Future Role of Bank Advisors and Traditional Bank Branches in the Age of Digitalization—An Empirical Investigation

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Abstract

Due to increasing digitalization, the German banking sector is undergoing a massive period of change. This threatening challenge is massively influenced by demographic change, supervision and regulation, the low-interest phase and technological progress. In the last twenty years, mergers of regional banks, staff reduction measures and the closure of their traditional bank branches have been the order of the day. Banks in Germany are therefore forced to deal with the introduction of omni-channel concepts. The aim of the research is to make a statement on the extent to which the two distribution channels “bank advisor” and “traditional bank branch” will still play an active role for regional banks in Germany in the future. The results of standardized interviews with bank experts (N = 43) in Germany form the core of this study. This paper summarizes the findings of the quantitative research descriptively. Furthermore, the article critically examines the academic discussion on the digital transformation of banks in Germany, especially savings and cooperative banks. This article is structured as follows: Introduction, Literature Review, Methodology, Results and Discussion, Conclusions, Limits and Directions for further Research. The results of this article can be useful for researchers and bank practitioners to identify and utilize the strategic change potential under omni-channel aspects due to the digital transformation.

Keywords

Banking, Cooperative Banks, Digitalization, German Banks, Omni-Channel, Regional Banks, Savings Banks
1. Introduction

The German banking sector is traditionally divided into three subsectors or pillars (see Figure 1). These are private banks (pillar 01), savings banks (pillar 02) and cooperative banks (pillar 03). Savings banks and cooperative banks are very similar in their structure, clientele and product range. In contrast to private banks, savings banks and cooperative banks belong to the so-called regional banks (Frank et al., 2014; Giebe, 2019; Giebe & Schulz, 2021c). Therefore, the focus of this research is on savings banks and cooperative banks in Germany.

The entire industry has been facing extreme challenges for several years. The cause, among other factors, is the historically lowest interest rate level in the euro area and in Germany (Wolgast, 2016). In addition, the influence of new digital technologies has long since found its way into companies’ business processes. No company can defend itself against the effects of the digital transformation. And those who do not face this situation with a suitable strategy have a big problem (Liu et al., 2011; Hess et al., 2016). So-called financial technology companies (FinTechs) are also entering the banking market and have occupied niches. The focus here is often on improving processes through the use of information technology (Gai et al., 2018). The pressure on banks to act arises, among other things, from changes in the demand for new solutions. This also applies to the improvement of existing products or optimized product positioning (Mavlutova & Volkova, 2019).

According to Fischer and Arz (2016), the focus of banks is rather on improving the economic framework conditions, so that banks neglect the necessary serving of customer interests. This poses the risk that banks may not be optimally prepared for future challenges (Fischer & Arz, 2016). Digitalization is therefore changing many processes in the German banking market. Many German banks could miss the boat in the age of digital transformation (Giebe, 2019). Due to the circumstances described above, regional banks in Germany are forced to act.

![Figure 1](image-url).

Figure 1. The three pillars of the German banking system (Giebe & Schulz, 2021c).
Engerer and Schrooten (2004), Eim et al. (2006) and Auerbach (2009) already conducted research on the two banking groups, the savings banks and cooperative banks in Germany, several years ago. These studies primarily document merger activities of both banking groups (Engerer & Schrooten, 2004; Eim et al., 2006; Auerbach, 2009). And the trend will continue, with more mergers of regional banks expected in the coming years (Terliesner, 2016).

Current research in the German banking sector using the example of savings banks and cooperative banks also focuses on distribution channels. For example, Giebe and Schulz (2021a, 2021b, 2021c) confirmed in their research that savings banks and cooperative banks had to drastically reduce both the number of employees (see Figure 2) and the number of traditional bank branches (see Figure 3) in the years 1999-2018, not least due to digitalization (Giebe & Schulz, 2021a; Giebe & Schulz, 2021b; Giebe & Schulz, 2021c).

The current state of research assumes that digitalization has an impact on banking. According to Menrad and Varga (2020), the blanket assumption is not wrong, but it is too imprecise and undifferentiated. In their quantitative study, they look at customer behavior in relation to the acceptance of digital channels and technologies in banking in the European Union. Even the consolidated view of banks in the European Union is that the trend is to reduce branches and push digital channels. However, customer behavior is by no means representative of all banks in the European Union. Thus, further research is needed to analyze country-specific aspects to study the shift from analogue to digital banking (Menrad & Varga, 2020).

