Historical perspectives on accounting in Germany: Evidence from corporate archives and academic journals

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List of Abbreviations

ADHGB	*Allgemeines Deutsches Handelsgesetzbuch* (General German Commercial Code)
AG	*Aktiengesellschaft* (stock corporation)
AktG	*Aktiengesetz* (Stock Corporation Act)
ALR	*Allgemeines Landrecht für Preussische Staaten* (General Law for Prussian States)
DBW	*Die Betriebswirtschaft*
DM	*Deutsche Mark*
FAH	*Familien-Archiv Hügel* (Hügel family archive); archival reference code
GmbH	*Gesellschaft mit beschränkter Haftung* (limited liability company)
HGB	*Handelsgesetzbuch* (German Commercial Code)
K	*Krupp-Archiv* (Krupp archive); archival reference code
KRG	*Kostenrechnungsgrundsätze* (Cost Accounting Principles)
KWVO	*Kriegswirtschaftsverordnung* (War Economy Ordinance)
LSÖ	*Leitsätze für die Preisermittlung aufgrund der Selbstkosten für öffentliche Auftraggeber* (Guidelines for Cost-Based Price Determination for Public Authorities)
M	*Mark*
NIS	New Institutional Sociology
NS	National Socialist
NSDAP	*Nationalsozialistische Deutsche Arbeiterpartei* (National Socialist German Workers' Party)
PM	*Papiermark*
PublG	*Publizitätsgesetz* (Disclosure Law)
RM	*Reichsmark*

RPÖ	*Richtlinien für die Preisbildung von öffentlichen Aufträgen* (Guidelines for the Pricing of Public Contracts)
Rtlr.	*Reichstaler gemeinen Geldes* (Reichstaler in common currency)
Sbr.	*Stüber*
Tlr.	*Reichstaler preußisch Courant* (Reichstaler Prussian Courant)
U.S.	United States
VA	value added
VAD	value added distribution
WA	*Villa Hügel Werksarchiv* (factory archive); archival reference code
WW I	First World War
WW II	Second World War
ZfB	*Zeitschrift für Betriebswirtschaft*
ZfhF	*Zeitschrift für handelswissenschaftliche Forschung*

Chapter 1
Introductory summary

Disclaimer: In the course of preparing this dissertation, the AI-assisted tools Claude (Sonnet 5, Anthropic) and DeepL were employed in certain sections for language refinement purposes. Their use was strictly limited to linguistic aspects such as spelling, grammar, punctuation and style, as well as translation support. I reviewed and edited all text following any generative AI-assisted suggestions and accept full responsibility for the content of this dissertation.

Why should accounting research concern itself with the past? In a discipline whose 'mainstream' is oriented towards capital markets and the informational needs of present-day decision makers, historical inquiry seems to require justification. From this mainstream much of contemporary accounting research describes itself, with some irony for the historian, as 'empirical-archival'. What is meant are large databases of financial and market data, analysed statistically, rather than the archives of firms or other organisations in which the traces of accounting's past are preserved (Napier 2006; Gomes et al. 2011). Within this environment, research that works with such archives in the literal sense has at times been suspected of being merely 'antiquarian' (Napier 2006, 1989; Sangster 2025). The most compelling response to this suspicion rests on a particular understanding of what accounting is. If accounting were no more than a technique for recording transactions, its history would indeed be of limited interest, a chronicle of methods progressively refined and superseded (Gomes et al. 2011, 390). A substantial body of research has, however, established a different view. Accounting is a social practice, and is embedded in the economic, political and cultural contexts in which it operates (Hopwood 1983, 288; Miller 1994; Carnegie et al. 2020). It shapes these contexts as much as it reflects them, and it influences how organisations are governed and how economic life is understood (Burchell et al. 1980, 5). Studying accounting's past reveals that arrangements which appear natural today are the contingent outcomes of historical processes. It thereby allows contemporary accounting thought and practice to be understood more deeply and more critically (e.g. Carnegie and Napier 1996; Gomes et al. 2011; McBride et al. 2025).

The conception of accounting as a social practice has changed accounting history research. Traditional accounting historiography focused on documenting past accounting techniques and tracing their evolution, as exemplified by Littleton ([1933] 1981) and, in the German literature, by Penndorf (1913) (Napier 2001; Previts et al. 1990a, 1990b). The 'new accounting history' that emerged in the late 1980s broke with this tradition and drew on theoretical perspectives from various disciplines, such as sociology, political economy and philosophy (Miller et al. 1991). As a result, historical research no longer focused on accounting techniques alone but increasingly examined the conditions under which accounting practices emerge and change (Miller et al. 1991, 396; Miller and Napier 1993, 633; Napier 2006, 457). However, calls for 'common ground between "new" and "old" accounting history' (Funnell 1996, 38) were voiced early, and the more recent literature describes a field in which the study of accounting's past as a set of practices and the study of accounting's roles in

organisations and society complement rather than oppose each other (Napier 2006; Gomes 2008; Carnegie et al. 2020). Accordingly, the three studies of this dissertation combine these two perspectives. Chapter 2 reconstructs the accounting practices of Friedrich Krupp's cast steel factory in its formative years (1811 to 1826); Chapter 3 traces the distribution of the value added generated by Krupp across nearly two centuries (1811 to 1998); Chapter 4 examines accounting research published in German academic business journals between 1929 and 1945. Each study works from primary sources and asks what the reconstructed practices or discourse reveal about the organisations, the institutions and the contexts from which they emerged.

Within accounting history, the single-case study holds a central methodological position. Many important contributions to the field are based on the records of a single organisation (e.g. McKendrick 1970; Edwards et al. 1990; Quattrone 2004; Quinn and Moreno 2024). The two Krupp studies in this dissertation follow this approach; the third study extends the case logic from the firm to the discipline. From the perspective of large-sample research, such studies have been criticised for their limited generalisability (Lukka and Kasanen 1995, 71). However, it is precisely the depth of the individual case that allows accounting to be observed in its context (Cooper and Morgan 2008). Studies of a local, time-specific setting can yield insights into how accounting emerges from, and acts upon, its environment that aggregate data cannot provide (Carnegie and Napier 1996; Gomes et al. 2011, 391). The aim of such research is often not statistical but 'theoretical' or 'analytical generalisation', the refinement of concepts and theories against the details of a documented case (Lukka and Kasanen 1995, 77).

Historical case studies depend on the survival of records and on access to them (see also Detzen and Hoffmann 2021, 667). The studies in this dissertation rest on two kinds of source material. The two Krupp studies draw on the Krupp Historical Archive in Essen, founded in 1905 and the oldest corporate archive in Germany (Stremmel 2023). The archive holds extensive accounting records covering the entire period examined in the two studies, from the earliest journals and ledgers of the founding years to the consolidated statements of the twentieth century. However, and inevitably, the holdings are not complete: not everything was archived and parts were destroyed in the Second World War (WW II) (Stremmel 2023), a challenge that most studies of this kind share (Decker 2013). Archives, therefore, are not neutral: what survives, and what does not, is itself an outcome of organisational and historical processes, and its interpretation requires source criticism (Decker 2013, 166). The third

study uses German academic business journals from 1929 to 1945, available in university library holdings. The printed record is complete. The challenge lies instead in the contextualisation, since the journals were written and edited under the political conditions of the National Socialist regime.

While the three studies differ in their specific thematic orientation, their shared focus on Germany unites them and enables them to contribute collectively to the broader field of German accounting history. The field has a long tradition in German accounting research. According to Mattessich and Küpper (2003, 122) 'after the Italians, the Germans used to be ranked […] next as being interested in historical accounting research' in the first half of the twentieth century. Several German scholars of that time worked on topics that ranged from Roman bookkeeping and the Fugger inventories to Pacioli and the first history of German accounting itself (Penndorf 1913; Mattessich and Küpper 2003; see also Küpper and Mattessich 2005). In the second half of the century, however, accounting history in Germany declined (Küpper and Mattessich 2005, 378). One reason lies in the publication culture of German business economics. German accounting research in general (and also accounting history) long appeared in books (and practitioner journals) rather than in international journals (Fülbier and Weller 2011). The shift towards a greater focus on international ('mainstream') journals appears to have reduced German accounting researchers' interest in historical issues. Nevertheless, topics relating to German accounting history continue to be covered in specialist journals and beyond.

The existing literature can be grouped into five strands. A first concerns the history of German accounting research itself. Küpper and Mattessich (2005; see also Mattessich and Küpper 2003) provide a broad overview of German accounting research over the course of the twentieth century, from the early debates on *Bilanztheorien* associated with Schmalenbach and Schmidt to developments in the post-war period. Further studies have examined various areas and aspects of German business economics and accounting research (Busse von Colbe 1996; Busse von Colbe and Fülbier 2013; Fülbier and Gassen 2011; Fülbier and Weller 2011). A related body of research considers how major German accounting scholars (e.g. Schmalenbach, Schmidt and Mahlberg) were received internationally (Forrester 1977; Clarke and Dean 1986; Graves 1989). Another important theme is the development of 'controlling' as a distinct German-language field (Coenenberg and Schoenfeld 1990; Schäffer and Binder 2008; Brandau et al. 2017; Weber and Wiegmann 2021). Mention must also be made of Schneider (2001), whose wide ranging history of economic thought ('*Geschichte*

und Methoden der Wirtschaftswissenscahften') does not fit neatly within this strand of research but remains too substantial for the (German) history of business economics (and accounting) to be overlooked.

A second strand addresses financial reporting and its regulation. The recurring theme here is the distinctiveness of the German system, with a focus on creditor protection, prudence and the relationship between financial and tax accounting (e.g. Ballwieser 2010). Studies in this strand examine the interpretation of the prudence principle across legal cultures (Evans and Nobes 1996), window-dressing in the inter-war period (Spoerer 1998), the history of asset valuation and fair value (Richard 2005; Hoffmann and Detzen 2013), the emergence of differential reporting (Eierle 2005), the internationalisation of German accounting regulation (Fülbier and Klein 2015) and Germany's standard setting compared to other countries (Camfferman and Detzen 2018). A third strand deals with the auditing profession in Germany. Statutory auditing was introduced in response to the economic and financial crises of 1929 to 1931 (Quick 2005). Subsequent research has approached the development of the profession from a range of perspectives, including sociological analyses (e.g. Harston 1993; Evans 2003, 2018) or broad historical analyses of its institutional evolution (e.g. Markus 1997).

A fourth strand, and the most dynamic in recent years, applies critical approaches, with a focus on the National Socialist era. Early work examined the loss of accounting's 'aura' of neutrality in the First World War (WW I) (Gallhofer and Haslam 1991) and the adaptation of accounting systems during the Weimar hyperinflation (Hoffmann and Walker 2020). Research on the Nazi period addresses the role of accounting in expropriation and the Holocaust (e.g. Funnell 1998; Lippman and Wilson 2007; Twyford 2021; Twyford and Funnell 2023), corporate history (Booth et al. 2007), the international profession's accommodation of the regime (Walker 2000), and, closest to the third study of this dissertation, the situation of academic institutions and academics under the regime and in denazification (Detzen and Hoffmann 2018, 2020). Fülbier (2021) has argued that this line of research has only begun to explore German academia under National Socialism and has called for further work.

A fifth strand examines accounting practices at the level of individual firms, drawing primarily on evidence from business archives. Compared with the other areas discussed above, this body of research remains relatively small. Richard (2012) examines Prussian railway accounting in the nineteenth century; Steinfeld (2022) analyses hidden reserves in the pre-WW I chemical industry; Pleitgen (2005), in a German-language dissertation, follows the development of business accounting at three firms, among them Krupp, between 1890 and

1940. Beyond these studies, detailed reconstructions of how German firms organised their accounting and how surviving records document changes in practice remain rare. This gap stands in marked contrast to the richness of German business archives (in addition to Krupp, see e.g. BASF or Deutsche Bank).

The three studies in this dissertation are connected to these research strands in different ways. The two studies on Krupp add to the limited body of firm-level case studies on German companies. The first study covers a period earlier than most of the existing literature, examining the 'start-up' phase of a firm whose accounting has mainly been studied in later stages of its history (e.g. Pleitgen 2005). The second study examines the distributional outcomes recorded in the Krupp's accounts over a period of almost two centuries. In doing so, it also sheds light on the accounting records that have so far received little scholarly attention. The third study lies at the intersection of the first and fourth strands. The histories of German accounting research tend to focus primarily on the period up to the 1920s or 1930s and on developments after WW II (e.g. Busse von Colbe 1996; Küpper and Mattessich 2005; Busse von Colbe and Fülbier 2013). However, the years in between mark a turning point. While German accounting thought held a leading international position in the early twentieth century, it had lost this by the post-war period, when the centre of the discipline shifted to the United States (Mattessich and Küpper 2003). How the discipline itself operated during these years remains largely unexplored. At the same time, the critical research on accounting in the Nazi era has concentrated on practices, firms and individual institutions; whether and how National Socialist ideology entered the content of accounting research itself has hardly been examined. The third study addresses both gaps. It examines the period through the published accounting research papers and traces the extent to which the regime and its ideology left marks on what was researched, and how. In this way, each study addresses a different gap in the accounting history of Germany.

The first study, '**Accounting practices of a "start-up" in pre-industrial Germany: The case of Friedrich Krupp (1811–1826)**', examines how accounting emerged in a newly founded firm at a time when formal accounting regulation was largely absent. Friedrich Krupp established his cast steel factory in 1811, in the political and economic turbulence of the Napoleonic era and before the onset of German industrialisation. Like other merchant families of the period, the Krupps moved from commerce into industrial production (see e.g. Oldroyd 2007), and like many contemporaries across Europe, Friedrich Krupp attempted to replicate the English cast steel process (Gall 2000). The venture was not a commercial

success. It employed a handful of workers, consumed the family fortune in pursuit of a product it never brought reliably to market, and was deeply indebted when its founder died in 1826. This combination makes the case particularly interesting because the enterprise was small and struggling, yet still required to document its activities in an institutional environment that provided little guidance on how such records should be kept. The study draws on New Institutional Sociology, in particular Scott's (2014) three-pillar framework of regulative, normative and cultural-cognitive forces, a perspective well suited to young organisations that face uncertainty and must build legitimacy to overcome newness (e.g. Tsamenyi et al. 2006; Quinn and Moreno 2024). The analysis rests on the surviving records of the founding years, including general ledgers, journals and expense lists known as *Lohnzettel*. The findings show a predominantly single-entry bookkeeping-oriented system, supplemented by rudimentary management accounting. The three pillars operated with markedly different intensity. The regulative pillar, formally constituted by the French *Code de Commerce* and the Prussian *Allgemeines Landrecht*, was present but exerted little continuous pressure on daily practice; where legal aspects mattered, it was through partnership agreements rather than statute. The normative and cultural-cognitive pillars, rooted in the mercantile traditions in which Krupp had been raised, proved more influential. Their effects, however, were tied to specific individuals, above all the founder and his accountant, and did not survive their departure. The system that emerged was detailed yet fragile: more differentiated than one would expect for an enterprise of this size, but unable to consolidate into stable routines or institutionalised practices in the sense of Burns and Scapens (2000). The study thereby illustrates how the three pillars interacted. While the weak regulatory environment increased the influence of normative and cultural-cognitive forces, it also made these forces fragile because they relied on individuals whose departure could not be offset by any institutional mechanism.

The second study, '**Two centuries of Krupp through the lens of value added distribution**' (coauthored with Thorben Bonn, Rolf Uwe Fülbier and Bernhard Pellens), shifts the perspective from how the books were kept to what they record. It reconstructs the value added generated by Krupp from its foundation in 1811 to the merger with Thyssen, and traces how this value was distributed among employees, shareholders, creditors and the state. The concept of value added makes it possible to assess a firm's economic performance in its social context (Burchell et al. 1985). The income a firm generates is the joint product of its contributors and information about its distribution permits conclusions about each group's (fair)

share of the value created (Haller et al. 2018). The study starts from the view of the firm as a nexus of contractual relationships among its contributors (Jensen and Meckling 1976, 310). Understood in this way, the income a firm generates is the joint product of these contributors, a perspective with a long tradition in accounting thought (Suojanen 1954) that also underlies stakeholder theory (Freeman 1984). The analysis also responds to calls to examine questions of distribution and inequality from an accounting perspective (Tweedie and Hazelton 2019). Empirically, the study rests on heterogeneous archival sources, from the *Lohnzettel* of the founding years through internal balance sheets and reports to the published annual accounts of the twentieth century. The findings show a persistent predominance of labour. Over almost the entire period, employees received the largest share of value added, reflecting the labour intensity of steel and armaments production, the bargaining power that came with statutory co-determination after 1951 and the priority that the family repeatedly gave to its workforce, visible in welfare provisions that were extensive by the standards of their time (McCreary 1968). The shareholders' share behaves as a residual and is the most volatile of the four. The state's share is highly context-dependent, rising sharply in periods of war and rearmament and repeatedly reshaped by changes to the tax system. The creditors' share remains low except in episodes of expansion or distress. The study also makes visible what the figures alone cannot adjudicate. For example, the employment figures from the early 1940s are partly affected by forced labour. Therefore, assessing value added distribution requires historical judgement alongside the figures. Furthermore, the study reflects on what a long-run reconstruction of value added can and cannot recover from records that were never designed for this purpose. This includes the classification decisions, consolidation problems and inflation adjustments that such a reconstruction requires.

The third study, '**Accounting research in Nazi Germany: Analysis of German academic business journals from 1929 to 1945**' (coauthored with Rolf Uwe Fülbier), turns from the firm to the discipline. It examines how accounting research responded to the political conditions of the Nazi era, based on the three leading German academic business journals of that time. From the volumes of 1929 to 1945, a period that includes the late Weimar years as a basis for comparison, 1,830 articles were extracted, of which 1,013 have an accounting focus. The theoretical lens is the sociology of science as elaborated by Merton, whose ethos of science comprises a set of norms governing scientific practice (Merton [1942] 1973). Merton also analysed how totalitarian regimes constrain these norms, partly with reference to Nazi Germany itself (Merton [1938] 1973). The '*Gleichschaltung*' of German academia,

the removal of scholars deemed politically or racially undesirable and the redirection of research towards the regime's priorities, has been documented for many disciplines (see e.g. Beyerchen 1992), but not for accounting research. The findings show that accounting research retained its application-oriented character after 1933, but its content increasingly aligned with the regime's priorities. The share of practically useful topics rose while pure science, including accounting theory and accounting history, declined. Ideological influence is most visible in cost accounting, in the introduction of the '*Führerprinzip*' into corporate governance and in accounting education. Methodologically, ethical-normative studies gained ground and served as a gateway for ideological content. Scholars of Jewish origin disappeared from the journals or were prevented from entering academic careers, although open attacks within the articles remained rare. Schmalenbach's theories continued to be used even as he faced personal disadvantages because of his Jewish wife (Kruk et al. 1984). The language of most articles remained factual and technocratic, with the extent of Nazi rhetoric varying across the three journals. Taken together, the picture is one of passive conformity rather than open opposition, comparable to what has been observed for Fascist Italy (Cinquini 2007). What this meant for the discipline in the longer run is difficult to measure. As Beyerchen (1992) concludes for other fields, the damage the regime inflicted cannot be quantified, yet its presence is evident.

The dissertation proceeds as follows. Chapters 2 to 4 present the three studies in the order they were introduced. Chapter 5 contains concluding remarks.

Chapter 2

Accounting practices of a 'start-up' in pre-industrial Germany: The case of Friedrich Krupp (1811-1826)

ABSTRACT

This paper examines the emergence of accounting practices at Friedrich Krupp (founded 1811 in Essen), the predecessor of today's ThyssenKrupp Group. Drawing on New Institutional Sociology, particularly Scott's (2014) three-pillar framework, I analyse how regulative, normative and cultural-cognitive forces shaped Krupp's accounting during pre and early industrialisation, a period characterised by shifting political and institutional conditions and limited accounting regulation. Adopting a historical case study approach, the paper draws on extensive archival material from 1811–1826, including general ledgers, journals and cost records. The analysis reveals a predominantly single-entry bookkeeping-oriented system supplemented by rudimentary management accounting. The regulative pillar exerted little continuous pressure, while normative and cultural-cognitive influences, rooted above all in mercantile traditions, proved more influential. The system that emerged was detailed yet fragile, more differentiated than expected for an enterprise of this (small) size but too dependent on specific individuals to consolidate into stable practices. The paper contributes to accounting history by providing a systematic institutional analysis of accounting in a German pre-industrial start-up enterprise using previously unstudied archival records.

Keywords: accounting, early industrialisation, New Institutional Sociology, start-up, Krupp

A working paper version is available as Gehrt (2026) and submitted to *Accounting History Review*.

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2.1. Introduction

In 1811, amid the political and economic turbulence of the Napoleonic era, and just before the onset of German industrialisation, Friedrich Krupp founded a small cast steel factory in Essen. At that time, Essen was a small, economically declining town, shaped more by trade than industry, as war and trade disruptions had eroded its earlier role as a regional commercial centre. Until then, the town's leading families, including the Krupps, had built their wealth through commerce (Probst 1985, 8–10). Friedrich Krupp himself grew up in this merchant environment. By founding a steel factory, he moved beyond his family's commercial activities towards industrial production. Similar shifts can be observed elsewhere during this period, with merchant families investing in industrial ventures (Oldroyd 2007). His focus on cast steel was not unusual; many contemporaries across Europe were attempting to replicate the English steel-making process developed in Sheffield in the mid-eighteenth century (Gall 2000, 19). In its early years under Friedrich Krupp's leadership (1811 to 1826), the company saw little commercial success. It employed only a handful of workers, produced little of commercial value and consumed the family fortune in the pursuit of an innovative product, English cast steel, that Friedrich Krupp never succeeded in bringing reliably to market. By the time of his death in 1826, the enterprise was deeply indebted and showed few signs of the later well-known company that would play a central role in German industrialisation and eventually form the historical core of today's ThyssenKrupp Group.

This paper examines the emergence and development of accounting practices at the Krupp company during these founding years. The struggling 'start up' operated in a period of shifting political and institutional conditions, when formal accounting standards and regulations were largely absent. Yet the company still had to keep records of its business activities, many of which have been preserved in the Krupp Historical Archive located at Villa Hügel in Essen. This makes Krupp a valuable case for investigating how accounting practices emerge in young organisations at a time when accounting was far less institutionalised than today. While some aspects of Krupp's later accounting system have been examined in previous research (e.g. Pleitgen 2005) the records from the period under founder Friedrich Krupp have not yet been studied comprehensively. Although these early documents are occasionally referenced in works on corporate finance, management history or broader corporate history (e.g. Däbritz 1923; Lindenlaub and Köhne-Lindenlaub 1988; Keßler 1995; Gall 2000; Beyer 2007; James 2011), they have not undergone systematic analysis. While there are hardly any

studies on comparable companies of this period in Germany, a substantial body of research examines accounting practices in early-industrial settings, particularly in Britain. This literature points to a range of accounting practices, from relatively simple charge-and-discharge systems to more detailed (cost) records used to support the organisation of increasingly complex operations (e.g. Edwards and Boyns 1992; Fleischman and Parker 1991; Oldroyd 2007; see also Dobie and Oldroyd 2020, 121–24).

Drawing on New Institutional Sociology (NIS), and in particular Scott's (2014) three-pillar framework of institutions, the paper investigates how regulative, normative and cultural-cognitive elements shaped the emergence and development of Krupp's accounting practices. This perspective is especially well-suited for analysing organisations facing uncertainty, making it highly relevant to Krupp, a 'start-up' in the dynamic early-industrialisation phase, that must build legitimacy to overcome newness, gain stakeholder trust and ensure long-term survival (e.g. Tsamenyi et al. 2006; Quinn and Moreno 2024). In addition to this external institutional perspective, the intra-organisational perspective, i.e. the agency of actors such as the founder Friedrich Krupp and other stakeholders (esp. business partners and his accountant), is also taken into account. Methodologically, the paper adopts a historical case study design. Primary sources include extensive archival accounting records from 1811 to 1826 (the year of the founder's death), including general ledgers, journals, expenditure accounts (so-called *Lohnzettel*) and other records preserved in the Krupp Historical Archive.

The analysis reveals a predominantly single-entry bookkeeping-oriented system, supplemented by rudimentary management accounting practices. The three institutional pillars operated with markedly different intensity. The regulative pillar was formally present but exerted little continuous pressure on day-to-day practice. Where it mattered, it was the partnership agreements rather than the statutory provisions of the French *Code de Commerce* (hereafter Code) or the *Allgemeines Landrecht für Preussische Staaten* (General Law for Prussian States, ALR) that carried weight. The normative and cultural-cognitive pillars, rooted above all in mercantile traditions and supplemented by influences from the iron industry, were the more significant sources of influence. Yet their effects were closely tied to specific individuals (esp. Friedrich Krupp and his accountant) and could not be sustained after their departure. The result was a detailed yet fragile system, remarkably differentiated for such a small and early-stage enterprise, but unable to develop into stable routines.

The paper makes three contributions. First, it adds to the very limited literature on German corporate accounting during the pre- and early-industrialisation period. While British

industrial accounting has received considerable scholarly attention, comparable German cases remain largely unstudied, and this paper provides one of the first systematic analyses of accounting practices in a German firm of this era. Second, the early records of the Krupp company have not previously been examined from an accounting perspective, despite their survival in the Krupp Historical Archive. Third, by applying Scott's (2014) three-pillar framework to a young pre-industrial enterprise, this paper adds to institutional accounting history literature by analysing how regulative, normative and cultural-cognitive forces shape accounting practice emergence in conditions of uncertainty and incomplete institutionalisation.

The remainder of the paper is structured as follows: First, NIS is introduced as the theoretical framework, followed by a description of the research design and data. Next, the institutional context is outlined, leading into a description of Krupp's accounting practices and an analysis of these practices through the lens of Scott's three pillars. The final section provides a conclusion.

2.2. Theoretical framework

According to NIS, which provides the theoretical framework for this study, the historical examination of Krupp's early accounting practices requires an understanding of the institutional context in which the young company operated (esp. Scott 2014; DiMaggio and Powell 1983). This is based on the premise that organisations seek to legitimise their existence by conforming to prevailing institutional rules and norms (DiMaggio and Powell 1983). Using this theoretical perspective to illuminate the creation and change of historical accounting practices is an expression of new accounting history that recognises accounting not only as a technical, but also as a social practice that influences and is influenced by human behaviour (e.g. Carnegie et al. 2020). NIS has repeatedly been used to explain the stability or change of accounting practices, both in modern (e.g. Nor-Aziah and Scapens 2007; Tsamenyi et al. 2006) and historical (e.g. Quinn and Moreno 2024; McBride 2019; Quinn and Gibney 2018; Baker and Rennie 2013; Sargiacomo 2008) settings. Institutionalist research can operate at different levels of analysis, ranging from the world system and society to the individual organisation and its subsystems (Scott 2014, 106). Studies drawing on historical institutionalism, for example, tend to focus on political and regulatory accounting change at the societal level (e.g. McBride 2021; Fülbier and Klein 2015). In general, all levels are relevant to the

analysis of organisations and should be understood as interconnected rather than separate (Scott 2014, 105). The present study draws on the broader institutional context at the societal level, but its analytical focus lies on accounting practices within a specific organisation.

Scott (2014, 56) defines institutions as consisting of 'regulative, normative, and cultural-cognitive elements that, together with associated activities and resources, provide stability and meaning to social life'. In this sense, the understanding of how economic activities should be recorded and calculated, i.e. the socially shared understanding of what constitutes appropriate accounting, can be conceptualised as an institution. Although less formalised than today, such understandings already existed in the early nineteenth century (see the institutional context). Based on the definition, Scott's (2014) three-pillar framework offers insights into the emergence, development and stabilisation of institutions and institutionalised practices. It demonstrates how the external institutional context shapes the way organisations conduct certain activities, such as accounting (Quinn and Moreno 2024). The framework is particularly well-suited for analysing organisations operating under uncertainty, where seeking legitimacy becomes especially critical (Tsamenyi et al. 2006). This makes it highly relevant to the case of Krupp, which, as a 'start up', had to build and maintain legitimacy to overcome the liabilities of newness, build stakeholder trust and ensure its long-term survival (Bruton et al. 2010, 427). The term 'start-up' is used here deliberately, despite its anachronistic character, to capture the firm's organisational condition: Krupp was a newly founded organisation without established organisational routines. While shaped by institutional influences, it lacked established accounting practices that could be reproduced or changed over time. Contemporary ('modern') start-up research shows that the introduction of accounting and control practices is shaped not only by internal needs such as growth and increasing complexity, but also by external demands related to establishing legitimacy (e.g. Becker and Endenich 2023; Davila and Foster 2007). Such practices serve to align the organisation with externally defined expectations, a dynamic that is likely to be relevant for the historical case examined here as well. Previous studies on the change and stability of accounting practices (e.g. Nicoliello and Aliabadi 2022; Quinn and Gibney 2018; Quinn and Moreno 2024) often draw on the concept of rules and routines (Burns and Scapens 2000). In the present case, however, such rules and routines were not yet in place and therefore cannot serve as a source of change, although they may develop over time.

Scott's (2014) framework distinguishes three institutional elements, the regulative, normative and cultural cognitive pillars, which differ in how they guide behaviour and generate

legitimacy. They range from formally enforced rules to taken for granted assumptions and typically operate in combination, reinforcing each other when aligned and creating tensions when they are not (Scott 2014, 59, 71).

The regulative pillar consists of formal laws and coercive mechanisms that organisations must comply with, here particularly statutory accounting and bookkeeping requirements. Compliance is driven by expedience, as actors conform to avoid sanctions, and legitimacy is based on legal authority (Scott 2014, 60). Furthermore, the strength of the regulative pillar depends on the extent to which rules are effectively enforced by the state (North 1990, 4; Scott 2014, 62). The normative pillar refers to values and social expectations that define appropriate organisational behaviour, without being legally binding. It also includes the role of professions (Mezias 1990, 435). While formal accounting standards and norms or an accounting profession hardly existed in the early nineteenth century, various stakeholders, such as workers, suppliers and creditors (here in particular the family), still expected transparency and reliability. The logic of the normative pillar is one of appropriateness: rather than asking what is permitted, actors ask what is expected of someone in their position (Scott 2014, 65). Breaking norms tends to produce feelings of shame or dishonour, while adherence generates respect (Scott 2014, 66). In this sense, what was considered appropriate accounting for Friedrich Krupp was shaped by contemporary mercantile values and norms and by expectations associated with his societal roles. The cultural-cognitive pillar encompasses shared beliefs and common understandings within a cultural context. Compliance at this level is not driven by obligation, but by taken-for-granted understandings. Actors conform because certain ways of doing things are simply seen as normal. Legitimacy stems from cultural comprehensibility, meaning that practices are legitimate when they conform to recognised scripts (Scott 2014, 66–70). This cultural-cognitive context can be shaped, for example, by family background (Quinn and Gibney 2018, 19 describe familial merchant background as a cultural-cognitive influence on how accounting is done) or professional environment (shared beliefs in a professional field, as in the case of Krupp, the iron and steel industry).

Institutions are conveyed through different types of carriers, including symbolic systems, relational systems, activities and artifacts (Scott 2014, 95–96). Accounting records can be interpreted as institutional artifacts (see Suchman 2003, 98 for the definition of artifacts; see also Rahaman et al. 2024). They are not merely passive repositories of economic data, but rather active carriers of the institutional forces that shaped their form and content (Quattrone 2009, 103). While carriers are typically understood as mechanisms through which

institutions are reproduced and transmitted, this study focuses on the artifact creation, treating accounting records primarily as outcomes of the institutional forces that shaped their structure and form.

Although institutional theory emphasises the stability and constraining power of institutions, this does not mean that actors are passive recipients of institutional pressure. Scott (2014) defines agency as an actor's ability to influence the social world. This is based on what Scott (2014, 94) calls a 'voluntaristic theory of action', which holds that actors can intervene in or refrain from a particular process or state. In this sense, actors do not simply mirror institutional pressures in their behaviour but selectively interpret them. This is particularly relevant in the present founding context, where the absence of established practices leaves comparatively wide room for the choices of the individuals. Therefore, the accounting practices that emerged at Krupp cannot be explained solely by the institutional environment; the roles of Friedrich Krupp and his business partners as interpreters and translators must also be considered.

