

# But This Time It's Different – the Rise of the Retail Investor

TRUSTDBLE: Towards a New Class of DBMSs for Data Sharing

Digital Embracement of Firms: Measurement, Antecedents, and Financial Consequences

The Role of ESG Data in the Sustainable Transformation of the Real Economy



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## Editorial

# But This Time It's Different – the Rise of the Retail Investor

Jacob Hetzel

After yet another year of Covid-19, the global financial markets have proven to be surprisingly robust, quite surprisingly so for many, if you take into consideration that the virus is still not under control. But apart from the striking recovery after the fast crash during the first lockdown, there has been another very interesting phenomenon: the return of the retail investor. One could not miss the headlines about meme stocks, the trading boom, and it seems like all the calls for more shareholders in Germany have finally had their effect. Of course, quite often people now compare the current rise of the retail investor with the one more than 20 years ago when “new economy” stocks were first skyrocketing and, then, often went bankrupt. But can both phenomena really be compared? Or to put it a little more crudely: Do boomers invest differently than zoomers? Back in the late 90s and early 2000s the trading boom was largely based on the idea of getting rich quickly. Is this different today?

### Where does the trend to invest come from?

Unlike twenty years ago, most investors do not place bets on single stocks hoping to double their money in a short period of time. They rather use

the access to capital markets to solve various issues. When it comes to investing, most people are in the same boat: Negative interest rates or even custody fees for deposit accounts plus an inflation rate higher than many younger investors have ever experienced before leave almost no alternative to investing in the stock market. Then, there is the question of retirement. Most people realize that possibly the state pension scheme will not be sufficient to keep living standards up in the future. Even before the new German government mentioned the plan of a capital-based pension fund in the coalition agreement, many investors took matters into their own hands and started investing with a clear goal in mind: saving up for retirement. Furthermore, the ongoing corona crisis has played its part in the return of the retail investor to the markets. First of all, over the past year, after the fastest crash in the history of stock markets, in 2020, markets have very quickly recovered and mostly risen. This positive sentiment has helped tremendously to get people to invest. Also from another point of view the pandemic “helped”. Measures like the closure of restaurants, restricted travel and lockdowns meant two things: People saved and had more



**Jacob Hetzel**  
Head of Distribution  
Scalable Capital

money to invest and, maybe more importantly, more time to think about their financial future. Neobrokers made it easy for everyone to open up a trading account from the comfort of their home.

### But who are those investors and what do they invest in?

Through all the media hype about the rise of the retail investor and neobrokers, many people are led to believe that those investors are only teenagers and twenty-somethings betting their money on meme stocks and crypto currencies. That is not the case. The phenomenon is a lot broader. The average customer of the Scalable Broker, for example, is in their thirties. But what do people invest in? How do they use their newly found access to capital markets? The rise of the retail investor is also directly related to the rise of a certain type of financial product, the ETF. Over two thirds of our clients are invested in these cost-effective, broadly diversified, and passive funds. The focus clearly lies on well-known and mostly global benchmarks like the MSCI World or the FTSE All-Country-World. Savings plans are also very popular among investors, every second customer has at least one ETF savings plan, on aver-

age people save more EUR 450 a month into three ETFs. If we look into the top ten traded securities in the broker, we find eight ETFs and only two single stocks. This clearly shows that investors are focused on long-term investments rather than short-term gains. Of course, there is also speculation, but on a much smaller scale than one might expect given the hype around the “reddit traders versus hedge funds” topic in early 2021. In the Scalable Broker, less than 4% of the clients traded this stock at the time. The GameStop saga brought attention to the topic of stock market investments to people that had not at all been familiar with the field, but then mostly chose to invest in a smarter way.

### So is it really different this time?

If you compare the rise of the retail investor to the boom more than 20 years ago, you can clearly see that there are many differences. Most importantly, the focus of investors has shifted. From single stocks to ETFs, from short term to long term. This does not mean that everyone who has opened up a trading account will stay in the market for the next two decades, but overall this new rise of the retail investor should last a lot longer than the last one.

## Research Report

# TRUSTDBLE: Towards a New Class of DBMSs for Data Sharing

RECENTLY, A NEW CLASS OF SYSTEMS FOR SHARED AND COLLABORATIVE DATA MANAGEMENT HAS GAINED MORE AND MORE TRACTION. IN CONTRAST TO CLASSICAL DATABASE MANAGEMENT SYSTEMS (DBMS), SYSTEMS FOR SHARED DATA NEED TO PROVIDE ADDITIONAL GUARANTEES TO ENSURE THE INTEGRITY OF DATA AND TRANSACTION EXECUTION. IN THIS PAPER, WE PRESENT TRUSTDBLE, A NEW DBMS THAT EXTENDS THE ACID PROPERTIES (I.E., ATOMICITY, CONSISTENCY, ISOLATION, DURABILITY) USED BY CLASSICAL DBMS WITH A NEW VERIFIABILITY COMPONENT TO ADDRESS THESE NEW REQUIREMENTS.

