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DAX Companies in 2019, Financial Performance and Their Women Quota on Supervisory and Management Boards

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ABSTRACT

Before the Covid-19 pandemic in German 30-DAX companies the women quota in supervisory boards and management boards increased compared to previous years. The COVID-19 pandemic led to a decrease in women's participation on the labour market, the working life of women being particularly affected. As of September 2020, the number of women in executive positions of the 30-DAX companies decreased, six women leaving the executive board in just one year (AllBright, 2020: 8). The present article investigates the situation of DAX companies with regard to their financial performance in 2019, their sectors of activity and women quota on their supervisory and management boards. It proposes the introduction of new key performance indicators (KPIs), such as the women process performance development (WPPD) index and it shows how such KPIs can be integrated in a company process in order to force a structural and systemic change.

KEYWORDS

DAX, women on supervisory boards, women on management boards, key performance indicators, gender quota, women process performance index.

1. Introduction and literature review

As of 2021, many parts of the world claim to be committed to non-discrimination and fighting inequality at all levels of society, yet does equality prevail? For instance, equality between women and men in employment, work and pay is explicitly enshrined in the article 23 of the Charter of Fundamental Rights of the European Union (EU), but there are still great differences in career opportunities and salary levels of men and women. Estonia, Latvia, Austria and Germany had in 2019 the highest gender pay gap (understood as "the percentage difference in average gross hourly earnings between men and women" – Statistisches Bundesamt, 2019), while the gender employment gap for the same year was 11.7%, meaning that less women than men are employed at EU level (European Commission, 2020a). The proportion of women in management positions is also much lower, with almost 6.9% of top companies' CEOs as women (European Commission, 2020b: p. 4).

The situation is similar with the one from the United States of America (USA), where the gender employment gap in 2018 was 11% (England et al., 2020) and a woman earned on average 82 cents for every $1 a man would earn (Bleiweis, 2020). Of all S&P 500 companies, only 6% of CEO positions were hold by women (Catalyst, 2021).

The COVID-19 pandemic brought to the fore that countries led by women were more successful in dealing with the challenges of the crisis than countries led by men. One such example is New Zeeland's prime minister, Jacinda Ardern. She led her country well and calmly through the pandemic by acting early and following a clear strategy. Germany's chancellor Angela Merkel has been also often praised for her crisis management skills (see for instance Boden, 2020) and Germany has been "traditionally" the largest economy of the EU, in 2019 for instance generating almost a quarter (24.7%) of the gross domestic product (GDP) of the entire EU (Eurostat, 2020). This requires a strong management at country's level and strong companies with visionary leadership. In this context, the current article looks at the largest German companies in terms of market capitalization, which are part of the DAX 30 blue chip index, DAX being "the undisputed benchmark for German stocks and a reliable barometer for Europe's largest economy" (Quontigo, 2021). The focus is laid on the management structures of these companies in light of gender diversity. In the past, women were rather a rarity in management positions. In recent years, however, this has changed, a determinant factor being the introduction of a women's quota for the supervisory boards. Moreover, women started to be appointed also

for executive positions, where no quota applies. Jennifer Morgan became the first chief executive officer (CEO) of a DAX company in October 2019 (Weibler and Endres, 2019) and she is not the only female CEO of a German company: Nicola Leibinger-Kammüller, is for instance CEO of Trumpf (Kujacinski, 2021). In the future, more and more women are expected to hold these positions. This raises the question of whether women's presence in management positions also have a positive influence on the success of the company in business. The goal of this article is firstly therefore to offer an overview of the management boards, both executive and supervisory, of DAX 30 companies in 2019. Secondly, we aim to investigate whether there is a correlation between the earnings before taxes (EBT), as well as the earnings before interest and taxes (EBIT) as important key performance indicators (KPIs) of a company and the proportion of women in management positions. The following hypotheses are formulated and will be tackled in the following sections:

> H1: Companies with a higher gender quota in supervisory boards are more successful and achieve a higher EBIT or EBT.
>
> H2: Companies with a higher gender quota in management boards are more successful and achieve a higher EBIT or EBT.

The paper draws on existing literature in the field of key performance indicators (KPIs), diversity management, women quota and supervisory boards and it is structured as follows: in a first step, the DAX-30 companies are described on the basis of the annual reports. As publicly traded companies in Germany have a two-tier board structure, this dual board structure will be described and the women quota for both the management and the supervisory board will be calculated and presented. Furthermore, a correlation analysis is conducted in order to see, whether there is a relationship between the number of women on supervisory boards and management boards and the financial performance of the companies under scrutiny. Considering however that women presence in companies in general and especially on companies' boards is still low, the author of this paper proposes the introduction of a new metrics, called the "women process performance management" (WPPM) index, which will be shortly described in the methodology part. The last sections are dedicated to the findings regarding the DAX companies in 2019, the implementation of the WPPM index as part of a company's process is thoroughly described, and finally the limitations of this study as well as suggestions for future research are provided.

2. Methodology

The raw data necessary to conduct this study was collected from the annual reports of the DAX companies from 2019. For completeness sake, the companies' overview (see Tables 1 and 2) includes also Wirecard, a company that entered the DAX blue-chip market index in 2018 and began insolvency proceedings in June 2020, in what is known as "Germany's biggest post-war scandal" (Reuters, 2021). Due to the unreliability of the financial data from Wirecard's balance sheets, this company was excluded from our analysis.