2.3. Research design and data

This study employs a historical case study design to examine the accounting records of Friedrich Krupp's cast steel factory during the period from its founding in November 1811 until the death of its founder in October 1826. A case study approach is well suited for this purpose, as it enables an in-depth investigation of complex practices within their specific historical and institutional context (Yin 2018; Cooper and Morgan 2008). In line with Sangster's (2025) critique of antiquarian accounting history, this study does not simply describe accounting records and their structure. Instead, it focuses on why these practices emerged and on the institutional factors that shaped them.

The case offers a compelling analytical opportunity for three reasons. First, the founding period of an organisation is a formative stage at which the institutional forces that shape organisational practices are particularly visible. Studying the emergence of a new organisation requires precisely such a setting, as established practices have not yet stabilised, allowing the influence of the surrounding institutional environment to be observed. Second, the period from 1811 to 1826 coincided with a time of significant upheaval in Prussia. This was marked by state reorganisation following the Napoleonic Wars, as well as the transition towards early industrialisation, providing a rich and dynamic institutional context. Third, the

Krupp Historical Archive holds extensive primary source material[1] covering the entire period under investigation, enabling detailed empirical analysis.

The available records are diverse in nature and span the entire analysis period. The records include general ledgers, journals, expense records, cost overviews, income and expense accounts, cash books and a range of further documents such as notebooks, goods ledgers, copy letter books, commission books and cash receipts. Balance sheets or annual financial statements are not available, as the size and complexity of the company did not require them in the early years. In this context, a clarification of terminology is warranted. In general, 'bookkeeping' often refers to the (technical) recording of transactions, whereas 'accounting' is used more broadly to encompass a range of internal management and external reporting practices. Sangster (2025) notes that the historical conflation of these terms has, in part, led to historical ledgers being evaluated against modern accounting criteria, resulting in misleading conclusions. The distinction between bookkeeping and accounting cannot always be clearly drawn, and both terms are used in this study in relation to Krupp's records. Care is taken throughout to interpret the records on their own terms rather than through the lens of modern categories. The currency of the records is *Reichstaler gemeinen Geldes* (Rtlr.), with one Rtlr. comprising 60 *Stüber* (Sbr.) (Lindenlaub and Köhne-Lindenlaub 1988, 113). The records are in German and handwritten. Where relevant, secondary sources such as company chronicles or transcripts from the archives are used to contextualise the primary sources.

The primary sources are analysed through the institutional lens developed before, with Scott's (2014) three-pillar framework providing the organising structure for the empirical analysis. The analysis proceeds in several stages. First, the accounting records are read in full to gain an overview of the available material and to understand the underlying processes. Key documents are then transcribed, in some cases supported by *Transkribus*, an AI-based handwriting recognition tool. The accounting records and the practices they reflect are subsequently contextualised within their economic and technical environment and coded for evidence relating to Scott's (2014) pillars. Finally, they are interpreted with respect to the institutional forces that shaped their design and recordkeeping practices.

1 The relevant primary sources are freely available online at www.archive.nrw.de/historisches-archiv-krupp. References in this paper follow the archive's signature system. 'FAH' denotes the *Familienarchiv Hügel* (Hügel family archive). Page references correspond to the image numbers in the digital archive.

2.4. Historical and institutional context

2.4.1. Business development, legal form and key actors of the Krupp company, 1811-1826

The Krupp company (the cast steel factory) was founded in 1811 by Friedrich Krupp (1787–1826) and can be described from an organisational perspective as a family business.[2] Its establishment depended not only on the economic and social resources built up by previous generations, but also on the direct or indirect involvement of several family members in shaping its early development. In addition, external partners were also involved, with whom Friedrich Krupp entered into partnership agreements and collaborated in the production of cast steel. Understanding the family background, the business development (from a technical and financial perspective) and the legal form (as well as ownership structure) is therefore essential for analysing the company's accounting practices and understanding the institutional context.

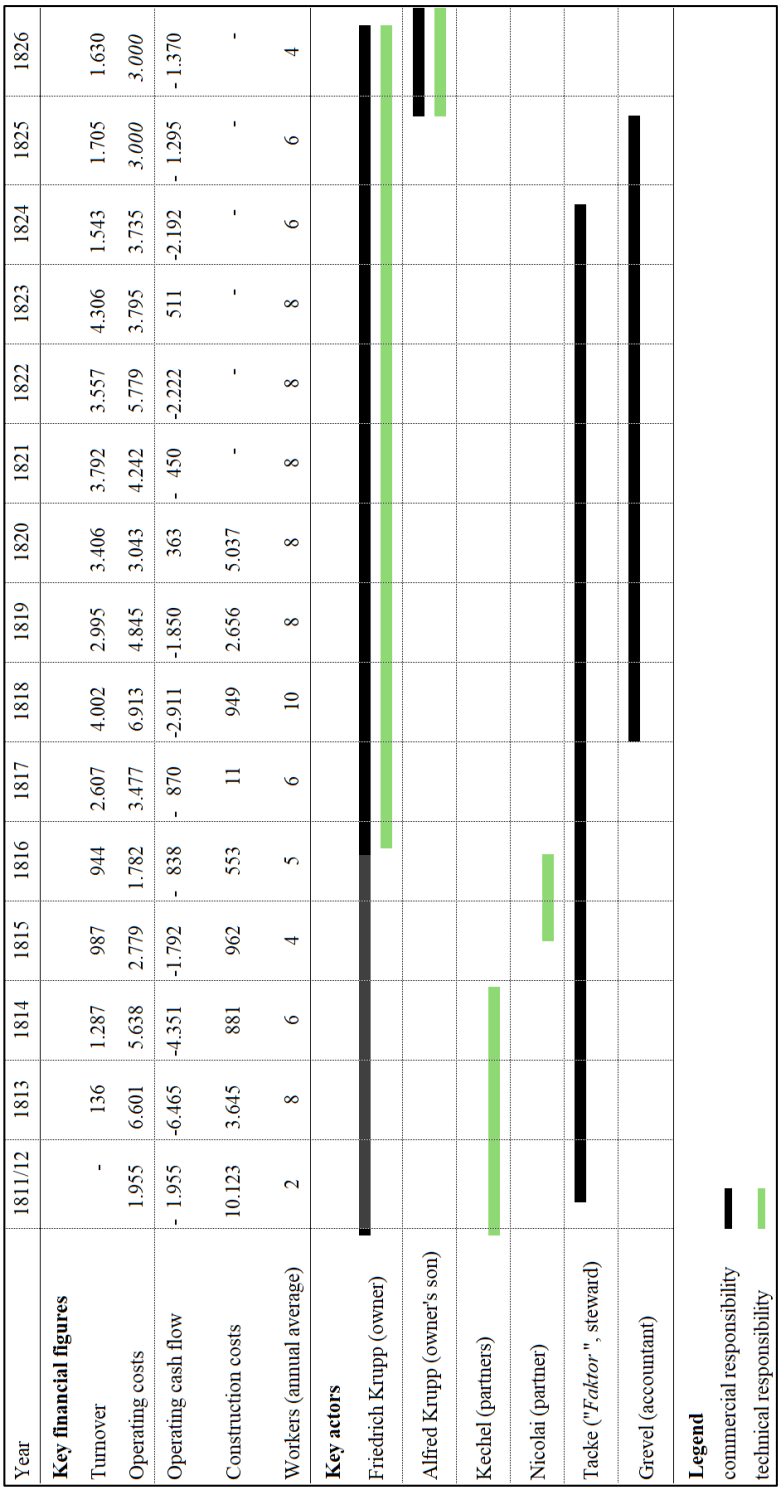
Friedrich Krupp came from a merchant family that had been established in Essen since the end of the sixteenth century. The earliest known ancestor, Arndt Krupp, appears in the records of the Essen merchants' guild in 1587. Over subsequent generations the family accumulated wealth through trade and property ownership and became part of the propertied classes of Essen (Probst 1985). However, Gall (2000, 10) emphasises that the Krupp family was neither as influential nor as wealthy as the patrician families of other, more prominent cities, and that their fortunes fluctuated repeatedly. Friedrich Krupp's grandmother, Helene Amalie Krupp (née Ascherfeld, 1732–1810), played a major role in creating the family's fortune. In 1751, she married the merchant Friedrich Jodocus Krupp (1706–1757) and, after his early death in 1757, significantly expanded his colonial goods trade[3] under the name '*Wittib Krupp*' (Probst 1985). Their son, Peter Friedrich Wilhelm Krupp (1753–1795), also died at a young age, leaving his wife, Petronella Krupp (née Forsthoff, 1757–1839), primarily responsible for raising their children Friedrich Krupp and his two siblings. In 1808, Friedrich Krupp married Theresia Krupp (née Wilhelmi, 1790–1850), who also came from a merchant family in Essen. The couple had four children, including Alfred Krupp (1812–

2 From a legal perspective, Friedrich Krupp's business activities were strongly personalised (Beyer 2007, 102).

3 Colonial goods trade refers to the import and distribution of imported goods from European colonial territories (e.g. coffee, sugar, tea, spices); for Krupp's activities in this field, see Probst (1985).

1887), the ‘Cannon King’, who took over after his father died and turned it into a successful large company (Gall 2000, 40).

Figure 1. Financial figures and key actors.



Source: FAH 1 A 20; FAH 1 A 32; FAH 1 A 38; FAH 1 A 50; FAH 1 A 53; FAH 1 A 55; FAH 1 A 57; FAH 1 A 62; FAH 1 A 63; FAH 1 A 68; FAH 1 A 96; FAH 1 A 102; Lindenlaub and Köhne-Lindenlaub (1988).

The Krupp family was closely connected to the administrative institutions of the town. For several generations, family members held municipal offices and participated in local administration. Friedrich Krupp himself continued this tradition. In 1812, during the period of French administration, he became a member of the municipal council of Essen (Gall 2000, 23; Probst 1985, 13).

After a short engagement in his grandmother's '*Gute Hoffnung*' ironworks in 1807/08, Friedrich Krupp became an independent merchant for the first time in 1809, trading in colonial goods. He operated this business, not only the cast steel factory established later, under the trade name '*Friedrich Krupp*', often abbreviated as '*Fried. Krupp*'. At the time, there was no legal registration of new companies, instead, merchants were personally authorised by entry in the municipal register (Beyer 2007, 100). After his grandmother's death in 1810, Friedrich Krupp received a significant inheritance and integrated her colonial goods business into his own. The amount of around 40,000 Rtlr. consisted not only of the colonial goods, but also of cash, cash equivalents and real estate and enabled Friedrich Krupp to build the cast steel factory (Gall 2000, 17–18).

Krupp's interest in iron and steel developed at a time when the English method of cast steel production was beginning to be imitated on the Continent, making investment in cast steel increasingly attractive (Gall 2000, 19). On 20 November 1811, he concluded a contract with the brothers Georg and Wilhelm von Kechel to find a 'joint factory for the production of English cast steel and all the resulting products' (translated from the partnership agreement in FAH 1 B 169, 3, art. 1). As part of the agreement, the von Kechels assumed responsibility for the technical operations, while Krupp managed the commercial affairs (FAH 1 B 169, 8, art. 10). Operating under Friedrich Krupp's name, the steel business ran alongside the colonial goods trade until the latter was discontinued around 1812. Although Krupp and the von Kechels held equal shares and were each entitled to a third of the profits, Krupp alone provided the capital, and the factory was to remain his property until the von Kechels repaid two-thirds from their profit share (FAH 1 B 169, 5, arts 2–4). As shown in Figure 1, no profits were made in the first years, so Krupp was still the sole owner of the factory when he signed a new contract with the von Kechels on 9 April 1813 (FAH 1 B 169, 28). Under this agreement, they waived their ownership opportunity in exchange for a salary. However, due to

continued lack of success, this contract was also cancelled in November 1814, and the von Kechels had to leave the factory (WA 7 f 159).[4]

On 15 July 1815, Krupp concluded a contract with another partner, Friedrich Nicolai. Together they founded a new company based on the cast steel factory called '*Firma Nicolai & Krupp'* (see the partnership agreement in FAH 1 B 185). As the name implies, Krupp and Nicolai were to be equal partners and share profits and losses equally. Krupp again overestimated the technical capabilities and financial resources of this partner, with the result that the joint company not only never entered the market with finished cast steel products, but, following a legal dispute, was dissolved after just one year (Berdrow 1915, 88). After these failed partnerships, Krupp himself took over the technical responsibility for the factory, which subsequently led to first successes in cast steel production and a significant increase in sales. As a result, from the end of 1816, Krupp was able to produce and sell cast steel for the first time and expanded his product portfolio to include additional tools as well as dies and rollers for mints. In the preceding years, sales had been limited to the sale of files made of cement steel and the resale of unused raw materials (Lindenlaub and Köhne-Lindenlaub 1988, 94).

2.4.2. Institutional context of early nineteenth-century accounting

2.4.2.1. Regulative

Friedrich Krupp founded his company in times of great political and legal change. At the time of the Holy Roman Empire of the German Nation, the city of Essen was under ecclesiastical rule (in detail Ribbeck 1915). It was occupied by Prussian troops in 1802 and formally annexed by Prussia in 1803 (Brand 1971, 10). Following the Empire's dissolution in 1806, Essen became part of the Napoleonic satellite state known as the Grand Duchy of Berg (Brand 1971, 33–35). As a result of this geopolitical change, the French Code, enacted in 1807, was implemented on 1 February 1812 (*No 52. Décret impérial portant l'Organisation judicaire* printed in Kotulla 2010, 516–62). The Code regulated commercial law and contained basic bookkeeping provisions. It was not an accounting standard in the modern sense but established legally binding documentation requirements. In particular, every merchant (*tout commerçant*) was required to keep a journal (*livre-journal*), an inventory book (*livre des inventaires*) and a copy letter book (*livre de copies de lettres*) (*Code de Commerce* 1807,

4 Copies of the correspondence between Krupp and the von Kechels on the cancellation of the partnership can be found in WA 9 d 408.

arts 8–9). The journal was to record all business transactions on a daily basis. The inventory had to be prepared annually and entered in the inventory book. It included movable and immovable property, receivables and liabilities, thereby resembling a balance sheet (*Code de Commerce 1807, art. 9)*. Both the journal (*Code de Commerce* 1807, art. 9) and the inventory (*Code de Commerce, suivi* 1808, app. 9) were required to record not only business transactions but also the merchant's private expenses (*dépense de sa maison*) and assets. Appendix 9 of the Code, although not forming part of the promulgated statutory text, provides a detailed template for the inventory. It lists the required items with examples and ends with a final overview of assets (*actif*), liabilities and net capital (*passif*) in account form, referred to as *balance* (*Code de Commerce, suivi* 1808, 305). It further indicates that assets are to be valued at their current market value (*cours*) at the time the inventory is prepared (*Code de Commerce, suivi* 1808, 297).[5] All books were required to be kept in chronological order, without blank spaces, gaps or marginal alterations (*Code de Commerce* 1807, art. 10). The intention of the Code was to create reliable records for use in case of insolvency and conflict, rather than to establish a general framework for disclosure (e.g. Howard 1932; Labardin 2011).

In addition to the bookkeeping requirements set out in the Code, French and Prussian fiscal regulations imposed further formalities on accounting practices. Brand (1971, 116) cites a written account by a merchant, dated 8 June 1807, which indicates that the introduction of the stamp law (*Stempelgesetz*) imposed more demanding accounting obligations in the Grand Duchy of Berg. He referred to a requirement for double-entry bookkeeping and emphasised that many small merchants neither kept proper journals nor possessed basic literacy skills.[6] Before that, the Prussian government already required every page of merchant's accounting books to be stamped and charged a so-called *Paraphengeld* (stamp duty) for this (Brand 1971, 13; Krünitz 1807, 470).

The bookkeeping regulations in the 1807 Code were not a Napoleonic innovation; they trace their origins back to the *Ordonnance de Commerce* (hereafter Ordinance) enacted in 1673. The two statutes differ little in their formal bookkeeping requirements. The Ordinance was further clarified and elaborated in Jacques Savary's accompanying commentary (see Savary

5 The Code itself does not contain any valuation rules. Delaporte (1808, 122), in his commentary, likewise argues that goods should be valued according to what they 'truly are worth' (see also Richard 2005, 834).

6 The requirement for double-entry bookkeeping referred to here cannot be verified in the legal source (see Scotti 1821, 1053, No. 2949 [Brand incorrectly states No. 2049]) cited by Brand (1971, 116, n. 431). Nevertheless, as Brand (1971, 116) suggests, it seems that the French-inspired and comparatively 'ultra-modern tax system' encountered 'medieval conditions' in Essen.

and Klein-Blenkers [1676] 2010). Schneider (2001, 900) identifies Savary as the first author to address the purpose of the balance sheet (*Bilanzzweck*). He distinguishes between an inventory of business assets, valued at historical cost for the purpose of measuring operating performance (dynamic perspective), and a supplementary statement of overall wealth, including private assets, valued at estimated market values for insolvency assessment (static perspective); this distinction disappeared under the Code (e.g. Richard 2005; Schneider 1987, 446, 2001, 901; ter Vehn 1929, 249–52). Instead, it requires a single inventory representing the merchant's entire personal fortune, thereby reinforcing a predominantly static perspective oriented towards creditor protection (Richard 2005, 834).

Both the Ordinance and the Code lacked effective enforcement mechanisms, so compliance was largely tested only in insolvency (Howard 1932, 97). In such cases, the penalties for violations were strict, yet the sanctions were not always consistent, but rather selective and shaped by discretionary decisions (Labardin 2011, 273). Some merchants therefore apparently did not keep accounting books (Labardin 2011, 270; Simon 1886, 2, fn. 4). In addition, introducing the French legal system in the relatively small Grand Duchy of Berg placed a heavy burden on the judiciary, as implementation time was short and too few legal professionals were familiar with the new law (Schubert 1977, 149; Kotulla 2010, 44). However, although the bookkeeping regulations were only enforced to a limited extent in everyday commercial activities, it created a potential pressure and risk environment that could come into effect in cases of insolvency or conflict.

Table 1. Extracts from Krupp's partnership agreements with von Kechels and Nicolai.

Article	Original German text	English translation
Contract between Krupp and the von Kechel brothers from 20 November 1811		
3	*Das Capital oder der nöthige Fond zur Betreibung dieser Fabric wird von dem Herrn Kaufmann Friedrich Krupp gegen vier von hundert Zinsen vorgeschoßen, und die Fabric selbst hierfür sowohl, als auch für das Capital belastet.*	The capital, or the funds required to operate this factory, shall be advanced by the merchant Friedrich Krupp at an interest rate of four per cent, and the factory itself shall be charged as security both for this interest and for the capital.
4	*So lang die Vorschüße, welche der Herr Kaufmann Friedrich Krupp zum Besten und Betrieb der gedachten Fabric hergegeben hat, demselben nicht wiederum obrückbezahlt sein werden, sollen die Fabric sowohl, als auch alle davon abhangenden Gegenstände als sein Eigenthum anzusehen sein, und darum also auch die im Ersten Articul gedachte Gemeinschaft keinen anderen Sinn und Wirkung bis dahin*	So long as the advances which the merchant Friedrich Krupp has provided for the benefit and operation of the said factory have not been repaid to him, the factory, together with all property connected therewith, shall be regarded as his property; accordingly, the partnership referred to in article one shall, until such repayment, have no other meaning or

	haben, als daß der Gewinnst unter den drey Gesellschaftern gemein und theilbar sein solle.	effect than that the profits are to be shared jointly among the three partners.
10	*Die Aufsicht über die Fabriquate übernehmen die Herren von Kechel gemeinschaftlich, und die Geschäfte des Comptoirs der Herr Friedrich Krupp, welcher sich zugleich auch einzig und allein nur mit der Einnahme und Ausgabe zu befassen hat…*	The supervision of the fabricated goods shall be undertaken jointly by the gentlemen von Kechel, while the management of the office shall be the responsibility of Mr. Friedrich Krupp, who shall also be solely and exclusively in charge of income and expenditure…
14	*Die Bücher und Rechnungen der Gesellschaft sollen am Ende eines jeden Jahres abgeschlossen, und über Gewinn und Verlust die Bilanz gezogen werden.*	The company's books and accounts shall be closed at the end of each year, and a balance shall be drawn to determine profit and loss.
	Contract between Krupp and Nicolai from 15 July 1815	
4	*Den Betrieb der Fabrik übernimmt p. Friedrich Nicolai, die Correspondenz – Kasse und Buchführung aber der p. Friedrich Krupp, welcher nicht bloß in jedem Augenblick seinem Gesellschafter auf Verlangen, Bücher pp offen legen, sondern auch vierteljährig eine förmliche Revision machen und alle Jahr eine Bilance anfertigen und vorlegen wird, so wie hinwiederum der Gesellschafter p. Friedrich Nicolai zu allen Zeiten zu den bestimmtesten Auskünften und Nachweisen wegen des Betriebs, verpflichtet ist.*	The operation of the factory shall be undertaken by Mr Friedrich Nicolai, while correspondence, cash management, and bookkeeping shall be the responsibility of Mr Friedrich Krupp, who shall not only, at any time and upon request, lay open the books and related records to his partner, but shall also conduct a formal review on a quarterly basis and prepare and present a balance annually; likewise, his partner, Mr Friedrich Nicolai, shall at all times be obliged to provide the most precise information and documentation concerning the operation.
6	*Das Gut des p. Friedrich Krupp, auf welchem der Redhammer vorhanden ist, wird mit allen seinen Rechten und Gerechtigkeiten, Lasten und Abgaben, so wie auch die neuen von ihm erbauten Fabrik Gebäude mit allen in ihnen befindlichen Maschinen Werkzeugen und Materialien von p. Friedrich Krupp nach den ihm selbst kostenden Preisen, vom Tage des Abschlußes dieses Gesellschafts Vertrags angerechnet der Gesellschaft selbst übertragen und der Betrag des Ganzen ihm als Einlage Capital gutgeschrieben.*	The estate of Mr Friedrich Krupp, upon which the Redhammer is situated, together with all rights and appurtenances, charges and obligations, as well as the factory buildings newly erected by him, including all machines, tools, and materials therein, shall, at cost price, be transferred by Mr Friedrich Krupp to the partnership as of the date of the conclusion of this partnership agreement, and the total amount thereof shall be credited to him as capital contributed.
7	*Einstweilen und bis der p. Friedrich Nicolai ein gleiches Capital eingelegt hat, wird das des p. Friedrich Krupp aus dem Gesellschaftsfond ihm jährlich mit 5 Procent verzinset…*	For the time being, and until Mr Friedrich Nicolai has contributed an equal amount of capital, the capital of Mr Friedrich Krupp shall bear interest at five per cent per annum out of the partnership fund…
8	*Es werden zu dem Ende zur Betreibung der Fabrik und allen zu machenden neuen Anlagen von p. Friedrich Nicolai, einzig und allein alle Kosten hergeschoßen und zwar so lange, bis diese Ausgaben dem Einlage Capital des p. Friedrich Krupp gleich sind.*	For this purpose, all costs required for the operation of the factory and for any new installations shall be advanced solely by Mr Friedrich Nicolai, and this shall continue until such expenditures are equal to the capital contributed by Mr Friedrich Krupp.

10	…Gewinn und Verlust, der aus dieser gemeinschaftlichen Fabrik und Handlung entsteht, unter beyden Gesellschaftern zu völlig gleichen Theilen getheilt und getragen.	…any profit or loss arising from this joint factory and enterprise shall be shared and borne equally between the two partners.

Note: Translated by the author with the assistance of DeepL.
Source: For contract with von Kechel see FAH 1 B 169, transcript in Berdrow (1915, 91–93); for contract with Nicolai see FAH 1 B 185, transcript of important sections in Berdrow (1915, 312–315).

The 1673 Ordinance influenced not only France and the Napoleonic Empire but also other parts of Europe, including Prussia (Walton 1993, 288). There, it served as a model for the *Allgemeines Landrecht für Preussische Staaten* (General Law for Prussian States, ALR) enacted in 1794, which also contained accounting regulations. In contrast to the 1807 Code, the ALR emphasises a dynamic accounting perspective (e.g. lower of cost or market principle, profit determination; Richard 2005, 832). While sections 562 et seq. ALR (Part II, Title 8) establish general accounting principles without explicitly mentioning a balance sheet or inventory, section 566 ALR makes the evidential value of commercial books dependent on them being kept in a commercial manner (*nach kaufmännischer Art*), without defining this in more detail. Double-entry bookkeeping was therefore not required, as under both the Code and the Ordinance. However, section 1468 ALR (Part II, Title 20) states that a merchant who does not prepare an annual balance sheet (*die Balance seines Vermögens*) and subsequently becomes insolvent is deemed to be negligently insolvent. Sections 614 et seq. ALR (Part II, Title 8) contain rules for commercial companies (*Handlungsgesellschaften*). Under sections 654 and 656 ALR, partners are entitled to profit distribution after preparing the annual balance sheet, thereby establishing the balance sheet's function as the determination of distributable profit for the first time (Schneider 1987, 443). Sections 642–646 ALR contain specific provisions for determining this distributable profit, unless otherwise regulated in the partnership agreement: Current assets must be valued at the lower of cost or market (section 644 ALR), assets subject to wear and tear must be depreciated (section 645 ALR) and uncollectible or doubtful debts must be written off (section 646 ALR).

After Napoleon's defeat, Essen returned to Prussian control in 1813/14 (Brand 1971, 153). While much of the French legislation remained in force in most of the Rhineland as 'Rhenish law' (Schubert 1977, 602; Vogl 2020, 482), the ALR was reintroduced in the districts of Duisburg, Essen and Rees on 1 January 1815 (Strauch 2007, 311).

In addition to the legal requirements, Krupp committed in his partnership agreements with the von Kechel brothers and Friedrich Nicolai to keep commercial books, although the

specific nature and details of the bookkeeping were not defined. Table 1 shows the relevant extracts from the partnership agreements. Both partnership agreements provide for an annual determination of profit through the preparation of a balance sheet, while the 1816 contract additionally requires regular access to the books and quarterly formal reviews. The 1816 agreement briefly addresses valuation issues by using historical costs (*selbst kostenden Preisen*) to value the machinery, tools and materials contributed to the company at the time of its foundation (see FAH 1 B 185, art. 6).

2.4.2.2. Normative and cultural-cognitive

The normative expectations surrounding Krupp's accounting practices and his cultural-cognitive understanding of them were likely shaped by several distinct spheres, particularly the coal and iron industry, municipal administration and mercantile accounting, the latter probably being the most influential.

Before founding the factory, Krupp had gained practical experience in the iron industry at the '*Gute Hoffnung*' ironworks. Several accounting records from this ironworks are preserved in the Krupp Historical Archive. Taken together, they point to a varied set of practices, with conventional commercial records such as personal accounts in the ledgers appearing alongside records specific to smelting operations, including a stock ledger (*Lagerbuch*) with quantitative inventory data and specialised 'ironworks reports' (*Hüttenberichte*) (e.g. FAH 1 A 10; FAH 1 A 11; FAH 1 A 15). The accounting practices of ironworks were shaped, at least in part, by the administrative demands of the state. Private ironworks operated under close state oversight that extended beyond production to bookkeeping and financial reporting, with local mining offices (*Bergämter*) exercising this authority. The oversight persisted through the period of French administration, during which existing supervisory structures were reorganised rather than dismantled (Wiegand 2000). In the existing historical literature, Rhenish ironworks accounting records are mainly used as sources on the economic conditions (e.g. Probst 1985) rather than being analysed from an accounting perspective. The limited accounting history research on the Rhenish iron industry makes it difficult to reconstruct the accounting conventions that prevailed in this sector. By contrast, the British literature is more extensive. Several studies have examined the accounting practices of iron industry firms, often with a particular focus on emerging forms of cost accounting (e.g. Edwards and Boyns 1992; Fleischman and Parker 1991).

Friedrich Krupp's role in the municipal administration of Essen, which followed family precedent, may have provided a further sphere of institutional influence on his accounting practices. When Krupp was appointed to the municipal council (*conseil municipal*) in 1812, Essen was governed by the French municipal constitution introduced in 1808, which had replaced the existing Prussian administrative framework and reorganised local governance along French prefectural lines. Under this constitution, municipal financial affairs were tightly controlled: the annual budget and accounts required submission to the supervisory authority for final approval, and no act of the municipal administration was legally valid without governmental consent (Wiedfeldt 1903, 8). Friedrich Krupp himself took these expectations seriously. He repeatedly called for clarity and transparency in the city's accounts, pressed for costs incurred for different purposes to be booked separately, and advocated for a systematic property register to prevent municipal assets from being lost through poor record-keeping (Wiedfeldt 1903, 50). Following Essen's incorporation into Prussia in 1815, the administrative framework shifted towards the cameralistic tradition. Cameralistic bookkeeping, the public sector accounting system developed in German and Austrian territories, rested on a strict separation between monetary and material asset management and on the chronological recording of receipts and expenditures (Filios 1983; Forrester 1990). Either way, both administrative cultures reinforced standards of financial orderliness, which were also consistent with the mercantile accounting values.

Although no organised accounting profession existed in early nineteenth-century Germany, accounting practices had deep historical roots in European mercantile traditions (e.g. Penndorf 1913). The oldest surviving German commercial books date back to the thirteenth and fourteenth centuries. Many of these early records are from Hanseatic merchants, some from southern Germany and other regions (Penndorf 1913, 3–16; Kellenbenz 1973, 136). These early commercial books primarily served to monitor debt relationships and the capital contributions of partners (ter Vehn 1929, 164; Penndorf 1913, 36). In Italy, double-entry bookkeeping had already been developed, particularly in trading centres such as Florence and Venice, by the thirteenth century (e.g. de Roover 1956). It spread more widely across Europe following the publication of Luca Pacioli's *Summa de Arithmetica, Geometrica, Proportioni et Proportionalita* in 1494 (Dobie and Oldroyd 2020, 117).

In Germany, books describing double-entry bookkeeping were published from the sixteenth century onwards, often copied or adapted from Pacioli's work (Penndorf 1913, 132; the same applied to textbooks from other European countries, see Yamey 1967, 65). Especially in

southern Germany, accounting practices were influenced by Italian methods and the use of double-entry bookkeeping (e.g. the Fuggers in Augsburg, see Baker and Quéré 2019; Kellenbenz 1973, 137), whereas in north-western Europe, they were shaped more by the practices of the Hanseatic League (Dobie and Oldroyd 2020, 119; Funnell and Robertson 2014, 53). Friedrich Krupp's commercial activities were embedded in this north-western sphere. He sourced imports for the colonial goods trade primarily from Dutch trading centres such as Amsterdam or Rotterdam, and distributed them mainly within the Grand Duchy of Berg and Westphalia (e.g. Düsseldorf, Münster, Elberfeld, Duisburg, Dortmund or Hamm) (Berdrow 1915, 27, 55, 60; see also FAH 1 A 133). Hanseatic merchants predominantly used single-entry bookkeeping systems (Dobie and Oldroyd 2020, 119; Funnell and Robertson 2014, 54). Although knowledge of double-entry bookkeeping was available (e.g. through published textbooks), it was rarely adopted, as single-entry methods were generally sufficient for most merchants, particularly those operating on a smaller scale (Dobie and Oldroyd 2020, 119; Sangster 2025, 380). At the end of the eighteenth century and the beginning of the nineteenth century, some textbooks expanded single-entry bookkeeping with the aim of developing a system that was less cumbersome than Italian double-entry bookkeeping (esp. Jones's [1796] 'English system of bookkeeping'; see Penndorf 1913, 192–95; Yamey 1956) and 'combining the previous single- and double-entry methods of commercial bookkeeping in the most practical way and reducing them to the easiest and most reliable system' (from Meiser's [1803] '*Neuerfundene deutsche Buchhalterei*' as cited in Penndorf 1913, 195, translated by the author). Although these systems were initially successful and widely discussed, they attracted criticism and never achieved widespread adoption. Nonetheless, they illustrate the existence of hybrid forms between single- and double-entry bookkeeping (Penndorf 1913, 195, 197).