Carsten Binnig

Simon Karrer

### Motivation

Recently, a new class of systems for shared and collaborative data management has gained more and more traction. Examples of such systems include Veritas (Allen et al., 2019), BlockchainDB (El-Hindi et al., 2019), FalconDB (Peng et al., 2020), and Spitz (Zhang et al., 2020).

Compared to classical database management systems (DBMSs) that are designed to be used by a single party, these systems enable multiple parties to manage a shared database (DB) in a collaborative manner. For example, think of a shared database for medical patient records. It would allow hospitals and doctors to directly share and modify patient data to keep track of

Muhammad El-Hindi

Benedikt Völker

diagnoses and treatments a patient received. Clearly, shared DBs provide many opportunities not only in the medical domain (e.g., for large-scale epidemic studies), but also for many other fields where access to a shared DB enables more effective collaboration or new use cases (e.g., in the financial domain or supply chains).

However, unlike classical DBMSs, systems for shared data need to provide additional guarantees to ensure the integrity of data and transaction execution, called verifiability guarantees. The main reason for this is that when manipulating a shared DB in a collaborative way, there is often mutual distrust between the different parties that jointly access the shared DB since

they often have different interests (e.g., think of an insurance company and a hospital that use a shared database for medical records). Hence, the goal of the verifiability guarantees is to govern the shared database, i.e., to guarantee that the shared database is only modified based on a predefined and agreed upon set of transactions that every party adheres to and that none of the parties can tamper with the data.

If we now look at how existing systems for shared data (such as those mentioned at the beginning) provide verifiability, we can observe that these systems typically take a very implementation-centric approach and often do not integrate well with the ACID guarantees of classical DBMSs. Also, the concrete verifiability guarantees that existing systems provide vary significantly and are hard-baked into their execution model.

### Vision

In this paper, we propose to take a more principled and more database-centric approach to provide verifiability for shared data systems. We present the main concept behind our system, TRUSTDBLE, which is to extend the ACID properties used by classical DBMSs with a new verifiability component resulting in the ACID-V properties. Similar to the other components in ACID, such as the well-known isolation property, TRUSTDBLE allows to specify the guarantees of verifiability in a declarative manner using different verification levels (i.e., strict or more loose). We believe that extending the ACID properties with verifiability is not only a natural fit and gives

applications well-defined guarantees, but it also enables a new class of shared DBMSs that decide based on the verification level what optimizations and concrete execution strategies are required for the desired guarantees.

### From ACID to ACID-V

*Adding the V to ACID.* In classical databases, transactions are governed by the ACID properties. As mentioned before, the concrete properties that should be satisfied can be defined declaratively and are implemented by databases in various ways. For example, for the Isolation) in ACID, a user can declare the specific isolation level (e.g., read committed, serializable) that a transaction should run under. This isolation level is, then, guaranteed by a database through its concurrency control scheme (e.g., optimistic or pessimistic). Similarly, we propose to add a new verifiability property that a user can specify declaratively and that database systems can implement in different ways. Looking at verifiability from a conceptual perspective allows to reason about the guarantees a system provides independent from implementation details.

To add the V to ACID, we extend the classical transaction state model of ACID-compliant DBMSs by a verified state. For simplicity, Figure 1 visualizes the extended state model for ACID-V for the case in which all nodes in a shared DBMS act honestly. We will discuss malicious behavior in follow-up work. In our state model, a transaction can only reach the verified state after it reached the committed state.