"Born" in 1988, DAX with its 30 companies currently represents "approximatively 80 percent of the aggregate market capitalisation of listed German stock corporations" (Deutsche Börse, 2021). Some of the companies first included in the index in 1988 were still constituents of the index in 2019: e.g. Allianz, BASF, Bayer, Henkel, etc. This speaks for the stability and consistency in terms of economic performance of these companies, and for the reliability of this index in depicting the German economy in general. All DAX companies must publish annually their accounts and these include information also about their supervisory and management boards and the compliance with the German Corporate Governance Codex. A two-tier management model, in opposition to the Anglo-Saxon one-tier model, characterizes the corporate governance practice in Germany. The German supervisory board ("Aufsichtsrat"), as the name implies, has an oversight role of the management actions and it shows the importance of stakeholders such as employees, state unions, etc. The supervisory boards in Germany are generally large (20 members for companies having over 2,000 employees) and are elected by the employees and by the the shareholders (10 members each) (ICGN, n.a.).

Our approach was to first collect both financial data and information about the composition of the boards of DAX companies, which will be presented in the following two tables. The revenue, the EBT and EBIT have been selected as some of the most common KPIs used by companies. For instance, as publicly listed companies all DAX firms must report their revenues. EBIT as a profit metric takes into consideration depreciation and amortization (but not interests and taxes) and it is a practical KPI for comparing companies from the same sector (Binder and Högsdal, 2017), an aspect that will be dealt with in this article. The EBT is an additional and complementary KPI to the EBIT, as the earnings of a company are influenced also by the interests the company has to pay to finance its capital structure (Binder and Högsdal, 2017). We also calculated the women quota for each of the DAX companies, for both the executive and the supervisory boards. In order to measure

the strength of the relationship between the women quota of this companies and their financial performance as measured by the EBIT or EBT we conducted a correlation analysis.

As already mentioned, the author proposes the introduction of a KPI called "women process performance management" (WPPM) index, which can be calculated as following:

$$WPPM = \frac{Customer\ Importance\ \times\ Customer\ Satisfaction}{Process\ Cost\ Rate\ (Women\ Capacities) \div Benchmark\ Cost\ Rate\ (Women\ Capacities)}$$

This KPI should increase over a long strategic planning period. A better position in comparison with the main benchmark competitor should be achieved for instance by improving the process cost rate via better recruitment of qualified women or improving customer experience. The WPPM index should be measured at least once quarterly within the following overarching company process:

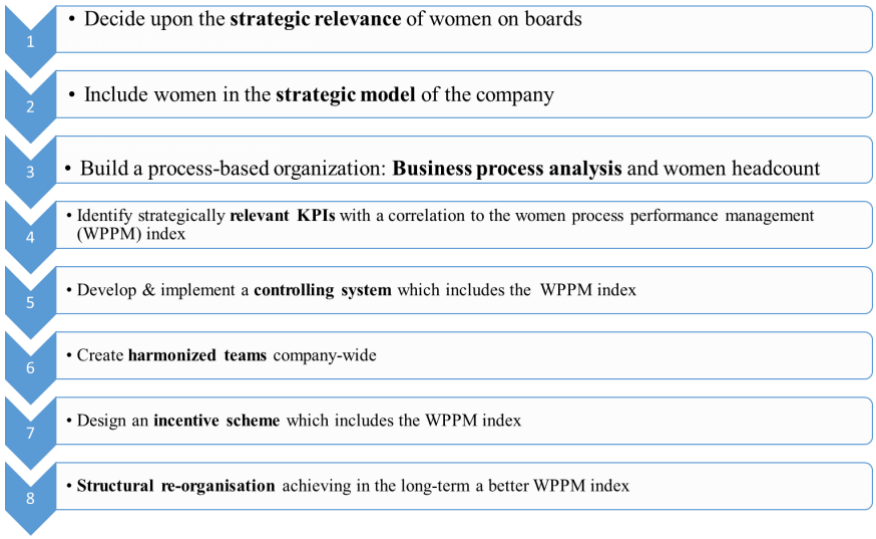

Figure 1: The eight-step company process aimed at increasing women presence at all levels of a company (own creation).

The process visualised in Figure 1 will be thoroughly described in a subsequent section. The following section proceeds with the overview of the DAX companies and some of the computed calculations are also included. The results of the correlation analysis and the testing of the hypotheses will be presented.

3. Findings – DAX 30 companies in 2019 and women presence on boards

Table 1 and Table 2 provide a brief overview of the index composition of DAX, as well as key financial information in the form of revenues, EBIT, etc., workforce and women presence on the boards of these companies.