The account books used in mercantile practice varied considerably over time and were not yet strictly standardised in the early nineteenth century. In the early Hanseatic context, records were often kept in a single debt book, in which business transactions were recorded without strict separation, and sometimes supplemented by informal notes or loose slips of paper (Penndorf 1913, 37). With the adoption of double-entry bookkeeping, a three-book system was established: a memorial for chronological notes, a journal for formalised entries and a ledger for account classification. Over time, the system became more differentiated with the introduction of specialised subsidiary ledgers, such as cash books or purchase and sales ledgers, even in single-entry systems (Penndorf 1913, 201). Different textbooks

classified accounting books in various ways and imposed varying requirements. In practice, books were sometimes used inconsistently, and their contents did not always correspond to their titles (Penndorf 1913, 190; Yamey 1967, 56).

Alongside the accounting of independent merchants, the accounting practices of appointed stewards or agents likewise formed a recurrent feature of economic organisation wherever distance between owners and operations required mechanisms of accountability. During pre and early industrialisation, landowners, merchants and entrepreneurs employed agents to administer specific estates or branches of their operations. In this context, distinct accounting practices emerged, primarily to provide accountability for entrusted goods and cash transactions (ter Vehn 1929, 166). This principal-agent logic was evident, for example, in the case of British stewards who employed charge-and-discharge accounting when managing landed estates (e.g. Dobie and Oldroyd 2020, 122; Napier 1991; Oldroyd 2007, 18). Similar practices existed in France, where especially mining and metallurgical enterprises (often controlled by nobility and financiers) used them to manage their industrial operations (Lemarchand 1994). In the German commercial language, the term '*Faktor*' was used to refer to managers of remote business establishments or warehouses.[7] From the sixteenth century onwards, parts of the German accounting literature discussed the bookkeeping practices of such agents, including Fugger accountant Matthäus Schwarz, who consolidated accounts from various agencies (*Faktoreien*) at their Augsburg head office (Penndorf 1913, 49). These various practices differed in nature and complexity but always pursued the goal of control in principal-agent relationships.

Beyond the regulative requirements imposed by legislation, orderly bookkeeping was also expected within everyday commercial practice (e.g. by business partners, employees, suppliers or creditors). Among merchants, bookkeeping was embedded in shared norms of honest and diligent commercial conduct (Sangster 2021). Accounts were expected to be kept regularly and properly, and entries had to be clear, for example by avoiding erasures, so that they could withstand scrutiny (see e.g. Schwalbach 2016 on the development of the moral dimension of the concept of the '*ehrbarer Kaufmann*'; also Penndorf 1913, 184). These norms were also adhered to within the family, where financial matters were kept formal and handled in a commercial manner (Beyer 2007, 100).

7 In mining and smelting, the term '*Faktor*' denoted the operations manager; this study uses the German term for Krupp's operations manager. In commercial usage, the term had a broader meaning, referring to various kinds of agents (in English sometimes 'factor', see e.g. Oldroyd (1998) but also 'agent' or 'steward').

Expectations of what accounting should look like were also conveyed through education, but in early nineteenth-century Germany, this education was only weakly institutionalised. Formal bookkeeping instruction was limited, with knowledge primarily circulating through experience and imitation within merchant households and firms. The sons of wealthy merchants were often sent abroad (e.g. to Venice, Breslau, Paris, Antwerp or London, see Penndorf 1913, 188) to learn advanced methods, including double-entry bookkeeping. In addition, a few private schools teaching bookkeeping were established in Germany, but the standard of teaching was often low (Penndorf 1913, 188). Textbooks further expanded access by systematising procedures and presenting practical examples (Penndorf 1913, 107 ff.). The first German commercial school was founded in Hamburg in 1768. Others followed, including one in the Rhineland in Düsseldorf in 1776. However, these schools were mostly attended by foreigners (Penndorf 1913: 228). For many merchants, a practical apprenticeship was the main way to learn bookkeeping. Friedrich Krupp's own background illustrates this. He did not even finish Latin school in Essen, instead starting a commercial apprenticeship at his grandmother's company, right after his confirmation. From as early as 1800 (at the age of 13), his handwriting can be sporadically traced in the firm's accounting books (Berdrow 1915, 13).

2.5. Description of Krupps' accounting records and practices

2.5.1. Structure of the accounting system and allocation of responsibilities

From the foundation of the cast steel factory, Krupp kept detailed records, making it possible to reconstruct the structure of the 'start-up' accounting system today. Many of the surviving account books encompassed both the colonial goods trade and the cast steel factory, thus documenting the activities of the 'merchant Friedrich Krupp' as a whole. In most cases, however, the two lines of business were clearly distinguished within the books themselves, for example through separate sections.[8] In the early years, accounting practices and responsibilities for maintaining the accounts were not yet fully standardised and remained subject to occasional change (see also Figure 1).

A central figure in Krupp's accounting practices was the operations manager '*Faktor*' Tacke, who was hired in May 1812 (FAH 1 A 20, 154). He maintained a separate cash fund from

8 In August 1812, for example, he opened a new section in a journal under the heading '*Journal für die Stahlfabrik zu Altenessen*' ('Journal for the steel factory in Altenessen'; FAH 1 A 131, 103).

which he independently paid wages, purchased tools and materials and covered other factory expenses. Every two weeks, Tacke prepared expense reports recording these transactions, referred to as '*Lohnzettel*'.[9] The transactions recorded on the *Lohnzettel* were then transferred to the account books. In the early years, this task, along with most other aspects of the company's accounting, was handled by Krupp himself. This changed in 1818, when Krupp appointed his distant relative Conrad Adolf Grevel as accountant.[10]

Furthermore, transactions were recorded chronologically in two journals (FAH 1 A 131, 103–145, 151–242 until 1822; FAH 1 A 134, 22–245 from 1823 onwards; see also WA 9 d 479; WA 9 d 451; WA 9 m 6). While some entries were taken from the *Lohnzettel*, these were not transferred in full detail, and the journals also contained transactions that likely originated from business activities conducted directly by Friedrich Krupp. In addition, Krupp's accounting comprised several general ledgers. The accounts of the cast steel factory are mainly found in two general ledgers (FAH 1 A 20, '*Haupt-Buch Nr. 1*'; FAH 1 A 136, untitled; see also WA 9 d 212; WA 9 d 368; WA 9 m 4). A third ledger contains mainly personal (customer and supplier) accounts (FAH 1 A 130, '*Cladde-Buch*'; see also WA 9 d 449), while a fourth, labelled '*Geheim-Haupt-Buch*' ('secret general ledger', FAH 1 A 128; see also WA 9 m 5) records confidential loans. Several additional books served more specialised functions. These include a '*Waaren-Scontro*' (FAH 1 A 137) recording inventories and raw materials, as well as a copy letter book (FAH 1 B 88) containing copies of business correspondence. From 1818 onwards, a number of small specialised booklets appeared alongside the main account books. These served a range of functions, including the recording of factory expenses, receipts and expenditures, cash movements, outstanding balances, goods transactions and deliveries to and from the factory.[11]

9 *Lohnzettel* are available for the years 1811–12 (FAH 1 A 32), 1813 (FAH 1 A 38), 1814 (FAH 1 A 50), 1815 (FAH 1 A 53; FAH 1 A 55), 1816 (FAH 1 A 57), 1817 (FAH 1 A 62), 1818 (FAH 1 A 63), 1819 (FAH 1 A 68), 1823 (FAH 1 A 96), and 1824 (FAH 1 A 102). Separate '*Lohnzettelbücher*' are available for 1820 (FAH 1 A 75), 1821 (FAH 1 A 76) and 1822–24 (FAH 1 A 93).

10 Grevel began countersigning the *Lohnzettel*, a task previously performed mainly by Krupp himself, as early as March 1816. In a later legal case against Krupp, however, Grevel stated that he encountered a considerable amount of unfinished work upon entering employment. It is therefore possible that some earlier *Lohnzettel* were processed retrospectively after his official appointment at Krupp (Beyer, 2007, 264).

11 These booklets include '*Unkosten der Gussstahlfabrik*' (FAH 1 A 87, 1822; FAH 1 A 95, 1823; FAH 1 A 103, 1824), '*Zubuße und Ausbeute der Gussstahlfabrik*' (FAH 1 A 79, 1821; FAH 1 A 88, 1822; FAH 1 A 99, 1823–24; WA 9 d 413, 1815), '*Cassa-Cladde*' (FAH 1 A 71, 1818–19; FAH 1 A 73, 1820; FAH 1 A 77, 1821; FAH 1 A 89, 1822; FAH 1 A 97, 1823; FAH 1 A 105, 1824; FAH 1 A 109, 1825), '*Restanten-Buch*' (FAH 1 A 85, 1821–24), '*baar für Waaren*' (FAH 1 A 83, 1821–24), '*Absendungen nach der Fabrik*' (FAH 1 A 84, 1821–24; FAH 1 A 101, 1823–24), and '*Absendungen nach Essen*' (FAH 1 A 82, 1821–22).

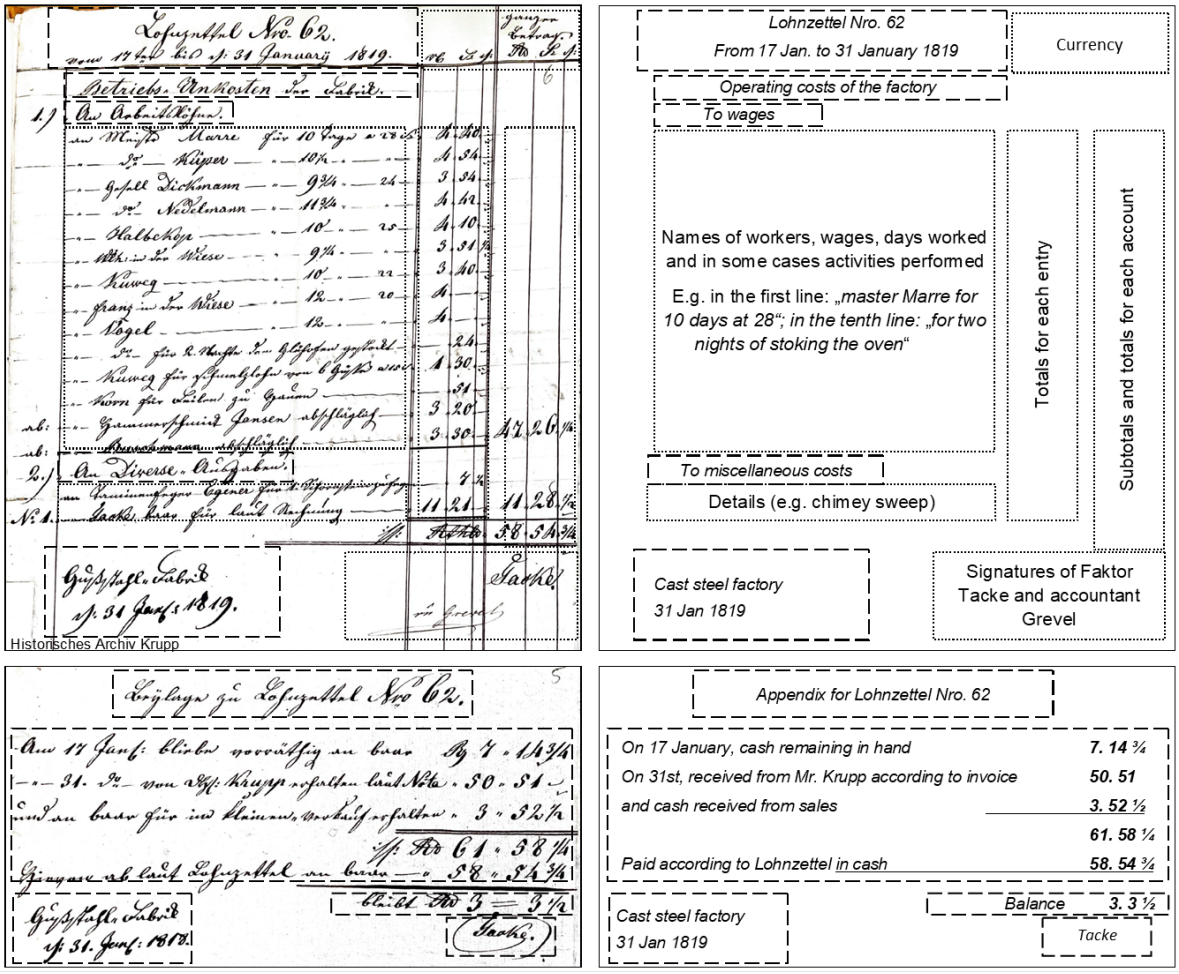
After *Faktor* Tacke left the company in September 1824 and accountant Grevel followed a year later, in September 1825, no successors were appointed to either position. Consequently, the accounting records became increasingly incomplete. As Krupp's health worsened, he increasingly relied on support from his family, with his mother, wife and son assisting with bookkeeping and correspondence. However, they lacked the time and expertise to maintain the accounting system as comprehensively as Grevel had done (see also Beyer 2007, 266).

2.5.2. Lohnzettel and simple cost accounting

From 1811 until 1824, the *Lohnzettel* constituted the primary operational accounting records for factory expenses. Prepared on a fortnightly basis and consecutively numbered, they allowed for systematic cross-referencing with the account books. Six main accounts were used: partnership, household equipment, property, first trials, operating costs and construction costs.[12] The first three accounts contain only a few entries throughout the entire period. The last three accounts are used predominantly and are further subdivided into wages, materials, tools and miscellaneous costs. The account structure was not static: the first trials account, for example, was closed in 1813. Figure 2 shows a *Lohnzettel* from 1819, in which only the operating costs account appears, subdivided into wages and miscellaneous costs. As the figure illustrates, the individual entries often contain detailed information on workers, hours worked, wage rates, materials and prices, although both the level of detail and the information recorded varied and were not standardised. Most *Lohnzettel* conclude with a *Recapitulation*, summarising the totals of the individual accounts and cost categories and thereby providing a quick overview of expenditures. Some are also accompanied by appendices recording changes in the factory cash fund (see the lower part of Figure 2). For each two-week period, the opening cash balance was reconciled with cash received from sales, deposits from Friedrich Krupp, and the expenditures recorded on the *Lohnzettel*, thereby yielding the closing balance. These appendices survive only for the years 1818 and 1819, although references in the 1817 *Lohnzettel* indicate that they were already in use by that time (FAH 1 A 62, 30).

12 The original account titles were '*Societäts-Conto*', '*Haushaltungs-Geräthe*', '*Immobilien-Conto*', '*Betriebskosten zu den ersten Versuchen*', '*Betriebs-Kosten*' and '*Bau-Kosten*'.

Figure 2. 'Lohnzettel Nro. 62.'



Note: Translated by the author.
Source: FAH 1 A 68, 5–6.

From 1820 onwards, the structure and function of the *Lohnzettel* changed, as they thereafter recorded only labour wages. These entries were transcribed into dedicated *Lohnzettelbücher* (small booklets) providing a tabular overview of when individual workers had been deployed. Each *Lohnzettel* in the *Lohnzettelbuch* is divided into two sections. The left-hand side of the sheet lists the workers' names in sequence, occasionally with specifying the type of work performed or product produced. The right-hand side contains a tabular grid. The columns of this table correspond to the individual days of the fortnightly period. The cells record the daily labour performed by each listed worker, noting full days as well as half and quarter days; days without any labour are marked with a zero. Three summary columns record total days worked, the wage rate, and the resulting monetary amount.

The *Lohnzettel* were transferred to the general ledgers in several ways. From a cost accounting perspective, the operating costs and construction costs accounts are of particular interest.

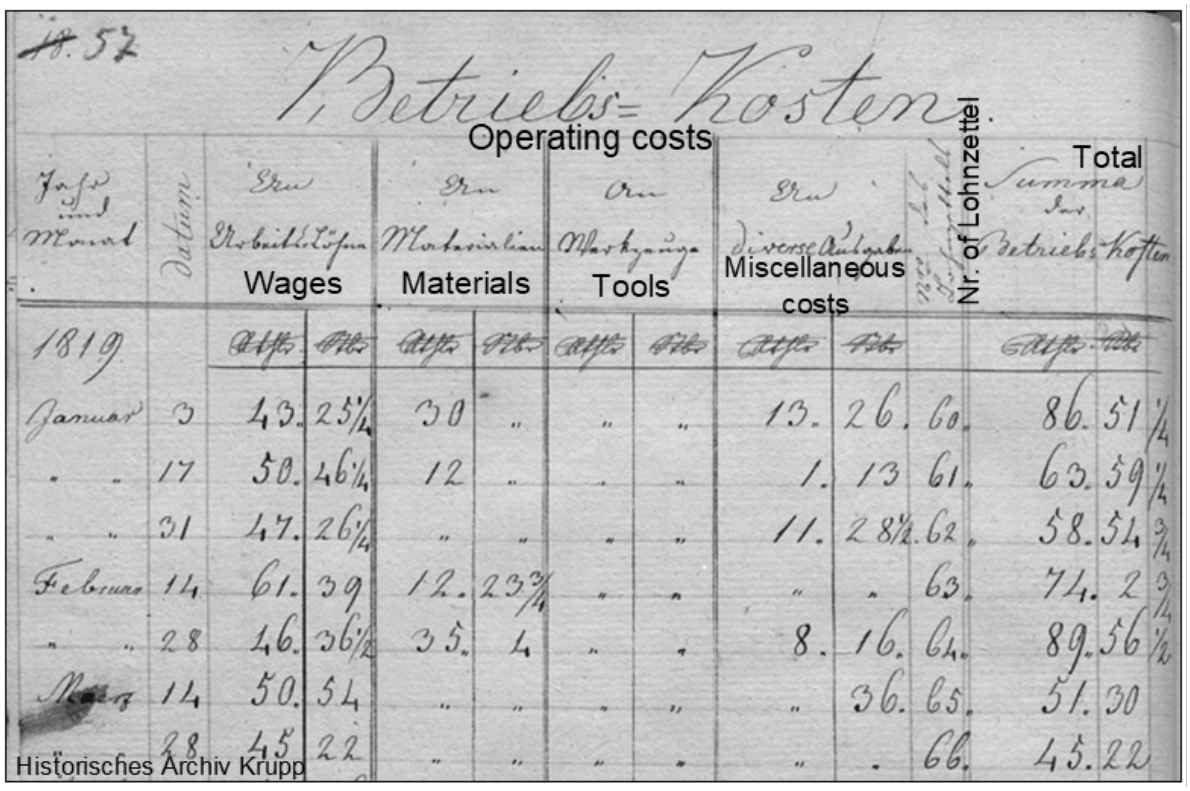
Both can be found in *Haupt-Buch Nr. 1*, where all six *Lohnzettel* accounts appeared under the heading '*General-Fabrik-Ausgaben-Buch*' ('general factory expenditure ledger', FAH 1 A 20, 235–243). The remaining accounts were treated as conventional expense accounts, with entries recorded on the debit side. They were used only temporarily and contain few entries. The operating costs and construction costs accounts, by contrast, were used more extensively, closed annually[13] and differed in structure from the other accounts. Rather than being organised by debit and credit, they were arranged in tabular form with separate columns for wages, materials, tools and miscellaneous costs, representing a form of cost classification accounting. Figure 3 presents an extract of the operating costs account from 1819. Each line corresponds to a *Lohnzettel*, whose number is recorded alongside the entry. The two accounts retained this structure until 1820. From 1820 onwards, the total costs of the cast steel factory were no longer recorded in the general ledger but in a separate booklet, where factory expenses were recorded monthly through individual entries with brief descriptions. Unlike the earlier accounts, these entries were no longer organised by cost categories.

At the end of 1817, Krupp prepared an internal profit and loss calculation covering the entire period since the foundation of the company (FAH 1 A 20, 51; see also WA 7 f 132). Figure 4 reproduces this calculation while retaining the original layout. In addition to the account balances, Krupp included imputed interest at a rate of five percent on his invested capital. On this basis, he calculated a total loss of 40,167 Rtlr. by the end of 1817. Notably, construction and land acquisition costs were treated as expenses rather than capitalised, accounting for a substantial share (around 40 %) of the calculated loss.

Beyond these records, there is no evidence that Krupp maintained a formal system of cost or management accounting. His surviving notebooks (e.g. FAH 1 A 60) contain occasional notes on pricing and cost calculations, suggesting that these matters were handled in an ad hoc manner rather than through established procedures.

13 From 1812 to 1817, the balance of the account at the end of each year is carried forward to the following year; from 1818 to 1820, the account is closed annually.

Figure 3. Extract of account ‘Operating costs’.



Note: Translated by the author.
Source: FAH 1 A 20, 57.

Figure 4. Profit and loss calculation 1817.

Operating costs										Construction costs									
	To Wages		To Material		To Tools		To Miscellaneous costs		Total Operating costs		To Wages		To Material		To Tools		To Miscellaneous costs		Total Construction costs	
	Rtlr	Sbr.	Rtlr	Sbr.	Rtlr	Sbr.	Rtlr	Sbr.	Rtlr	Sbr.	Rtlr	Sbr.	Rtlr	Sbr.	Rtlr	Sbr.	Rtlr	Sbr.	Rtlr	Sbr.
	6.086	8	10.889	6	434	27 ½	3.979	24	21.389	5 ½	6.619	14 ¾	6.659	31 ¾	76	22 ¾	820	14 ½	14.175	23 ¾
first trials							1.232	44	1.232	44	property account						2.024	30 ½	2.024	30 ½
partnership account							126	45	126	45										
household equipment							472	8 ¾	472	8 ¾										
household equipment							31	40 ¼	31	40 ¼										
imputed interest							6.499	15 ½	6.499	15 ½										
	6.086	8	10.889	6	434	27 ½	12.341	57 ½	29.751	39	6.619	14 ¾	6.659	31 ¾	76	22 ¾	2.844	45	16.199	54 ¼

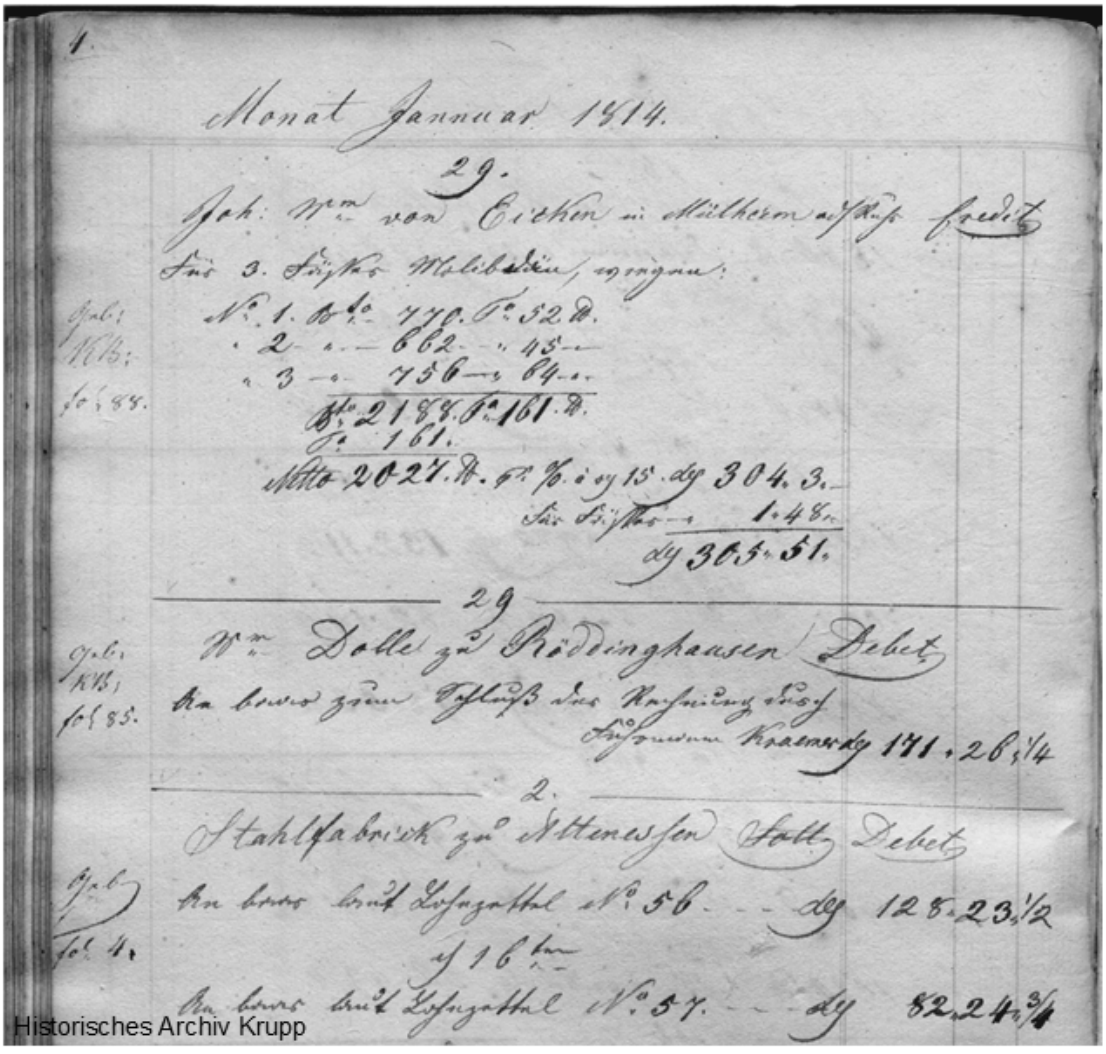
including the adjacent operating costs	29.751	39
total of the factory expenses	45.951	33 ¼
less the revenues as per folio 15	5.960	55 ¾
balance of the expenses remains	39.990	37 ½
imputed interest as per folio 9 for 1811 to 1813	319	8 ½
balance of the expenses remains	40.309	46
less for furniture as per folio 1	142	42
as of December 31, 1817, balance of the costs remains	40.167	4

Note: Translated by the author.
Source: FAH 1 A 20, 51–52.

2.5.3. General ledgers and journals

Krupp kept detailed journals throughout the entire period under investigation. Journal entries typically related to a single account. Figure 5 provides an extract from the journal for 1814. The first entry, for example, records the purchase of three barrels of molybdenum under the respective supplier account and includes calculations of weight and price, but no corresponding stock account was debited. Symbols and abbreviations alongside the entries indicate the general ledger and page to which the respective entry was posted. The notation 'KB fol. 88' shows that the transaction was subsequently transferred to folio 88 of the *Cladde-Buch*. Most entries recorded in the journals relate to debtor and creditor accounts from this book. Krupp did not open it anew when he founded the cast steel factory; it therefore also contains accounts relating to customers and suppliers from the colonial goods trade.

Figure 5. Extract from the journal.



Source: FAH 1 A 131, 105.

The untitled general ledger (FAH 1 A 136) contains several accounts central to the accounting of the cast steel factory. One such account was used to settle transactions relating to Tacke's factory cash fund. It was debited with deposits made by Krupp and credited with the expenditures recorded on the *Lohnzettel*. At the end of each year, the account was closed and the balance carried forward as the opening balance for the following year, allowing Tacke's total annual expenditures to be read directly from the account. The company's central profit and loss account is also located in this ledger. From November 1811 to the end of 1813, it was maintained as two separate accounts: a private account, '*Fried. Krupp*', and a company account, '*General-Fabrik-Unkosten-Conto*' ('general factory cost account'). Income from the cast steel factory was recorded on the debit side of Krupp's private account, while expenses, typically corresponding to the total of a given *Lohnzettel*, were entered on the credit side. The company account contained the same entries in reverse, with expenses on the debit side and income on the credit side. The corresponding entries were also recorded in the journal and usually reflected the *Lohnzettel* totals and the respective accounts (see the last entry in Figure 5). A note beneath the account states that both accounts were merged 'by the new accounting system set up on 1 January 1814' (FAH 1 A 136, 33), forming a single account titled '*Stahlfabrik zu Altenessen*' ('steel factory in Altenessen')[14]. This account effectively continued the former company account. In addition to expenses and income derived from the *Lohnzettel*, it also included transactions recorded only in the journal as well as imputed interest. By the end of 1824, accumulated losses of 77,920 Rtlr. had been recorded. From July 1825 onwards, the account was no longer maintained.

Despite the predominance of single-account journal entries, the records also contain some indications of double-entry practice. One is the loss calculation discussed above. The accounts *Fried. Krupp* and *General-Fabrik-Unkosten-Conto*, for example, were closed against one another through corresponding debit and credit entries, which are explicitly recorded in a separate section of one journal (FAH 1 A 131, 100). Of particular interest are three pages in the same journal (FAH 1 A 131, 147–149), set apart under the heading '*General-Journal Littra A*'. This section stands without apparent connection to the surrounding entries and contains bookings from August 1812 to April 1813 that had already been recorded in the regular journal. Here, however, they are presented in the manner of double-entry bookkeeping, with compound entries recording both debits and credits. Stock accounts are also employed, for example '*Osemund-Conto*', so that a purchase of osmond iron is debited to the

14 In 1819, the account was renamed 'steel factory & steel hammer'.

respective stock account and simultaneously credited to the supplier's account. These stock accounts do not appear in any of the general ledgers. They can only be found in the *Waaren-Scontro*, where entries are sporadic and typically record quantities rather than values.

Although the accounting records are, overall, notably extensive, the journals and general ledgers were not always maintained in a fully systematic or standardised manner. Some were neither kept in consistent chronological order nor used exclusively for their original purpose. *Haupt-Buch Nr. 1*, for example, begins with entries for a *Waaren-Scontro* before being continued as a regular general ledger. Others contain copies of *Lohnzettel*, account overviews associated with different ledgers, blank pages or sections relating to entirely different accounting purposes. This suggests a flexible and pragmatic approach to record-keeping.

2.6. Institutional analysis

The theoretical framework outlined earlier suggests that the emergence and development of accounting practices in young organisations is shaped, alongside factors such as operational necessity, to a significant extent by their institutional environment. The following analysis traces these influences across Scott's (2014) three pillars: regulative, normative and cultural-cognitive. Krupp's regulative environment was shaped by two successive legal frameworks: the French Code, implemented in 1812, and the Prussian ALR, reintroduced in Essen in 1815. This rapid legal transition, combined with the weak enforcement mechanisms of the time, resulted in a regulative pillar that, while formally present, exerted little continuous pressure on Krupp's accounting practices. The records nevertheless indicate partial compliance with core legal requirements. Krupp maintained both a journal and a copy letter book, as prescribed by the Code (arts 8–9). However, no inventory book was kept, nor do the general ledgers contain entries that would satisfy the inventory requirements set out in the Code and its accompanying commentary.

This raises the question of whether Krupp's non-compliance reflects a deliberate choice or a gap in the archival records. Some journals of his grandmother (esp. FAH 1 A 16 starting in 1807, i.e. predating the Code's formal introduction) are considerably closer to the legal requirements: pages are stamped with the French fiscal mark (stamp law), entries are recorded without gaps and chronological order is strictly maintained. The contrast with the factory records (e.g. repurposed books, blank pages, inconsistent order) may reflect the loss of a separate set of formal journals or a pragmatic response to circumstances in which no external

party demanded compliance. In either case, the regulative pillar's limited influence cannot be attributed to ignorance of its requirements, not least given Krupp's role in municipal administration. No changes are apparent in the accounting records during the transition from the Code to the ALR, which further suggests that the Code had little real impact on the accounting practices. Overall, the records comply somewhat better with the ALR, which does not mandate specific account books but merely requires bookkeeping conducted in accordance with commercial practice. However, there is no balance sheet of the kind the ALR required to avoid a presumption of negligent insolvency, nor does Krupp calculate depreciation on materials and goods. The spirit of the ALR is nevertheless evident in the two partnership agreements. Both provide for annual profit determination through a balance sheet, a mechanism rooted in the ALR's dynamic, profit-oriented accounting logic rather than the Code's static, creditor-protection perspective. The Nicolai agreement further specifies valuation at historical cost (*selbst kostenden Preisen*, see Table 1), which resonates with the ALR's cost-based valuation framework (section 644) and diverges from the Code's emphasis on current market values.