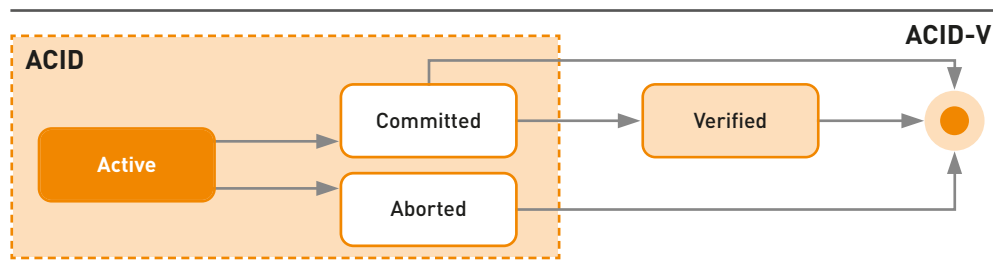


Figure 1: Simplified State Model for ACID-V (the classical transaction state model is extended with a verified state)

Modeling verified as a state that follows the committed state has several advantages. First, since verification is typically an expensive step, the model leaves some freedom when the transition from committed to verified happens (i.e., directly after the commit or deferred). Moreover, it enables the user to declare which state is allowed to be read by other transactions (e.g., if committed, but unverified can be read or if all state must be verified before becoming visible). Second, the verified state is an optional state as shown in Figure 1, i.e., not all committed transactions need to be verified, which allows partial verification to reduce the overhead introduced by verification.

**Verification Levels.** While a formal definition of ACID-V and a more complete discussion of possible verification levels are out of scope for this paper, in the following, we show how a first set of different verification levels can be defined based on the state model we introduced before. Based on this, we will discuss what implications different verification levels can have on the integrity of data/execution and a system’s performance.

**Strict Verification (SV):** This verification level

requires that all transactions need to be verified. Moreover, all transactions are allowed to read only verified state. A similar guarantee can be provided by the online verification schemes of existing systems such as Veritas and BlockchainDB which guarantee that the result of a transaction is verified before becoming visible to other transactions. In terms of transaction execution, this level implies that transactions should transition from the committed state to verified as fast as possible. Otherwise, this can lead to low performance or in worst case starvation (i.e., if there are too many unverified transactions). Clearly, strict verification, thus, has a high overhead and might lead to inferior performance when compared to more relaxed levels that we discuss below.

**Unstrict Verification / full (UV-f):** Compared to the previous level, UV-f is a more relaxed verification level since it allows transactions to read from committed but not yet verified state. That is, even if the verification of a transaction is still pending, other transactions can access its committed state. However, all transactions are still being verified (hence, it is called full) and unsuccess-

ful verification in case of malicious behavior needs to be handled. In contrast to the SV level, though, this makes room for different optimizations. Most importantly, transactions are not blocked by potentially expensive verification protocols since verification can be executed in batches and in a deferred manner. This is similar to deferred verification schemes available in existing systems.

**Unstrict Verification / partial (UV-p):** This verification level relaxes the guarantees of the previous level (UV-f) even further. Similar to UV-f, transactions are allowed to access committed, but unverified state. Further, in partial unstrict verification (UV-p), we do not enforce that all transactions need to be verified. Consequently, this verification level assumes that verified is an optional state of a transaction. In this level, a user can, thus, explicitly request to verify only a subset of transactions. Hence, UV-p could be used to limit the verification overhead to some (e.g., important) transactions or to provide probabilistic guarantees by verifying only a sample of all transactions.

### Conclusion and Future Directions

In this paper, we presented our vision for TRUST-DBLE as an ACID-V-compliant DBMS for data sharing. As a core contribution, we propose to specify the guarantees of verifiability in a declarative manner and let the DBMS decide what optimizations and concrete execution strategies are best suited to meet the guarantees of a particular verification level. We think that the model of ACID-V-compliant DBMSs can trigger many follow-up

work. For example, the verification levels proposed in this paper are just an initial direction and a more profound discussion of what levels data sharing applications actually need is required. Further, similar to isolation levels that have triggered different implementation strategies, we think ACID-V will also enable a wide variety of different implementation strategies to achieve the desired guarantees of verification.

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## Research Report

# Digital Embracement of Firms: Measurement, Antecedents, and Financial Consequences

MANY PEOPLE CLAIM THAT FIRMS NEED TO EMBRACE DIGITAL TECHNOLOGIES. YET, WE KNOW LITTLE ABOUT DIGITAL EMBRACEMENT, ITS ANTECEDENTS, AND ECONOMIC CONSEQUENCES. THIS ARTICLE PROPOSES A TEXTUAL APPROACH TO MEASURE DIGITAL EMBRACEMENT AND APPLIES IT IN AN EMPIRICAL STUDY COVERING 2,278 PUBLICLY LISTED U.S. FIRMS OVER 17 YEARS. THE RESULTS OUTLINE A VAST HETEROGENEITY IN FIRMS' DIGITAL EMBRACEMENT IN AND ACROSS INDUSTRIES. REMARKABLY, A HIGHER DIGITAL EMBRACEMENT PREDICTS HIGHER FINANCIAL PERFORMANCE.