![Figure 2](image_url). Comparison of the number of employees (Giebe & Schulz, 2021c).
This research gap is taken as an opportunity to examine the banking market more closely using the example of the savings banks and cooperative banks in Germany as part of the omni-channel discussion. The research question defined in this thesis is whether the two distribution channels “bank advisor” and “traditional bank branch” will still play an active role for savings banks and cooperative banks in the future. This research question is very interesting in the light of Figure 2 and Figure 3, as the number of advisors as well as the number of traditional branches has been greatly reduced.

2. Literature Review

To substantiate the quantitative research project with scientific literature, a search was made in scientific databases for suitable literature. In total, findings, and essences from 27 articles were considered in this work. The researched literature can be divided into three parts. The first cluster contains 9 articles on the situation in the German banking sector, especially in the savings and cooperative banks. These are the research papers by the following authors: Auerbach (2009), Eim et al. (2006), Engerer & Schrotten (2004), Frank et al. (2014), Giebe & Schulz (2021a), Giebe & Schulz (2021b), Giebe & Schulz (2021c), Löffler & Giebe (2021) and Wolgast (2016). It can be seen from the literature reviewed that the banking sector is facing a very big challenge. In the last twenty years, there have been collective branch closures as well as staff reduction measures.

The second cluster summarizes the results from 11 articles on digitalization or digital transformation. These are the research papers by the following authors:
Fischer & Arz (2016), Gai et al. (2018), Giebe (2019), Giebe et al. (2019), Ham-merström et al. (2019), Hess et al. (2016), Hock & Giebe (2022), Liu et al. (2011), Mavlutova & Volkova (2019), Sebastian et al. (2017) and Sun et al. (2018). The main findings of the literature section researched are that the digital transformation has also inexorably hit the banking industry. Technical innovations such as robo advisory or big data analytics are discussed and applied in this context.

The third and final cluster is about literature on omni-channel discussions and other distribution channels from 7 articles. These are the research papers from the following authors: Kraft (2019), Menrad (2020), Menrad & Varga (2020), Rohrmeier (2015), Terliesner (2016), Wohllebe et al. (2020) and Wohllebe et al. (2021). The discussion about an optimal om-ni-channel strategy is decisive for this literature section. The studies on current expert opinions are rudimentary. For this reason, there is a research gap for the German banking sector. This paper aims to close the research gap insofar as the opinions of banking experts can be considered. The results of the findings of all three parts are summarized narratively in this research paper and used for a discussion.

3. Methodology

In order to answer the research question, a series of interviews was arranged and successfully implemented from August to October 2021. The profession of bank clerk is the relevant training profession in the banking sector. The majority of employees in the banking sector complete this vocational training (Frank et al., 2014). Therefore, participants were randomly selected who had successfully completed vocational training at a savings bank or a cooperative bank in Germany. Finally, personal interviews were conducted by telephone or video conference with a total of 43 trained bank clerks. In addition to this aspect, another premise was that the interviewees are currently employed in the financial services sector. With these attributes, the interview partners can be attested the status of “banking expert” in the view of the authors.

3.1. Demographical Findings

24 bank experts are male and 19 female. The average age over all bank experts is 38.4 years. It is even well-balanced between the sexes. The average age of the male bank experts is 38.75 years and of the female experts 37.94 years. Another question answered was the period since accomplish their education. The average professional experience can be divided into three groups: 1) 7% 1 - 5 years, 2) 42% 6 - 15 years and 3) 46% more than 15 years.

The 43 bank experts were asked to respond to the following statements:

Statement I: The bank advisor will continue to play an active role in the age of digitalization (only one answer possible).