When Krupp's partnership with Nicolai collapsed in 1816 and the dispute was brought before the Essen court (Berdrow 1915, 88–89), the accounting records acquired a new function. The documents prepared for the proceedings (FAH 1 B 185) were not in line with the general provisions of the ALR but were instead tailored to what was useful for substantiating Krupp's claims. This is consistent with Labardin's (2011, 275) observation that, in cases of insolvency in nineteenth-century France, the usefulness of accounting documents was often considered more important than their statutory compliance. Compiled from existing records and transcribed into calligraphic fair copies for submission to the court, they are framed entirely from Krupp's perspective as a sole owner to whom funds were owed rather than as accounts of a jointly run business. The court records consisted of four types of documents: a personal account calculating Nicolai's alleged debts to Krupp, an inventory of raw materials and finished goods (valued at historical cost), calculations of Krupp's invested capital and a register of household goods lent to Nicolai. The underlying primary records (e.g. the *Lohnzettel*) are referenced but not preserved within this set of documents. The original account books were therefore likely also presented to the court. As the partnership agreement served as the primary point of reference in the proceedings, its provisions assumed a central role in shaping the documents (esp. sections 6 and 7, see Table 1), which is consistent with the ALR's own deference to contractual arrangements in several relevant provisions (e.g. sections 642, 644).

The Nicolai dispute thus shows where the regulative pillar's influence primarily resided in Krupp's case. The statutory provisions of the Code and the ALR left little imprint on the accounting records, because the coercive mechanisms and sanctions that give the regulative pillar its force were largely absent. Instead, they seem primarily to have ensured a minimum level of bookkeeping. The partnership agreements may have exerted a more direct regulative influence. The basis of legitimacy in this case was therefore less what Scott (2014, 60) describes as 'legally sanctioned' in the statutory sense than the authority of private agreements, whose force became effective especially in the context of legal dispute. At Krupp, the regulative pillar thus operated less through general compliance with formal commercial law than through the enforcement of contractual agreements in situations of conflict.

The limited influence of formal commercial law gave greater importance to the normative expectations embedded in contemporary mercantile practice. The normative framework surrounding Krupp's accounting practices derived largely from mercantile traditions acquired through commercial training and practice. This was also the case for Krupp, who acquired his commercial training within his grandmother's business. These traditions included not only practical bookkeeping knowledge but also expectations regarding honest and orderly commercial conduct. Of particular importance here were Krupp's early partners, who had a contractual right to inspect the accounting records (see Tabel 1). In some cases, accounts were structured directly around them (e.g. the von Kechels' household equipment or the partnership account) or the accounting logic followed from the commercial relationship (beyond what was required by the partnership agreement). The first trials account, for example, corresponded to the initial experimental phase of cast steel production undertaken together with the von Kechels. Likewise, in the early years operating and construction costs were accumulated over several years rather than closed annually, possibly because Krupp's cumulative expenditures were more relevant for the agreed capital contributions than any single year's performance. The detailed breakdown of cost categories may further reflect a 'logic of appropriateness' (Scott 2014, 65): keeping costs transparent was not the outcome of explicit contractual enforcement, but may be understood as enacting what was professionally expected in such a context. Such practices could also be read through a functional accountability lens ('logic of instrumentality', Scott 2014, 65), with earlier partnership contexts offering well-documented parallels (e.g. Hooper 1995; Kuter et al. 2024). Whether these records also served internal decision-making purposes remains unclear; the distinction between financial reporting and management accounting use cannot be drawn here. This is hardly

surprising for a firm of this size at the time, as in early industrial enterprises this distinction was rarely relevant, with the same records typically serving both internal and external purposes (Dobie and Oldroyd 2020, 123).

More generally, the complexity of Krupp's accounting increased markedly with the involvement of external business partners. Earlier records, such as a private account book begun in 1807 (FAH 1 D 2), contain only sparse and unsystematic entries, and his preceding accounting from the colonial goods trade remained relatively simple (esp. in terms of general ledger accounts). A clear professionalisation becomes visible after the factory was established. This may suggest that the external partners brought normative expectations of what appropriate accounting looked like, though more instrumental considerations arising from contractual relationships may also have played a role.

Krupp's family, too, placed expectations on how the accounts were kept. Transactions between family members were recorded with the same formality as external commercial dealings and entered in the *Geheim-Haupt-Buch*. This reflects the family's mercantile background and can be interpreted as a cultural-cognitive influence (see also Quinn and Gibney 2018, 79), as long-standing exposure to mercantile practices meant that certain accounting conventions became taken for granted for Krupp. The mercantile imprint is most clearly visible in the general ledger for debtor and creditor accounts (FAH 1 A 130), which Krupp did not open anew for the cast steel factory but continued from the colonial goods trade. That the debtor and creditor logic of a trading business was carried over without modification into a manufacturing context illustrates how deeply mercantile logics shaped what an accounting system was assumed to look like.

Krupp's accounting also incorporates further elements characteristic of mercantile bookkeeping. His reliance on single-entry methods was typical of smaller merchants of the period, particularly those operating in the Hanseatic-influenced regions of north-western Europe. In such contexts, the primary purpose of accounting was often limited to tracking debtors, creditors and inventory (Dobie and Oldroyd 2020, 119). Stock levels were frequently recorded in physical units rather than in monetary terms (Funnell and Robertson 2014, 56), a practice that can likewise be observed in Krupp's *Waaren-Scontro*. Against this background, the brief attempt to introduce double-entry bookkeeping is particularly noteworthy. What counts as double-entry is not clearly defined. As Sangster (2025) shows, the literature relies on several competing and often implicit definitions. Following De Roover, double-entry refers to the dual recording of transactions within an integrated system of real and

nominal accounts, in which the books balance and profit and loss can be determined (Sangster 2025, 370). Other authors impose different or additional requirements, such as bilateral account formats or the use of a single currency. At the same time, single-entry bookkeeping remains equally vague and is often defined, following Besta, only in negative terms as any form of bookkeeping that is not double-entry (Yamey 1997, 15). As Sangster (2025) argues, this lack of definitional clarity has led to confusion and misinterpretation in the historiography of bookkeeping. Krupp's system clearly does not meet these criteria as a whole. However, the three journal pages from 1812 (FAH 1 A 131, 147–49) may represent an attempt to introduce full double-entry bookkeeping, one that was apparently not carried through. Knowledge of double-entry methods was widely disseminated through contemporary accounting manuals and was therefore certainly accessible to Krupp. That he abandoned it after only a few months can be explained by the absence of the conditions under which double-entry bookkeeping typically became worthwhile. The advantages historically attributed to double-entry, such as the control of debt, the oversight of distant agents and partners and the ability to determine profit (Sangster 2025), probably didn't play a major role in Krupp's situation. The cast steel factory operated at a single location, with *Faktor* Tacke present on site and his expenditures already monitored through the *Lohnzettel* and their countersignature. Credit transactions with external parties were limited and adequately captured by the single-entry debtor and creditor accounts. A formal profit calculation, in turn, would have offered little additional insight in a venture that was running at a loss throughout the period and whose accumulated losses were already visible in the capital account. Quinn and Kristandl (2022) make a similar argument for the Kelheim brewery in seventeenth-century Bavaria, where single-entry bookkeeping persisted for almost a century despite knowledge of double-entry because it was 'fit for purpose' within its organisational field.

Krupp's early professional experience in the iron industry likewise shaped his understanding of accounting. This is most evident in the position of *Faktor* Tacke, a role adopted from ironworks of that time. In early nineteenth-century iron production, the *Faktor* was responsible for supervising production and overseeing workers rather than performing physical labour himself (Beyer 2007, 261). Krupp himself had previously worked in a similar position at his grandmother's ironworks (Probst 1985, 49). The term and concept of *Lohnzettel* also appears to originate from this context: a general ledger of this ironworks refers to *Lohnzettel*, although none have survived in the archive, making it unclear whether their content corresponded to those used at the cast steel factory (FAH 1 A 11, 48). In certain respects, the

Lohnzettel resemble the 'short-period cost sheets' described in the literature on early British industrial accounting (Boyns et al. 1997, 406). However, this similarity should not be overstated, as the British examples stem from a later period, from larger and more established enterprises, and are more analytical. One of the earliest examples is the set of five-weekly cost sheets prepared at the Dowlais ironworks from 1845, which reported costs per ton of output alongside detailed breakdowns by cost element (Boyns et al. 1997). The cost sheets of Welsh collieries from 1870 to 1914, as described by Boyns (1993), were partly prepared, like Krupp's, on a fortnightly basis. They also recorded costs by category, mainly wages and materials, but in a much more standardised way. Overall, the cultural-cognitive pillar appears to have left the deepest imprint on Krupp's accounting practices. Krupp seems largely to have followed (taken-for-granted) mercantile conventions and practices from the contemporary iron industry.

Over the study period, Krupp's accounting practices do not appear to have developed into institutionalised routines and instead remained strongly shaped by individual actors. Following Feldman and Pentland (2003, 95), routines can be understood as repetitive and recognisable patterns of interdependent actions involving multiple actors. Routines would become institutionalised in the sense of Burns and Scapens (2000) if they were reproduced over time and embedded in organisational practice, gradually becoming independent of specific individuals. This is often the case in accounting (including in historical contexts, see e.g. Quinn and Gibney 2018); however, it was not the case at Krupp, where practices remained closely tied to individual actors. Krupp himself established the initial accounting structure, preparing the first *Lohnzettel* and setting up the account book structure. The system reflected his own background and the cognitive schemas he brought to the task. When Grevel joined as accountant, the influence of a different professional formation became visible. While Krupp's system was shaped by the conventions of the merchant (and ironworks) world he knew, Grevel introduced changes that reflected his own understanding of systematic bookkeeping: he placed less emphasis on the general ledger, added supplementary booklets and modified the structure of the *Lohnzettel*. However, these changes did also not embed the practices in structures capable of surviving his departure, and the system did not prove sustainable in this form.

2.7. Conclusion

This paper has examined the accounting practices of Friedrich Krupp's cast steel factory between 1811 and 1826, a period in which the company operated as a small loss-making 'start-up' investing in an innovative but in the region largely unproven technology. Drawing on Scott's (2014) three-pillar framework, the analysis has shown that the system that emerged was detailed yet fragile: remarkably differentiated for an enterprise of this size, yet incapable of sustaining itself beyond the tenure of the individuals who maintained it.

The three pillars operated with markedly different intensity. The regulative pillar, shaped by the Code and the ALR, was formally present but exerted little continuous pressure on day-to-day practice. Its influence was only partial, visible in the definition of required records and in the application of certain principles in partnership agreements. In legal disputes, the partnership agreement carried more weight than the broader statutory provisions. By contrast, the normative and cultural cognitive pillars, rooted above all in mercantile traditions, were the more significant sources of influence. The records reflect many features of mercantile accounting, along with some influences from the iron industry. The expectations of business partners and family members are also evident in the detailed records. Yet the effects of the normative and cultural cognitive pillars were closely tied to specific individuals and could not be sustained after their departure. The interaction between the pillars is equally revealing. The weak regulative environment heightened the importance of the normative and cultural cognitive pillars, but also made them more fragile, as no institutional mechanism could compensate for the loss of the actors who sustained them. Overall, the institutional context did not provide a sufficiently developed accounting framework to transform Krupp's accounting practices into stable routines or institutionalised practices (Feldman and Pentland 2003; Burns and Scapens 2000).

Several limitations should be noted. The analysis is based on the records of a single enterprise, and the extent to which the patterns observed at Krupp generalise to other German 'start-ups' of the period cannot be established without comparable case studies. The possibility that additional journals, for example regulatory-compliant ones, once existed but have not survived cannot be ruled out; however, the surviving documents in the archive are highly comprehensive and likely provide a reliable picture. Future research could examine other newly established companies of the early nineteenth century to assess whether the dynamics observed here were typical in this period. More broadly, the accounting practices of firms

during early industrialisation in Germany merit further study, and a wealth of primary sources is available in various archives. The Krupp Historical Archive also holds numerous additional accounting records from Krupp for periods beyond those examined here that remain to be fully analysed. It would be particularly worthwhile to examine the years after Friedrich Krupp and the rise of the firm under Alfred Krupp to better understand how accounting practices became institutionalised, or failed to do so, in the decades that followed.

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Chapter 3

Two centuries of Krupp through the lens of value added distribution

ABSTRACT

This paper analyses the long-run distribution of economic value at the Krupp company using historical accounting data from its foundation in 1811 to its merger with Thyssen in 1998. Based on extensive archival sources, including early income and expense list, balance sheets, internal reports, and published annual accounts, it reconstructs how the firm's generated value was allocated among key stakeholders over nearly two centuries. Rather than examining accounting practices or reporting formats, the study focuses on accounting-based distributional outcomes and their development across changing historical and institutional contexts. Krupp provides a particularly insightful case due to its longevity, changes in legal form and ownership structure, and exposure to diverse political and economic regimes. The paper traces the shares allocated to employees, owners, creditors, and the state, and interprets shifts in light of contextual factors such as family ownership, regulation, and periods of crisis and war. The findings show a persistent predominance of labour-related allocations, alongside variation in the shares accruing to shareholders and the state. These patterns reflect institutional and historical circumstances and demonstrate the analytical potential of historical accounting data for studying long-run distributional outcomes.

Keywords: value added distribution, accounting history, stakeholder, Krupp

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3.1. Introduction

The Krupp company is one of the oldest and best-known German companies. Founded in 1811 as a small cast steel factory, the firm developed over more than two centuries into a large industrial conglomerate and, following several changes in legal form and two major mergers, continues to operate today as part of ThyssenKrupp AG. The company is more closely intertwined with Germany's economic, political and social history than almost any other. Throughout its existence, Krupp has operated under various political systems from the Kingdom of Prussia to the German Empire, the Weimar Republic, the National Socialist regime and the Federal Republic of Germany. It has further experienced socio-economic phases such as industrialisation, economic crisis, war, reconstruction and globalisation (see Gall 2000, 2002a).

Since Krupp has also experienced 200 years of accounting regulation and has almost continuously prepared corporate accounting data, this company is also highly relevant and extremely interesting for business and accounting history research. While a few other studies have examined Krupp's corporate financing of the early years till 1880 (Lindenlaub and Köhne-Lindenlaub 1988; Lindenlaub 2006), Krupp's accounting practices remain largely unexplored. The few exceptions focus on specific periods and particular aspects. Gehrt (2026) examines the company's early years from 1811 to 1826, Pleitgen (2005) analyses the period from 1890 to 1940, and Burchardt (1987) concentrates on profits during the First World War (WW I). On the one hand, there is no accounting history study that exploits the long time series of accounting data over the entire period of the company's existence with all the various political, military and economic changes. On the other hand, prior research usually ignores the somewhat special character of Krupp and regularly reduces the analyses to the negatively connoted armaments company, whose growth in size has been strongly driven by the major wars in the younger German history. In the public awareness, Krupp played a central role as a steel and armaments company, which at the beginning of WW I became the largest German company in terms of the number of employees (Burchardt 1987). This makes Krupp a symbol of the dark side of German history where the entrepreneurial Krupp family was always close to the representatives of political power. However, the name Krupp stands like no other for the industrialisation of Germany and the incorporation of social responsibility into corporate activity as well (James 2011). Krupp is particularly known for its welfare program, which was considered industry-leading and had a significant

impact on the lives of workers and the city of Essen (McCreary 1968). Even in 1844, long before any discussions on topics like corporate social responsibility, Alfred Krupp emphasised the fair distribution of resources within his company (Hielscher and Beckmann 2009). At the same time, and this is also part of the ambivalent Krupp history, the company was heavily involved in war crimes during the Second World War (WW II), especially the exploitation of forced labourers (Abelshauser 2002).

The paper has a two-part research objective. First, it reconstructs Krupp's created value and its distribution among stakeholders using heterogeneous archival sources. We examine Krupp's stakeholder orientation over time by drawing on the concept of value added (VA) and its distribution among stakeholders, referred to as value added distribution (VAD). These concepts allow to assess the economic performance of a company in its social context (Haller 1997). The discussion about reporting and analysing VA information has a long tradition in the field of social reporting (e.g. Shaoul 1998) and is also taken up in modern sustainability reporting (e.g. Haller and van Staden 2014; Haller et al. 2018; Quattrone 2022). Information about the distribution among stakeholders enables social (and ethical) conclusions about each group's fair share of the value created (Haller et al. 2018), since corporate economic activities depend on the collaboration of various stakeholders, such as owners, creditors, employees, suppliers or the government. In addition, the analysis considers how Krupp's historical context and its character as a family firm shaped the VAD. Finally, the analysis of VAD allows conclusions about the inequality of resource distribution from an accounting perspective as called for by Tweedie and Hazelton (2019). This makes it possible to assess the history and success of Krupp from a perspective that goes beyond pure profits. Second, we examine the accounting development of Krupp from 1811, when the first simple income and expense lists (so-called *Lohnzettel*) were used, until its merger with Thyssen AG in 1999. These accounts evolved over time into double-entry bookkeeping and more modern financial statements.

Thus, we see the contribution of our study to the accounting and business history literature as threefold. First, to the best of our knowledge, this study is the first to measure the VA of a German company over nearly two centuries to reflect the social impact of corporate engagement. This analysis considers the special character of this steel and armaments company in the tension between the always visible closeness of the entrepreneurial family to the ruling political power (of whatever kind) on the one hand and its statements on social responsibility on the other. Second, we apply the VA approach to historical financial statements and

critically review the application of the method in a special use case. Utilising the example of the Krupp company, we aim to highlight challenges in determining VAD in an accounting history context. Third, we provide an insight into Krupp's heterogeneous historical accounting data since 1811, which has not been fully analysed to date, and link it to the development of accounting regulation and other context factors on German grounds.

The results suggest that, over almost the entire observation period, Krupp allocated the largest share of its VA to its employees. In addition to conventional compensation such as wages, this includes additional social benefits such as voluntary health insurance or housing funds for workers. This pattern reflects both the labour-intensive nature of steel and armaments manufacturing and the institutionalised bargaining power of employees that emerged from broader political changes, although this interpretation applies only to conventional employment relationships and not to the exploitation of forced labour under the Nazi regime during WW II. By contrast, the shareholders' share behaves as a residual: it is the most volatile of the four, expanding in prosperous years and turning negative in years of loss. The government's share is highly context-dependent, rising sharply during periods of war and rearmament, and repeatedly reshaped by changes to the tax system. Meanwhile, the creditors' share remains low throughout most of the company's history, rising only during specific periods of expansion or financial distress.

The remainder of this paper is organised as follows. The following section develops the theoretical framework. It is followed by the research design. The next section introduces the Krupp case: its historical context and, in more detail, the development of its accounting records. The results section then presents the VAD and discusses it against the expectations set out in the theoretical framework and the historical context. A concluding section closes the paper.

3.2. Stakeholders and their claims on value added

In economic theory, the firm can be viewed as a nexus of contractual relationships among its stakeholders. This perspective gives rise to various, e.g. agency-theoretic, explanations for the functioning of firms (e.g. Jensen and Meckling 1976), but also to a broader view of the firm as a cooperative arrangement among its different contributors. This latter view has a long tradition in accounting thought and is most clearly reflected in the enterprise theory of the firm, which conceptualises the corporation as a social institution accountable to

multiple stakeholder groups rather than merely to its shareholders (Suojanen 1954; Purdy 1983). This resonates also with the broader research programme initiated by Hopwood (1976), who called for accounting to be studied as a social and organisational rather than a purely technical practice (see also Burchell et al. 1980; Hopwood 1983). The income the firm generates is, accordingly, the joint product of its contributors, to be distributed among them. Therefore, the firm's long-term survival is the primary goal, to which the claims of individual stakeholders remain subordinate (Purdy 1983, 534). From a management perspective, stakeholder theory shifted the focus from maximising shareholder benefit to the value a company creates for, and that is claimed by, all of its stakeholders (Freeman 1984; Parmar et al. 2010). Stakeholders in this sense comprise all groups connected to the company, for example through wages, financial liabilities or the supply of goods (Freeman 1984; Harrison and Wicks 2013). On this conception, the company is a collective that creates value through the relationships and interactions among its stakeholders (Parmar et al. 2010). The management's task is therefore to distribute that value in a way that is fair enough to sustain each group's continued contribution, rather than to maximise the return of any single party (Parmar et al. 2010; also Suojanen 1954, 393; Purdy 1983, 536). Because stakeholders who are treated fairly tend to reciprocate, the creation of value and its distribution are understood as inseparable (Harrison et al. 2010). Krupp's practice anticipated these ideas by more than a century. The founder, Friedrich Krupp, had already paid his employees' medical bills, and his son Alfred continued these voluntary benefits, founding a health insurance fund for the workforce in 1834 (Stercken and Lahr 1992; Hielscher and Beckmann 2009). As early as 1844, well before any stakeholder theory, Alfred Krupp had made clear that the fair distribution of resources played a significant role at Krupp (Hielscher and Beckmann 2009).

From this theoretical perspective, the VA statement has evolved within accounting practice, particularly since the 1970s (Haller and van Staden 2014, 1194). It did not become fully established in financial reporting, but is still used by some companies today (e.g. in Brazil, where it is mandatory, see Haller and van Staden 2014, 1194) and is once again playing a more prominent role in sustainability reporting today.[15] The VA statement quantifies the wealth a firm generates through its own activity (broadly, the difference between the value of its output and the cost of the goods and services bought in to produce it) and sets out how that wealth is distributed among those who help create it: employees, capital providers, the

15 The Global Reporting Initiative uses an indicator for VAD (direct economic value generated and distributed) as the primary economic indicator in its standards (Global Reporting Initiative 2016).

state and the firm itself through reinvestment (Haller 1997). Originating in the social-reporting tradition, the concept measures performance in an explicitly social context (Shaoul 1998) and thus permits an accounting-based assessment of which stakeholders participate in a firm's success, and to what extent.

However, how VA is distributed is not settled within the firm alone. The share that each stakeholder group receives reflects its relative bargaining power, which depends not only on the legitimacy and urgency of its claim, but also on its control over resources that the firm cannot easily forgo (Mitchell et al. 1997, 854; see also Pfeffer and Salancik 1978; Coff 1999). The importance of a given group depends also on the firm's industry and technology. A labour-intensive activity increases the proportion of value created by labour and makes it a less easily replaceable input, strengthening employees' claims; a capital-intensive activity shifts the balance in favour of capital providers (Pfeffer and Salancik 1978, 24–25). Bargaining power is also shaped by the institutional setting in which the firm operates. For example, representation rights, worker co-determination, labour and tax law and the firm's legal form all influence how far capital, labour and the state can assert their claims, and how the created value is distributed among them (Aguilera and Jackson 2003, 456, 460). Because these factors differ over time and across political systems, the historical context is central to analysing the VAD.

For family firms, as Krupp was for much of its history (Gall 2000), accounting research has identified distinctive distributional patterns. Such firms pursue not only financial but also identity-related goals, which shapes how they share value among stakeholders (e.g. Gomez-Mejia et al. 2007; Berrone et al. 2012). They are reluctant to raise external finance or reduce their workforce, doing so only in exceptional circumstances (Gallizo et al. 2017), and they tend to retain earnings rather than distribute them (Romano et al. 2001). The owners' share is therefore often reduced before employees are dismissed, and employees regularly receive non-monetary as well as monetary benefits (Gomez-Mejia et al. 2014). The picture differs for the remaining groups. The government's share does not systematically differ from that of non-family firms (Gallizo et al. 2017). Meanwhile, a lower reliance on interest-bearing debt leaves a comparatively smaller share for creditors (Corbetta 1995; McConaughy et al. 2001).

3.3. Research design: Value added distribution as analytical lens

To measure Krupp's value creation and its distribution, we use the VA approach. In the accounting literature, several authors have examined how a VA statement should be structured (e.g. Burchell et al. 1985; Haller 1997). In general, the VA attributable to the company is measured as the difference between the market value of the goods produced (i.e., sales revenue, *S*) and the purchase price of the raw materials and input products used (*B*), thus separating the VA generated within the company from the value of the externally purchased input products (Burchell et al. 1985).

$$S - B - DP = W + I + T + R + D \quad (1)$$

with: *R* = retained earnings, *S* = sales revenue, *B* = bought-in material and services, *DP* = depreciation and amortisation, *W* = wages, *I* = interest, *D* = dividends and *T* = taxes.

Derived from the income statement, VA is therefore presented as a net value, calculated as sales revenue (*S*) minus the cost of input products (*B*) minus depreciation and amortisation (*DP*) (as shown in Formula 1) (Morley 1979; Evraert and Riahi-Belkaoui 1998).
Furthermore, Formula 1 shows that value added can not only be measured as the difference between a company's output and input but can also be distributed among the company's major stakeholders: shareholders, creditors, employees and the state. The shareholders are entitled to the retained earnings and the dividends (*R*+*D*), the creditors to the interest (*I*), the employees to the wages (*W*) and the government to the taxes (*T*). In contrast to stakeholder theory, this does not include all stakeholder groups in the wider sense. It only includes those groups whose claims are reflected as distinct residual or contractual items in the company's income statement. Suppliers and customers, for example, are not included. Their exchange with the firm is already netted out in the sales revenue (*S*) and the cost of bought-in materials (*B*). In this way, value added indicates the share of the total value added that was distributed to each of the individual stakeholder groups (Haller and van Staden 2014).

Krupp does not produce its own VA statements over the course of its history, and the accounting records that survive vary considerably in form. We therefore reconstruct VA and its distribution from these records, rather than extracting a ready-made figure. We assign the accounting items from the various sources to the four stakeholder categories of employees, creditors, government and shareholders in order to make the very heterogeneous data as comparable as possible across all periods. To make the calculation as transparent as possible,

not only is the data presented and explained in detail in the next chapter, but the classification decisions are also set out alongside the quantitative results. Changes in currency and periods of severe inflation make it difficult to compare absolute figures over a period of almost two centuries. Therefore, the analysis primarily focuses on the proportion of VA that was allocated to each group in each period. Alongside these figures, we use inflation-adjusted data to preserve a sense of the magnitudes involved. The general and accounting-historical context in which the results are discussed, and the development of Krupp's reporting, are set out in the following chapter.

3.4. The Krupp case: Historical context and accounting records

3.4.1. Krupp company and its historical context

To provide context for Krupp's accounting history, it is essential to include information on the legal form, accounting regulations, involved persons and key events, as shown in Table 2. On November 20, 1811, Friedrich Krupp founds the cast steel factory (Gall 2000, 20). He dies in 1826, bequeathing the company to his wife, Theresia Krupp-Wilhelmi, who continues the business with their eldest son, Alfred Krupp (Gall 2000, 40). In 1848, Alfred assumes full ownership of the company from his mother during a bankruptcy-threatening crisis (Gall 2000, 68). After Alfred Krupp's death in 1887, his son, Friedrich Alfred Krupp, takes over the company's ownership and management. Friedrich Alfred Krupp has no son, so after his death in 1902, the company is inherited by his underage daughter, Bertha Krupp, who does not actively participate in its management (Gall 2000, 319). In 1906, Bertha marries the diplomat Gustav von Bohlen und Halbach, and they adopt the name Krupp von Bohlen und Halbach. Gustav joins the supervisory board and influences the company's management in the following years. Their marriage produces eight children, with their eldest son, Alfried Krupp von Bohlen und Halbach, joining the company in 1935. Alfried becomes a member of the board of directors in 1941 and inherits ownership of the company in 1943 (James 2011). He is the last owner of the company from the Krupp family, as he does not pass the company on to his son Arndt after his death in 1967 but transfers it to a newly established foundation (James 2011).

In terms of legal form, the company's history can be divided into three main periods. First, from 1811 to 1902, the company operates as a sole proprietorship, (majority-)owned by the Krupp family. Second, from 1903 to 1943, the company's legal form changes to an

Aktiengesellschaft (AG, stock corporation). However, the shares are owned by the family (Bertha Krupp) and are not publicly traded on the stock exchange. In 1943, Hitler personally turns Krupp back into a sole proprietorship, transforming it on November 12 into a 'family firm with specially regulated succession' (*Lex Krupp*). After WW II the company is expropriated and partially broken up but returns to the Krupp family in the 1950s. The third main phase in its legal evolution begins in 1968 with the conversion of the company into a *Gesellschaft mit beschränkter Haftung* (GmbH, limited liability company). No family member becomes shareholder of the GmbH, but the newly established Alfried Krupp von Bohlen und Halbach Foundation (Gall 2002a). The legal form of the GmbH exists until Krupp merges with Hoesch in 1992 and becomes an AG again.

Table 2. Key events and persons in Krupp's history.

Year	Key events and persons	Sales (M€-23)	Employees
1811	Founded by *Friedrich Krupp (1787–1826)*	-	2
1826	Friedrich Krupp dies, Theresia Krupp-Wilhelmi and *Alfred Krupp (1812–1887)* continue operations	0.09	4
1848	Alfred Krupp becomes sole owner	2.41	74
1857	Start of the production of armaments	14.63	1,007
1871	Franco-Prussian War	263.61	10,400
1887	Alfred Krupp dies, *Friedrich Alfred Krupp (1854–1902)* takes over the company	354.49	20,200
1896	Acquisition of *Germaniawerft* (shipyard) in Kiel, shortly before, further important acquisitions of *Grusonwerk* (armaments company) in Magdeburg (1893) and *Stahlwerk Annen* (steelworks) in Witten (1886).	622.75	29,420
1903	Change of legal form to an *Aktiengesellschaft* (AG, stock corporation), the shares remain owned by the family through *Bertha Krupp (1886–1957)*	993.85	40,951
1906	Bertha Krupp marries *Gustav Krupp von Bolen und Halbach (1870–1950)*, who becomes chairman of the supervisory board	1,644.89	61.754
1914	Start of WW I	2,559.62	81,001
1918	End of WW I	3,240.67	201,697
1919	After WW I: conversion of production to civilian products	2,009.15	89,264
1933	Nazi seizure of power	1,204.37	75,240
1939	Start of WW II	4,601.28	139.259
1943	Change of legal form to a personal company with specially regulated rules of succession (Lex Krupp) and *Alfried Krupp von Bohlen und Halbach* (1907*–1967)* becomes sole owner	4,916.25	235,304
1945	End of WW II	4,765.15	277,382
1946	After WW II: the Krupp company comes under Allied control, is partially expropriated and some parts of the business are dismantled	643.79	59,102
1948	Krupp trial: Alfried Krupp von Bohlen und Halbach is sentenced to twelve years in prison	456.62	70,039
1951	Alfried Krupp von Bohlen und Halbach is pardoned and released early from prison	4,168.85	74,689

1953	Alfried Krupp von Bohlen und Halbach is given back ownership of his company and Berthold Beitz joins the company as chief representative	6,417.00	77,457
1968	Change of legal form to a GmbH; owner is the newly established Alfried Krupp von Bohlen und Halbach Foundation under the chairmanship of Berthold Beitz	11,578.50	87,079
1976	The state of Iran acquires a 25.01 % stake in the company	13,343.49	76,161
1992	Merger with Hoesch AG: Friedrich Krupp AG Hoesch-Krupp	21,072.87	91,411
1999	Merger with Thyssen AG: ThyssenKrupp AG	14,256.81	58,392

Note: The sales values are inflation-adjusted real values for 2023. The calculation is based on data from Bundesbank (2023). The number of employees includes up to 33,366 (1918) draftees in WW I and up to 49,416 (1945) draftees in WW II. Note for 1998 that sales and number of employees refer to before the merger, as the observation period of this study ends with this event.
Sources: Information on key events and persons from Abelshauser (2002), Gall (2000), Gall (2002a), James (2011), Pleitgen (2005), Pierenkemper (2002), Tenfelde (2000), Tenfelde (2002).

3.4.2. Changing German accounting regulations

The accounting requirements (of public companies) changed regularly during this period as a result of various laws. The *Allgemeines Deutsches Handelsgesetzbuch* of 1861 (ADHGB 1861, General German Commercial Code) was the first German commercial law that applied throughout the German Confederation (detailed explanation of the legislative development in Schneider 2001; Eierle 2005; Fülbier and Klein 2015). In 1870, it was supplemented by the *Aktiengesetz* (AktG, Stock Corporation Act) with further regulations for stock corporations and limited joint-stock partnerships. The AktG was first reformed in 1884 in response to the *Gründerkrise* (1870 to 1873) (Richard 2005; Haaker and Velte 2014). In 1897, the ADHGB was replaced by the new *Handelsgesetzbuch* (HGB, German Commercial Code), with only minor changes in terms of accounting. However, the obligation for stock corporations to publish their annual financial statements was new (Sec. 265 HGB of 1897). This formed the legal basis for the published Krupp annual reports from 1903 onwards. Further stock corporation law reforms in the first half of the twentieth century introduced, among other things, specific layouts of the balance sheet and income statement (1931) and finally separated the AktG from the HGB (1937) due to its increasing complexity (Fülbier and Klein 2015). In 1965, the AktG introduced the first mandatory requirement for stock corporations to prepare consolidated financial statements, though initially, the scope of consolidation was limited to domestic subsidiaries. For other legal forms, group accounting requirements were introduced in 1969 by the *Publizitätsgesetz* (PublG, Disclosure Law), motivated by a financial crisis at Krupp, which had a negative impact on many stakeholders who were not sufficiently informed due to the lack of publication requirements for non-incorporated companies (Busse von Colbe and Fülbier 2013).