Simeng Han

Bernd Skiera

Alexander Hillert

### Introduction

Consultants, politicians, and academics encourage firms to embrace digital technologies because they believe that, by doing so, firms achieve higher economic success. For example, according to Fitzgerald et al. (2013), for many firms, the ubiquity of digital technologies is changing their business landscape, and the effective and quick response to new digital technologies is affecting their survival. In addition, in March 2016, the German Federal Ministry for Economic Affairs and Energy published the Digital Strategy 2025, which involves supporting digital startups and assisting firms to become more digital.

Yet, most of these encouragements are based on anecdotal evidence but lack solid empirical support. As a result, little is known about differences in the embracement of digital technologies across firms and industries, their antecedents, and, most importantly, their economic consequences.

This lack of knowledge is problematic because it does not allow firms to take effective steps towards a digital economy. Without sufficient knowledge, it is challenging for firms to benchmark themselves against their competitors. It is also hard for politicians to make appropriate decisions on whether, where, and how to sup-

port a stronger embracement of digital technologies.

Our vision is to measure the embracement of digital technologies for many firms at many points in time at reasonable costs. More precisely, our aims are (1) to develop and apply a score to measure firm-level digital embracement, (2) to compare the score across firms in various industries at different points in time, (3) to examine the antecedents of the score, and (4) its financial consequences.

### Approach to Measure Score of Digital Embracement

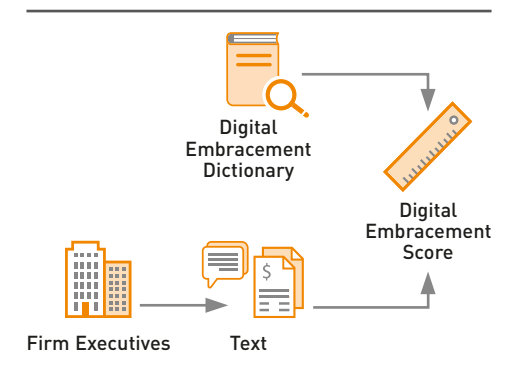
Previous studies show that the attention of a firm's top management substantially shapes the firm's behavior and performance (Ocasio, 1997). Thus, the extent of attendance of the firm's executives to digital technologies can represent how much the firm embraces digital technologies.

Our study proposes the construct of digital embracement as firm executives' strategic attention towards digital technologies. In this definition, the word "attention" indicates that digital embracement is about the attitude and intention towards adopting digital technologies. The word "strategic" implies that the attention should reflect firm executives' enthusiasm towards the opportunities coming with digital technologies instead of the concern about the threats induced by digital technologies. Furthermore, the attention should be forward-looking.

Previous research suggests that language rep-

resents attention so that when one considers a topic, one tends to express the subject in words (Humphreys and Wang, 2018). Analogously, we can use executives' communication to measure their attention towards various topics [Berger et al., 2020].

Therefore, we adopt a textual analysis method and analyze communication from firms' executives to measure digital embracement. Specifically, we look at the share of communication firms' executives devote to discussing plans on adopting digital technologies for their business. To identify such communication reflecting digital embracement, we build a "lexicon" of terms capturing the discussion on intended adoption of digital technologies, namely, a digital embracement dictionary. Figure 1 illustrates the basic idea of our approach.



**Figure 1: Illustration of the Measurement of Digital Embracement**

For building our digital embracement dictionary, we take the digital dictionary from Kindermann

et al. (2021) as a starting point. We use an information systems textbook as our training library (Rainer and Prince, 2019). We expand the previous dictionary by including additional terms capturing digital embracement (e.g., “augmented reality”), removing terms not necessarily digital-related (e.g., “designer”), and removing negative terms (e.g., “malware”).

Our final digital embracement dictionary consists of 702 terms, including 273 single words (e.g., “digital”) and 428 multigram terms (e.g., “data center”, “platform as a service”). In particular, compared to the previous dictionary, our dictionary expands on the bigrams (e.g., “search engine”) and trigrams (e.g., “natural language processing”). Out of the 564 new terms in our dictionary, 384 are bigrams, trigrams, or terms with even more words. These terms help us avoid misclassification and ambiguity caused by homonyms of single words. Furthermore, our dictionary expansion includes numerous terms specific to industries that the previous dictionary fails to capture, such as “facial recognition”.

We use transcripts of firms’ quarterly earnings conference calls as the text source for our measurement. We preprocess the text of each earnings call following a standard procedure. We compute the number of digital embracement terms in each preprocessed text and take the percentage share of digital terms in the preprocessed text as our digital embracement score.