• Applies
• Somewhat true
• Somewhat disagree
Does not apply

*Statement II: The traditional bank branch will continue to play an active role in the age of digitalization (only one answer possible).*

- Applies
- Somewhat true
- Somewhat disagree
- Does not apply

3.2. Verification of Potential Different Perspectives of Both Bank Groups

In order to investigate whether the experts of the cooperative banking group and those of the public banking group assess the future significance of the advisor and that of the branch offices differently, a multivariate analysis of variance (MANOVA) of the experts’ opinions was conducted. MANOVA analyses are a popular statistical tool in scientific analyses that allow the comparison of mean vectors between groups and an assessment of the effects of independent variables on dependent variables (Backhaus, Erichson, Plinke, & Weiber, 2018: p. 164; Finch & French, 2013). In particular, it was analysed whether the experts of the different bank groups (the independent variable) have a different perspective on the assessment of the role as a future bank advisor and on the importance of the bank branches (both the dependent variables), taking into account the increasing digitalization in the banking sector. The statements of the bank experts “agree”, “tend to agree”, “tend to disagree” and “disagree” were scored on a scale of 1 to 4, where “agree” was scored as 4, “tend to agree” as 3, “tend to disagree” as 2 and “disagree” as 1. Using this scaling, the values could be evaluated by an arithmetic mean. Subsequently, the influence of these independent variables on a set of metric variables as dependent variables could be evaluated. Afterwards, the influence of these independent variables could be investigated by difference tests on the set of existing metric variables as dependent variables (Backhaus et al., 2018; Hair, 2019). Statistical significance was measured using the F-statistics of a MANOVA and the variances respectively the mean square deviations were obtained from the dispersions by dividing them with their respective degrees of freedom (Backhaus et al., 2018). The null hypothesis $H_0$ of a MANOVA analysis assumes that the mean vectors of all groups are equal and thus correspond to the same population (Hair, 2019; Johnson & Wichern, 2014). $H_0$ in the 2 group case can be represented using the t-statistics according to Finch and French (2013) as follows:

$$
T^2 = (\bar{Y}_1 - \bar{Y}_2) \left[ S \left( \frac{1}{n_1} + \frac{1}{n_2} \right) \right]^{-1} (\bar{Y}_1 - \bar{Y}_2)
$$

whereby, $\bar{Y}_1$ is the mean vector for the group 1 and $\bar{Y}_2$ is that of the group 2. The sample size for group 1 is represented by $n_1$ and that for 2 by $n_2$.

The sample pooled covariance matrix is calculated by
Covariance matrix for group 1 is represented by \( S_1 \) respective \( S_2 \). The transpose operator (\( \prime \)) is used to form sums of squared differences in the context of matrices, and the inverse \((-1)\) is used for matrix division (Finch & French, 2013). Statistical significance is measured at a significance level \( \alpha \) of 0.05 (p-value \( \leq \alpha \)) (Hair, 2019; Johnson & Wichern, 2014). SPSS 27 Statistics 27 and R-4 (4.0.2) packages were used to perform statistical analysis.

4. Results and Discussion

When selecting the answer options, a four-point Likert scale was chosen. This was to exclude a tendency towards the middle. Furthermore, only one answer option was provided in order to obtain a clearly interpretable answer. In chapter 4.1 (Distribution channel: Bank advisor) and chapter 4.2 (Distribution channel: Traditional bank branch) the answers of the test persons are described and visualized in bar charts. Chapter 4.2 contains statistical tests.

4.1. Distribution Channel: Bank Advisor

53.49% of the banking experts believe that bank advisors will continue to play an active role in the future and voted “applies”. 34.88% of the banking experts agreed with the statement “somewhat true”. 11.63% of the bank experts chose the third best possible answer option “somewhat disagree”. On the other hand, none of the respondents were of the opinion that bank advisors will no longer play an active role in the future. The statement “does not apply” was not selected (see Figure 4).

4.2. Distribution Channel: Traditional Bank Branch

25.58% of the banking experts believe that the traditional bank branch will continue to play an active role in the future and voted “applies”. 37.21% of the banking experts...
banking experts agreed with the statement “somewhat true”. 32.56% of the banking experts chose the third best answer option “somewhat disagree” and 4.65% of the respondents are of the opinion that the traditional bank branch will no longer play an active role and voted for “does not apply” (see Figure 5).

In a direct comparison of the two distribution channels, the vote for the “bank advisor” is more than twice as high as the vote for the “traditional bank branch” for the answer option “applies”. The second-best answer option “somewhat true” is apparently almost the same size. For the “somewhat disagree” answer, the “traditional bank branch” is given an almost three times higher answer than the “bank advisor”. Also, for the vote “Does not apply”, only the “traditional bank branch” had two of the 43 answers. It can be interpreted that, from the point of view of the bank experts, the traditional bank branch will be of medium importance in the future. The role of the bank advisor, on the other hand, is seen by the bank experts as having a better, more solid, and good significance (see Figure 6).