3.4.3. Archival sources: Krupp's accounting records

For our analysis we use primary sources from the Krupp Historical Archive in Essen, Germany. It contains a wide range of accounting documents from the company's foundation in 1811 (simple income and expense lists, general ledgers etc.), the first balance sheets (from the 1830s) and the first profit and loss accounts (from the 1860s) through to complete internal and external annual financial statements. We were allowed to digitise the very extensive documents with well over 10,000 pages for better processing.[16] The sources are partly in various German handwritings (1811 up to ca. 1942). The software *Transkribus* was used to recognise some of the handwritten texts. The period under investigation runs from 1811, the founding of the company, to the merger with Thyssen in 1999. We end the analysis period here, as Krupp is the smaller party in this transaction and is therefore strongly influenced by Thyssen (before the transaction Krupp has about 58,000 employees and sales of about 17.6 billion DM, after the transaction ThyssenKrupp has about 185,000 employees and sales of almost 30 billion DM). Especially for the contextualisation and interpretation of our results, we also use secondary sources, such as company chronicles, collections of letters, biographies and history books. Similar to the study by Quinn and Gibney (2018), the sources we analysed are mainly defined by Scott (1990) as recurrent and special administrative records. The majority of the financial documentation used in our study, such as balance sheets, income statements and financial statements, are categorised as recurrent records, which were produced as a mandatory part of the operational business. The additionally used documents such as letters or internal notes regarding financial statements, on the other hand, can be categorised as special records, which represent a response to specific situations or inquiries.

The records are in different currencies: From 1811 to the mid-1830s, the currency is *Reichstaler gemeinen Geldes*[17] (Rtlr.), then *Reichstaler Prussian Courant*[18] (Tlr.), worth about 30 % more (Lindenlaub and Köhne-Lindenlaub 1988, 113). From the beginning of the 1870s, the unit of account is *Mark*[19] (M), worth about one third of the Tlr., remaining in use until the early 1920s. In the financial years 1923 and 1924, Krupp prepares its annual financial statements in *Papiermark* (PM), an unofficial term for the *Mark* after the abandonment of the gold standard in the years of inflation, which culminated in the German hyperinflation

16 In addition, a number of primary sources relating to the early years under Friedrich Krupp are freely available online on the archive's website (see Gehrt 2026).
17 1 Rtlr. = 60 *Stüber*.
18 1 Tlr. = 30 *Groschen*, 1 *Groschen* = 12 *Kupferpfennig*.
19 1 M = 100 *Pfennig* (The same calculation ratio also applies to the following currencies PM, RM and DM).

of 1923 and rendered the *Papiermark* practically worthless. As of October 1, 1924, following the currency reform that ended the hyperinflation, Krupp prepares an opening balance sheet in *Reichsmark*[20] (RM), which is the currency until the end of WW II. From 1948, the currency is *Deutsche Mark* (DM).

Figure 1 provides an overview of Krupp's accounting data examined in this study. The scope and professionalism of the records has changed considerably over time and has been strongly influenced by, among other things, the growth of the company, the change in its legal form, but also external factors such as changes in accounting rules.

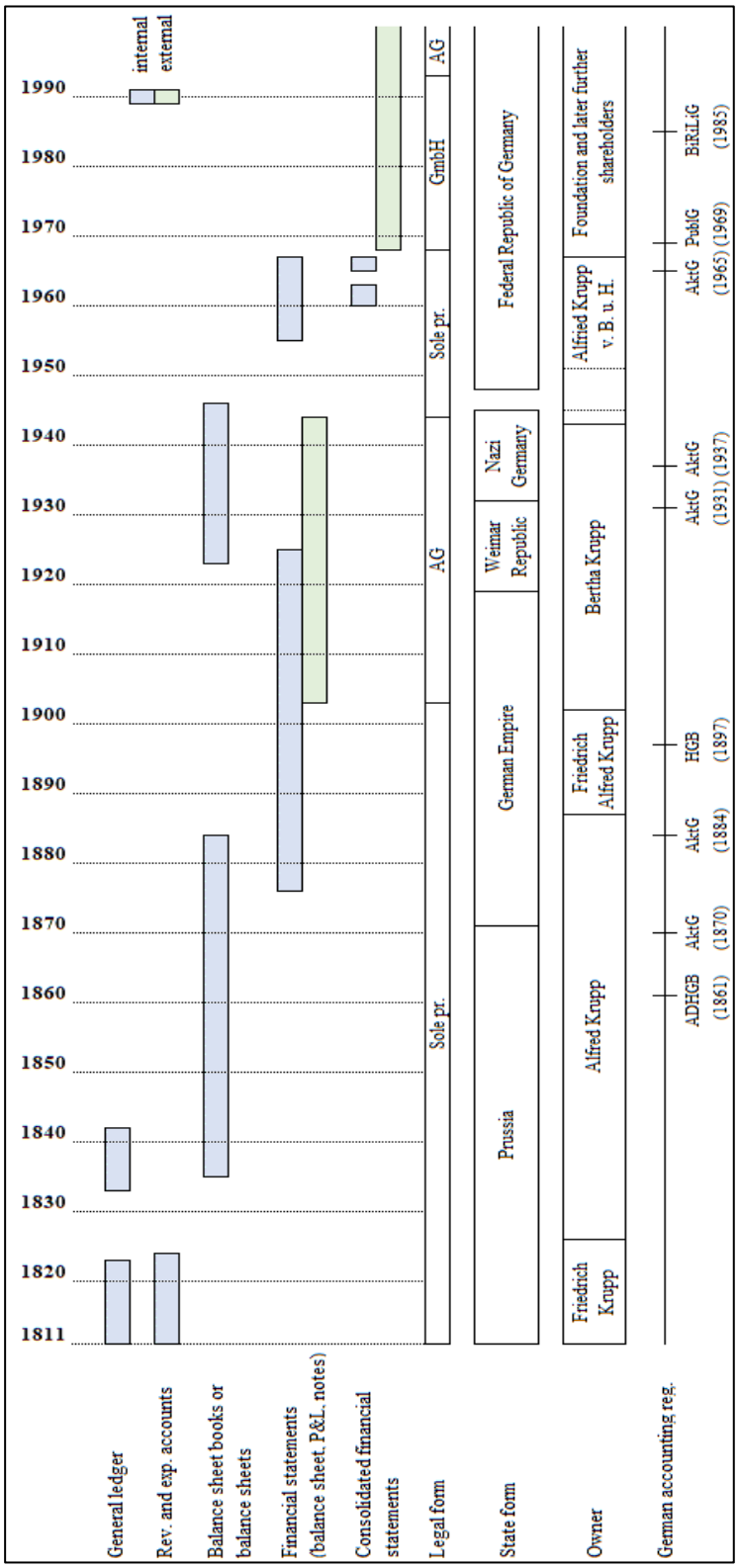
From 1811 until his death in 1826, Friedrich Krupp keeps detailed records of his company (in detail see Gehrt 2026). He records the factory's expenses in so-called *Lohnzettel* every two weeks. Alongside these, he keeps journals, ledgers and various subsidiary ledgers as part of a single-entry bookkeeping system. There is no profit and loss account yet, but wages and taxes can be taken from the *Lohnzettel* and interest expenses from one of the ledgers. Although Friedrich Krupp did not yet carry out regular profit calculations, it is possible to calculate the profits (or, in fact, predominantly losses) retrospectively from the records.

After the death of Friedrich Krupp in 1826 the sources change. Until 1835 there are no uniform accounting records because the 14-year-old Alfred Krupp and his mother lack the necessary knowledge of detailed bookkeeping (Lindenlaub and Köhne-Lindenlaub 1988). In 1835 Carl-Friedrich von Müllers joins the company as a silent partner, which made more detailed balance sheets necessary (Lindenlaub and Köhne-Lindenlaub 1988). Balance sheets are therefore available for subsequent years, although these were prepared at irregular intervals.[21] The preparation of the first balance sheets goes along with the first growth spurt of the company. While the company grows very slowly under Friedrich Krupp's management, employing only between two and ten workers and making no profits, his wife and son develop the business into a profitable company with around 100 employees by the end of the 1840s (Gall 2000).

20 The PM was replaced by the *Rentenmark* at a ratio of 1:1 trillion, which was then replaced by the RM at a ratio of 1:1 (Deutsche Bundesbank 1965).

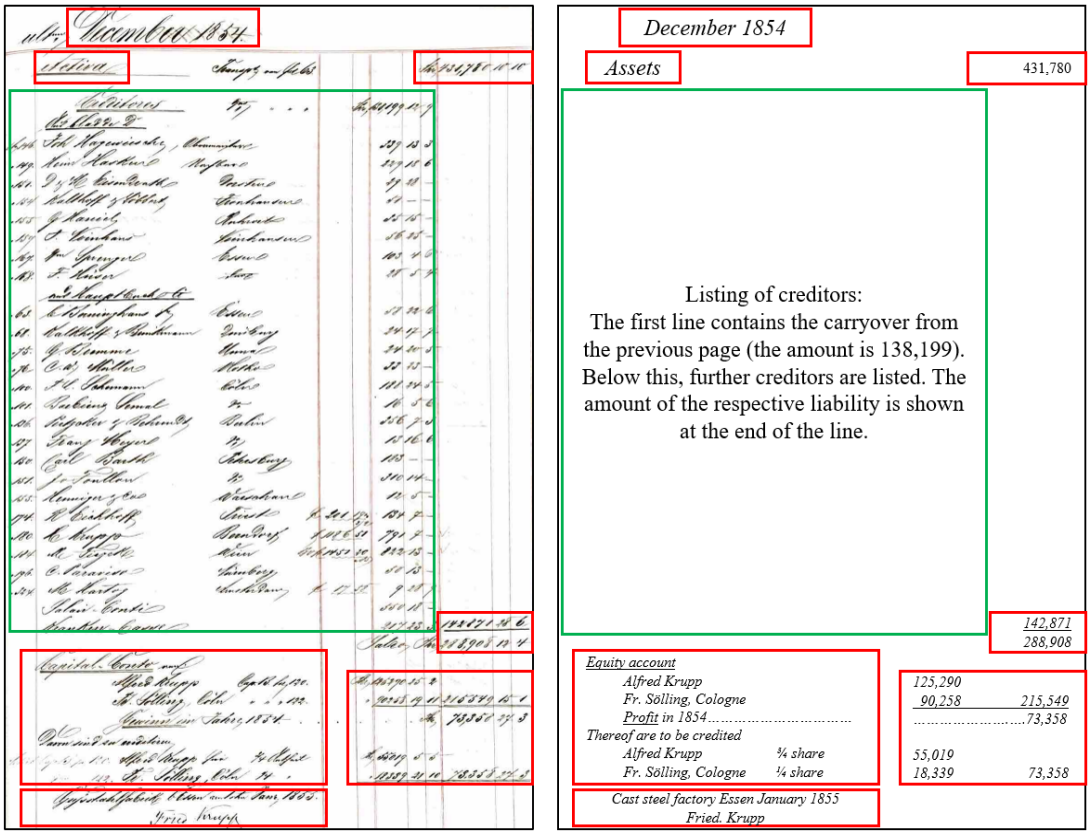
21 There are balance sheets as of the reporting date June 1, 1847 and December 31, 1850 in WA 2 A 17. According to Lindenlaub and Köhne-Lindenlaub (1988) there are also balance sheets as of August 1, 1835; February 1, 1837; February 1, 1840, February 1, 1843 (FAH 2 A 47), October 31, 1844; February 28, 1846 and December 31, 1847 (WA 1 57), which, however, were not available to us. Lindenlaub and Köhne-Lindenlaub (1988) summarise the values from the balance sheets.

Figure 6. Sources and key contextual elements.



Note: The sources shown do not cover all accounting-related materials in the Krupp Historical Archive, but those we considered most suitable for our VA analysis. For example, general ledgers exist for longer periods but were not consistently suitable for this purpose.

Figure 7. Profit calculation in the balance sheet as of December 31, 1854.



Source: WA 1 58, 64.
Note: The red boxes show direct translations (translated by the authors) or direct reproduction of the figures, the green boxes show explanations of the handwritten text or figures. For reasons of simplicity, the figures are shown without decimal places. The software *Transkribus* was partly used for handwriting recognition.

Krupp professionalises its accounting system from 1848. Bongartz (1984) and Pleitgen (2005) describe the implemented structures in detail. From December 31, 1851, there are annual detailed balance sheets in balance sheet books (balance sheet book for 1851–1856 in WA 1 58 and balance sheet book 1857–1863 in WA 1 59). The records are still handwritten, and the structure of the balance sheets and the designation of the accounts differ slightly from year to year. The balance sheets cover between 12 and 31 pages and are set up in staggered form. They start with non-current assets, such as land, factory, other buildings and machinery. This is followed by current assets, which include, for example, materials, equipment, liquid assets and debtors. The asset items are followed by the creditors, which are not subdivided as much as the asset items. On the right side of every page, the individual positions are added up and subtotals are formed. Finally, the total liabilities are deducted from the total assets to determine equity. The equity account is broken down by all shareholders. Since profit and loss accounts are not yet used, earnings are determined by comparing the equity accounts at the beginning and end of the financial year, considering withdrawals and

contributions. As an example, Figure 7 shows the calculation of earnings in the balance sheet as of December 31, 1854.

At this point, there is still no profit and loss account that would allow for a straight-forward calculation of VAD; only the relevant profits can be derived from the balance sheets. Other sources are available alongside the balance sheet books, such as general ledgers, subsidiary ledgers and cash books, but these are not used here. As the company grows, the ledgers become more extensive and complex so that isolating items relevant to the calculation, such as wages and taxes, becomes barely feasible, and perhaps even impossible given some gaps in the records. From 1863, profit and loss accounts are introduced in the general ledgers. These show on the credit side profits from the operating account and the factory account, investment income and extraordinary income and on the debit side expenses not yet included in the profits of the operating and factory accounts, such as depreciation, interest and general expenses (Lindenlaub 2006). However, the profit and loss accounts are not transferred to the balance sheet books, where only the changes in the equity accounts continue to be shown (see WA 1 1517 for 1863–1874 and WA 1 1520 for 1875–1883).

From 1876 internal annual reports are available. These contain a balance sheet, a profit and loss account, the equity account of Alfred Krupp (respective Friedrich Alfred Krupp from 1887) and some further explanatory notes. The notes in particular vary greatly in terms of content and level of detail. In addition, the annual reports from 1881 onwards contain a letter (or report) from the responsible accountant, which summarises the main points of the financial year and is addressed directly to Krupp (e.g. for 1881 in WA 4 1303). These reports indicate that Alfred respective Friedrich Alfred Krupp was probably the primary addressee of the available annual reports. While the annual reports are initially completely handwritten, typewritten templates are introduced from 1885 (for the summarising reports already from 1883) onwards, which, however, continue to be filled in by hand with the values. Figure 8 shows the template for the profit and loss account with the values for the year 1885/86. On the debit side, item 1 includes an account for interest expenses and item 5 an account for workers' support and other welfare purposes, both relevant to the VAD. The total expenditure on employees, however, is not immediately apparent.

Figure 9 and Figure 10 show sample excerpts from the summarising reports for the managing director. This not only shows how this information can be used for calculating VAD, it also provides insights into the company's performance measurement. The summary of the results in Figure 9 shows for example, how Krupp divides sales into 'war material' and 'peace

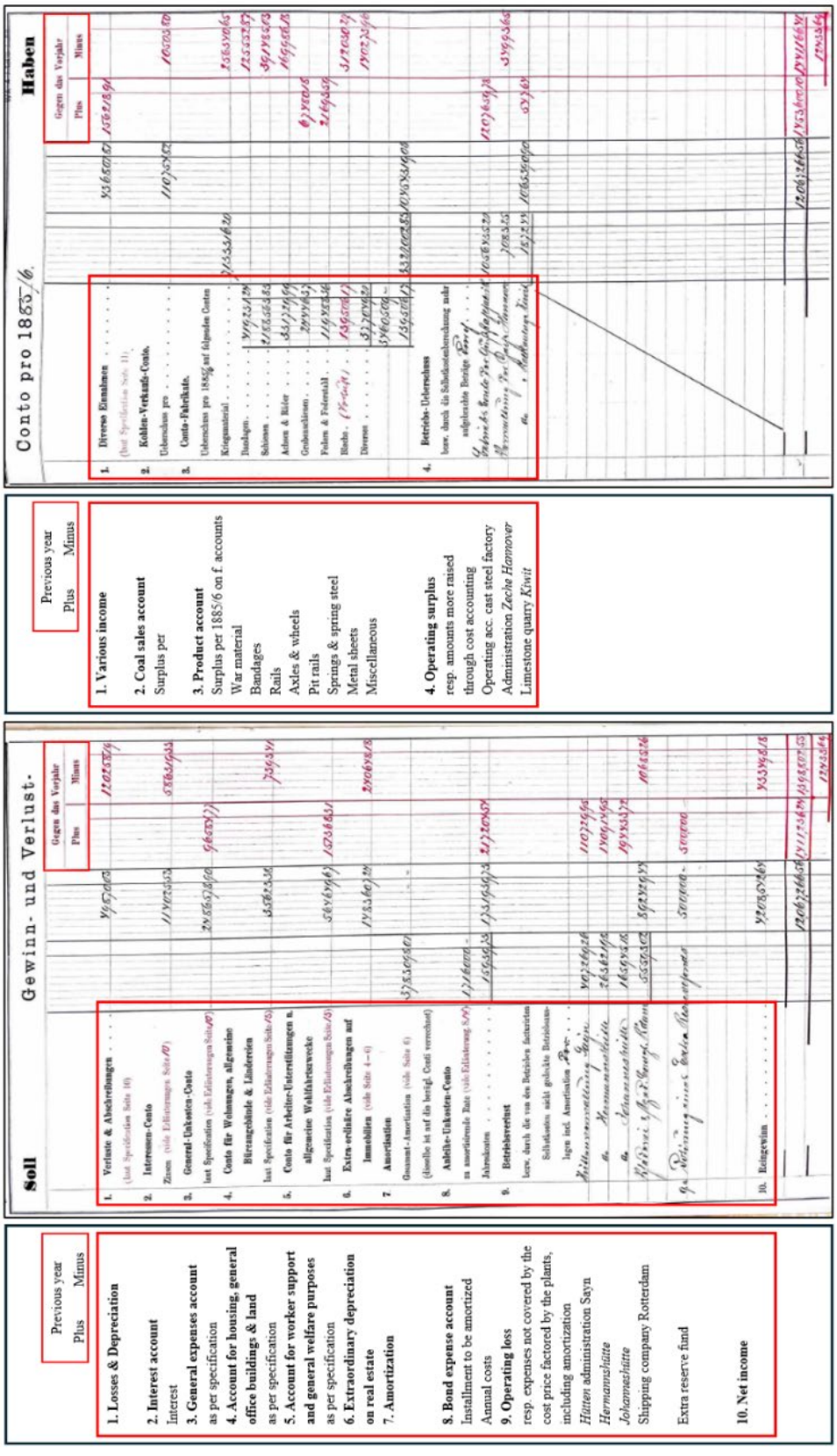
material'. Furthermore, return on sales appears to be a key performance indicator. The breakdown of wages in Figure 10 shows how detailed these were measured and apparently used for decision making. Overall, the internal reports, which are available in changing form (biggest change to fiscal year 1903/04, as Krupp had to apply the accounting regulations for stock corporations from this fiscal year onwards due to the change in legal form) up to 1924, contain extensive information, including information on VAD.

In addition to the internal accounting records, external annual reports were published from 1903 onwards. This is due to the company's change of legal form to a stock corporation on July 1, 1903 and the associated disclosure obligations. From then on, the company operated as a stock corporation until 1943, when it was transformed back into a sole proprietorship. External annual reports are therefore available for the period from 1903 to 1943.

The conversion back to a sole proprietorship in 1943 put an end to Krupp's disclosure obligations, which in any case no longer played a major role due to the lost war. During the war, Krupp's production facilities were severely damaged by bombing raids (James 2011). After WW II, the company came under Allied control, was expropriated and partially dismantled (James 2011). Alfried Krupp and other Krupp directors are sentenced to long prison terms in the Nuremberg Trial. However, they were pardoned as early as 1951 and the expropriation was cancelled in 1953 (James 2011). Due to these events, hardly any accounting documents are available for the immediate post-war period.

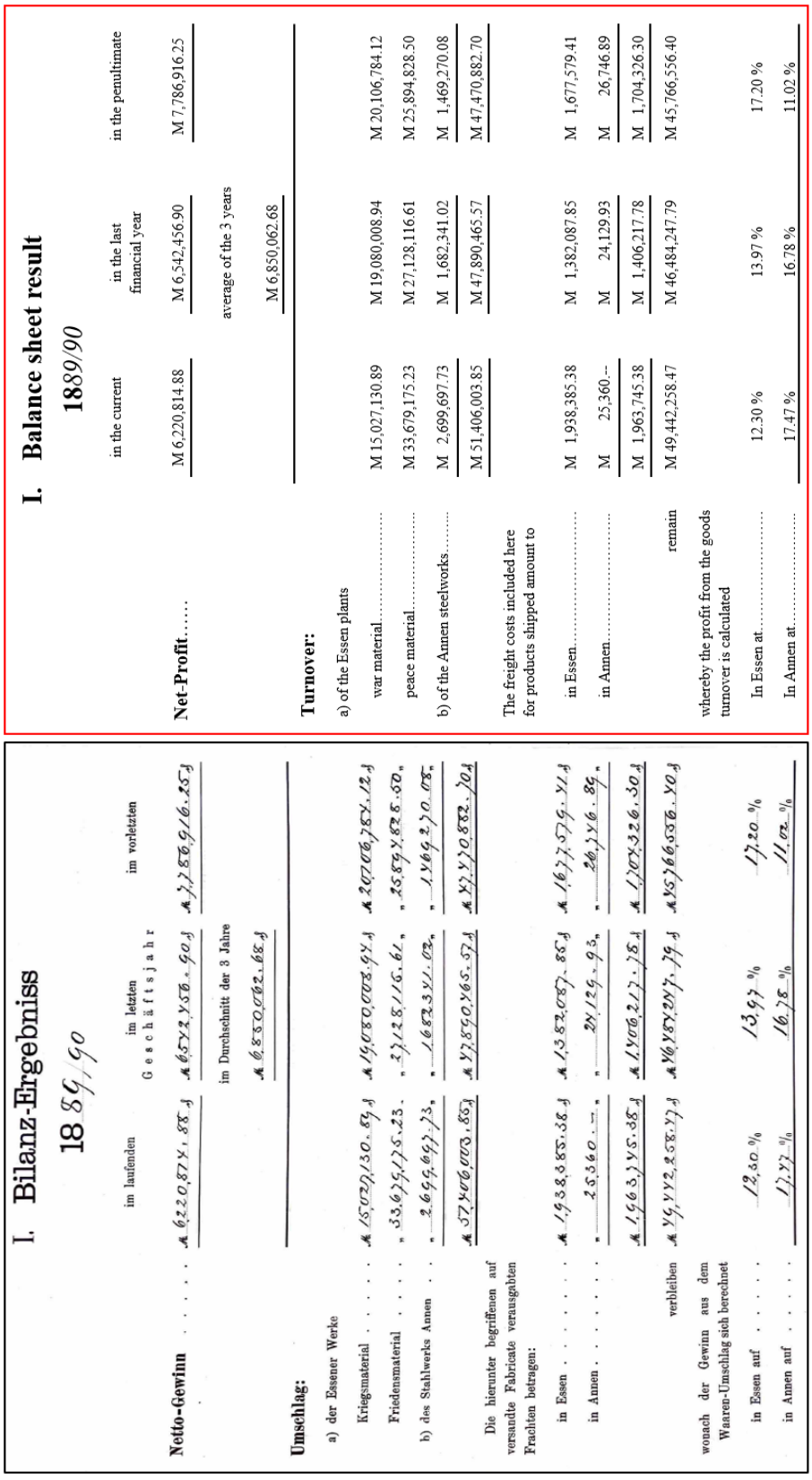
Internal annual reports are available again from the 1955 financial year onwards. However, before the introduction of the PublG, the source situation remains incomplete and seems rather incomprehensible. External consolidated financial statements prepared in accordance with HGB are available from 1968 onwards. From this point onwards, the VAD can be calculated in greater detail and with a higher degree of reliability from the annual reports.

Figure 8. Profit and loss account for the financial year 1885/86.



Source: WA 4 1308, 4–5.
Note: The red boxes show direct translations (translated by the authors). The software *Transkribus* was partly used for handwriting recognition.

Figure 9. Excerpt from internal report 1889/90.



I. Bilanz-Ergebniss

18 89/90

	im laufenden Geschäftsjahr	im letzten Geschäftsjahr	im vorletzten
Netto-Gewinn	ℳ 6220,87X,88 ₰	ℳ 65X2,X56.-90 ₰	ℳ X,X86,9X6.25 ₰
		im Durchschnitt der 3 Jahre	
		ℳ 6,850,062.68 ₰	
Umschlag:			
a) der Essener Werke			
Kriegsmaterial	ℳ 15,027,130.89 ₰	ℳ 19,080,008.94 ₰	ℳ 20,106,784.12 ₰
Friedensmaterial	„ 33,679,175.23.	„ 27,128,116.61 „	„ 25,894,828.50 „
b) des Stahlwerks Annen	„ 2,699,697.73 „	„ 1,682,341.02 „	„ 1,469,270.08 „
	ℳ 51,406,003.85 ₰	ℳ 47,890,465.57 ₰	ℳ 47,470,882.70 ₰
Die hierunter begriffenen auf versandte Fabricate verausgabten Frachten betragen:			
in Essen	ℳ 1,938,385.38 ₰	ℳ 1,382,087.85 ₰	ℳ 1,677,579.41 ₰
in Annen	„ 25,360.— „	„ 24,129.93 „	„ 26,746.89 „
	ℳ 1,963,745.38 ₰	ℳ 1,406,217.78 ₰	ℳ 1,704,326.30 ₰
verbleiben	ℳ 49,442,258.47 ₰	ℳ 46,484,247.79 ₰	ℳ 45,766,556.40 ₰
wonach der Gewinn aus dem Waaren-Umschlag sich berechnet			
in Essen auf	12,30 %	13,97 %	17,20 %
in Annen auf	17,47 %	16,78 %	11,02 %

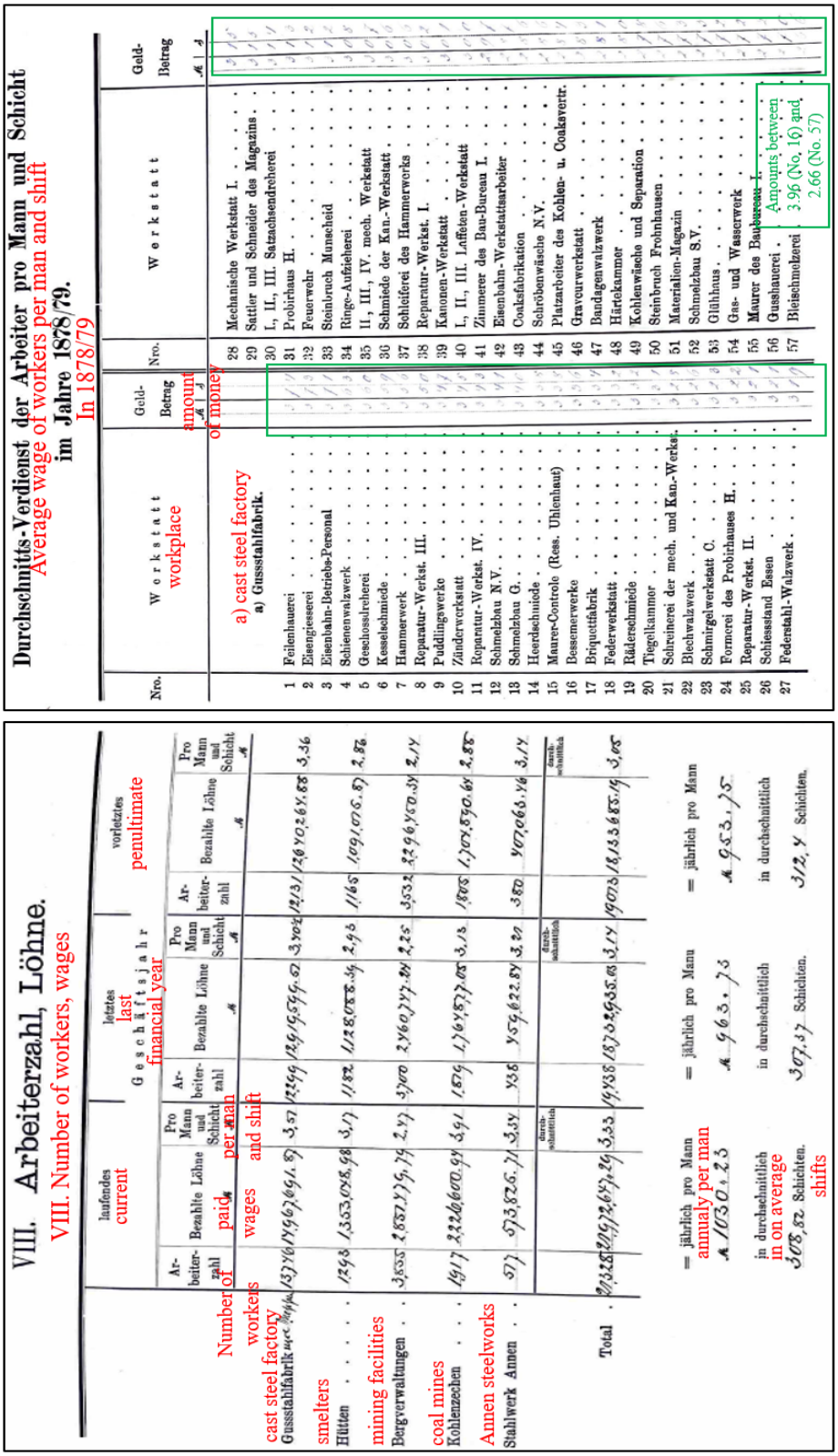
I. Balance sheet result

1889/90

	in the current financial year	in the last financial year	in the penultimate
Net-Profit	M 6,220,814.88	M 6,542,456.90	M 7,786,916.25
		average of the 3 years	
		M 6,850,062.68	
Turnover:			
a) of the Essen plants			
war material	M 15,027,130.89	M 19,080,008.94	M 20,106,784.12
peace material	M 33,679,175.23	M 27,128,116.61	M 25,894,828.50
b) of the Annen steelworks	M 2,699,697.73	M 1,682,341.02	M 1,469,270.08
	M 51,406,003.85	M 47,890,465.57	M 47,470,882.70
The freight costs included here for products shipped amount to			
in Essen	M 1,938,385.38	M 1,382,087.85	M 1,677,579.41
in Annen	M 25,360.—	M 24,129.93	M 26,746.89
	M 1,963,745.38	M 1,406,217.78	M 1,704,326.30
remain	M 49,442,258.47	M 46,484,247.79	M 45,766,556.40
whereby the profit from the goods turnover is calculated			
In Essen at	12.30 %	13.97 %	17.20 %
In Annen at	17.47 %	16.78 %	11.02 %

Source: WA 4 1312, 37.
Note: The right box shows direct translations (translated by the authors). The values are in the currency *Mark*.

Figure 10. Extracts of wage overviews from the 1889/90 and 1878/79 annual reports.



Source: WA 4 1312, 50; WA 4 1301, 139.
Note: The image on the left is from the internal annual report from 1889/90 and the one on the right from 1878/79. Translations of the key terms in the illustrations are shown in red (translated by the authors). The values are in the currency *Mark*.

3.5. Value added distribution at Krupp

3.5.1. Business development and total value added

The completeness of the VAD calculations varies across both time periods and stakeholder groups. The extent to which the available records permit these calculations is therefore discussed separately for each stakeholder group in the following sections. Accordingly, Tables 3–6 do not present data for every year but instead focus on four decades for which the VAD can be fully reconstructed. The available records for the intervening years are incomplete; these gaps are addressed in the text.