We conduct a series of validations to ensure the internal and external validity of our score. The

results of our validations show that our measurement captures the characteristics of digital embracement.

### Empirical Study

We collect transcripts of earnings conference calls published from 2003 to 2019 from Refinitiv. We obtain firms’ financial data from Compustat and the CRSP stock market database. For each firm in our sample, we require at least three consecutive years of transcripts. The final sample comprises 86,664 quarterly observations from 2,278 firms with around 38.47 quarterly observations per firm.

Figure 2 presents the distribution of digital embracement scores in 2003, 2011, 2019, and across all years. The distribution development shows that the average digital embracement score increased from 0.58 in 2003 to 0.92 in 2019, equivalent to a 50% increase.

We observe that the 25<sup>th</sup> percentile, the median, the 75<sup>th</sup> percentile, and the maximum digital embracement scores increased over time. This development also corresponds to the “flatter” distribution of digital embracement scores in 2019, compared to 2011 and 2003, showing a decreasing share of firms with a digital embracement score close to zero. Thus, such development indicates that, in general, the digital embracement score of firms in our sample increased over time.

Next, we look at how the digital embracement scores vary across industries. Table 1 presents

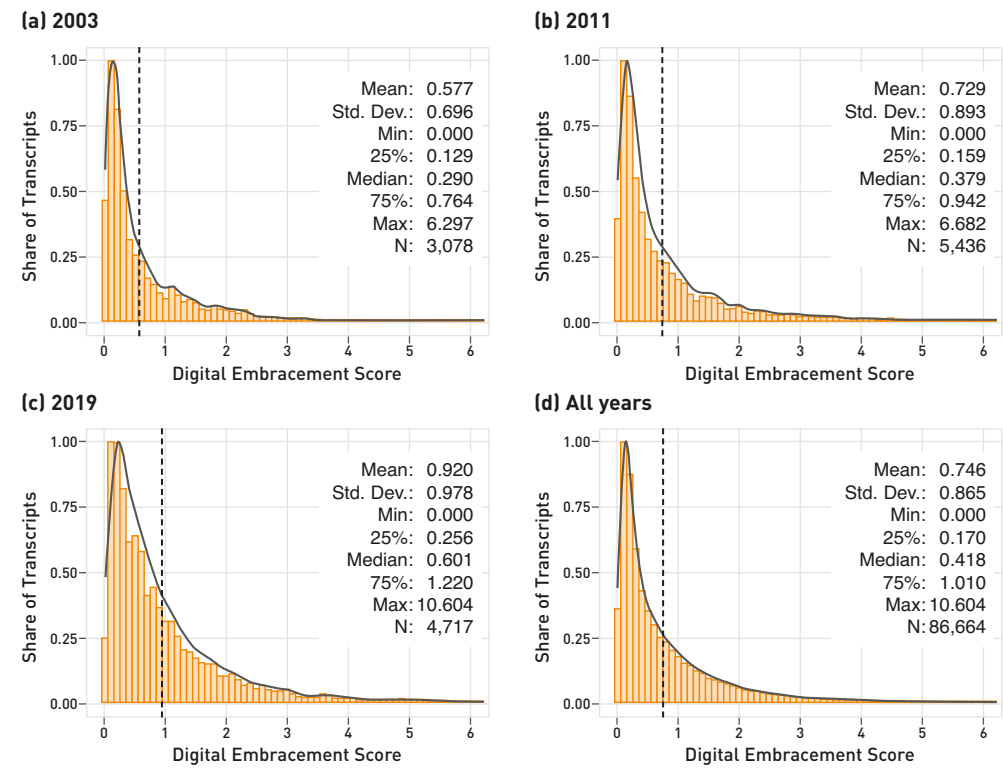


Figure 2: Distribution of Digital Embracement Score

the ranking of industries according to their average digital embracement score in 2003, 2011, and 2019. While business equipment and telecommunication remain the two industries with the highest digital embracement scores, utilities and energy have the lowest average digital embracement scores in all three years. For example, in 2019, business equipment’s average digital embracement score was 1.90, around eight times the average digital embracement score of utilities (0.24).

Such ranking seems intuitive since the business equipment and telecommunication industries include firms advanced in information technologies, such as Oracle. In contrast, firms in the utilities and energy industries typically have fewer opportunities to embrace digital technologies in their operations.

The average digital embracement score of healthcare increased from 0.56 in 2003 to 0.73 in 2019, equivalent to an increase of 30.4%.