Nr.	Company	Sector	Revenue in mEUR	EBIT in mEUR	EBT in mEUR	EBT/ Revenue	Employees	EBT/ Employees in €
1	Adidas	Fashion, Sport	23,640	2,660	2,558	11%	59,533	42,968
2	Allianz	Insurance	142,369	11,855	11,077	8%	147,268	75,217
3	BASF	Chemical Industry	59,316	4,052	3,302	6%	117,628	28,072
4	Bayer	Pharmaceutical Industry	43,545	4,189	2,880	7%	106,092	27,146
5	Beiersdorf	Chemical Industry	7,653	1,032	1,037	14%	20,654	50,208
6	BMW ST	Automotive	104,210	7,411	7,118	7%	133,778	53,208
7	Continental	Automotive	44,478	- 268	- 589	-1%	241,458	- 2,439
8	Covestro	Chemical Industry	12,412	852	761	6%	17,201	44,242
9	Daimler	Automotive	172,745	4,329	3,830	2%	298,655	12,824
10	Deutsche Bank	Financial	23,165	- 2,634	- 2,634	-11%	87,597	- 30,070
11	Deutsche Börse	Financial	3,054	1,452	1,398	46%	6,775	206,347
12	Deutsche Post	Logistics	63,341	4,128	3,474	5%	546,924	6,352
13	Deutsche Telekom	Telecommunication	80,531	9,457	7,260	9%	210,533	34,484
14	E.ON	Energy provider	41,484	1,409	797	2%	78,948	10,095
15	Fresenius	Pharmaceutical Industry	35,409	4,631	3,912	11%	294,134	13,300
16	Fresenius Medical Care	Pharmaceutical Industry	17,477	2,270	1,840	11%	120,659	15,250
17	Heidelberg Cement	Construction supplier	18,851	2,008	1,633	9%	55,047	29,666
18	Henkel VZ	Chemical Industry	20,114	2,899	2,811	14%	52,450	53,594
19	Infineon	Electrical industry	8,029	1,161	1,083	13%	41,418	26,148
20	Linde plc	Mechanical Engineering	28,228	2,933	2,285	8%	79,886	28,603
21	Lufthansa	Aerospace	36,424	1,689	1,860	5%	138,353	13,444
22	Merck	Pharmaceutical Industry	16,152	2,120	1,735	11%	57,036	30,419
23	MTU Aero Engines	Aerospace	4,628	706	667	14%	10,660	62,570
24	Münchener Rück	Insurance	51,457	4,004	3,190	6%	39,662	80,430
25	RWE	Energy provider	13,125	1,267	- 752	-6%	19,792	- 37,995
26	SAP	Software	27,553	4,473	4,596	17%	100,330	45,809
27	Siemens	Healthcare, Energy	86,849	7,087	5,646	7%	383,000	14,742
28	Volkswagen VZ	Automotive	252,632	16,960	18,356	7%	671,205	27,348
29	Vonovia	Real Estate Industry	3,092	3,524	3,139	102%	10,345	303,432
30	Wirecard	Financial						

Table 1. DAX companies as of 2019 and their financial performance as measured by EBIT and EBT. Source: Data collected from the annual records of the companies.

Nr.	Company	Sector	Number of Executive Board Members	Women on the Executive Board	Women's quota in Executive Board	Number of Supervisory Board Members	Women on the Supervisory Board	Woman's quota in Supervisory Board
1	Adidas	Fashion, Sport	6	1	17%	16	5	31%
2	Allianz	Insurance	10	2	20%	12	4	33%
3	BASF	Chemical Industry	7	1	14%	12	4	33%
4	Bayer	Pharmaceutical Industry	7	-	0%	20	7	35%
5	Beiersdorf	Chemical Industry	8	1	13%	12	4	33%
6	BMW ST	Automotive	7	1	14%	20	7	35%
7	Continental	Automotive	7	1	14%	20	6	30%
8	Covestro	Chemical Industry	4	1	25%	12	4	33%
9	Daimler	Automotive	8	2	25%	20	6	30%
10	Deutsche Bank	Financial	7	-	0%	20	7	35%
11	Deutsche Börse	Financial	6	1	17%	16	6	38%
12	Deutsche Post	Logistics	8	1	13%	20	7	35%
13	Deutsche Telekom	Telecommunication	9	2	22%	20	8	40%
14	E.ON	Energy provider	5	-	0%	20	6	30%
15	Fresenius	Pharmaceutical Industry	7	1	14%	12	4	33%
16	Fresenius Medical Ca	Pharmaceutical Industry	7	2	29%	6	2	33%
17	Heidelberg Cement	Construction supplier	8	-	0%	12	5	42%
18	Henkel VZ	Chemical Industry	6	1	17%	16	6	38%
19	Infineon	Electrical industry	4	-	0%	16	6	38%
20	Linde plc	Mechanical Engineering	7	1	14%	12	3	25%
21	Lufthansa	Aerospace	6	1	17%	20	6	30%
22	Merck	Pharmaceutical Industry	5	2	40%	16	5	31%
23	MTU Aero Engines	Aerospace	4	-	0%	12	4	33%
24	Münchener Rück	Insurance	9	1	11%	20	9	45%
25	RWE	Energy provider	2	-	0%	20	6	30%
26	SAP	Software	8	2	25%	18	9	50%
27	Siemens	Healthcare, Energy	8	2	25%	20	7	35%
28	Volkswagen VZ	Automotive	8	1	13%	20	6	30%
29	Vonovia	Real Estate Industry	4	1	25%	12	4	33%
30	Wirecard	Financial						

Table 2. DAX companies as of 2019 and the composition of the management and supervisory boards. Source: Data collected from the annual records of the companies.

A quick look at Table 1 informs the reader that the company with the highest revenue, the highest EBT and the highest EBIT of all DAX companies in 2019 was incontestably Volkswagen. The situation is different though if one looks at the women presence on the executive and supervisory boards of Volkswagen.

In the following, we deepen the analysis of DAX companies aiming to offer an in-depth image of DAX index in 2019 and to test at the same time the hypothesis of the study. Table 3 for instance gives an overview of DAX most important sectors of activity in alphabetical order.

Nr.	Sector	Revenue in mEUR	EBIT in mEUR	EBT in mEUR	EBT/ Revenue	Employees	EBT/ Employees in k€
1	Aerospace	41,052	2,395	2,527	6%	149,013	16,958
2	Automotive	574,065	28,432	28,715	5%	1,345,096	21,348
3	Chemical Industry	99,495	8,835	7,911	8%	207,933	38,046
4	Energy provider	54,609	2,676	45	0%	98,740	456
5	Financial	26,219	- 1,182	- 1,236	-5%	94,372	- 13,097
6	Insurance	193,826	15,859	14,267	7%	186,930	76,323
7	Pharmaceutical Industry	112,583	13,210	10,367	9%	577,921	17,938
8	Others	340,114	37,431	31,674	9%	1,487,016	21,300

Table 3. Sectors of activity of the DAX companies in 2019. Source: Data collected from the annual records of the companies; own representation.