The first years of the cast steel factory can be characterised as those of a start-up (Gehrt 2026). The young business aims to produce innovative cast steel but initially meets with little success (e.g. Lindenlaub and Köhne-Lindenlaub 1988; Gall 2000; James 2011). Table 3 outlines the VAD for the years 1811 to 1821. The years are characterised by a mostly negative VA and negative net income, which result in particular from low sales. Due to the negative VA, the percentage distribution among the four stakeholder groups is difficult to interpret and is therefore not shown in Table 3. The development continues until after the death of Friedrich Krupp in 1826. Owing to a lack of sources for 1826 to 1835, it can only be assumed that the company initially continues to operate at a loss (Lindenlaub and Köhne-Lindenlaub 1988). The situation improves slowly from 1836. The company now has 80 employees and generates annual sales of 23,320 Tlr. (approx. 1.04 million euros real 2023). The economic crisis of 1847/48 hits Krupp hard, with the company narrowly avoiding insolvency. Its first major growth phase then starts in the 1850s (Pleitgen 2005). Krupp benefits from the expansion of the railway network by providing certain intermediate steel components, but also from the production of armaments, which starts in 1857 (Pleitgen 2005). The company then generates continuously and rapidly increasing profits, reaching its temporary peak in 1872/73, immediately after the foundation of the German Reich in 1871 and the end of the Franco-Prussian War (1870/71). At this time, Krupp records sales of around 11.7 million Tlr. (approx. 274 million euros real 2023) and employs roughly 16,000 people. With the *Gründerkrach* and the global economic crisis of 1873/74, Krupp also finds itself in financial difficulties but is saved by the issue of a bond (Pleitgen 2005). The company's financial development up to the mid-1880s is relatively successful (i.e. largely profitable) but rather stagnant. Subsequently, another phase of strong growth begins, lasting until the end of WW I. This growth is partly achieved through acquisitions, the most important being the

Grusonwerk in Magdeburg (armaments company, 1892/93) and the *Germaniawerft* in Kiel (shipyard, 1896).

Table 4 shows the VAD for the financial years 1881/82 to 1890/91. The total annual VA is between 19.4 (1882/83) and 36.8 (1890/91) million M (160.9 and 272.9 million euros real 2023, respectively). Employees receive by far the largest average share of VA (75 %), followed by shareholders (19 %), whose comparatively high share reflects the company's successful development in this period, while the government and creditors receive markedly smaller shares (2 % and 4 %, respectively). From the turn of the century to the end of WW I, sales rise to around 1,100 million M in 1917/18 (around 3,075 million euros real 2023), driven largely by the production of war material, which accounts for 80 to 90 % of sales during the war (Pleitgen 2005). This expansion, together with the growth of the workforce from 41,000 (1903) to 168,000 (end of the war) and the resulting sharp rise in wages, pushes total VA up, to between 246.5 and 406.8 million M (1914/15–1917/18; not tabulated).

After the war, the conversion from war material to civilian products, combined with repeated years of losses and fluctuating employee numbers throughout the 1920s and early 1930s, leads Krupp into another financial crisis (Lindenlaub 2006), during which total VA is significantly lower than in the war years. Inflation from WW I onwards, and in particular the extreme hyperinflation of 1921 to 1923, makes it difficult to compare the figures in the annual financial reports and thus the VA during this period. Although inflation-adjusted values help to some extent, they remain highly uncertain for this period and are not calculated for the hyperinflation years (Deutsche Bundesbank 2023).

Table 3. Value added distribution 1811 to 1821.

Year	1811/12	1813	1814	1815	1816	1817	1818	1819	1820	1821
Sales (nominal, Rtlr.)	-	136	1.287	987	944	2.607	4.002	2.995	3.406	3.792
Sales (real, €-2023)	-	5.794	55.985	39.677	30.586	59.700	131.666	127.587	176.090	178.982
Employees										
Number	*2*	*8*	*6*	*4*	*5*	*6*	*10*	*8*	*8*	*8*
Wages operations (nominal, Rtlr.)	24	1.505	2.098	613	763	1.083	1.952	1.385	1.447	2.692
Wages construction (nominal, Rtlr.)	3.193	1.923	563	605	326	10	301	898	1.204	
Wages operations (real, €-2023)	1.022	64.113	91.263	24.643	24.721	24.801	64.221	59.001	74.810	127.062
Wages construction (real, €-2023)	136.022	81.920	24.491	24.321	10.562	229	9.903	38.255	62.247	
Creditors										
Interest (nominal, Rtlr.)	805	1.080	1.445	1.445	1.525	1.720	1.720	1.985	2.110	1.850
Interest (real, €-2023)	34.293	46.008	62.858	58.089	49.410	39.388	56.588	84.561	109.087	87.320
Government										
Taxes (nominal, Rtlr.)	70	70	70	70	70	70	70	70	90	90
Taxes (real, €-2023)	2.982	2.982	3.045	2.814	2.268	1.603	2.303	2.982	4.653	4.248
Shareholders										
Earnings (nominal, Rtlr.)	-3.396	-8.338	-6.600	-4.055	-3.174	-3.367	-5.423	-4.729	-2.875	-3.379
Earnings (real, €-2023)	-144.676	-355.203	-287.099	-163.027	-102.825	-77.107	-178.424	-201.452	-148.615	-159.474
VA (nominal, Rtlr.)	-2.497	-5.683	-2.987	-1.927	-816	-494	-1.681	-1.289	772	1.253
VA (real, €-2023)	-106.379	-242.100	-129.934	-77.481	-26.426	-11.316	-55.313	-54.908	39.934	59.156

Sources: FAH 1 A 20, FAH 1 A 32, FAH 1 A 38, FAH 1 A 50, FAH 1 A 53, FAH 1 A 55/55a, FAH 1 A 57, FAH 1 A 62, FAH 1 A 63, FAH 1 A 68/68a, FAH 1 A 75, FAH 1 A 76, FAH 1 A 79, Lindenlaub and Köhne-Lindenlaub (1988) (taxes and interest), Gall (2000) (employee numbers).

Note: The nominal values are in the currency *Reichstaler gemeinen Geldes* (Rtlr.). The real values are in 2023 euros. The calculation is based on data from Bundesbank (2023). Taxes and interest are taken from estimates and analyses by Lindenlaub and Köhne-Lindenlaub (1988).

Table 4. Value added distribution 1881 to 1891.

Year	1881/82	1882/83	1883/84	1884/85	1885/86	1886/87	1887/88	1888/89	1889/90	1890/91
Sales (nominal, M)	46.402.878	46.026.993	36.512.250	42.559.537	47.318.145	42.201.110	47.470.883	47.890.466	51.406.004	55.854.718
Sales (real, €-2023)	403.705.039	391.229.441	321.307.800	361.756.065	397.472.418	354.489.324	398.755.417	387.912.775	406.107.432	435.666.800
Employees										
Number	*18.300*	*17.800*	*17.000*	*17.100*	*18.300*	*20.200*	*21.000*	*22.300*	*24.000*	*24.600*
Wages (nominal, M)	17.754.009	17.542.288	15.483.799	15.714.777	16.333.214	18.069.688	19.603.256	20.282.310	23.645.109	27.703.176
Wages (real, €-2023)	154.459.876	149.109.449	136.257.427	133.575.606	137.198.999	151.785.381	164.667.353	164.286.715	186.796.362	216.084.772
Share	76,0%	73,2%	80,8%	71,4%	75,4%	79,3%	69,2%	73,0%	75,9%	79,9%
Creditors										
Interest (nominal, M)	1.458.891	1.437.141	1.303.415	1.245.283	699.691	526.590	574.714	481.898	637.405	727.316
Interest (real, €-2023)	12.692.353	12.215.701	11.470.053	10.584.907	5.877.404	4.423.353	4.827.600	3.903.375	5.035.498	5.673.061
Share	6,2%	6,0%	6,8%	5,7%	3,2%	2,3%	2,0%	1,7%	2,0%	2,1%
Government										
Taxes (nominal, M)	379.510	421.469	201.731	392.635	422.019	247.793	367.608	478.805	668.191	529.962
Taxes (real, €-2023)	3.301.737	3.582.487	1.775.229	3.337.394	3.544.955	2.081.460	3.087.905	3.878.319	5.278.708	4.133.700
Share	1,6%	1,8%	1,1%	1,8%	1,9%	1,1%	1,3%	1,7%	2,1%	1,5%
Shareholders										
Earnings (nominal, M)	4.570.595	2.165.845	4.642.041	4.208.543	3.937.258	7.786.916	6.542.457	6.220.815	5.691.661	6.713.177
Earnings (real, €-2023)	36.564.760	17.976.512	37.136.327	33.668.341	31.498.063	62.295.330	50.376.918	46.034.028	42.118.295	49.677.509
Share	16,1%	19,1%	11,3%	21,1%	19,4%	17,3%	27,5%	23,5%	20,0%	16,4%
VA (nominal, M)	23.929.534	19.374.528	21.803.832	21.634.082	22.955.554	28.212.680	27.674.273	30.982.134	34.790.344	36.845.423
VA (real, €-2023)	191.701.933	160.892.873	174.592.038	173.268.976	183.813.241	225.800.555	213.349.229	229.602.951	257.782.640	272.868.117

Sources: WA 4 1304, WA 4 1305, WA 4 1306, WA 4 1307, WA 4 1308, WA 4 1309, WA 4 1310, WA 4 1311, WA 4 1312, WA 4 1313, Gall (2000) (employee numbers).
Note: The nominal values are in the currency *Mark* (M). The real values are in 2023 euros. The calculation is based on data from Bundesbank (2023).

From the mid-1930s, Krupp again boosts the production of war material (Lindenlaub 2006), significantly increasing the company's sales and total VA (see Table 5). Its economic development during WW II resembles that of WW I. Sales peak at around 1,200 million RM in 1941/42 (5,561 million euros real 2023), total VA reaches around 465 million RM (2,140 million euros real 2023) in the same year, and the workforce again grows sharply, peaking at around 277,000 in 1945. The average VAD is shown in Table 5, with employees again receiving the largest share (73 %); shareholders receive 4 %, the government 20 % and creditors 3 % of VA. After Alfried Krupp's imprisonment and the control of the company by the British military government, it is difficult to calculate VA.

After the company returns to the ownership of the Krupp family in 1951, it initially develops well but is again in financial difficulties between 1965 and 1967. Sales increase steadily from 1968 onwards, exceeding 10,000 million DM for the first time in 1977. Table 6 shows the VAD for the period from 1968 to 1976. The total VA is between 1,539 and 2,946 million DM (around 3,372 and 4,802 million euros real 2023). Employees again receive by far the largest share of VA, averaging 86 %, the highest of all periods examined, while the shares of shareholders (1 %), the government (5 %) and creditors (7 %) are all significantly lower. The number of employees fluctuates around 80,000 in the 1970s and subsequently falls significantly to a low of 53,115 in 1991. This reflects the company's inconsistent economic development, also visible in the annual results, which swing between profit and loss, particularly in the 1980s, when they are negative on average. Following the 1992 merger with Hoesch AG, the resulting Fried. Krupp AG Hoesch-Krupp has 91,411 employees, an annual turnover of 23,157 million DM and a total VA of 7,261 million DM (around 21,073 and 6,608 million euros real 2023, respectively). After two poor financial years, the company returns to profitability and steadily increases its sales.

Table 5. Value added distribution 1933/34 to 1942/43.

Year	1933/34	1934/35	1935/36	1936/37	1937/38	1938/39	1939/40	1940/41	1941/42	1942/43
Sales (nominal, RM)	335.866.679	488.191.705	604.367.482	674.003.823	772.539.608	920.255.718	1.007.988.751	1.079.853.673	1.208.906.753	1.068.751.071
Sales (real, €-2023)	1.746.506.731	2.489.777.696	3.082.274.158	3.437.419.497	3.862.698.040	4.601.278.590	4.939.144.880	5.183.297.630	5.560.971.064	4.916.254.927
Employees										
Number	*75.240*	*91.507*	*98.341*	*108.765*	*123.408*	*139.259*	*149.290*	*159.308*	*178.071*	*235.304*
Wages (nominal, RM)	117.141.268	153.767.374	173.612.053	198.594.858	226.637.963	263.498.063	276.212.667	301.005.739	316.955.293	312.816.293
Wages (real, €-2023)	609.134.594	784.213.607	885.421.468	1.012.833.775	1.133.189.817	1.317.490.313	1.353.442.068	1.444.827.548	1.457.994.349	1.438.954.949
Share	81,3%	78,5%	74,4%	73,7%	75,8%	67,3%	73,3%	68,0%	68,1%	74,2%
Creditors										
Interest (nominal, RM)	6.812.673	7.500.821	7.667.788	7.334.437	6.400.597	6.552.898	9.549.996	10.737.155	9.854.860	10.043.449
Interest (real, €-2023)	35.425.898	38.254.185	39.105.721	37.405.631	32.002.987	32.764.489	46.794.981	51.538.343	45.332.358	46.199.867
Share	4,7%	3,8%	3,3%	2,7%	2,1%	1,7%	2,5%	2,4%	2,1%	2,4%
Government										
Taxes (nominal, RM)	13.466.488	25.005.981	37.628.146	47.293.285	44.896.519	98.538.866	80.323.848	120.137.565	128.278.043	98.134.695
Taxes (real, €-2023)	70.025.736	127.530.504	191.903.543	241.195.753	224.482.593	492.694.331	393.586.856	576.660.313	590.079.000	451.419.598
Share	9,3%	12,8%	16,1%	17,6%	15,0%	25,2%	21,3%	27,1%	27,6%	23,3%
Shareholders										
Earnings (nominal, RM)	6.651.601	9.689.548	14.354.206	16.226.877	21.111.743	22.705.615	10.719.666	10.894.132	10.115.320	780.191
Earnings (real, €-2023)	34.588.325	49.416.693	73.206.452	82.757.075	105.558.715	113.528.075	52.526.364	52.291.834	46.530.471	3.588.879
Share	4,6%	4,9%	6,2%	6,0%	7,1%	5,8%	2,8%	2,5%	2,2%	0,2%
VA (nominal, RM)	144.072.029	195.963.723	233.262.193	269.449.458	299.046.822	391.295.442	376.806.177	442.774.591	465.203.517	421.774.629
VA (real, €-2023)	749.174.552	999.414.989	1.189.637.184	1.374.192.234	1.495.234.112	1.956.477.209	1.846.350.269	2.125.318.038	2.139.936.178	1.940.163.293

Source: WA 1 1495, WA 1 1496, K 31 1929, Gall (2002) (employee numbers and sales).
Note: The nominal values are in the currency *Reichsmark* (RM). The real values are in 2023 euros. The calculation is based on data from Bundesbank (2023).

Table 6. Value added distribution 1968 to 1976.

Year	1968	1969	1970	1971	1972	1973	1974	1975	1976
Sales (nominal, DM)	5.286.984.122	6.053.815.478	6.774.053.286	6.830.632.465	6.237.551.968	7.388.186.662	8.706.206.168	8.582.821.070	9.015.869.041
Sales (real, €-2023)	11.578.495.227	13.015.703.278	14.022.290.302	13.456.345.956	11.664.222.180	12.855.444.792	14.191.116.054	13.217.544.448	13.343.486.181
Employees									
Number	*87.079*	*79.500*	*80.340*	*79.663*	*74.931*	*76.100*	*80.892*	*78.912*	*76.161*
Wages (nominal, DM)	1.332.583.456	1.365.171.974	1.572.977.789	1.718.433.626	1.743.268.447	1.981.209.376	2.478.630.193	2.419.959.879	2.560.455.790
Wages (real, €-2023)	2.918.357.769	2.935.119.744	3.256.064.023	3.385.314.243	3.259.911.996	3.447.304.314	4.040.167.215	3.726.738.214	3.789.474.569
Share	86,6%	82,1%	79,2%	86,6%	87,1%	84,3%	84,1%	92,7%	89,4%
Creditors									
Interest (nominal, DM)	156.917.823	152.832.096	172.567.892	161.710.756	154.596.935	171.550.292	211.722.107	170.353.331	149.224.173
Interest (real, €-2023)	343.650.032	328.589.006	357.215.536	318.570.189	289.096.268	298.497.508	345.107.034	262.344.130	220.851.776
Share	10,2%	9,2%	8,7%	8,1%	7,7%	7,3%	7,2%	6,5%	5,2%
Government									
Taxes (nominal, DM)	59.922.039	81.786.228	131.345.915	89.088.550	89.737.615	114.091.743	168.047.049	82.088.469	155.095.015
Taxes (real, €-2023)	131.229.265	175.840.390	271.886.044	175.504.444	167.809.340	198.519.633	273.916.690	126.416.242	229.540.622
Share	3,9%	4,9%	6,6%	4,5%	4,5%	4,9%	5,7%	3,1%	5,4%
Shareholders									
Earnings (nominal, DM)	-9.873.611	63.105.225	109.611.118	16.048.522	13.382.917	82.651.442	87.479.487	-60.572.624	624.466
Earnings (real, €-2023)	-21.623.208	135.676.234	226.895.014	31.615.588	25.026.055	143.813.509	142.591.564	-93.281.841	924.210
Share	-0,6%	3,8%	5,5%	0,8%	0,7%	3,5%	3,0%	-2,3%	0,0%
VA (nominal, DM)	1.539.549.707	1.662.895.523	1.986.502.714	1.985.281.454	2.000.985.914	2.349.502.853	2.945.878.836	2.611.829.055	2.865.399.444
VA (real, €-2023)	3.371.613.858	3.575.225.374	4.112.060.618	3.911.004.464	3.741.843.659	4.088.134.964	4.801.782.503	4.022.216.745	4.240.791.177

Source: WA 104 17–18, WA 104 19–20, WA 104 6768, WA 104 6769, WA 104 6770, WA 104 6771, WA 104 6772, WA 104 6773, WA 104 6774.
Note: The nominal values are in the currency *Deutsche Mark* (DM). The real values are in 2023 euros. The calculation is based on data from Bundesbank (2023).

3.5.2. Shareholders, the Krupp family

For a long time, Krupp operates as a typical family business. This makes the Krupp family the most important, but not always the only, shareholder for much of the company's history. From the company's foundation in 1811 until 1903, it is run as a sole proprietorship. Minority shareholders such as Georg and Wilhelm von Kechel (1811–1814), Friedrich Nicolai (1814–1816), Carl-Friedrich von Müller (1835–1843) or Friedrich Sölling (1843–1859) are involved at various points during this phase but are not the focus of this analysis. The main changes in ownership structures and legal forms are shown in Table 2 and Figure 6.

The analysis of the VAD shows that the earnings, i.e. the share attributable to the shareholders, varied considerably. In the start-up phase under Friedrich Krupp, losses are initially high. Throughout his life, Friedrich Krupp never makes a profit with his company. By the time of his death, he has almost completely exhausted his grandmother's inheritance[22], most of which he uses to fund the company. The company develops more favourably under his son Alfred Krupp, who runs the company together with his mother[23] from 1826. As described before, the sources at the beginning of this period are incomplete, but the company probably does not make its first profits until around ten years later. The first roughly 25 years of the cast steel factory thus significantly reduced the Krupp family's wealth.

In 1848 Alfred Krupp buys his mother's shares in the company. The following period is characterised by strong growth and profits for the Krupp family. During this period, the earnings can be taken from the balance sheets. As Figure 3 shows for 1854, equity is calculated as assets minus liabilities and compared with the previous year's capital accounts of Alfred Krupp and Friedrich Sölling. The resulting earnings are allocated in proportion to their ownership shares. The calculation is carried out in this way until the introduction of the profit and loss account in the mid-1860s. The earnings grow by an average of 32.68 % per year between 1848 and 1865 (not adjusted for inflation), from 16,534 Tlr. to around 2 million Tlr.

22 Friedrich Krupp inherited around 40,000 Rtlr. (around 1.6 million euros real 2023), made up of various assets (cash and cash equivalents, real estate, goods etc.), from his grandmother, Helene Amalie Krupp, née Ascherfeld. She stemmed from a successful merchant family and married into the likewise successful Krupp merchant family, with whom she already had family ties, as the first Krupp in Essen, Arndt Krupp, was her great-great-great-grandfather. She ran a colonial goods business (Gall 2000).

23 Although the widow Theresia Krupp, née Wilhelmi, initially became the sole owner of the company, her son, the 14-year-old Alfred Krupp mainly managed the business. Theresia's daughter Ida and her brother-in-law Carl Schultz also supported the continuation of the company (Lindenlaub and Köhne-Lindenlaub 1988).

The detailed internal annual reports available from the mid-1870s onwards contain overviews of the owners' capital accounts. In addition to Alfred Krupp's capital account, an account for his son Friedrich Alfred Krupp is introduced in 1883, after the latter joins the company's management. Parts of the net profit are allocated to both capital accounts, and withdrawals, such as credits to other family members or other third parties, are also shown.[24]

Except for a few crisis years (1874/75, 1879/80) the company continues to make profits at the end of the nineteenth century. The share of the equity providers in the VAD is remarkably high. Table 4 shows that the family receives between 11.3 % (1883/84) and 27.5 % (1887/88) of the company's VA over the financial years 1881/82 to 1890/91, an average of 19.2 %. This share, however, consists largely of profits retained and reinvested in the company rather than distributed to the family.

One symbol of the family's financial success in the mid to late nineteenth century is the construction of the castle-like Villa Hügel in Essen-Bredeney, completed in 1873. Villa Hügel plays an important role in interpreting the VAD, as it exemplifies how the family benefits from the company beyond profits. The boundaries between the private and business spheres at Villa Hügel are blurred in both practical and accounting terms (Borchardt 2001). The residence and its extensive grounds serve to represent the company while also providing many private amenities.

The period as a stock corporation from 1903 to 1943 is dominated by the two world wars. Due to the change in legal form, the values used for the VA calculation now mainly consist of data from external annual reports (K 31 1903; K 31 1929), which were prepared in accordance with the rules for stock corporations applicable at the time. In addition to the earnings, which can be taken directly from the income statement, the report of the board of directors provides information on the appropriation of profit. This means that the amount of dividends, reserves or other payments from profits, e.g. to pension funds, can be seen in the reports. At the beginning of the twentieth century, Krupp achieves consistently high profits, which amount to around 11.5 million M in the 1903/04 financial year and grow to over 21 million M by 1909/10. Driven by WW I and the increased demand for armaments, Krupp's profits rise sharply, reaching almost 86.5 million M. The share of the shareholders in the VAD is around 35 % that year. However, the figure falls to 18 % and 10 % in the following

24 Until Alfred Krupp's death in 1887, 80 % of the net profit is credited to his account and 20 % to Friedrich Alfred Krupp's account (see WA 4 1298–1309). The accounts are initially called *Capital-Conto des Herrn Alfred Krupp* and *Capital-Conto F.A Krupp*, in 1888 they are renamed *Capital-Conto Fried. Krupp* and *Privat-Conto Fried. Alfred Krupp* (see WA 4 1298–1317; WA 4 2411.1–2417.1).

years, and even to 1 % in the last year of the war, 1917/18. The main reason for this, with sales rising steadily, is the skyrocketing personnel expenses.[25] In 1918/19 Krupp records a loss around 36 million M, giving the family a substantial negative share in the VAD.

The years after WW I are financially difficult for Krupp. The phase includes several years of losses with a negative share of VA for the family. Krupp does not return to profitability until the National Socialists come to power and rearmament begins. However, the shareholders' share of VA is significantly lower than in previous phases, ranging between 7.1 % (1937/38) and 0.2 % (1942/43) (see Table 5). As after WW I, Krupp suffers heavy losses towards the end of WW II, again driven primarily by the sharp rise in personnel expenses. The two wars therefore show many parallels in Krupp's financial development and VAD.

After the expropriation following WW II, no earnings can initially be attributed to the family. Due to the poor data situation for this period, VAD can only be calculated again from 1968 onwards, when the newly established foundation becomes the sole shareholder, and its share of VA falls once more relative to earlier periods. Between 1968 and 1976, it ranges from -2.3 % (1975) to 5.5 % (1970), averaging just 1.4 % (see Table 6). In 1976, the shareholder structure changes when the Iranian state acquires 25.01 % of the shares. Between 1976 and 1991, the shareholders' share falls slightly to an average of 0.6 % but fluctuates far more widely, ranging from -10.6 % (1989) to 8.5 % (1982). After the merger with Hoesch AG in 1992, two years of negative earnings follow, before the company stabilises and shareholders again receive positive returns between 1994 and 1998, ranging from 0.7 % (1994) to 9.0 % (1998) of VA (average 5.5 %).

Overall, the shareholders' share is the most volatile of the four, being the only one to turn negative in years of loss, such as 1918/19 and 1975. This volatility stems from shareholders' status as residual claimants, entitled only to what remains once employees, creditors and the government have been paid (see Fama and Jensen 1983). Their share therefore reflects the company's performance rather than any deliberate allocation. It comprises all profit attributable to the shareholders, whether distributed as dividends or retained within the company. However, the records indicate that, in difficult years, the family reduced its own distributions and retained profits within the company. This is consistent with the restrictive dividend

25 The full personnel expenses cannot be calculated from the sources we use. The values for the VAD from 1914/15 to 1917/18 were therefore supplemented with calculations of total labour costs by Burchardt (1987).

policy and reinvestment from retained earnings that are characteristic of family firms (Romano et al. 2001; Gomez-Mejia et al. 2007).

3.5.3. Employees

Krupp's corporate history is closely linked to various social responsibility and welfare programmes that were initiated as early as the nineteenth century and provided employees and the surrounding area around Essen with significant economic benefits (McCreary 1968; James 2011). Employees are expected to receive the largest and most stable share of VA at Krupp, reflecting both the labour intensity of the steel industry and the priorities of a family firm. On the accounting side, this is reflected in eleven further items that we assign to employees in addition to salaries and wages as part of the VAD between 1811 and 1998. These items relate to welfare purposes and to the insurance and support of employees. Welfare purposes (in the profit and loss account between 1881 and 1945) mainly include subsidies for discounted shopping facilities and workers' housing, as well as anniversary gifts for employees. During WW I, however, the welfare fund account was also used to continue paying the wages of families of employees who had been called up (Burchardt 1987).

The items relating to retirement provision and employee benefits include the following: workers' insurance (profit and loss statement, 1903–1931), workers' foundation (1907), civil servants' pension fund (1908, 1910–1912), pension and benefit funds (1913–1916, 1927–1928), workers' holiday fund (1913–1914, 1916), invalidity foundation (1915), social security contributions (1932–1945, 1960–1962, 1968–1985), contributions to trade associations (1938–1945), statutory social security contributions (1954–1958, 1965–1966), voluntary social expenses (1954–1958) and expenses for pensions and benefits (1968–1985).[26] Items such as the workers' foundation or the workers' holiday fund show that, as in other family businesses (see e.g. Gomez-Mejia et al. 2014), Krupp employees received benefits going beyond wage and pension payments. From 1986 onwards, all personnel-related expenses in the income statement are combined in a single personnel expenses item. While some accounts were merely renamed or generalised over time (e.g. civil servants' pension fund becoming pension and benefit funds in 1912/1913), others show the range of benefits that Krupp provided to its employees in addition to wages and salaries. This is particularly

26 Original terms: *Arbeiterversicherung, Arbeiterstiftung, Beamten Pensionskasse, Pension u. Unterstützungskassen, Arbeiter-Urlaubsfonds, Invalidenstiftung, Soziale Abgaben, Beiträge Berufsvertretungen, Gesetzliche soziale Abgaben, Freiwillige soziale Aufwendungen, Aufwendungen für Altersversorgung und Unterstützung*.

evident in 1913, in the coexisting items welfare purposes, workers' insurance, pension and benefit funds, workers' holiday fund and Christmas bonuses for civil servants and workers. As wages and salaries were not always reported separately or as personnel expenses, we could not compile primary data for wages and salaries in several periods. In these cases, wages and salaries were either not included in the profit and loss account or absorbed into other items, such as cost of sales.

Between 1811 and 1826 the company employs between two and ten workers (see Table 3). The wages of the workers can be taken from the *Lohnzettel*. In addition to wages, other worker support benefits must also be included in the calculation. The *Lohnzettel* show that Friedrich Krupp paid his workers sick pay[27] long before the continued payment of wages during periods of illness was established through collective agreements and, later, legislation in the twentieth century.

While no observations can be made on employment-related conditions for the period until 1880, appendices to the profit and loss accounts provide more detailed information for the years 1881 to 1892. For this period, expenditure on employees can be derived from the reported amounts for salaries, wages, workers' support and general welfare purposes. These employee-related expenses increased from around 17.7 million M in 1881/82 to around 27.7 million M in 1890/91 (see Table 4). For the years 1893 to 1902, the appendices from which the exact employee numbers, wages and salaries could be taken are missing. For these years, only the workers' support and general welfare purposes item, taken from the profit and loss account, is available. It rises from around 1.1 million M to around 1.7 million M.

Since wages and salaries are not reported in the annual financial statements from 1903 to 1931, the total share of VA attributable to employees can only be estimated for this period. However, other items in the profit and loss account shed light on employees' share of VA. For example, between 1903 and 1945, several financial statements (with varying frequency) report items that can be attributed to Krupp employees, including welfare purposes, workers' insurance, the workers' foundation, pensions and support funds, the workers' holiday fund, Christmas bonuses for civil servants and workers and contributions to trade associations.[28]

27 E.g. *Lohnzettel* 97 from 1815 (FAH 1 A 55): '*Unterstützung an den Hammerschmied Küpper während seines Krankseins*' (translated: Support to the hammer smith Küpper during his sickness) as cited in Stercken and Lahr (1992, n. 3).

28 Originial terms: *Wohlfahrtszwecke, Arbeiterversicherung, Arbeiterstiftung, Pensions u. Unterstützungskassen, Arbeiter-Urlaubsfonds, Weihnachtszuwendungen für Beamte und Arbeiter, Beiträge an Berufsvertretungen.*

From 1932 onwards, wages and salaries are shown as a separate item within the income statement, making the share of VA attributable to Krupp employees apparent for the first time. At its peak, 94.91 % of VA is allocated to employees in 1932; the lowest share is 67.98 % in 1941. Because wages and salaries are comparatively fixed in absolute terms from one year to the next, while total VA fluctuates considerably, the employees' relative share fluctuates mechanically as a result, rising when VA contracts and falling when it grows. This wide range therefore mirrors the volatility of total VA itself rather than any instability in employees' position.

During the war years in particular, this share should not be read as an indicator of employee welfare. From 1942, an increasing proportion of Krupp's workforce consisted of foreign civilians, prisoners of war and concentration camp prisoners subjected to forced labour under conditions documented at the Krupp trial in 1947/48 (Abelshauser 2002). A high employee share in these years therefore reflects the scale of wartime production and its heavy reliance on forced labour (for the remuneration of forced labourers, see Abelshauser 2002, 424–29), rather than a voluntary or reciprocal distribution of value.

The items welfare purposes and workers' insurance in particular appear in each of these periods. It is striking that expenses for welfare purposes were not significantly reduced even in difficult and loss-making periods (e.g. between 1929 and 1931). It is equally striking that in prosperous periods various employee expenses were increased before dividends were paid to shareholders (e.g. between 1902 and 1904 or 1970 and 1973). Krupp thus displays the characteristics of a family-owned company: a restrictive dividend policy on the one hand, and, on the other, a workforce that is reduced only as a last resort. However, this last point concerns the treatment of the workforce in terms of numbers and should be kept distinct from the size of employees' shares in the VA, as discussed above. A high share does not necessarily imply stable employment. From the 1970s, for example, Krupp's workforce contracts considerably alongside the broader crisis of the German coal and steel industry, even as the wage share of VA remains high (WA 104 6774).

With the reorganisation of the company from 1968 onwards, the funds attributable to employees are shown in full in the annual financial statements. The share of personnel expenses in VA rises significantly between 1968 and 1998, to an average of 87.85 %, with many financial years in which it exceeds 90 %. This period coincides with the extension of statutory co-determination. Krupp, as a coal and steel producer, was subject to the 1951 *Montanmitbestimmungsgesetz* (Mining Co-determination Act), which gave employee representatives

parity on the supervisory board, and from 1976 to the general *Mitbestimmungsgesetz* (Co-determination Act) (McGaughey 2015; Müller-Jentsch 2021; Zahn 2015; Lauschke 2007). This close alignment between labour and management is a defining feature of Germany's coordinated capitalist economy, a pattern also captured by the term 'Rhenish capitalism' (Albert and Gonenc 1996; Thelen 2004; see also Fülbier and Klein 2015, 353). Institutionalised bargaining power of this kind offers a further explanation for the higher and more consistent wage share of this period.