2003		2011		2019	
Industrie	DES	Industrie	DES	Industrie	DES
Business Equipment	1.276	Telecommunication	1.704	Business Equipment	1.901
Telecommunication	1.051	Business Equipment	1.512	Telecommunication	1.751
Healthcare	0.562	Other	0.671	Other	0.857
Other	0.462	Healthcare	0.614	Shops	0.777
Consumer Durables	0.410	Shops	0.557	Healthcare	0.733
Shops	0.368	Consumer Durables	0.536	Consumer Nondurables	0.567
Manufacturing	0.306	Consumer Nondurables	0.411	Consumer Durables	0.552
Chemicals	0.251	Chemicals	0.323	Chemicals	0.517
Finance	0.214	Manufacturing	0.303	Manufacturing	0.442
Consumer Nondurables	0.204	Finance	0.245	Finance	0.414
Utilities	0.161	Utilities	0.193	Energy	0.321
Energy	0.155	Energy	0.192	Utilities	0.244

**Table 1: Ranking of Industries According to Digital Embrace-ment Score (DES)**

However, its rank among the industries decreased from the third to the fifth. Similarly, the ranking of consumer durables decreased from fifth to seventh place, although the industry has a 34.1% increase in its average digital embrace-ment score (from 0.41 in 2003 to 0.55 in 2019). In contrast, shops (i.e., wholesale and retail) and consumer nondurables achieved a remarkable increase in their rankings (shops from the sixth to the fourth; consumer non-durables from the tenth to the sixth) by more than doubling their average digital embrace-ment score from 2003 to 2019 (shops from 0.37 to 0.78; consumer nondurables from 0.20 to 0.57).

Then, to investigate the antecedents of digital

embrace-ment more formally, we perform a regression analysis. Our results confirm that large differences across industries in digital embrace-ment scores exist. The year fixed-effects cover a development over time, for which we observe a gradual increase from 2009 to 2019.

In addition, we find that more profitable and lower leveraged firms have higher digital embrace-ment scores. Namely, financial pressure negatively affects firms' digital embrace-ment. Our results also show that larger firms and younger firms have higher digital embrace-ment scores. Furthermore, firms listed on Nasdaq have higher digital embrace-ment scores. Interestingly, book-to-market ratio does not have a

statistically significant effect on digital embrace-ment scores. In other words, the traditional perspective of value versus growth firms cannot explain the extent to which firms embrace digital technologies.

Lastly, we investigate whether the digital embrace-ment score predicts future firm profitability and future firm value. Our results show that a firm's digital embrace-ment score has a significantly positive effect on its future profitability and future firm value.

Based on our estimates, a one standard deviation increase in a firm's digital embrace-ment score predicts a 0.49 percentage points increase in gross profit over total assets twelve months later, corresponding to 8.40% of the average gross profit of the firms in our sample. Furthermore, a one standard deviation increase in a firm's digital embrace-ment score is associated with a 0.08 increase in Tobin's q twelve months later. This effect corresponds to 3.64% of the average Tobin's q (2.25) in our sample. These results suggest that digital embrace-ment has a significant economic impact.

## Conclusion

Our study uses textual analysis to introduce a new measurement of firm-level digital embrace-ment. We apply it to 86,664 transcripts of earnings calls between 2003 and 2019 and investigate digital embrace-ment's antecedents and economic consequences. The positive effect of digital embrace-ment on future firm performance shows that firms should embrace digital tech-

nologies. Thus, politicians should also encourage and support firms' digital embrace-ment.

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## Insideview

# The Role of ESG Data in the Sustainable Transformation of the Real Economy

INTERVIEW WITH CHRISTINA SELL

**Today's investors increasingly turn to sustainable and socially responsible investing. Consequently, aspects of ESG – i.e., "Environmental Social Governance" – are becoming more important for companies. What is the role of a market operator, specifically your Trading and Clearing Division, in this context?**

Generally, our mission is to translate client needs into capital market products. With regards to ESG, we want to offer beneficial, market-driven solutions that respond to changing societal values and that support the sustainable transformation of the real economy.

**In which fields is ESG data applied and what financial products use ESG data?**

ESG data is at the core of our ESG product development and applied in all fields where we can provide additional value to the market – starting from increasing transparency through resource and capital allocation, to effective risk

mitigation. To give just two examples: Dedicated ESG segments and available issuer ratings improve transparency and ease investment decisions, while our ESG derivatives products can be utilized to hedge against respective market risks.