It could be proven that the distribution channel “bank advisor” is considered more important than the “traditional bank branch”. However, it makes sense to look at the practicality in combination. According to Rohrmeier (2015), the traditional bank branch will continue to play an important role for customers in the future, as some of them still consider personal advice to be important (Rohrmeier, 2015).

4.3. Results of the MANOVA Analysis

The analysis of the expert outcomes revealed a violation of the normal distribution, as is often the case when evaluating rating scales (Kline, 2016: p. 74; Weiber & Mühlhaus, 2014: p. 181), which is, however, one of the fundamental prerequisites for a MANOVA analysis (Eschweiler, Evanschitzky, & Woisetschläger, 2014).
To address and heal this issue, among others Backhaus et al. (2018: p. 199), Eschweiler et al. (2007: p. 550), Glaser (1978: p. 165) suggests using equal-sized groups by randomly eliminating data-sets to transform the data closer to a symmetric normal distribution. Applying this, the group size of the experts from the public banking sector was reduced.
The analysis by outliers (cut-off values were calculated using the Chi² distribution with a p-value of 0.001) regarding the Mahalanobis distance (Backhaus et al., 2018: p. 234) for the multivariate outliers in the data set did not reveal any irregularities (Backhaus et al., 2018: p. 199; Eschweiler et al., 2007: p. 550). Correlations between the dependent variables were low at 0.585 (r < 0.90) at a significance level of 0.001 (2-tailed), indicating that multicollinearity was not a confounding factor in the analysis (Harlow, 2005: p. 46; Verma, 2016: p. 191) (see Figure 7). Homoscedasticity of the error variances between “Advisor will play an active role” and for “Branch Office will play an active role” was fulfilled and assessed by Levene’s test of equality for the results (p > 0.05). Furthermore, homogeneity of the covariances was determined by Box’s test (p > 0.001) (Hair, 2019: p. 372; Verma, 2016: p. 211).

Finally, a one-way MANOVA found no statistically significant differences between the Bank Groups (experts’ opinion) on the combined dependent variables, F (2, 37) = 1.087, p = 0.348, partial η² = 0.056, Wilk’s Λ = 0.944.

The results reveal a consistent, non-significantly divergent view among bank experts on the future role of bank advisors and the role of the bank branch in the context of the strong increase in digitalization in the banking business.

The results in Table 1 show that advisors will continue to play an indispensable role in traditional banks. Even the increased digitalization will not achieve any significant change in this professional profile, both banking groups agree. Both banking groups also agree on the role of the bank offices. Although their importance is less pronounced than the role of the bank advisor, the bank experts are of the opinion that the branch office will continue to play an important role. However, the opinion on this is less clear in relation to the standard deviation. There are also slight differences in unambiguity. On average, the opinion of cooperative bank experts is less firmly established than that of their colleagues in the public sector.

Table 1. Perspective of the advisor and the role of the office as perceived by the different bank groups.

| Independent variables | Advisor will play an active role | Branch Office will play an active role |
|-----------------------|----------------------------------|----------------------------------------|
|                       | Mean SD                          | F-Value Significance Partial η²        | Mean SD                          | F-Value Significance Partial η² |
| Bank Experts          |                                  |                                       |                                   |                                  |
| n = 43                |                                  |                                       |                                   |                                  |
| reduced randomly      |                                  |                                       |                                   |                                  |
| driven to:            |                                  |                                       |                                   |                                  |
| Cooperative Bank      | 3.35                             | 0.356                                 | 2.650                             | 1.759                             |
| Bank Group            | 3.55                             | 0.009                                 | 3.050                             | 0.041                             |
| n = 20                | 0.67082                          | 0.554                                 | 0.87509                           | 0.192                             |
| Savings Bank          | 0.68633                          |                                       | 0.82558                           |                                   |
| Group n = 20          |                                  |                                       |                                   |                                  |

p < 0.05 for testing significance (H0: no differences in the mean vectors of the dependent variables between the groups); SD = Standard deviation; F (df Hypothesis, df Error); F (1, 38).
5. Conclusion

The research question formulated within the framework of this work, whether the two distribution channels “bank advisor” and “traditional bank branch” will still play an active role for savings banks and cooperative banks in the future, can be answered. It can be stated that from the point of view of the bank experts, the sales channel “bank advisor” is rated better than the sales channel “traditional bank branch”. This means that the bank advisor will play a more important role than the traditional bank branch from the respondents’ point of view. The value of this research lies in its topicality and the fact that the respondents were trained in a savings bank or a cooperative bank in Germany. Thus, the results can be interpreted as a statement by “banking experts” who are currently working in the financial services industry.