Taken together, the consistently high share of VA going to employees across the company's history reflects the central place of this group in Krupp's value creation. In part, this follows from the nature of the industry. Steel and armaments manufacturing is labour-intensive, so that a large and comparatively hard-to-replace workforce forms a substantial component of the value created and holds a correspondingly strong claim upon it (Pfeffer and Salancik 1978). In part, it reflects the orientation of a family firm. The accounts show that Krupp sustained employee-related expenditure through downturns and expanded it before rewarding owners. However, these additional benefits were not (purely) philanthropic. They also served to retain a scarce resource, a skilled and hard-to-find workforce, and thereby to secure the firm's continued growth (Hielscher and Beckmann 2009).

3.5.4. State

Krupp, as a large steel producer and major arms manufacturer, is closely connected to the government throughout its history. In the VAD, taxes are attributed to the government, or more broadly, to the state. This understates the state's true weight as a stakeholder, however, since it is also a regulator and an important customer, particularly in wartime. Therefore, the relationship between the state and the company deserves closer attention, as it extends beyond the purely fiscal sphere.

In the start-up phase of the company from 1811 to 1826, no complete tax payments can be identified in the sources[29] and the estimates of tax burdens compiled by Lindenlaub and Köhne-Lindenlaub (1988) are used instead. In general, the Prussian tax system of the early nineteenth century relied primarily on indirect taxes, local levies and the personal taxation of entrepreneurs rather than on comprehensive taxation of business profits, making firm-level tax payments difficult to identify in historical records (Spoerer 2015). Until the

29 Lindenlaub and Köhne-Lindenlaub (1988) point out that some tax payments are included in the *Lohnzettel* and *Cassa-Büchern*, but that the records are not complete.

introduction of profit and loss accounts, the sources do not provide any information on tax payments. Between 1881/82 and 1890/91, the share of taxes in the VAD remains relatively constant between 1.1 % (1883/84 and 1886/87) and 2.1 % (1889/90). The absolute tax payment ranges between 200,000 M and 700,000 M and thus averages around 8.6 % of the annual earnings. From 1876 to 1889, there is no information on the amount of taxes in the income statement. From 1890 onwards, the entry for taxes is included, but the amount of taxes listed here is 0 M up to 1901. Only in 1902 taxes are reported in the amount of around 2.5 million M. These results are in line with the analysis of this period by Pleitgen (2005). These numbers should not be interpreted as evidence that Krupp was effectively untaxed during this period. Rather, it reflects the characteristics of the German tax system before the major Prussian income tax reform of 1891 and the gradual expansion of direct business taxation around the turn of the century. Moreover, until 1903, Krupp was a sole proprietorship, meaning that business income was taxed primarily at the owner's level. As a result, taxes reported in the company's accounts underestimate the actual tax burden during this period.

Against this background, the rise in reported tax payments after 1902 marks an important shift. In the financial years 1902/03 to 1912/13, taxes amounted to an average of 18.6 % of annual earnings. This increase partly reflects Krupp's incorporation as an AG in 1903, which made the distinction between the company and the owner family clearer in accounting and tax terms. The share in the VAD cannot be determined precisely due to incomplete information on personnel expenses for these years but is estimated to be slightly higher than for the period shown in Table 4.

During WW I, tax expenses rise disproportionately to annual earnings. In the financial years 1914/15 to 1917/18, the government's average share of VA is therefore around 6.8 %, peaking at 10.5 % in 1915/16. A similar pattern emerges before and during WW II. Even before the war itself, the government's share of VA is already elevated (see Table 5). This share averages 14.2 % in 1933/34 to 1937/38 and rises to 24.9 % during the war years. This increase reflects the Nazi state's much stronger fiscal extraction, achieved especially through rising corporate and income tax rates on large firms and high incomes (Buggeln 2021). In the case of Krupp, however, this heavier ongoing tax burden coexisted with exceptional political privileges, most notably the *Lex Krupp* of 1943, which mainly affected inheritance and succession taxation rather than ordinary annual tax payments. In the post-war period, taxes take on a smaller role again and from 1968 onwards are permanently below 10 % of

total VA, a period in which, as shown before, Krupp's earnings were themselves comparatively modest.

3.5.5. Creditors

Over the almost 200 years covered by this study, the composition of Krupp's creditors changed considerably. While the company was initially financed by loans from individuals, it later borrowed from banks or issued bonds on the capital market. To determine the share of VA attributable to creditors, we analyse the interest expense item in the income statement. However, this item does not appear throughout the entire period in Krupp's annual financial statements. In these cases, we draw on secondary literature, on the one hand, and on qualitative information from the annual reports, on the other.

In the years 1811 to 1826, interest expenses are paid to private individuals and amount to between 805 Rtlr. in 1811 and 2,255 Rtlr. in 1823 (see Table 3). The average during this period is 1,725 Rtlr. Together with personnel expenses, interest expenses are the largest cost items in this initial period. Due to the low level of sales at the time of the company's founding, they account for a large proportion of Krupp's losses, averaging 95 % of sales. This suggests that creditors are already central to Krupp's earliest phase and that external credit helps sustain an unprofitable and highly uncertain industrial start-up (see also Lindenlaub and Köhne-Lindenlaub 1988). Interest payments can be traced through secondary sources for this period. For 1827 to 1877, however, no such data are available, either from secondary sources or from the financial statements. We decide against estimating interest expenses (roughly) on the basis of recognised liability items. At least from 1873 onwards, we can assume increased interest expenses, as a 5 % interest-bearing bond with a volume of 30 million M is issued at that time (Pleitgen 2005).

From 1878 to 1902, the cost of debt capital can be determined from the income statement. Throughout this period, Krupp's creditors mainly comprise private individuals and banks, with interest expense reported separately for each creditor. It stands at just over 2 million M in 1878, falls to a low of around 0.5 million M in 1886/87, and then rises steadily to reach roughly 2.4 million M by 1901/02. The sharpest single-year drop, from around 1.25 million M in 1884/85 to 0.7 million M in 1885/86, occurs because the bond issued in 1873 is paid down by some 9.5 million M that year, reducing the outstanding balance to just under 0.25 million M (see Table 4). From 1903 to 1943, the profit and loss accounts show interest payments to Krupp's creditors for 1903 to 1907 and 1923 to 1942. For the years in between,

interest expense and income are shown only as a net figure. However, we determine interest expenses for 1908 to 1918 using information on interest-bearing debt capital and the corresponding interest rates disclosed in the management board's reports. In the period from 1903 to 1918, interest expenses range from around 1.9 million M (1903) to almost 4.4 million M (1914), which means that Krupp's creditors receive an average 8 % share of the VA.

After WW I, the hyperinflation and the resulting currency change, interest expenses increase from around 1.2 million RM in 1924 to as much as 10.7 million RM in 1941. The share of VA attributable to creditors averages 22 % from 1925 to 1931, before dropping to an average of 4 % in the following years, from 1932 to 1943. Particularly striking within this period is the 608 % rise in interest expenses to around 8.5 million RM in 1925. This increase results from a bond that Krupp issues on the US market in 1925, in response to high operating losses caused by the weak German economy and weak demand from abroad. The bond amounts to 10 million US dollars, or around 42 million RM (K31 1903, *Bericht des Direktoriums* 1925).

From 1968 to 1997, interest payments vary between 4.52 % (170 million DM, 1979) and 10.19 % (157 million DM, 1968) of VA. Within this period, cycles of rising and falling interest payments alternate more frequently than in earlier periods. The years 1991/92 in particular see interest expenses rise by 68 %, from 344 million DM to 579 million DM. This increase is mainly due to Krupp raising external capital to finance the acquisition of Hoesch AG.

While the share of VA typically remained below 10 %, creditors became especially critical during periods of financial instability and economic crises. From the company's early reliance on private loans to later engagements with institutional lenders and bond markets, creditors repeatedly provided the necessary financial support that enabled Krupp to navigate challenging economic environments. This pattern reflects two distinct but complementary features of German corporate finance. On the one hand, Germany has historically been a bank-based, credit-oriented economy (e.g. Fülbier and Klein 2015). On the other hand, family firms draw especially heavily on this available credit when under financial pressure, since raising external equity or reducing the workforce are less attractive options for them (Schmid 2013). Krupp's recourse to creditors in moments of crisis therefore reflects not only Germany's credit-based system but also a distinctly family-firm pattern of using debt as a buffer against financial distress.

3.6. Conclusion

This study has examined Krupp's accounting records and the VAD among its stakeholders over almost two centuries. By reconstructing VA from Krupp's financial statements (and other accounting records) from its founding in 1811 to the merger that formed ThyssenKrupp AG in 1999, the analysis has traced both how the value the company created was shared among employees, shareholders, creditors and the state, and how Krupp's own accounting practice evolved against a background of profound social, political and economic change. This made it possible to assess the company's accounting and business history beyond profit alone. The resulting patterns are shaped, among other things, by the labour demands of heavy industry, the different tax regimes and the priorities of a family firm. More broadly, they illustrate what a long-run reconstruction of VA can recover from historical accounts that were never designed for this specific purpose. The study provides, to the best of our knowledge, the first VA reconstruction for a German company over nearly two centuries. It applies the VA approach to historical financial statements and critically reflects on the method's use in this setting.

Across the whole period, employees received the largest share of VA. This reflects the labour-intensive nature of steel and armaments manufacturing, which gives employees a strong claim to the value they help to create (Mitchell et al. 1997; Pfeffer and Salancik 1978); the institutionalised bargaining power that came with statutory co-determination from 1951 onwards; and, more broadly, the priority that Krupp, as a family firm, repeatedly gave to the welfare of its workforce. Krupp's extensive welfare provisions, by the standards of their time, exemplify industrial paternalism and an early form of corporate social responsibility (Hielscher and Beckmann 2009). However, retaining a skilled workforce and securing the firm's continued growth were at least as important as welfare for its own sake. In periods of economic downturn, the distributions to the family (dividends) were curtailed before the workforce was reduced, consistent with the priorities associated with family firms (e.g. Gomez-Mejia et al. 2014).

The shareholders' share behaves as a typical residual, paid out only after wages, interest and taxes have been settled (see Fama and Jensen 1983). It is accordingly the most volatile of the four, expanding in prosperous years and, at several points, turning negative. The states' share is highly context-dependent. It rises sharply during periods of war and rearmament and has been repeatedly reshaped by changes to the tax system itself. These changes range from

the fragmented levies of the early nineteenth century and the war taxes of 1916 to the deliberate use of taxation and extraordinary legal privilege to finance rearmament and war in the Nazi era and WW II. Finally, the creditors' share remained low throughout most of the company's history, rising only during specific periods of expansion or distress, such as the 1873/74 crisis, the mid-1920s and the acquisition of Hoesch AG in 1992. Each of these episodes was associated with a loss of managerial autonomy, ranging from bank-appointed oversight in the 1870s to the governance reforms preceding the transition to the Krupp Foundation in the 1960s (Gall 2002b)

Beyond that, there are also problematic aspects which are not directly reflected in the figures alone. The high number (and proportion) of employees in the early 1940s was partly due to the exploitation of forced and slave labour. Therefore, the figure for this period cannot be interpreted as an indication of fair distribution. The tax privileges secured through the 1943 *Lex Krupp* demonstrate that the same state that heavily taxed the firm during wartime also shielded the family from the ordinary law of succession. While VAD makes such patterns visible in the accounts, it cannot adjudicate them on its own; this requires the kind of historical and ethical judgement that this study has attempted to provide alongside the figures.

In addition to these interpretative challenges, some further limitations should be mentioned. Reconstructing VA from historical accounts requires a series of classification decisions about which items to include and how to assign them to each stakeholder group. These choices are made as explicitly as possible throughout the preceding chapters; however, they are partly subjective. A more fundamental constraint lies in the underlying data. Krupp's records were never designed to support a VA calculation, resulting in gaps. For example, due to the presentation of net figures in the profit and loss account in some periods, key information such as wages, interest and taxes is omitted. The sources also change over time, drawing on internal management accounts in some periods and published external reports in others. Each of these was prepared under different conventions and for different audiences. Another limitation concerns consolidation. Before Germany introduced uniform rules for group accounts, there was no consistent standard for combining Krupp's various business units, so it is not always possible to determine the scope of a given set of figures. Two further constraints are specific to particular periods. The hyperinflation from 1921 to 1923 makes inflation-adjusted values for those years particularly uncertain. Additionally, because personal and corporate taxation were not clearly separated before Krupp's conversion into a stock corporation in 1903, the shareholders' and the states' share for the sole proprietorship period cannot be fully

compared with that of later periods. While these constraints are largely unavoidable in a study spanning heterogeneous accounting records kept under six different forms of state organisation, a further limitation follows from the single-case design itself. Some of the interpretations offered here could be strengthened by comparing them with those of other companies. However, the single-case design enabled us to carry out the calculations and interpretation in the required depth. Furthermore, there are few German companies with a comparable volume of historical accounting data and such a long corporate history. Therefore, the comparative question is one for future research to take up.

Comparison with other German family firms or heavy-industry companies would be the natural next step. Furthermore, rather than attempting a similarly long-run reconstruction, future work could focus on a shorter period. This would allow a more granular calculation, drawing on more homogeneous set of sources, and would make comparison with other companies considerably easier. The Krupp Historical Archive contains additional financial and accounting data (including secondary sources) that could refine the calculations if the focus were narrowed to a single period. The forced-labour years also invite closer quantification. Separating the wages paid to the regular workforce from the value extracted through forced and slave labour (Abelshauser 2002 presents parts of this data for Krupp) would provide a firmer numerical basis for both descriptive and normative interpretations of that period. Overall, the use of VAD in accounting history can provide a starting point for exploring a variety of distributional issues affecting stakeholders and wider society.

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FAH 1 A 50, ‘Lohnzettel pro 1814’ der Gussstahlfabrik, Nr. 56–82.

FAH 1 A 53, Lohnzettel vom 1. Januar bis 16. Juli 1815.

FAH 1 A 55, ‘Lohnzettel’ der Gussstahlfabrik, Nr. 97–108 (Teil 1).

FAH 1 A 55a, Lohnzettel vom 16. Juli bis 31. Dezember 1815. Duplikate.

FAH 1 A 57, ‘Lohnzettel 1816’ der Gussstahlfabrik, Nr. 109–116 (1–6 und Nachtrag zu 7).

FAH 1 A 62, ‘Lohnzettel pro 1817’ der Gussstahlfabrik, Nr. 8–33.

FAH 1 A 63, ‘Lohnzettel pro 1818’ der Gussstahlfabrik, Nr. 34–59.

FAH 1 A 68, ‘Lohnzettel pro 1819’ der Gussstahlfabrik, Nr. 60–85.

FAH 1 A 68a, Quittungen zu den Lohnzetteln aus 1819.

FAH 1 A 75, ‘Lohnzettel Buch 1820’ der Gussstahlfabrik, Nr. 86–112.

FAH 1 A 76, ‘Lohnzettel-Buch pro 1821’ der Gussstahlfabrik, Nr. 113–138 (zwei Hefte).

FAH 1 A 79, Einnahmen und Ausgaben der Gussstahlfabrik.

FAH 1 A 88, Zubuße und Ausbeute der Gussstahlfabrik im Jahre 1822.

FAH 1 A 99, ‘Zubuße und Ausbeute’ der Gussstahlfabrik.

FAH 2 A 47, Abschriften der Bilanzen vom 1. Juni 1847 und 31. Dezember 1850.

WA, *Villa Hügel Werksarchiv* (factory archive):

WA 1 58, Bilanzbuch v. 31.12.1851 b. 31.12.1856.

WA 1 59, Bilanzbuch v. 31.12.1857 b. 30.6.1863.

WA 1 1517, Bilanzen 1863–1874.

WA 1 1520, Bilanzen 1875–1884.

WA 1 1495, Bilanz-Buch I 1.10.1942–30.9.1945.

WA 1 1496, Bilanz-Buch Ltr B 30.6.1923–30.9.1942.

WA 4 1298, Bilanz pro 30. Juni 1876.

WA 4 1299, Bilanz pro 30. Juni 1877.

WA 4 1300, Bilanz pro 30. Juni 1878.

WA 4 1301, Bilanz pro 30. Juni 1879.

WA 4 1302, Bilanz pro 30. Juni 1880.

WA 4 1303, Bilanz pro 30. Juni 1881.

WA 4 1304, Bilanz pro 30. Juni 1882.

WA 4 1305, Bilanz pro 30. Juni 1883.

WA 4 1306, Bilanz pro 30. Juni 1884.

WA 4 1307, Bilanz pro 30. Juni 1885.

WA 4 1308, Bilanz pro 30. Juni 1886.

WA 4 1309, Bilanz pro 30. Juni 1887.

WA 4 1310, Bilanz pro 30. Juni 1888.

WA 4 1311, Bilanz pro 30. Juni 1889.

WA 4 1312, Bilanz pro 30. Juni 1890.

WA 4 1313, Bilanz pro 30. Juni 1891.

WA 4 1314, Bilanz pro 30. Juni 1892.

WA 4 1315, Bilanz pro 30. Juni 1893.

WA 4 1316, Bilanz pro 30. Juni 1894.

WA 4 1317, Bilanz pro 30. Juni 1895.

WA 4 2411.1, Bilanz pro 30. Juni 1896.

WA 4 2412.1, Bilanz pro 30. Juni 1897.

WA 4 2413.1, Bilanz pro 30. Juni 1898.

WA 4 2414.1, Bilanz pro 30. Juni 1899.

WA 4 2415.1, Bilanz zum 30. Juni 1900.

WA 4 2416.1, Bilanz zum 30. Juni 1901.

WA 4 2417.1, Bilanz zum 30. Juni 1902.

WA 104 17–18, Fried. Krupp GmbH, Bericht über das Geschäftsjahr 1968.

WA 104 19–20, Fried. Krupp GmbH, Bericht über das Geschäftsjahr 1969.

WA 104 6768, Fried. Krupp GmbH, Bericht über das Geschäftsjahr 1970.

WA 104 6769, Fried. Krupp GmbH, Bericht über das Geschäftsjahr 1971.

WA 104 6770, Fried. Krupp GmbH, Bericht über das Geschäftsjahr 1972.

WA 104 6771, Fried. Krupp GmbH, Bericht über das Geschäftsjahr 1973.

WA 104 6772, Fried. Krupp GmbH, Bericht über das Geschäftsjahr 1974.

WA 104 6773, Fried. Krupp GmbH, Bericht über das Geschäftsjahr 1975.

WA 104 6774, Fried. Krupp GmbH, Bericht über das Geschäftsjahr 1976.

K, *Villa Hügel Krupp-Archiv* (Krupp archive):

K 31 1903, Fried. Krupp Aktiengesellschaft Essen, Jahresbericht und Bilanz 1903/04–1928/29.

K 31 1929, Fried. Krupp Aktiengesellschaft Essen, Jahresbericht und Bilanz 1929/30–1942/43.

Chapter 4

Accounting research in Nazi Germany: Analysis of German academic business journals from 1929 to 1945

ABSTRACT

This study investigates accounting research during the Nazi era by analysing articles published in three major German academic business journals of that time. We identify 1,013 accounting articles from 1929 to 1945 and contextualise the research using a sociology of science perspective. Our findings reveal that after the Nazi seizure of power in 1933, accounting research retained its application-oriented focus but increasingly aligned with ideological views, including topics reflecting anti-liberal Nazi doctrines such as price regulation and changes in accounting education and corporate governance. Scientific norms and values were restricted in many ways and accounting research had to subordinate itself to the regime. Already existing ethical-normative research approaches gained importance. While most authors used a more factual, technocratic language, others demonstrated closer alignment with Nazi rhetoric. Instances of author discrimination were identified, but explicit reproaches remained rare.

Keywords: accounting research, Germany, Nazi period, ideology, totalitarian regimes, ethical-normative

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4.1. Introduction

During the National Socialist (NS, Nazi) era in Germany (1933–1945), the Nazi regime sought to reshape all aspects of public life according to its totalitarian ideology. Academic research was no exception: Universities and academic disciplines were systematically aligned with the political, racial and economic objectives of Hitler's dictatorship (Bessel, 2004). This process, known as '*Gleichschaltung*', entailed both the removal of scholars deemed politically unreliable or racially undesirable and the redirection of research agendas towards the regime's priorities (Beyerchen 1992). In physics, for example, some scientists supported the idea of '*Deutsche Physik*', rejecting certain theories such as relativity and quantum mechanics as 'Jewish physics' (Richter 1980, 125). Although this ideological campaign was ultimately unsuccessful and had no lasting impact on the field, it created a hostile environment that marginalised leading researchers and resulted in the dismissal or emigration of a significant proportion of physicists (Richter 1980; Beyerchen 1992). Numerous historical studies have shown that Nazi ideology has left its mark on a wide range of scientific institutions (e.g. Adam 1977; Becker et al. 1998) and disciplines (e.g. Beyerchen 1992; Mehrtens and Richter 1980), including business and economics (e.g. Gmähle 1968; Woll 1994).

However, accounting research during the Nazi era plays a minor role in these works, having received little scholarly attention to date. Accounting history studies that focus on German accounting research over a longer period regularly omit this specific period. They report up to the 1920s and 1930s before skipping to the post-war period (esp. Busse von Colbe 1996; Küpper and Mattessich 2005; Fülbier and Gassen 2011; Busse von Colbe and Fülbier 2013). It is noteworthy that German accounting theory and thought in the early twentieth century is widely regarded as having played a leading role internationally (Mattessich and Küpper 2003, 106; Küpper and Mattessich 2005, 346, 366). However, this prominence appears to have diminished after the Second World War (WW II), with the leadership in accounting research shifting to the United States (U.S.) (Mattessich and Küpper 2003, 106; Evans 2005). The intervening period of this transformation remains largely underexplored.

Only a small number of studies investigate some delimited facets of the Nazi period with a more explicit accounting link. They concentrate either on institutions and individuals (esp.

Mantel 2009 about German business faculties and professors, some of them accountants; Walker 2000 about early institutions of international accounting being captured by the Nazi regime) or on specific questions such as accountability and ideology (Detzen and Hoffmann 2018, 2020). Interdisciplinary and critical accounting research explores the role of accounting practices in Nazi Germany (as well as in other totalitarian systems such as Fascist Italy, e.g. Funnell et al. 2022), with particular attention to the Holocaust (Funnell 1998; Lippman and Wilson 2007; Twyford 2018, 2021; Twyford and Funnell 2023; see also the collection of papers edited by Funnell et al. 2024). If addressed at all, accounting research appears only occasionally in this context, mostly through brief references to the changing research environment rather than through any detailed analysis. Therefore, Fülbier (2021) addresses the need to 'dig deeper' and to further investigate the impact of the Nazi regime and ideology on accounting research in his comment on Detzen and Hoffmann (2020).

Against this background we apply a sociology of science perspective when we analyse accounting research in Nazi Germany. This perspective considers the contextual character of science, elaborated first by Robert K. Merton, also with reference to the Nazi period (esp. Merton [1938] 1973, [1942] 1973). We are therefore not only interested in better understanding the content of accounting research of that time, but also in analysing the impact of the extreme conditions of the Nazi era on this research, the changing political and social context in contrast to the Weimar Republic and the developments after 1933 up to WW II (1939–1945).

To capture accounting research, we concentrate on the three German top-tier academic journals in the field of business administration at the time. We extract articles between 1929 and 1945, covering not only the Nazi period but also the four preceding years for comparison. This results in 1,830 articles, of which 1,013 have an accounting focus. We examine the topics of accounting research over time and identify context-, especially ideology-driven elements in the research papers. Our findings reveal that accounting research after 1933, while maintaining its application-oriented tradition, is increasingly aligned with ideological perspectives with a visible trend towards ethical-normative studies that reflected the prevailing political, economic, and military conditions of the time. In this context, Merton's ([1942] 1973) ethos of science was significantly restricted, as accounting research was focused on serving Nazi objectives and ideology. We also identify some discriminatory elements on author-level and a rather technocratic language style.

With our study, we contribute in several ways to prior literature. First, we complement the historical analyses on German accounting research (Busse von Colbe 1996; Küpper and Mattessich 2005; Fülbier and Gassen 2011; Busse von Colbe and Fülbier 2013) by addressing the hitherto little-analysed Nazi period. Second, we extend the literature on (accounting) research under totalitarian political conditions (e.g. Cinquini 2007) by explicitly examining the influence of the Nazi context on accounting research. In this regard, we also add to Merton's sociological reflections on science in Nazi Germany (Merton [1938] 1973), providing a more concrete and accounting-specific focus. Third, we expand previous accounting history studies that addressed isolated institutional or personal facets of the Nazi era (esp. Detzen and Hoffmann 2018, 2020) by the accounting research dimension. The remainder of this paper is structured as follows: The next part reviews the existing literature on (accounting) research and accounting in Nazi Germany, followed by the theoretical framework and contextual foundations. The subsequent section describes the research design and data, and the following one presents the results. The paper closes with a conclusion.

4.2. Literature review

Previous research has examined the impact of National Socialism on different scientific disciplines, also with reference to elements of Nazi ideology (Hager 1949; Mehrtens and Richter 1980; Geuter 1984; Lundgreen 1985; Heske 1986; Proctor 1988; Walker 1989; Deichmann 1992; Siegmund-Schultze 1991; Renneberg and Walker 1994; Hendel et al. 2007 about medicine, mathematics, sociology, psychology, geography etc.). Furthermore, there are studies on individual institutions such as universities (e.g. Adam 1977 about *Universität Tübingen*; Becker et al. 1998 about *Universität Göttingen*), and biographical works on individual scientists (e.g. Kruk et al. 1984 on Eugen Schmalenbach). For science in Nazi Germany, a generally anti-intellectual image emerges, with little appreciation for 'pure science' (also Merton [1938] 1973, [1942] 1973). Scientists reacted to this with professional resistance, opportunistic or defensive accommodation, or genuine ideological alignment. The extent and nature of this varied not only between individuals but also across disciplines (Beyerchen 1992). While German economics (e.g. Kruse 1988; Woll 1994; Peukert 1999) and general business administration (e.g. Gmähle 1968; Hundt 1977, 89–125; Brockhoff 2017, 184–201) have been given some consideration in this regard, there is nothing like this for accounting research.

There is a broad understanding that accounting (research) has always been influenced by ideology (e.g. Ezzamel et al. 2007; Baker 2005). However, the extreme German Nazi era has received little, if any, attention. Detzen and Hoffmann (2020) discuss the ideological influence on the admin level of *Handelshochschule Leipzig* during this period and show how political pressure and Nazi ideology affected several dimensions of accountability. In an earlier study they also concentrate on accountability issues at an individual level when they study the denazification accounts of two accounting professors at the same business school (Detzen and Hoffmann 2018). However, the impact on accounting research was not analysed (Fülbier 2021). The same applies for those historical studies investigating German accounting research over a longer period. They start with the rise of the internationally influential German accounting theories at the end of the nineteenth and the beginning of the twentieth century, concentrate on hyperinflation problems in the 1920s, before regularly continuing with the post-war period (esp. Busse von Colbe 1996; Küpper and Mattessich 2005; Ballwieser 2010; Fülbier and Gassen 2011; Busse von Colbe and Fülbier 2013). The 1930s are only briefly touched due to new accounting legislation, especially the stock corporation law reform of 1937 (Ballwieser 2010, 62; Fülbier and Klein 2015, 349), and some practical accounting developments in the state planning system (e.g. new chart of accounts, cost accounting system, see Busse von Colbe 1996, 417).

Critical accounting research has shown that accounting practices can play a crucial role in totalitarian systems, including Nazi Germany, because they function as technologies of power and control, both within organisations (see, e.g. Carnegie et al. 2020) and at government level. During the Holocaust, accounting helped the Nazis to dehumanise Jews by reducing them to numbers, and to organise the bureaucracy of their systematic murder. This increased the efficiency of the regime's extermination policy and enabled those involved to distance themselves morally from their actions (Funnell 1998; Lippman and Wilson 2007; Twyford 2018, 2021; Twyford and Funnell 2023). In Fascist Italy, accounting practices played a role in the implementation of anti-Jewish policies and the organisation of concentration camps (Antonelli et al. 2018; Funnell et al. 2022). They were also used to align key cultural and educational institutions with the regime's ideology (Bigoni et al. 2020; Bigoni 2021; Papi et al. 2019), and to support the propaganda efforts through accounting reports that reinforced totalitarian narratives (Sargiacomo et al. 2016; Antonelli et al. 2023). Cinquini (2007) shows that, in 1930s Italy, the work of accounting and business economics scholars was partly linked to the regime's totalitarian ideology and actively contributed to

the development of its economic system. They were also directly involved in the development of accounting rules, which the state used to exercise control over companies and the economy (Cinquini et al. 2016). Cinquini et al. (2016) illustrate this with the case of a commission responsible for developing cost accounting rules. It shows that concerns relating to control and the exercise of power were embedded in the design of these rules. The successful implementation of a similar legislation in Nazi Germany partly informed this initiative.

4.3. Theoretical framework and contextual foundations

4.3.1. Sociology of science: Why context matters

From a sociological perspective, every science is embedded in a social context that is shaped by the political system, culture, and prevailing social values. Science and scientists do not exist in a vacuum; instead, they are influenceable, dependent on social institutions and, therefore, possible objects of investigation. Robert K. Merton is one of the first protagonists of the sociology of science, who emphasises the contextual character of science, i.e. that science and the foci of science are determined by social forces (esp. Merton [1938] 1973, [1942] 1973; first indications already by Weber [1920] 2013; see Tenbruck 1974).

Building on this sociological understanding, Merton ([1942] 1973) argues that science follows a set of institutional norms, which he calls the 'ethos of science'. It consists of four norms: universalism, which demands that scientific work is judged independent of the researcher's identity; communalism, which sees scientific knowledge as a collective good; disinterestedness, which expects scientists to act without personal or political bias; and organised scepticism, which requires the critical scrutiny of all claims (Merton [1942] 1973, 270–78).[30] 'Pure science', in Merton's view, adheres to these norms and is primarily orientated towards the expansion of knowledge, not immediate practical or political usefulness (Merton [1938] 1973, 260). However, these norms are not universally stable. Their institutionalisation is typically fostered in liberal-democratic social orders, but often undermined in totalitarian regimes (Merton [1938] 1973; see also Kalleberg 2010). Merton's reflections were shaped in particular by the instrumentalisation of science under National Socialism, however, he also showed in earlier works how science is influenced by social factors. He demonstrates, for example, the impact of Puritanism and Pietism on science in seventeenth

30 Mertonian norms are not necessarily seen today as a 'standard of perfect science' (e.g. Rothman 1972; Mulkay 1976; Turner 2007).

century England, with repercussions on the elite U.S. universities in the New England States up to today's understanding of science in general (Merton [1938] 1973).

According to Merton ([1942] 1973, 268), the term 'science' is 'deceptively inclusive', encompassing the characteristic methods by which knowledge is validated, the body of knowledge produced through their application, the system of values and norms that regulate scientific activities, or a combination of these elements. This broad understanding of science extends not only to the natural sciences, which are at the centre of Merton's work, but also the humanities and, within them, business sciences. In Germany, *Betriebswirtschaftslehre* (business administration) was recognised as a science at the beginning of the twentieth century (e.g. Schneider 2001, 201). This scientific self-conception is supported by Merton's sociological perspective, as early German business administration had a structured scientific discourse (e.g. scientific journals), an institutional framework (e.g. chairs at universities), and a shared methodological-normative orientation[31]. Although accounting research can be regarded today as a distinct discipline within the business sciences, its boundaries were considerably less distinct in the first half of the twentieth century. In Germany, the field of business administration, which was becoming increasingly broad at this time, traditionally goes back strongly to findings and theory formation in the field of accounting ('accounting as the starting point', Busse von Colbe 1996, 415). While research topics can be categorised thematically, the subfields of the 'science' *Betriebswirtschaftslehre* were not clearly distinguishable from a sociological or institutional perspective. Thus, while accounting research may not constitute an 'independent science', Merton's framework remains applicable due to its integration within the broader field of business administration. Therefore, an analysis of accounting research in Nazi Germany requires contextualisation. Like any other science, this research was quite certainly shaped by the conditions of its time, whose extreme nature had a profound impact on researchers both personally and professionally.