As it can be seen, the automotive sector is the most important one at DAX level, not only in financial terms (Revenue, EBIT, EBT), but also in terms of workforce. In just three automotive companies, which were part of DAX 30 in 2019, there were some 1,345,096 employees working. This only confirms once again that "the German automotive industry is a key industry for employment [and] growth …" (ifo Institute, 2021). The insurance sector, as well as the pharmaceutical and the chemical industry are also important pillars of the German economy. Under the label "Others", where 8 companies are put together, we included those sectors which contained only one company in DAX 30: for instance, Deutsche Post is the only logistics company member of the DAX 30 in 2019, Vonovia is the only company active in the real estate sector and member of DAX 30, etc. It is worth pointing out that these 8 companies together (Heidelberg Cement, Infineon, Adidas, Siemens, Deutsche Post, Linde plc, Vonovia, SAP and Deutsche Telekom) have a high EBIT and EBT and also a high number of employees.

In order to test the first hypothesis (H1: Companies with a higher gender quota in supervisory boards are more successful and achieve a higher EBIT or EBT), two steps are necessary. The women quota for the supervisory boards should be determined and the

EBIT or EBT of the DAX 30 companies should be examined. Figure 2 shows a top ten ranking of the DAX companies with regard to the KPI EBT per employee.

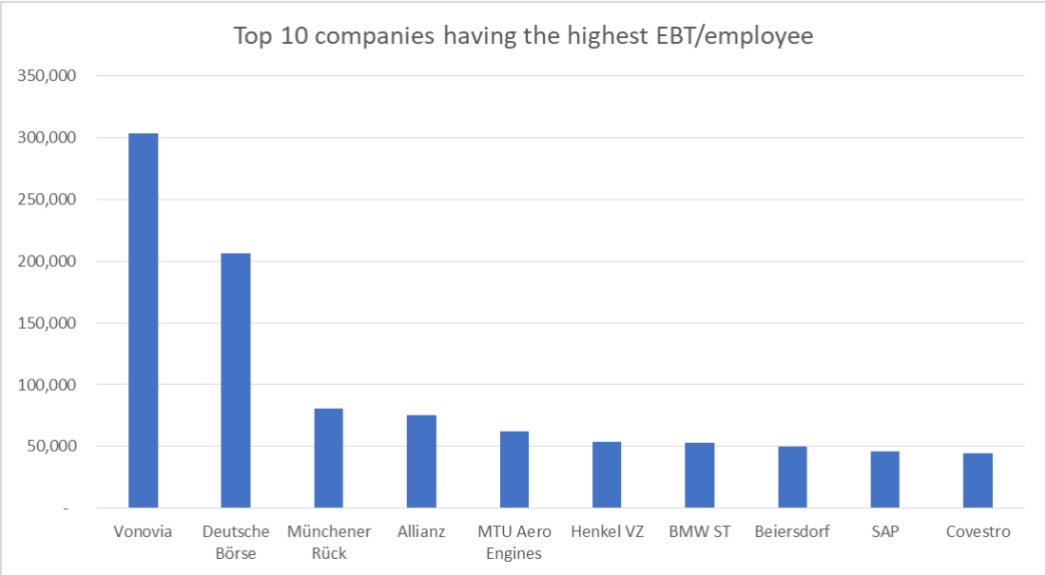

Figure 2. Top 10 DAX companies having the highest EBT/employee in 2019. Source: Data collected from the annual records of the companies; own representation.

On the first place in 2019 was Vonovia (active in the real estate sector) with an EBT/ employee of €303,432. Deutsche Börse with €206,347 and Münchener Rück with € 80,430 follow Vonovia in the 2019 EBT/employee ranking.

When considering hypothesis 1 (H1: Companies with a higher gender quota in supervisory boards are more successful and achieve a higher EBIT or EBT) it could be observed that a higher gender quota (see Figure 3) is not explicitly necessary for achieving a higher EBT or EBIT.

