	member	Count	11	33	214	91	349
		% within executive member position	3.2%	9.5%	61.3%	26.1%	100.0%
		% within level of education of the executive	64.7%	82.5%	71.1%	65.5%	70.2%
Total		Count	17	40	301	139	497
		% within executive member position	3.4%	8.0%	60.6%	28.0%	100.0%
		% within level of education of the executive	100.0%	100.0%	100.0%	100.0%	100.0%

Table 5.
Executive member position and level of education of the executive Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	14.226a	6	.027
Likelihood Ratio	15.811	6	.015
Linear-by-Linear Association	1.476	1	.224
N of Valid Cases	497		

Note. 2 cells (16.7%) have expected count less than 5. The minimum expected count is 2.33.

Table 6.
Executive member position and gender of the executive Crosstabulation

			gender of the executive		
			female	male	Total
executive member position	CEO	Count	1	79	80
		% within executive member position	1.3%	98.8%	100.0%
		% within gender of the executive	1.0%	20.0%	16.1%
	CFO	Count	11	57	68
		% within executive member position	16.2%	83.8%	100.0%
		% within gender of the executive	10.7%	14.4%	13.7%
	member	Count	91	259	350
		% within executive member position	26.0%	74.0%	100.0%
		% within gender of the executive	88.3%	65.6%	70.3%
Total		Count	103	395	498
		% within executive member position	20.7%	79.3%	100.0%
		% within gender of the executive	100.0%	100.0%	100.0%

Table 7.
Executive member position and level of education of the executive Chi-Square Tests

Chi-Square Tests			
	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	25.289a	2	<.001
Likelihood Ratio	35.601	2	<.001
Linear-by-Linear Association	25.025	1	<.001
N of Valid Cases	498		

Note. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 14.06.

According to the Chi-Square test, there is a significant relationship between the education level and the probability of being an executive board member. Only 3.4% out of all executive board members are without an academic degree. All others have at least a bachelor's degree. The majority, 60.6%, holds a master's degree. The highest academic degree held by 27.9% of all executive board members is a PhD.

The hypothesis can only be rejected, because the PhDs graduates are only the second largest group in the sample. The statistical correlation between holding a master's degree and becoming a board member in a listed company in Austria, Germany, or Switzerland is higher.

The second hypothesis (H2) was much more narrowly formulated and was aimed at the highest position on an executive board, the CEO: *There is a significant relationship between an academic degree of a PhD title and the probability of becoming a CEO in a listed company in Austria, Germany or Switzerland.*

To confirm or reject the hypothesis, the same statistical analysis as for hypothesis one was used. The Chi-Square test revealed a statistically significant relationship between the education level and the probability of being an executive board member. In the cross-tab, it is visible that 16.1% of all executive board members are CEOs. The highest numbers of CEOs are master graduates, the second PhDs. When comparing all groups within the educational level variable, it was found that non-academics have the highest probability to become CEO with more than 35.3%. Number two are the PhDs with 21.6% of all PhDs being CEOs. The largest group with master graduates as CEOs represents only 13.6% of all master graduates are CEOs.

This also means the second hypothesis must be rejected.

However, there is a strong relationship between an academic education and the likelihood of becoming an executive board member. Only 3.4% of executive board members have no academic education, in contrast to the Austrian average of 19.1% of people with an academic degree in 2020 (Astleithner et al., 2023).

Due to the highly topical nature of the subject of gender, a research question regarding this issue was added. RQ1: *Does gender have a statistical influence on becoming an executive board member?* In the Chi-Square test, there is a statistically significant relationship between the gender of an executive board member and the probability of being an executive board member. Only 20.5% of all executive board members are female. This group is underrepresented. Even worse is the ratio at the CEO level, only 1.3%, or one woman, is CEO of all index-listed companies in the German-speaking world. 16.2% of all CFOs are female. Thus, the research question can be answered positively as there is a clear connection between gender and the probability of becoming an executive board member.