**What are the main challenges in preparing ESG data and who offers them?**

For the time being, the list of challenges is still quite extensive: new metrics, new complexities, and new requirements arise at the same time that we face a lack of standardization, completeness of regulation, as well as the full support of analytics tools and techniques. Even the lack of relevant data points can be an issue. For instance, just think of climate risk information which needs to be integrated into companies' existing risk management frameworks and stress tests. To date, traditional sources have not provided climate or transition risk data, and systems are often not yet prepared to process



Christina Sell  
Chief Sustainability Officer  
Trading & Clearing  
Deutsche Börse

them. With ISS and Qontiqo, Deutsche Börse is very well equipped with leading ESG data research and analytics providers in-house, but startups and other companies can also be interesting partners. Last but not least, we should not forget that in this context the financial markets themselves are important data providers, i.e., they provide for transparent, supply- and demand-orientated market prices in the ESG area.

**Forward-looking, what is your expectation concerning the relevance of ESG data in the future?**

From my point of view, the relevance of ESG data will further increase, because it enables us to measure the impact that we generate and to work on science-based knowledge. Looking to the future, I am somewhat optimistic: Both the availability and quality of data, as well as the range of innovative tool solutions, is growing rapidly. Similarly, social and governance data

are becoming increasingly important alongside environmental data – a fact that can strengthen the positive transformational effect on societies. The new disclosure regulations are fueling this development.

AI might help to further accelerate this process. Data harmonization is certainly the most difficult part, but I sense a unique momentum of global efforts to achieve alignment and avoid contradicting regulations as we have seen in the past. With the EU leading on this ambitious path, we can already see positive effects, such as increased awareness and a rapidly growing number of investments in ESG products. But, of course, there is still a long way to go and we need to further improve our collaboration and performance to make the ESG transformation a success story within the given timeframe.

**Thank you for this interesting conversation.**

# Infopool

## News

### AIS Best Information Systems Publication Award

The authors Jens Lausen, Benjamin Clapham, Michael Siering, and Peter Gomber received the "AIS Best Information Systems Publication Award" for their paper "Who Is the Next 'Wolf of Wall Street'? Detection of Financial Intermediary Misconduct" published in the renowned "Journal of the Association for Information Systems". The award, issued annually by the Association for Information Systems (AIS), is the highest international publication award in information systems and reserved for only a small number of researchers in this discipline. Congratulations!

### Manisha Luthra Was Awarded a Grace Hopper Scholarship

Manisha Luthra (team Prof. Binnig) is one of 88 selected faculty members from all around the globe to be awarded a Grace Hopper scholarship! Congratulations!

### Nadja Geisler Was Awarded the Best Student Presentation Award

Nadja Geisler (team Prof. Binnig) was awarded the Best Student Presentation Award at DESIRES 2021 for her presentation on "Quest: A Query-driven Explanation Framework for Black-Box Classifiers on Tabular Data". Congratulations!

### Student Initiative TechAcademy

The student initiative "TechAcademy", based at Goethe University and supported by Prof. Skiera, received the award as "Students of the Year 2021" by the German University Association (DHV – Deutscher Hochschulverband) and the German Student Union (DSW – Deutsches Studentenwerk). Congratulations!

### Erich-Gutenberg-Prize for Lukas Jürgensmeier

Lukas Jürgensmeier, a doctoral student at the Chair of Prof. Skiera, won the Erich-Gutenberg-Prize for his Master's Thesis "Measuring Fair Competition on Digital Platforms: Visibility as a Novel Metric in Antitrust Cases". Congratulations!

### New Funded Project in the Rising Area of "Corporate Digital Responsibility"

The interdisciplinary research project CDR-CAT pursues the goal of developing procedures for the detection and automated assessment of all dimensions of corporate digital responsibility (CDR) for providers of digital products or services. The Goethe University Frankfurt (Chair of Information Systems and Information Management) and the Technical University Darmstadt participate in the project. The Hessian State Chancellery in the area of the Minister for Digital Strategy and Development funds the project.

### Successful First-Ever Hybrid efl Annual Conference 2021 on "Data, Liquidity & Market Structure – What's Next for Europe?"

The efl Annual Conference 2021 was held on September 30, 2021. It was the first-ever hybrid efl conference. Prof. Gomber and his team were responsible for the organization of the event. Over 300 attendees and 17 speakers, moderators, and panelists made the efl Annual Conference 2021 a success. It was a great pleasure to welcome so many participants either onsite or online. For further information or if you want to watch the conference recording, please visit the conference website: <https://www.eflab.de/annual-conference-2021>.