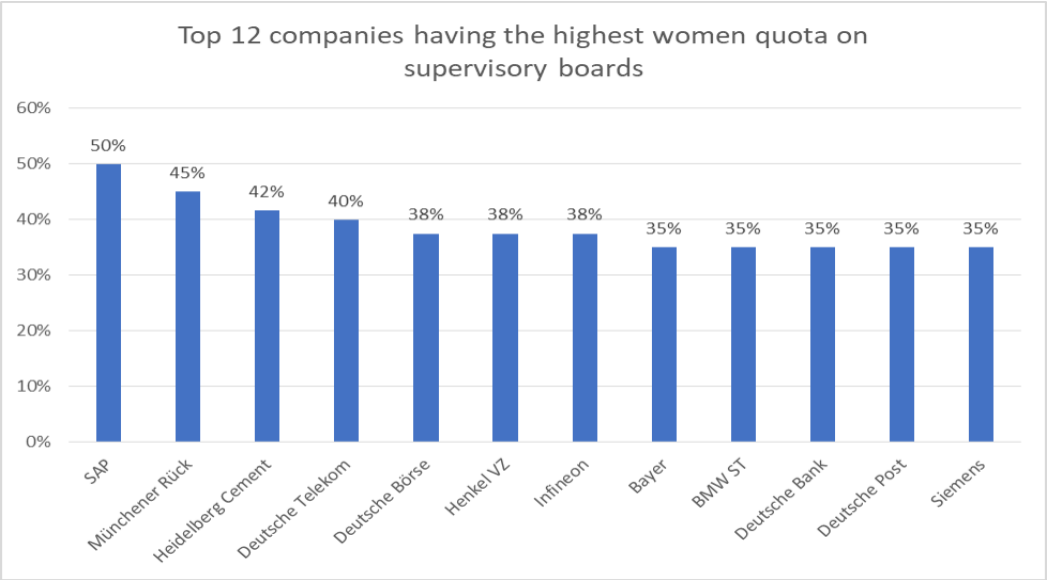

Figure 3: Top 12 companies having the highest women quota on supervisory boards. Source: Data collected from the annual records of the companies; own representation.

However, companies with a high women quota have nevertheless a high EBT or EBIT as well. This can be stated also for hypothesis 2 (H2: Companies with a higher gender quota in management boards are more successful and achieve a higher EBIT or EBT).

Some explanations are necessary for a better understanding of the women quota as presented in Figure 3. First, as it can be seen, DAX companies have a high women presence on their supervisory boards, one actually surpassing the legal regulations. Already in 2011 Germany's largest listed companies committed voluntarily to increase female representation by setting self-imposed targets. As the progress was slow, in May 2015 "The Equal Participation of Women and Men in Leadership Positions" law was passed, requiring that publicly traded companies should achieve starting with 2016 a women quota of 30 percent in supervisory boards (BMFSFJ, 2017). Therefore, Figure 3 shows that many of the DAX companies have over 30 percent women on their supervisory board, SAP reaching gender parity. Second, connecting Figure 2 and Figure 3[1] one can notice that while Vonovia had the highest EBT/employee, it is not the company with the highest women quota (it has a quota of 33 percent). Deutsche Börse has the second highest EBT/employee and a relatively high women quota of 38 percent, being one of the top 12

[1] Please note that the difference in the number of companies included in the rankings from Figure 2 and Figure 3 are due to the fact that no less than five companies have the same women quota of 35 percent. This difference can be observed also in other rankings included in this article.

companies with the highest women quota in supervisory boards. SAP has actually the highest women quota of all the DAX-30 companies, but it doesn't have the highest EBT/employee. Yet, there is an overlap between the two figures with regard to the companies included in the ranking, which can lead towards the idea that the first hypothesis could be supported.

In order to discuss the second hypothesis (Companies with a higher gender quota in management boards are more successful and achieve a higher EBIT or EBT) we also ranked the companies based on the women quota on their management board (See Figure 4). It has to be noted though that there is no mandatory quota for gender diversity on the management boards in Germany. However, whenever a woman is appointed CEO of a DAX company, as it happened in the case of Jennifer Morgan in 2019 (Co-CEO at SAP), there is quite a stir in the media and many hope for a sustainable change with regard to women presence also on the management boards. Yet, after only seven months, Morgan left her position, some seeing the COVID 19 pandemic as one of the reasons for her retreat (Saigol, 2020).

As of 2019 Merk had the highest women quota on its management board (40 percent) followed by Fresenius Medical Care (29 percent) and Covestro (25 percent). Merck however is not among the companies having a high EBT/employee ratio. Other companies such as Vonovia, Deutsche Börse, Henkel, Covestro, etc. are part of both rankings (the highest EBT/employee and the highest women quota on the management board) which can lead towards the idea that also the second hypothesis could be supported.

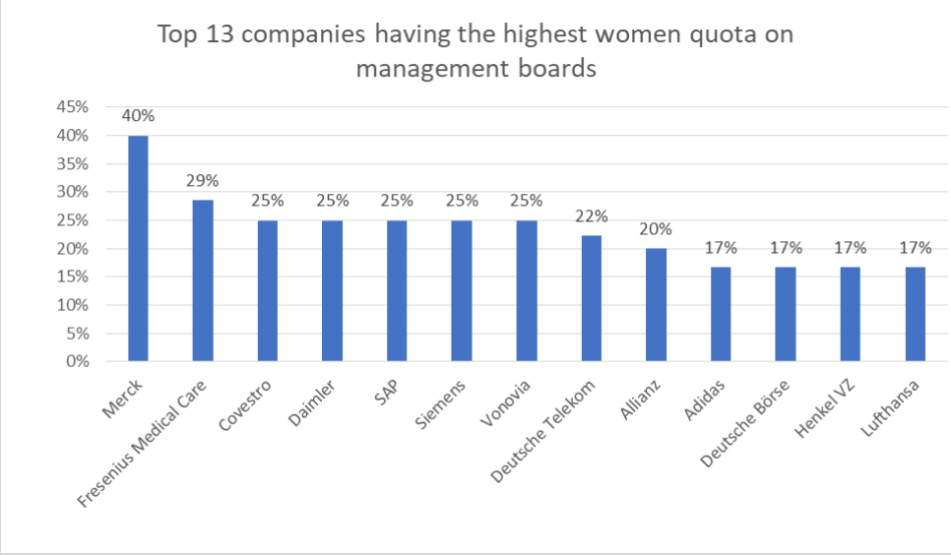

Figure 4: Top 13 companies having the highest women quota on management boards. Source: Data collected from the annual records of the companies; own representation.