According to Menrad (2020), the banking process will change significantly. Unfortunately, banks are lagging other industries. The introduction of an omni-channel concept in connection with digitalization activities will have a decisive influence on the banking business in Germany. Omni-channel management is seen as having an impact on bank sales, staff, processes, the customer side, customer satisfaction and loyalty (Menrad, 2020).

It is striking that the respondents with an average age of 38.4 years are younger than the bank average of 44.3 years (Arbeitgeberverband des privaten Bankgewerbes, 2018). It can be assumed that the subjects of this study thus have both the experience and innovativeness as well as an eye for visionary future and digitalization topics in general.

The right digital strategy of regional banks only has added value if it also receives the necessary attention. This goes hand in hand with the need to bundle resources and encourage investment. However, the best digital strategies derived operational decisions and strategic decisions at the same time (Sebastian et al., 2017). This balance must be found and applied in future omni-channel concepts.

6. Limits and Directions for Further Research

The authors are aware that this research is not representative. However, due to the background of the interview partners, the study can be considered as a thesis and can be further investigated in further research with a representative sample size.

The authors are also of the opinion, based on the assessment of Menrad & Varga (2020), that the findings of the study can in principle also be transferred to other countries of the European Union. However, proof has yet to be provided and could be considered in more detail in the context of further research.

With the increasing importance of smartphones, the development of mobile apps for the business purposes of companies has also increased. For example, push notifications are now a core functionality of mobile apps, which enable interaction with app users in the e-commerce sector (Wohllebe et al., 2020; Wohllebe et al., 2021). In addition to the existing channels studied, “bank advisor”
and the “traditional bank branch”, other channels could be investigated, for example, the use of banking apps.

Banks have more data about their customers than other industries. For this reason, innovative methods and solutions based on mathematical-statistical models have taken hold. This knowledge is called big data analytics and is used to focus on the customer. There are empirical studies that deal with big data analytics in the banking sector. Furthermore, Big Data Analytics is often used to be more competitive (Giebe et al., 2019; Hammerström et al., 2019; Sun et al., 2018). The German banking sector has all the prerequisites for a successful implementation of big data analytics in business processes. In retail banking, these technical innovations are already being used. A complete data-driven focus on an omni-channel strategy is a possible next development step (Hock & Giebe, 2022). Therefore, omni-channel strategies in the context of big data analytics can be the subject of further research.

A discussion can also be initiated under personnel aspects. Currently, banks in Germany are finding it difficult to find new entrants to the profession. At first glance, they are now considered unattractive employers (Löffler & Giebe, 2021). Thus, the omni-channel strategy could be concretely explored in connection with a possibly changing job profile of the banker.

In the age of digitalization, managers often communicate with their employees virtually. According to a literature-based study by Kraft (2019), there is a varying relevance of electronic media when leading virtual teams. Furthermore, conceptual challenges in e-leadership are described (Kraft, 2019). Under these conditions, omni-channel management can possibly also be examined and identified within banks in Germany.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

References

Arbeitgeberverband des privaten Bankgewerbes (2018). Altersstruktur der Beschäftigten im privaten Bankgewerbe. https://www.agvbanken.de/AGVBanken/Statistik/Statistik_Altersstruktur.pdf

Auerbach, C. M. (2009). Fusionen deutscher Kreditinstitute: Erfolg und Erfolgsfaktoren am Beispiel von Sparkassen und Kreditgenossenschaften. Springer Gabler. https://doi.org/10.1007/978-3-8349-8381-7

Backhaus, K., Erichson, B., Plinke, W., & Weiber, R. (2018). Multivariate Analysemethoden: Eine anwendungsorientierte Einführung (15th ed.). Springer Gabler. https://doi.org/10.1007/978-3-662-56655-8