## Selected efl Publications

### Bender, M.; Clapham, B.; Gomber, P.; Koch, J.-A.:

To Bundle or Not to Bundle? A Review of Soft Commissions and Research Unbundling.  
In: Financial Analysts Journal, 77 (2021) 3, pp. 69-92.

### Bräuer, K.; Hackethal, A.; Hanspal, T.:

Consuming Dividends.  
Forthcoming in: Review of Financial Studies.

### El Kihal, S.; Nurullayev, N.; Schulze, Ch.; Skiera, B.:

A Comparison of Product Return Rate Calculation Methods: Evidence from 16 Retailers.  
Forthcoming in: Journal of Retailing.

### Frank, M.; Ranft, L. M.:

Using Machine Learning Techniques to Explore Extra-Role Security Behavior.  
In: Proceedings of the 42<sup>nd</sup> International Conference on Information Systems; Austin (TX), U.S., 2021.

### Hättasch, B.; Geisler, N.; Binnig, C.:

Netted?! How to Improve the Usefulness of Spider & Co.  
In: DESIRES 2021; Padua, Italy, 2021.

### Koch, J.-A.; Lausen, J.; Kohlhase, M.:

Internalizing the Externalities of Overfunding – An Agent-Based Model Approach for Analyzing the Market Dynamics on Crowdfunding Platforms.  
In: Journal of Business Economics, 91 (2021), pp. 1387–1430.

### Jansen, N.; Hinz, O.:

Inferring Opinion Leadership from Digital Footprints.  
Forthcoming in: Journal of Business Research.

### Langenecker, S.; Sturm, C.; Schalles, C.; Binnig, C.:

Towards Learned Metadata Extraction for Data Lakes.  
In: BTW 2021; Dresden, Germany, 2021.

### Li, X.; Grahl, J.; Hinz, O.:

How Do Recommender Systems Lead to Consumer Purchases? A Causal Mediation Analysis of a Field Experiment.  
Forthcoming in: Information Systems Research.

### Weiler, M.; Stolz, S.; Lanz, A.; Schlereth, C.; Hinz, O.:

Social Capital Accumulation Through Social Media Networks: Evidence from a Randomized Field Experiment and Individual-Level Panel Data.  
Forthcoming in: Management Information Systems Quarterly.

### Zacharias, N.; Daldere, D.; Hinz, O.:

Which Collaborations Allow Firms to Become Gatekeepers? A Longitudinal Analysis of a Large-Scale Collaboration Network.  
Forthcoming in: European Management Journal.

For a comprehensive list of all efl news postings and efl publications see: <https://www.eflab.de>

# Infopool

## RESEARCH PAPER: RECONSIDERING RETURNS

The authors show that investors fail to incorporate dividends when evaluating performance. Specifically, investors' perception of performance is biased because the relevant measure, total returns including dividends (versus price changes), is rarely displayed although there is high attention and agreement on the appropriate measure for performance. Perhaps the most striking example of this is the fact that most major indices of market performance do not reinvest dividends (the DAX-30 is an exception), and investors seem to be confused about the implications of this. The authors show that the display of performance in terms of price changes has a significant impact on market participants and propose to shift the default display of market performance to total return indices (away from price indices).

Hartzmark, S. M.; Solomon, D. H.

Forthcoming in: *Review of Financial Studies*, 2022.

## RESEARCH PAPER: STRATEGIC DIRECTIONS FOR AI: THE ROLE OF CIOS AND BOARDS OF DIRECTORS

As a disruptive innovation, artificial intelligence (AI) has the potential to force firms to restructure or redefine their business models in order to survive, sustain operations, and gain competitive advantages. Upper echelons theory suggests that the presence of certain top management roles can significantly affect firm strategies and outcomes. Thus, this article examines whether the presence of a Chief Information Officer (CIO) facilitates AI orientation and how boards affect the relationship between CIO and AI orientation. Using a unique dataset drawn from the annual reports of 1,454 publicly listed firms, the authors find that CIOs interested in formulating an AI orientation should develop strong relationships with board members, particularly those who possess relevant knowledge.

Li, J.; Li, M.; Wang, X.; Thatcher, J. B.

In: *MIS Quarterly*, 45 (2021) 3, pp. 1603-1644.

## efl insights

The efl publishes the insights in the form of a periodic newsletter which appears two times a year. Besides a number of printed copies, the efl insights is distributed digitally via E-mail for reasons of saving natural resources. The main purpose of the efl insights is to provide latest efl research results to our audience. Therefore, the main part is the description of two research results on a managerial level – complemented by an editorial, an interview, and some short news.

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