In the following we look for further evidence by deepening the analysis with data at sector level. The reason for considering women presence on the boards of companies active in different sectors is the fact that there is a gender division also across sectors of activity, also known as sector segregation (Goldstein, Martinez and Papineni, 2019). For instance the automotive and construction sectors are regarded as typically male-dominated, while sectors such as health care or education are rather dominated by women. In Germany in 2020 the sectors where the workforce is mainly female-dominated were the education, social professions and medical and health care sectors (iwd, 2021). According to a 2020 OECD report women not only that are under-represented in the boardrooms across all sectors, in the technology and energy sectors, the percentage of women on boards is particularly low. The following two figures show the women quota in the sectors represented by the DAX companies in 2019.

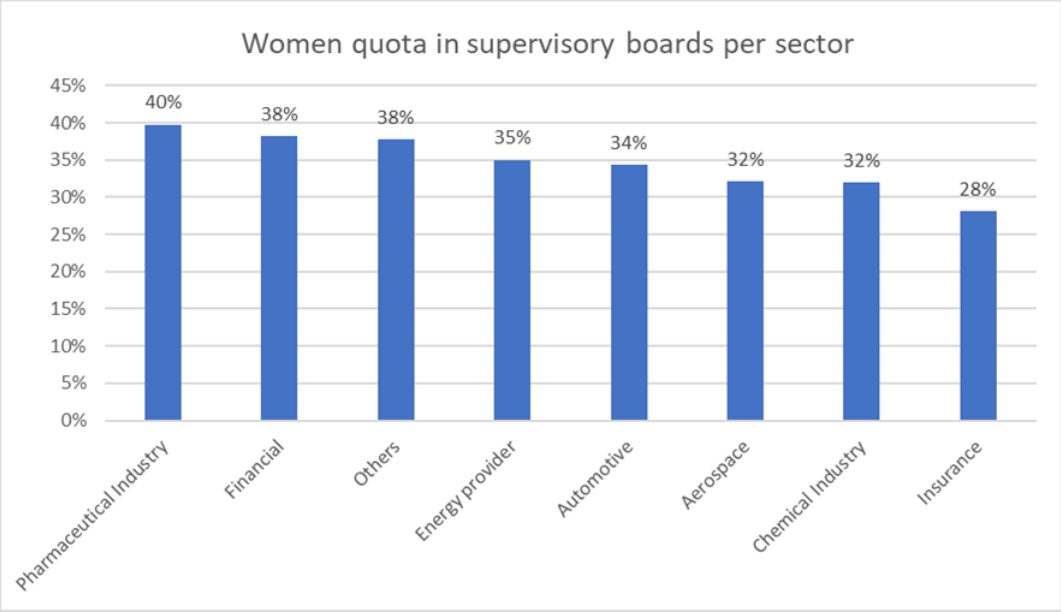

Figure 5. Women quota in supervisory boards per sector. Source: Data collected from the annual records of the companies; own representation.

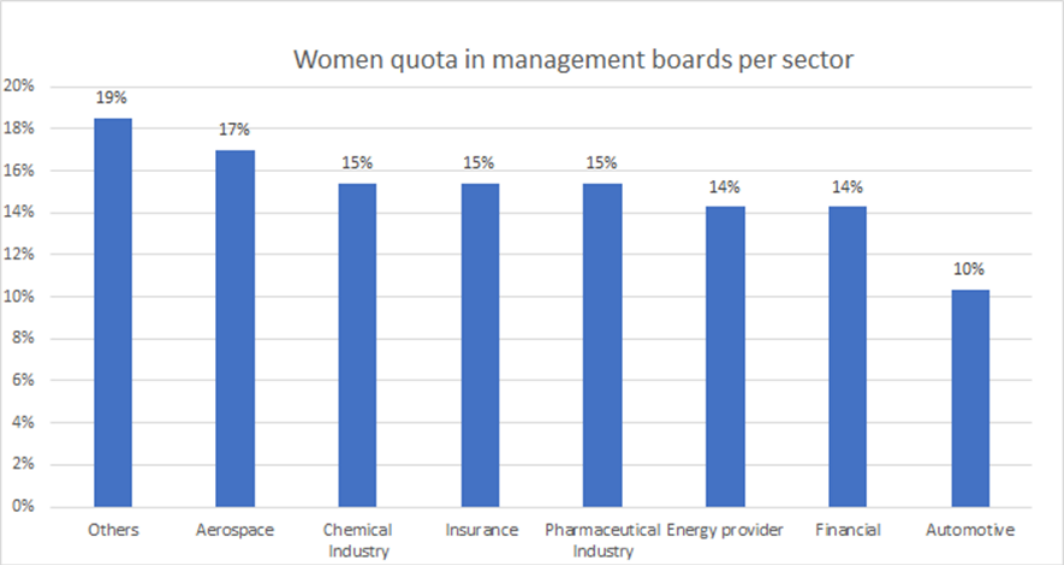

Figure 6: Women quota in management boards per sector. Source: Data collected from the annual records of the companies; own representation.

As expected the women quota in the supervisory boards is much higher than that in the management boards across all sectors and as already stated the most probable explanation is the German legislation, which imposes a quota for the supervisory boards, but not for the management boards. Moreover, though the pharmaceutical, the financial and the energy sectors have a high women quota on the supervisory boards, on the management boards these sectors are no longer the "champions" (the category "Others" due to its heterogeneity is not discussed here). It is the aerospace sector, which is on the first place in terms of women quota, which is surprising if one considers its rather technical character. The automotive sector in turn reflects its male-dominated aspect also on its management board with a women quota of only 10 percent.

Finally, the correlation analysis, which was run for the entire index, suggests a rather weak relationship between the financial performance of companies and the women quota as Table 3 indicates.