Eim, A., Lamprecht, D., & Wipprich, M. (2006). Die Netzwerke der Sparkassen-Finanzgruppe und des genossenschaftlichen FinanzVerbundes: Zukunftsperspektiven des Dreisäulensystems. Vierteljahreshefte zur Wirtschaftsforschung, 75, 53-72. https://doi.org/10.3790/vjh.75.4.53
Engerer, H., & Schrooten, M. (2004). Deutscher Bankensektor im Umbruch: Sparkassen und Genossenschaftsbanken relativ gut positioniert. *DIW Wochenbericht, 71*, 345-349. http://hdl.handle.net/10419/151306

Eschweiler, M., Evanschitzky, H., & Woisetschläger, D. (2007). Ein Leitfaden zur Anwendung varianzanalytisch ausgerichteter Laborexperimente. *Wirtschaftswissenschaftliches Studium, 36*, 546-554. https://doi.org/10.15358/0340-1650-2007-12-546

Finch, H., & French, B. (2013). A Monte Carlo Comparison of Robust MANOVA Test Statistics. *Journal of Modern Applied Statistical Methods, 12*, 35-81. https://doi.org/10.22237/imasm/1383278580

Fischer, B., & Arz, C. (2016). Innovationslust in Banken beurteilen. *Bankmagazin, 2–3*, 28-31. https://doi.org/10.1007/s35127-015-0721-2

Frank, I., Hackel, M., Helmrich, R., & Krekel, E. M. (2014). Entwicklungen und Perspektiven von Qualifikation und Beschäftigung im Bankensektor. *Wissenschaftliche Diskussionspapiere des Bundesinstituts für Berufsbildung (BiBB), No. 151*, 90 p. https://www.bibb.de/dienst/veroeffentlichungen/en/publication/show/7363

Gai, K., Qiu, M., & Sun, X. (2018). A Survey on FinTech. *Journal of Network and Computer Applications, 103*, 262-273. https://doi.org/10.1016/j.jnca.2017.10.011

Giebe, C. (2019). The Chief Digital Officer—Savior for the Digitalization in German Banks? *Journal of Economic Development, Environment and People, 8*, 6-15. https://doi.org/10.26458/iedep.v8i3.633

Giebe, C., & Schulz, K. (2021a). Cost Cutting Measures at Cooperative Banks in Germany as a Result of Digitalization and their Consequences. *Journal of Economic Development, Environment and People, 10*, 29-45. https://doi.org/10.26458/iedep.v10i2.693

Giebe, C., & Schulz, K. (2021b). Digitalization and Its Rapid Impact on Savings Banks in Germany. *Global Journal of Management and Business Research, 21*, 1-11. https://doi.org/10.34257/GJMBRBVOL21IS4PG1

Giebe, C., & Schulz, K. (2021c). Economic Effects of the Digital Transformation on the Banking Market Using the Example of Savings Banks and Cooperative Banks in Germany. *International Journal of Economics and Finance, 13*, 34-45. https://doi.org/10.5539/ijef.v13n6p34

Giebe, C., Hammerström, L., & Zwerner, D. (2019). Big Data & Analytics as a Sustainable Customer Loyalty Instrument in Banking and Finance. *Financial Markets, Institutions and Risks, 3*, 74-88. http://doi.org/10.21272/fmir.3.74-88.2019

Glaser, W. R. (1978). *Varianzanalyse. 95 Tabellen* (1. Aufl.). *Uni-Taschenbücher Interdisziplinär. Vol. 584*. Fischer.

Hair, J. F. (2019). *Multivariate Data Analysis* (8th ed.). Cengage.

Hammerström, L., Giebe, C., & Zwerner, D. (2019). Influence of Big Data & Analytics on Corporate Social Responsibility. *Socio Economic Challenges, 3*, 47-60. https://doi.org/10.21272/sec.3(3).47-60.2019

Harlow, L. L. (2005). *The Essence of Multivariate Thinking: Basic Themes and Methods. Multivariate Applications Series*. Lawrence Erlbaum Associates, Inc., Publishers.