In summary, it can be stated that, although scientific instruments could not proof the hypotheses, it is clear that a profound academic education and, therefore, also a PhD, always influence a person job opportunities positively. They might not be guarantees for a successful managerial career and a seat on the board of directors, but they are undoubtfully a vital investment in a key factor for a successful career: in oneself. The development of personal and technical skills and the attitude to challenge oneself and to strive for getting better every day, are essential steps in the right direction. Already long time ago, Socrates was convinced that "we cannot remain as we are". It does not matter who one is or what one has done, everyone can improve (Holiday, 2022). These statements are as true today as they were in the past.

CONCLUSION

Many young talents are faced with the difficult decision of starting an academic career or going straight into professional life. It is not possible to say in advance whether the arduous and sometimes lengthy path of studying will be worth all the effort or not. This article considered the question: *Is a PhD an entrance ticket for an executive board?* Inevitably, this article was not only concerned with the highest academic degree of PhD, but also in general with the question whether an academic education is a guarantee for a seat on an executive board of a publicly listed company in Germany, Austria or Switzerland. As already mentioned at the beginning, there are many factors in addition to academic education, which could not be discussed in this article.

One of the aims was to assess which academic degree offers the best chances of a promising management career. In the end, the most interesting finding question to be answered is whether engaging in a PhD degree is worth the effort.

As assumed, there is a significant relationship between a university education and a management career on an executive board. Master's graduates make up the largest group, followed by the actual target group of PhDs. Although it was assumed otherwise, both hypotheses had to be rejected. In both hypotheses, PhD graduates are the second largest group.

Hypothesis 1: "*There is a significant relationship between an academic degree of a PhD title and the probability to become a board member in a listed company in Austria, Germany, or Switzerland*", must be rejected because the strongest relationship is visible in the category of the master´s degree graduates. If one takes into account that far fewer students graduate with a PhD than with a master's degree and, therefore, the total number of available PhD graduates is lower, PhD executive board members are very highly represented .

Hypothesis 2 is similar to hypothesis 1 but is broken down even further to the highest management position in a stock corporation, the CEO. The results clearly show that master's degree graduates again represent the largest group of CEOs, but only in terms of absolute numbers. Relatively speaking, measured in terms of the different groups, the non-academics show the highest number. In the entire survey, there are only 17 non-academics, but 6 or 35.3% of them are CEOs. Factors that have certainly not been investigated play the overriding role here. 30 PhDs are CEOs and also represent the second largest group here, measured both in absolute and relative terms, which means 21.6% of all PhDs are CEOs, although only 16.1% of all executive board members are CEOs. If one considers all these factors and leaves out the factors that cannot be analyzed and which can influence a management career, an academic career as preparation or entry factor for a management career seems to be beneficial.

Due to the high degree of topicality and the data collected, a research question was added: "*Does gender have a statistical influence on becoming an executive board member?*" The data collected shows that gender influences management careers. The picture is very clear in the CEO position. There are currently, in the year 2022, more female graduates than male graduates in Austria. However, you have to look at the average year of the executive board member. Back then, there were fewer university graduates overall and fewer female graduates in general. Nevertheless, women are underrepresented in the index of listed companies analyzed. This will or should change over time.

RESEARCH LIMITATIONS AND SUGGESTIONS FOR FURTHER RESEARCH

This article is aimed exclusively at the German-speaking world. Therefore, only the three most important indices (ATX, DAX, and SMI) with the most important listed corporations are included in the research content. Thus, the results do not necessarily have to be valid throughout Europe or worldwide. Other researchers can compare the results with other regions, for example the northern European countries with a different attitude regarding education or, especially, gender.

A second limitation is that the research in this paper includes no influence of the different university statistics such as graduation statistics by gender or graduation rate measured against the total population in the researched area. Also, the statistics influence other social differences concerning demographic change.

Further areas of interest could be whether a CEO with a PhD influences the success or turnover of a company positively or how the proportion of women on the executive board could be developed in the future. Moreover, the education of second-level managers could be examined.

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