Correlation (between -1 and 1)	Management Board		Supervisory Board		In total	
1 = perfect Correlation		Women %		Women %		Women %
0 = no Correlation	EBT/Revenue	0.279	EBT/Revenue	0.108	EBT/Revenue	0.250
-1 = perfect negative Correlation	EBT/Employees	0.261	EBT/Employees	0.178	EBT/Employees	0.267

Table 3: Correlation results between financial performance and women quota for the entire DAX index as of 2019. Source: Data collected from the annual records of the companies; own representation.

A weak positive correlation of the women quota and the EBT/employee can be seen for the supervisory boards (r=0,178) and a slightly better correlation (but still weak) can be seen for the management boards (r=0,261).

As more and more voices from the political realm and various economic organizations emphasize the importance of increasing women's presence in the workforce and also their presence above the so-called "glass ceiling", the following section introduces an overarching company process containing eight steps and the WPPM index. The aim is to help companies in taking concrete measure and therefore to benefit from a diverse workforce at all levels.

4. A company process in eight steps to increase women presence

Keeping in mind the visual representation of the process as presented in Figure 1, in the following we describe each step and discuss its relevance.

4.1. Strategic relevance

Many companies nowadays are interested in integrating more women in management or supervisory boards not just in countries where legislation imposes a women quota but also in countries where it is (still) optionally. Therefore, achieving a women quota is strategically relevant for most companies. Consequently, companies search for an approach and a course of action to pursue a better integration of women into their boards and their business in general, but sometimes it is not clear which path would be the most appropriate. For instance in Germany, listed companies must achieve a gender quota of 30% on their supervisory boards. For managers this means that they need to search for a solution or an implementation concept. The KPI "women quota" must therefore be integrated not just in the vision and mission statements of the companies, but also at an early stage in the strategic planning process. In the tactical planning phase, women should appear in the organization charts by name, to show that the realization of a women quota of 30 % is not just a faraway dream, but the company is actually promoting women and is envisioning a pool of women talents. In the operating planning and budgeting process more women should be hired as responsible line managers who report planning figures for their departments. Moreover, the KPI women quota should be included into strategic performance management tools such as the Balanced Scorecard (BSC). Women quota could be for instance included in the internal perspective of the BSC and increase in this way the focus on this critical area.

4.2. Strategic model

A strategic model for a period of five to ten years should be developed and evaluated. Such a model could contain several strategic KPIs such as the EBT, the women quota, early warning indicators, scenario targets including worst case, best case and trend scenarios. Using the scenario technique or other strategic instruments, the KPI women quota can be emphasized. The slogan "What gets measured gets done" shows how relevant it is to integrate the women quota in scenarios e.g. as prognosis for the next ten years. The KPI women quota could be split into 'smaller' indicators such as the target for female recruitments in the overall workforce, the number of women in middle management, the number of women in the management board, the number of women in the supervisory boards, etc. The business model, together with the vision and the mission of a company, should offer a comprehensive and unified image in terms of goals and messages. If the company addresses mainly female customers, the company would surely benefit from emphasizing the importance played by women leadership and the commitment towards achieving a high women quota. Woman quota can be related also to other sustainability goals of the company. Whether it is self-commitment or law compliance, increasing the number of women at the top of companies should be clearly communicated and lived throughout the company. Moreover, a women quota can be a goal also at departmental level. The business model can stipulate that only those managers are eligible for a performance bonus (e.g. 20 percent) if their department or team have a women quota higher than 30 percent. This could be a consistent business model to increase the women quota in the long term also at management level.

4.3. Business process analysis

In the third step, a business process analysis has to be conducted. First, activities, sub-processes and main processes of different departments or of the company as a whole should be identified. This business process analysis can be conducted using anonymous interviews about the total headcounts in the cost centers. To know how many women headcounts work in these processes, the interviewers should keep a separate recording of male and female headcounts. The headcount data remains anonymous, but male and female capacities are distinguished for calculating the women quota for each individual activity, sub-process and main process. Second, cost drivers of the processes such as number of orders, number of male or female recruitments, number of women in management positions, etc. are identified. Third, the total process costs should be

calculated for the main processes, for the sub-processes and finally for the activities. If one considers some twenty main processes in a company, it seems easy to calculate the process costs that should be finally divided into male and female capacities. For the hundreds of sub-processes, the process calculation of the total process costs split into female and male costs could be more time consuming. The total process costs calculation for the final thousands of activities is still necessary because the activities are allocated at the end to sub-processes and main processes differentiated in male and female process costs. Fourth, the process cost rate must be calculated so that finally it can be said what are the process costs for one order execution, etc. The process cost rate divided into male and female costs can identify processes e.g. with a high performance and show if these processes have a high women quota too. Fifth, the allocation of activities to sub-processes and finally to main processes can show the male process costs and the female process costs e.g. for one order. In companies with a low women quota, the female process costs over all activities seem low compared to the male process costs. At the latest at this point it should be clear that the women quota must be increased by starting to recruit more women into management and supervisory boards and to the departments and teams too. The process cost rates can be implemented into a product calculation instead of the burden rates used for the indirect areas. Process cost rates e.g. for the sales process costs, the maintenance process costs or the security process costs are always interesting when they are integrated in a product calculation. Divided into male and female process costs, additional information becomes available.