Hess, T., Matt, C., Benlian, A., & Wiesböck, F. (2016). Options for Formulating a Digital Transformation Strategy. *MIS Quarterly Executive, 15*, Article No. 6. https://aisel.aisnet.org/misqe/vol15/iss2/6

Hock, K., & Giebe, C. (2022). Big Data Analytics in the German Banking Sector Using the Example of Retail Banking. *Account and Financial Management Journal, 7*, 2601-2616. https://doi.org/10.47191/afmj/v7i2.01
Johnson, R., & Wichern, D. (2014). *Applied Multivariate Statistical Analysis. Pearson New International Edition* (7th ed.). Pearson Education Limited.

Kline, R. B. (2016). *Principles and Practice of Structural Equation Modeling. Methodology in the Social Sciences* (4th ed.). The Guilford Press.

Kraft, M. H. G. (2019). How to Lead with Digital Media Effectively? A Literature-Based Analysis of Media in an E-Leadership Context. *Journal of Economic Development, Environment and People, 8*, 42-53. https://doi.org/10.26458/iedep.v8i4.639

Liu, D. Y., Chen, S. W., & Chou, T. C. (2011). Resource Fit in Digital Transformation: Lessons Learned from the CBC Bank Global E-Banking Project. *Management Decision, 49*, 1728-1742. https://doi.org/10.1108/00251741111183852

Löffler, L., & Giebe, C. (2021). Generation Z and the War of Talents in the German Banking Sector. *International Journal of Business Management and Economic Review, 4*, 1-18. http://doi.org/10.35409/IJBMER.2021.3319

Mavlutova, I., & Volkova, T. (2019). Digital Transformation of Financial Sector and Challenges for Competencies Development. *Advances in Economics, Business and Management Research, 99*, 161-166.

Menrad, M. (2020). Systematic Review of Omni-Channel Banking and Preview of Upcoming Developments in Germany. *Innovative Marketing, 16*, 104-125. https://doi.org/10.21511/im.16(2).2020.09

Menrad, M., & Varga, J. (2020). From Analogue to Digital Banking: Developments in the European Union from 2007 to 2019. *Regional and Business Studies, 12*, 17-32. https://doi.org/10.33568/rbs.2516

Rohrmeier, D. (2015). Lebenswelten 2020—Wie werden wir morgen unsere Finanzen manage? In M, Seidel & A. Liebetrau (Eds.), *Banking & Innovation. FOM-Edition (FOM Hochschule für Oekonomie & Management)*. Springer Gabler. https://doi.org/10.1007/978-3-658-06746-5_7

Sebastian, I., Ross, J., Beath, C., Mocker, M., Moloney, K., & Fonstad, N. (2017). How Big Old Companies Navigate Digital Transformation. *MIS Quarterly Executive, 16*, Article No. 6. https://aisel.aisnet.org/misqe/vol16/iss3/6

Sun, Z., Sun, L., & Strang, K. (2018). Big Data Analytics Services for Enhancing Business Intelligence. *Journal of Computer Information Systems, 58*, 162-169. https://doi.org/10.1080/08874417.2016.1220239

Terliesner, S. (2016). Wie Institute Ihre Zukunft sichern können. *Bankmagazin, 2-3*, 12-18. https://doi.org/10.1007/s35127-016-0002-8

Verma, J. P. (2016). *Repeated Measures Design for Empirical Researchers*. Wiley.

Weiber, R., & Mühlhaus, D. (2014). *Strukturgleichungsmodellierung. Eine anwendungsorientierte Einführung in die Kausalanalyse mit Hilfe von AMOS, SmartPLS und SPSS* (2nd ed.). Springer Gabler. https://doi.org/10.1007/978-3-642-35012-2_15

Wohllebe, A., Dirrler, P., & Podruzsik, S. (2020). Mobile Apps in Retail: Determinants of Consumer Acceptance—A Systematic Review. *International Journal of Interactive Mobile Technologies, 14*, 153-164. https://doi.org/10.3991/iijm.v14i20.18273

Wohllebe, A., Hübner, D. S., Radtke, U., & Podruzsik, S. (2021). Mobile Apps in Retail: Effect of Push Notification Frequency on App User Behavior. *Innovative Marketing, 17*, 102-111. https://doi.org/10.21511/im.17(2).2021.10

Wolgast, M. (2016). Das gegenwärtige Niedrigzinsumfeld aus Sicht der Sparkassen. *Vierteljahreshefte zur Wirtschaftsforschung, 85*, 11-29. https://doi.org/10.3790/vjh.85.1.11