4.4. Relevant KPIs

For increasing the women quota, it is necessary to measure a KPI, which we call "women process performance management (WPPM) index". This KPI should increase over a long strategic planning period and has the following formula:

$$WPPM = \frac{Customer\ Importance\ \times\ Customer\ Satisfaction}{Process\ Cost\ Rate\ (Women\ Capacities) \div Benchmark\ Cost\ Rate\ (Women\ Capacities)}$$

With the help of a customer survey, two KPIs are to be measured: the customer importance related to one process and the customer satisfaction attributed to it. It is important to measure both these KPIs, because the customer should be able to evaluate whether e.g. an order process is important for him or her and whether he or she is satisfied with the order

fulfillment in time. The customer survey should be accompanied by a business process analysis as described above. The result of this business process analysis should be the process cost rate, this time calculated considering the women capacities. By comparing this process cost rate based on women capacities with a benchmark process cost rate of women capacities of another company, a quotient can be built and a final equivalence number can be calculated.

If the women WPPM index is higher than 1, the strategic performance and value creation is good. If the index is lower than 1, then the qualitative and quantitative premises should be optimized. A better position in comparison with the main benchmark competitor should be achieved for instance by improving the process cost rate via better recruitment of qualified women or improving customer experience.

4.5. Controlling system

The controlling system consists of the planning process, the cost accounting process and the reporting process. The WPPM index can be integrated into a planning system. This means that the yearly budgeting process includes the women quota and the WPPM index and incorporates these two KPIs for the next fiscal year for each department of an enterprise.

In the cost and managerial accounting process cost types, cost centers and cost objects are identified. These cost elements are planned including additional KPIs like the women quota and the WPPM index for each cost center. For example, the cost center, order management must plan the costs, the relevant budget with the number of orders, the women quota as target for this cost center and the WPPM index. To calculate the WPPM index it must be ensured that the cost center is big enough and that customer contact (of internal or external customers) is fostered. Additionally when a process cost rate and a benchmark cost were identified, the WPPM index can be calculated and planned.

The relevant KPIs should be integrated in the monthly reporting process. A special chapter for important qualitative KPIs in each end month report ensures that the women quota and the women PPM index are continuously measured and a development trend can be registered. This is important when these two figures are also considered in determining the management variable remuneration.

4.6. Harmonized teams

Once processes are identified and KPIs are defined in a controlling system, the employees should be aware of them and consider them in their daily work. Harmonized teams where women and men work together often achieve better results and the defined KPIs like EBT, cost target and women quota are achieved easier. When women work together with several male team members, extraordinary ideas, remarkable product and process innovations take place and the team comes to unique results. In most cases, critical questions outside specifications are raised by women, and discussed together in the mixed teams.

To design a harmonized team it must be clear that the management supports harmonized teams formed by both men and women. Starting from the top management level, women should work together with men in management boards and supervisory boards but also at lower management level and throughout the entire company. Moreover, it is recommendable to integrate women into the structural organization and to show women and men by name in the company organigram. In process-oriented organizations, a harmonized team can be linked to a project or a process and should be led by a process responsible. The more process responsible are female, the better the KPI women quota becomes. Furthermore, the number of women in harmonized teams can be measured project based (short term) or process bases (in the long run).

4.7. Incentive scheme

External factors can influence the number of women in companies. For example, more lectures can be held at universities to attract more academic women, there should be more job ads looking for the best women in the media or more transparent information in the year-end reports about the number of women or the women quota in management or supervisory boards.

Internally there should be a consistent target setting process supported for instance by Management by Objectives (MBO) meetings. Managers and employees should meet at least twice a year to discuss about the already achieved personal targets and about the future expectations until end of the year. It is not enough to discuss only KPIs like the achieved profit, contribution margin or the sales figures. Additionally, the women quota, the WPPM index should be measured and based on target achievement, a variable part of the annual remuneration can be introduced.

4.8. Structural re-organization

The result of a process-based analysis should be to obtain a better effectivity and a higher efficiency company-wide. The KPIs women quota and WPPM index can be measured based on processes, at team level, at departmental level and for the entire enterprise. Process optimization teams (POTs) can be created to design the actual order process, the ideal process flow and the optimized standard process cycle. It should be ensured that an optimized standard process includes the KPIs women quota and the WPPM index.

5. Discussion of results and conclusion

This article offers a thorough analysis of the DAX index and its companies in 2019 by presenting data about the financial performance of this companies, sectors of activity and the women presence on supervisory and management boards. The existence of a mandatory women quota for the supervisory boards since 2016 led to an increase of women presence at the top of these companies, some of them even surpassing the legal requirements. However, in comparison with the situation on the supervisory boards, the CEO positions continue to be dominated by men, irrespective of the sector of activity.

Though no correlation could be found between a high number of women on the board of a company and the its financial performance, this result does not minimize the importance of a diverse workforce or that of a diverse company board. The presence of women on boards can be manifested not only by positively influencing a financial KPI, but also by bringing a change in the leadership style or in the strategic orientation of a company.

The sample of this study can be regarded as small, but the aim was to look at a representative index of one of the most important economies in Europe and in the world: Germany. At the same time having a larger sample might bring forward other problems, such as analysing companies from different regions and different countries, which might have different legislations and different corporate structures and cultures. On the other hand, the results can be enhanced by extending the analysis over a longer period of time. If for instance the reaserch would be conducted for data spaning over a decade or more, the results would gain in significance.

One major contribution of this article is the creation of an overaching company process with the aim to offer companies a guide on how the presence of women can be increased. Companies need to take advantage of both female and male talent and to build on their skills for a better future. We are aware that adding more women to the boards of

companies and in general in leadership positions is a challenging issue, but without commitment from various stakeholders (companies, policy makers, women, society at large, etc.) the "glass ceiling" might continue to be an obstacle also in the future.

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