4.3.2. Political and institutional context of (accounting) research in Nazi Germany

After the Nazi seizure of power in January 1933 (in detail Bessel 2004) and the abolition of parliamentary democracy through the Enabling Act in March (*Gesetz zur Behebung der Not von Volk und Reich*, March 1933), a series of laws and regulations followed to 'synchronise'

31 Although this normative orientation has later sometimes been dismissed (especially from the positive accounting research 'mainstream' since the 1970s), such criticism reflects a more narrow view of science; methodological pluralism not only legitimises normative research in applied fields like accounting, but recognises it as essential to fulfilling their practical orientation (Boland and Gordon 1992; Fülbier and Weller 2008).

the social, political, economic, and cultural institutions in the German Reich. All social forces, including universities, were incorporated into the hierarchical NS organisation, ideologically assimilated and controlled ('*Gleichschaltung*'). The Law for the Restoration of the Professional Civil Service (*Gesetz zur Wiederherstellung des Berufsbeamtentums*, April 1933) targeted Jewish and politically non-conformist civil servants and, therefore, also the academic staff at public German universities, who could be easily removed from their employment. This discrimination later also encompassed the non-civil servants in the academic staff (*Dritte Durchführungsverordnung*, May 1933). Highly racist 'purges' hit other university stakeholder groups as well. Race was introduced as admission criterion for students (*Gesetz gegen die Überfüllung deutscher Schulen und Hochschulen*, April 1933) and their highly politicised and agitating associations were integrated into the university administration (*Gesetz über die Bildung von Studentenschaften an wissenschaftlichen Hochschulen*, April 1933).

The hierarchical structure of the Nazi dictatorship, centred in the person of Hitler, was imposed on the universities as 'leader principle' *('Führerprinzip*'). Academic self-administration was abolished. Universities and their now more powerful rectors were placed directly under Nazi authorities (esp. *Vorläufige Maßnahmen zur Vereinfachung der Hochschulverwaltung*, October 1933; *Richtlinien zur Vereinheitlichung der Hochschulverwaltung*, April 1935; MacGregor 2003; Adam 1977, 46 about the '*Führeruniversität*'). Additional regulation infiltrated the academic life and practices, for example, that access to academic qualification and titles was restricted to 'Aryans' and assistant professors had the obligation to conduct physical labour services (*Reichshabilitationsordnung*, December 1934). Science as such was put in the service of politics and was instrumentalised for Nazi interests.

In view of these disruptive organisational changes on the university level, it almost becomes a minor matter that accounting regulations changed as well. Following the *Aktienrechtsnovelle* of 1931 during the world economic crisis, which introduced mandatory audits of financial statements, the newly constituted Stock Corporation Law (*Aktiengesetz*, January 1937) brought several changes, including the introduction of the *Führerprinzip* in German stock corporations and a comparatively new financial accounting regulation with an impact far beyond 1945 (Kessler 1938; Godin and Wilhelmi 1950; Gmähle 1968, 254; Möhle 1973, 59).

The regulation-driven context should be complemented by the personal situation of university researchers. They suffered from the completely changed, strongly politicised and

repressive working conditions, which included the abandonment of scientific freedom. Research was accepted only for the Nazi benefits:

> No longer truth, no longer objectivity, no longer freedom of value judgement, which is the essence of free science, were now in demand, but partisanship – partisanship in the sense of National Socialism. (Möller 1984, 65 with reference to a speech of the Bavarian Minister of Culture, Hans Schemm, 1933 to professors in Munich; translated by the authors)

In consequence, some researchers cooperated with the regime, others remained passive and conformist, and still others were excluded from science and society for political or racial reasons (Mantel 2009). The diaries of Victor Klemperer (Klemperer 1995, abridged and translated in 1998), a Jewish-born professor of literary studies at *Technische Universität Dresden*, exemplarily expose in detail the dramatic individual situation of those affected. His records illuminate 'the everyday experience of antisemitic persecution', 'the intrigues of German academic life in particular' (Caygill 2000, 292), the wave of arrests of colleagues, weak and strong humiliations and discriminations within the faculty and beyond, and the helplessness and personal depressions in times of arbitrariness, segregation and terror. Examples are the expulsion from faculty commissions, the prohibition to conduct examinations, the boycott of lectures by students, the withdrawal of research projects, or the ban to publish (Klemperer 1998, 3–114; Fülbier 2021, 377). Klemperer himself compares this time with the Jacobin reign of terror during the French Revolution that, unsurprisingly, drained the academic system. Many scientists left the German university system, some were murdered, dismissed, driven to suicide, emigrated, withdrew internally, or faced severe career restrictions (Grüttner and Kinas 2007; Mantel 2009). Student numbers declined sharply due to the anti-intellectual climate of that time, falling from 138,000 in 1931 to 40,000 in 1939 (Grüttner 1995, 101; Mantel 2009, 37; MacGregor 2003, 14).

4.3.3. Ideology as central contextual element

A central contextual element in the Nazi era was certainly Nazi ideology, which infiltrated all spheres of German society, including science and universities. The term 'ideology' is not universally defined in the literature. Thompson (1984) distinguishes between a 'neutral' and a 'critical' conception of ideology (also Baker 2005). Neutral definitions (primarily used in sociology) describe ideology as a system of ideas, opinions, or values connected to the social behaviour or political projects of certain groups. From a Marxist and neo-Marxist (or critical) perspective, ideology is primarily regarded as an instrument for maintaining or changing

hierarchical social structures. Marx and Engels ([1932] 2008) define ideology as a system of ideas and beliefs that is propagated as universal truth, yet in reality serves to reflect and protect the interests of the ruling class and to legitimise existing power structures. Gramsci expands this perspective with the concept of hegemony, which describes the ability of the dominant group to project its ideology as natural and universal, thus anchoring it in the cultural and social fabric (Hall et al. 2007). In the context of totalitarian systems, Arendt (1958, 469) describes an ideology as:

> quite literally what its name indicates: it is the logic of an idea. Its subject matter is history, to which the "idea" is applied; the result of this application is not a body of statements about something that is, but the unfolding of a process which is in constant change. The ideology treats the course of events as though it followed the same "law" as the logical exposition of its "idea". Ideologies pretend to know the mysteries of the whole historical process—the secrets of the past, the intricacies of the present, the uncertainties of the future—because of the logic inherent in their respective ideas.

The totalitarian ideological doctrine of the Nazis is probably best rooted in Hitler's '*Mein Kampf*' (Hitler 1925, 1927; critically annotated by Hartmann et al. 2016), where Hitler combines his stylised autobiography with conspiracy theory, German nationalism and a deeply racist and propagandistic world view (e.g. Holborn 1964; McInnis 1985; Augstein 1989; Nolte 1989; Kershaw 2013a, 2013b).[32] The transfer to the realm of science did not result in a coherent NS ideology of science (e.g. Möller 1984). However, Merton ([1938] 1973, [1942] 1973) as a contemporary witness of the Nazi regime already identifies selected ideological elements infiltrating the scientific hemisphere in the Nazi period and biasing the core principles of scientific work.[33] Scientific rationality seems to play no role in Nazi ideology; evidence-based observations and factual arguments were dismissed as dangerous lies whenever they contradicted it (Klemperer 1998, 12, 16). The key element, the 'anti-intellectualism', goes back to Hitler's preference for physical education and character-building over intellectual education (Hartmann et al. 2016, 1040–105; Möller 1984, 69) that relates to the Nazi preference of action over thought and feeling over rational inquiry (Noakes 1993, 380; Ericksen 2012, 62). In consequence, the pure science seems to suffer, whereas only science

32 The strong personal influence of Adolf Hitler on the Nazi era and ideology leads some to speak of 'Hitlerism', e.g. Neurohr (1957, 9), Klemperer (1947, 18), who also calls '*Mein Kampf*' the bible of NS.

33 According to Mulkay (1976), however, every normative structure of science can be viewed as an ideology, also the widely accepted principles (partly traced back to Merton's ethos of science) of rationality, emotional neutrality, universalism, individualism, disinterestedness, impartiality, communality, humility, and organised scepticism. Thus, Nazi ideology had affected another ideology – the assessment remains normative.

useful to the regime, especially with technical and military impact, remains. This weakens scientific activity in general, and the social sciences and humanities in particular (Merton [1938] 1973).

Instead, a strong political-nationalistic worldview and a pseudo-scientific racism and anti-Semitism were prevalent. Both were rooted in the almost religious '*völkisch*' idea of German supremacy – heavily inspired by Hitler's personal views (Hitler 1925, 1927; Hartmann et al. 2016), by other ideological books (esp. Rosenberg 1930) and by attitudes prevailing in parts of German society at the time (Mosse and Aschheim [1964] 2021; Holborn 1964; Vasey 2006). Thus, research in Nazi Germany was driven by nationalistic priorities and ethnocentric motives aimed at demonstrating the supposed superiority of the German intellect and race. This was coupled with an anti-democratic and non-liberal orientation, embedded in the Social Darwinist belief in 'strength', which is opposed to 'communist' egalitarianism (anti-Marxism and anti-Bolshevism, Nolte 1989), ethics, and sentimentality, as well as to tolerance towards any minorities perceived as 'weak' or 'inferior' (Hitler 1925, 1927; Hartmann et al. 2016; also Holborn 1964; Mosse and Aschheim [1964] 2021; Augstein 1989; Vasey 2006).

As Merton ([1938] 1973) showed, these ideological elements heavily influenced science and scientists, a finding that has been confirmed and extended several times. Others have (also) identified the instrumentalisation and politicisation of science for Nazi purposes, the associated nationalism, racism and 'cult of blood and soil', the discrimination on a professional and personal level, the orientation towards the *Führerprinzip* as well as the significantly lesser importance of the search for truth and the principle of reason (Gmähle 1968, 27–44; Tröger 1984; Lundgreen 1985; Brentjes and Albrecht 1992). Closely linked to this ideological orientation was the economic policy shift away from the liberal market economy towards state planning, autarky[34], and a focus on the public interest and the common welfare of the 'national community' ('*Volksgemeinschaft*') (Gmähle 1968, 41–57).

4.4. Research design and data

To identify accounting research in Nazi Germany, we focus on research articles from the three major German academic business journals of the period: *Die Betriebswirtschaft*

34 Hitler (1925, 1927) himself states in '*Mein Kampf*', Chapter 8 (Vol. 2): 'The strong is most powerful alone' (translated by the authors). See also Hartmann et al. (2016, 1281).

(DBW)[35], *Zeitschrift für Betriebswirtschaft* (ZfB)[36] and *Zeitschrift für handelswissen-schaftliche Forschung* (ZfhF)[37]. Accounting research was also published in books and practitioners' journals (e.g. *Der praktische Betriebswirt*) during that period. However, these three academic journals played a central role in research publication with a quite good reflection of the major research efforts throughout the twentieth century (e.g. Perrey 2010; Perrey et al. 2010; Fülbier and Weller 2011) – independent of whether they were the premier publication platform for business and accounting research, as requested by Schmalenbach (1931). Other relevant academic business and, even more so, specialised academic accounting journals did not exist in the German language area during that time.

All articles published in DBW, ZfB and ZfhF during the study period were taken from university archives and digitalised for our analysis. We concentrate on the Nazi period between 1933 and 1945 and include four additional years (1929–1932) of the fading Weimar Republic with a different political and social context before that for comparability reasons. The articles are all written in German and analysed in the original. Extracts used in the presentation of our results have been translated into English.

Our analysis combines bibliometric methods with both quantitative and qualitative content analysis (Donthu et al. 2021; Krippendorff 2004). The bibliometric and quantitative content analysis aims to identify patterns in the topics and authorship structures of the journals, serving both as a starting point and as a supplement to the qualitative analysis. We conduct an author-related performance analysis (Donthu et al. 2021, 288) to identify cases where ideological (esp. racist and discriminatory) factors may have influenced the possibility or impediment of publication. To identify accounting research within the journals, we manually classify the articles using a three-level system. It follows a deductive framework that broadly

35 The DBW was first published in 1930 by C. E. Poeschel publishing house and discontinued in March 1943. Throughout the entire period under review, the main editor of the journal was Heinrich Nicklisch (e.g. Large 2012; Hommel and Schmitz 2013, 337).

36 The ZfB was founded in 1924 by Fritz Schmidt, one of the most influential accounting theorists of that time (Mattessich 1986; Clarke and Dean 1986, 1989; Hommel and Schmitz 2013, 347) who was its editor until the journal was discontinued at the end of 1942. Until 1933 the journal was published by Industrieverlag Spaeth und Linde, from 1934 by Betriebswirtschaftlicher Verlag Gabler.

37 The ZfhF was founded in 1906 by Schmalenbach, perhaps the most influential German business and accounting researcher of the early twentieth century (e.g. Kruk et al. 1984; Clarke and Dean 1989; Busse von Colbe 1996; Küpper and Mattessich 2005; Fülbier and Weller 2011; Busse von Colbe and Fülbier 2013; Hommel and Schmitz 2013). To raise business administration to the level of a 'real' science, a scientific journal was considered necessary (Schmalenbach 1931, 1). Schmalenbach had been editor of the journal till his resignation as editor and University professor in early 1933 in view of his marriage with a Jewish wife (Kruk et al. 1984, 150–165). The editorship, however, remained in his academic school, when his former student Ernst Walb took over. The journal did not cease publication during WW II until 1944 with only five published articles in this penultimate year of WW II. During the period under review, the journal was published by G.A. Gloeckner publishing house.

categorises accounting into subcategories, refined inductively through repeated article reviews. We distinguish between accounting and non-accounting articles at the first level, with further subcategories at the second and third levels. We use a broad definition of accounting, as shown in Table 7. Non-accounting articles are excluded from further categorisation.

Table 7. Coding cluster.

1 Accounting			
1.1 Financial accounting and reporting	**1.2** Management accounting	**1.3** Auditing and governance	**1.4** Other
1.1.1 Terminology	**1.2.1** Terminology	**1.3.1** Auditing regulation	**1.4.1** Accounting history
1.1.2 Accounting regulation	**1.2.2** Cost accounting	**1.3.2** Profession	**1.4.2** Financial statement analysis
1.1.3 Bookkeeping	**1.2.3** Pricing and price calculation	**1.3.3** Auditing problems and technology	**1.4.3** Tax and tax accounting
1.1.4 Accounting for specific aspects	**1.2.4** Budgeting, planning, monitoring	**1.3.4** Corporate governance	**1.4.4** Accounting and business education
1.1.5 Public accounting	**1.2.5** Performance measurement	**1.3.5** Specific countries and industries	**1.4.5** Valuation
1.1.6 Accounting theory	**1.2.6** Specific countries and industries		**1.4.6** Accounting research theory
1.1.7 Specific countries and industries	**1.2.7** Ethical and political issues		
1.1.8 Ethical and political issues			
0 No Accounting			
No further classification (e.g., finance, production, marketing, …)			

In total, 1,877 articles were published in the three journals during the study period. We exclude obituaries, corrections, and editorials as well as articles without author information from our sample. This results in 1,830 articles, of which 1,013 (55 %) can be assigned to the field of accounting. The high proportion of accounting articles in (general) business journals is not only driven by our broad understanding of accounting but also shows the strong importance of accounting research in the early days of German business administration.[38] Table 8 displays the descriptive article data over time and journal.[39]

Since language can serve as both a reflection and an instrument of ideology (Thompson 1984), we examine the influence of Nazi ideology on the language used in accounting

38 Accounting articles in Schmalenbachs ZfhF have the highest proportion (70 %), DBW is ranked second (58 %) and ZfB third (45 %, the 'short articles' are included because they hardly differ in length from DBW articles).

39 Interesting to note, that the numbers of articles (accounting and in general) peaked around the time of the Nazi seizure of power and then fell over the years. When WW II started in 1939, the total number of articles was less than half of what it was in 1932, perhaps a first indication of the anti-intellectualism of the Nazi era.

research by conducting a keyword-based frequency analysis as part of our quantitative content analysis. We compile a list of NS (ideological) words using Schmitz-Berning's (2007) dictionary of Nazi terminology and supplement it with key terms identified in Klemperer's (1947) *lingua tertii imperii*. Based on these sources, we identify a total of 616 words. From this set, we exclude overly general or contextually ambiguous terms (e.g. *Arbeit* [work], *Leistung* [performance] or *Objektivität* [objectivity]), which occur frequently in business and academic language without necessarily conveying ideological meaning. The final lexicon consists of 287 words, of which 95 appear in the data and are listed in the footnote of Table 10.

We qualitatively examine the contexts in which NS-related terms appear to assess whether and how they are embedded in ideological narratives. Furthermore, acknowledging that ideological content is not always expressed through specific keywords, we conduct a broad screening of the entire sample. This interpretative step reflects the hermeneutic strand of qualitative content analysis (Mayring 2015, 29) and emphasises the importance of interpretation and narratives over purely descriptive or quantitative representations in 'new accounting history' (Napier 2006). In these two steps, we tag the articles for changes in content, methodological approaches, and other thematically relevant aspects, and subsequently link these to our theoretical framework, i.e. Merton's sociology of science. This involves iteratively moving between the empirical material and Merton's concepts, allowing the theoretical lens to guide without determining the interpretation. We interpret the texts not only in light of Merton's norms but also within the general socio-economic context (see esp. the second and third sections of 'Theoretical framework and contextual foundations') that, according to the sociology of science, inevitably influences science beyond these norms. Throughout the writing process, the interpretations were discussed and repeatedly revisited by both authors.

Table 8. Number of research articles per journal.

	Year	**1929**	**1930**	**1931**	**1932**	**1933**	**1934**	**1935**	**1936**	**1937**	**1938**	**1939**	**1940**	**1941**	**1942**	**1943**	**1944**	∑	**avg. pages**
Journal	Category																		
DBW	acc.	-	34	24	55	32	19	34	30	39	27	25	19	16	21	6	-	381 (58%)	5.26
	no acc.	-	25	37	13	23	29	19	26	18	26	12	12	18	12	2	-	272 (42%)	5.08
ZfhF	acc.	19	19	24	17	27	20	22	16	20	22	16	19	16	11	10	5	283 (70%)	17.16
	no acc.	6	6	10	18	13	11	7	8	6	10	11	6	3	7	2	0	124 (30%)	17.43
ZfB	acc.	26	21	26	13	18	13	11	7	10	9	4	3	9	6	-	-	176 (50%)	16.10
	no acc.	22	21	23	20	17	15	11	14	10	10	5	5	1	3	-	-	177 (50%)	15.01
ZfB	acc.	23	22	21	25	17	16	11	8	5	7	4	7	4	3	-	-	173 (41%)	4.57
(short articles)	no acc.	22	37	32	20	29	15	13	21	10	17	13	8	4	3	-	-	244 (59%)	4.69
∑	acc.	68	96	95	110	94	68	78	61	74	65	49	48	45	41	16	5	1,013 (55%)	
	no acc.	50	89	102	71	82	70	50	69	44	63	41	31	26	25	4	0	817 (45%)	

Note: Category 'acc.' denotes articles classified as accounting research (see classification in Tables 7 and 11) and category 'no acc.' as no accounting research. A dash ('-') indicates that no issue was published. As no journal issues were published in 1945, this column is omitted. In ZfB, short articles are explicitly designated as such and published in a separate section. Given their substantially different length compared to regular ZfB articles, they are represented as a separate category in the table.

4.5. Results

4.5.1. Changes in authorship

Between 1929 and 1945, 718 authors published in the three journals, 463 of whom contributed at least one accounting article. [40] Schmaltz (21) and Nicklisch (24), both editors of DBW, were the most active authors and published exclusively in their own journal –consistent with the practice of other editors, whose contributions also appeared primarily in their respective outlets.[41]

To identify accounting authors potentially discriminated against or supported by the Nazis, we restrict our analysis to those who published three or more accounting articles over time (Table 9), thereby focusing exclusively on authors in the field of accounting. Three distinct groups emerge: Those who ceased publishing in or shortly after 1933, those who began publishing after 1933, and those who published before 1933 and continued afterwards. Table 9 also provides insights into the authors' ages as of January 1933 and indicates if and when they became members of the *Nationalsozialistische Deutsche Arbeiterpartei* (NSDAP). This may reflect shifts in publication activity influenced by age or alignment with NS views. Although NSDAP membership is not a definitive proof of NS attitude, as there were strong informal pressures to join (although no compulsory memberships for professors or other academics), they may serve as a kind of indication, especially if they joined late or not at all (Mantel 2009, 62; Fülbier 2021, 382).

40 97 authors have published at least three accounting articles, collectively contributing 552 publications (55 % of all accounting articles). Among them, 13 authors have published at least 10 accounting articles, contributing 188 publications (19 % of all accounting articles).

41 This editor bias was also identified later for the same journals, in the post WW II period by Fülbier and Weller (2011).

Table 9. Accounting research output over time.

Author	*Age*	*NSDAP*	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940	1941	1942	1943	1944
Buhl, H.	32	No?	1		2													
Fritz, J.	54	No	1	2	1													
Hirschmann, I.				3		2												
Hoeres				2	1													
Kaiser					3													
Kalischer, H.	29	No	1	3	3	1												
Lehmann, F.	31	No?		3	1													
Lorentz, S.	40		1	3	4	1												
Schatz, T.				2		1												
Schlatter, C.		F			1	2												
Schulz-Mehrin			2		1													
ter Vehn, A.	32	F	5															
Weil, C.				1	2													
Wissel, P.				3														
Riedmüller, H.				1		2	1											
Wegner, G.						3	1											
Isaac, A.	44	No	2		1	3	3											
Kleine, K.			2				1											
Rost, G.	44	1940		2			1											
Schmalenbach, E.	59	No	2		1	1	3											
Penndorf, B.	59			3	1	2		1										
Banse, K.	31	1937			5			1										
Berg, K.			2		3	3	1	2		1								
Sewering, K.	45	No	1	1					1									
Deutsch, P.	31	1933		1	2		2	1										
Leyerer, C.	57	1939	6											1				
Richter, H.				2		1		2										
Falter, E.	28	1933		3	4			1	1		2							
Richter, A.	29	1933		2	2				1			1						
Kessler, E.					2			1	1									
Kalveram, W.	50	1937	1	3	2	2			1						2			
Gutenberg, E.	35	1937				2	2					1						
Hertlein, A.	46	1941		1	1	1				1				1				
Hundhausen, C.	39	1933		1	5	2	1		1		1	1			2			
Lehmann, M.	46	1932	4	4								1	1			2		
Bork, H.	39	1937	2												1			
Henzel, F.	41	1933		3	2	1	3		1	1					1	1		
Helpenstein, F.	43	1933		1				1	1									
Lisowsky, A.	37		3		1	3	2		1	2	2	2						
Mayer, L.	36	1933	1		2				2		1		1					
Rummel, K.	54			2	1							1						1
Weiß, A.						2					1		1					
Thoms, W.	33	1932			1	1	3									1		
Schmidt, F.	50	1937	3	5	2	3	3	3	3	2	4	1		1	2	1		
Werneburg, H.			2	4	1	2	2	2	3	2	3	1	2			1		
Hasenack, W.	31	1937	1	1	3	2	4					4			3			
Hermann, I.					1		1		1	1								
Kosiol, E.	33	1933		2	2	1		2	1		2	1	1	1				1
Nicklisch, H.	56	1940		1	2	3	2	3	5	2	4	2		1				
Aufermann, E.	40	1941	1	2	1	1		2	4	1	2	4			1			
Adler, H.	33					1							2					
Hellauer, J.	61			2	2	2	1	3	2	5	1	5		1		2		
Schmaltz, K.	27	1937				5	2	1	1	3	2	1	3	3	2			
Linhardt, H.	31	No	1						1		1	1			1			
Großmann, H.	60	1933			2		4	3	1	1	1		2				1	
Sommerfeld, H.	48	1937			1									3				
Rößle, K.	39	1933				1	2	1		1			1	1	1			
Weigmann, W.	30	1933				1	1	2		2	1	1				1		
Wirtz, C.	31			2					1		5		1	4	2			
Thieß, E.	29		1				1	3	5	1	4		1					
Walb, E.	52	No			1	1		1		1	2	1	1	2	1	3	2	
Fischer, G.	33			1				1		4	1	2	5		1	1		
Ameely, L.							2	1										
Beste, T.	38										1	2				2	3	1
Biskup, G.									1	2								
Bores, W.								3										
Denck, J.															1	2		
Dielefeld, E.													3					

			1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940	1941	1942	1943	1944	1945
Erhard, F.											2	4	1						
Feld, F.	45	1937	1		2		1	1	2			1							
Fischer, C.						6	2					1							
Fleege-Althoff, F.	46	1937	6																
Frank, E.	29		1		2														
Heilbrunn, O.	26	No?	4	5	3														
Johns, R.	32			1		1		2											
Kallmeyer, W.							3												
Kästner, G.								1	2	2									
Köhler, H.	35	1933				1		2	1										
Lampe, H.	39	1933			2	3		1	1	1	1								
Lax, W.						2	1												
Lindrath, H.	36	1937			1		2												
Mathews, K.					2		1	1	1			1							
Mauve, H.				2	1	3	4	5	2										
Noll, E.					1							2							
Ostersetzer, B.								2	1	2		1							
Peckolt, H.						3	3		2										
Ruberg, C.	40	1937	2	1	2	1	1		1										
Ruchti, H.	29	1937									2	3							
Sandig, C.	31	1937	2	2	4	1	2		1	2	2	3	1						
Schneider, E.	32	1933								1	1		1						
Schultze-Schlutius, H.			2	2	1	1				1									
Sommer, W.								3											
Spohr, W.					3	1	3												
Walb, H.							2	2	1										
Walter, A.						1		1	2		1	1							
Wolter, A.	21	1937					3				2	1							
Zahn, E.	23				5	6	1												

Note: The table includes all authors who published at least three accounting articles during the period under review (1929–1945). It illustrates the total number of publications (not only accounting) per year for each author. The green colour gradient shows annual publication volume: lighter shades denote fewer articles, darker shades more. 'Age' refers to the age of the authors at the time the Nazis came to power in 1933. 'NSDAP' denotes the year in which the authors joined the party, while 'No' indicates that they were not members. 'F' signifies foreign authors. Fields marked with question marks indicate uncertain assignments, though some evidence suggests a possible link to the respective information. Blank fields indicate no available data.
Source: For 'Age' and 'NSDAP' see Mantel (2009); except for the information on Buhl (VVN-BdA Kaiserslautern, 2025), Schlatter (Bedford 1997), Thieß (Hax 1963), Feld (Zabeck 2013), Heilbrunn (obituary printed in Heilbrunn 1969) and Zahn (Wikipedia 2025).

The first author group, with no or very few publications after 1933, consists of potentially discriminated authors. The best-known representative of this group is Schmalenbach, who renounced his professorship (and editorial work) at the University of Cologne in early 1933 to avoid impeachment due to his Jewish wife (Kruk et al. 1984; Mantel 2009, 393). Two other prominent professors on the list, F. Lehmann and Isaac, emigrated to escape the Nazi regime. Both were dismissed from their respective institutions in Germany due to their Jewish origins. Isaac proceeded to Istanbul University (1937), while Lehmann transferred to the New York 'New School for Social Research' (1934), where he ultimately took his own life in 1940 (Mantel 2009, 357, 370; Schneider 2001, 214, 219). Kalischer also emigrated to New York, as he was unable to continue his academic career in Germany due to his Jewish origins. He was, however, unsuccessful in establishing himself academically there and later worked in business (Mantel 2009, 421). Lorentz, also a promising candidate for a successful academic career, ceased his academic pursuits after 1933 and likely withdrew into a state of 'inner emigration' (Hasenack 1957; as cited in Mantel 2009, 768). These examples show that

several early-career accounting academics were prevented from pursuing an academic career because of their origin, according to Merton ([1942] 1973, 272) a violation of the principle of universalism, which holds that 'careers be open to talent' and that these are only prevented due to 'lack of competence'. Other notable names on the list are Buhl, who was probably a political Nazi opponent (VVN-BdA Kaiserslautern, 2025), as well as Schlatter (affiliated in the U.S., U.S. citizen) and ter Vehn (affiliated in Sweden, German citizen with change into Swedish citizenship in 1937).

The group who started publishing from 1933 onwards includes many nowadays unknown names. For 20 of the 35 authors, we were unable to obtain any further biographical data. Some of them may have benefited from the political system and no longer played a role in research after the war. The others include avowed National Socialists (e.g. Feld, see Zabeck 2013) and people with rather an affinity to National Socialism (e.g. Schneider, see Mantel 2009, 823; Zahn, officer in the *Wehrmacht*, see Wikipedia 2025). In this group are also authors who were critical of or even aggrieved by National Socialism (e.g. Johns and Ruberg, career probably hindered by anti-Nazi stance, see Schneider 2001, 223, Mantel 2009, 457). The same applies to the group of authors publishing before and after 1933. Although the majority were NSDAP members, some again with a strong Nazi affinity (e.g. Weigmann, M. Lehmann, and Thoms, see Mantel 2009) there are also others who were hindered in their careers by their refusal of National Socialism (e.g. Sewering, Aufermann, Linhardt, Thieß and Fischer, see Mantel 2009; Schneider 2001). But even if some politically non-conformist authors still appeared in the journals after 1933, this does not mean that they were not restricted by the Nazi regime. Johns' publications end in 1938 after he was denied an appointment as a full professor for political reasons in the same year (Mantel 2009, 45). Similar is the case of Thieß, whose publishing activities in the sample journals end in 1938 after he refuses to do 'ideological and physical exercises' as part of the habilitation process in the 'lecturers' camp' (Mantel 2009, 432). These cases and the general shift in authorship demonstrate that Merton's ([1942] 1973) principle of universalism, as in other sciences, was undermined in accounting research. Political conformity and racial criteria, rather than scientific performance, influenced who was allowed to publish and participate in academic accounting discourse.

In a more content-focused analysis of discrimination against authors, we find hardly any direct personal attacks against other researchers. Such attacks have indeed occurred sporadically (e.g. Thoms 1937, 544 attacks a publication by M. Lehmann in a book review and

accuses him of ‘liberalist-capitalist thinking’ or Findeisen denounces a doctoral thesis as ‘purely liberalist’; see Fülbier 2021, 379), yet they do not define the prevailing tone of the research articles.

4.5.2. Detecting Nazi ideology through language

During the Third Reich, the Nazis created a language, including numerous neologisms and word reinterpretations, which was intended to spread their ideology in all areas of society (Klemperer 1947). Elements of this language can also be found in accounting research. Table 10 shows the frequency of NS ideological words in the accounting articles. Nazi vocabulary increases most clearly in DBW after 1933, and to a lesser extent in ZfB. ZfhF shows the lowest levels, suggesting weaker alignment with NS discourse. The change in language can be interpreted as a (sociological) indicator of the politicisation of science. The increase in NS ideological words may result either from a stronger thematic focus on ‘NS content’ (associated with higher practical or political usefulness), or from the use of such terms in otherwise ‘neutral’ contexts. The latter might be understood as signalling political loyalty – a symbolic or actual agreement with the values of the system – and thus contradict Merton’s ([1942] 1973) principle of disinterestedness. The year 1935 represents the peak in Nazi vocabulary usage across all three journals, likely driven by thematic factors, as academic discourse around the NS reform of stock corporation law, ultimately enacted in 1937, intensified. While this is the first notable increase in ZfhF, Nazi terminology had already risen in DBW in 1933 and in ZfB in 1934. This suggests that the language in ZfhF primarily reflects engagement with accounting regulations under discussion at the time, whereas the other two journals show either earlier and deeper involvement with these issues or a more symbolic or ideological use of NS terms. The restriction of disinterestedness thus appears to vary across the journals.

Notably, there is a frequent use of the terms ‘*Volk*’ and ‘*völkisch*’ and its derivatives, reflecting the widespread and excessive emphasis on these terms in NS language (Schmitz-Berning 2007). Other ideological and linguistic features, such as the emphasis on community-related terms (and suppression of individuality), are also evident (see, e.g. the use of the word ‘*Gefolgschaft*’ or words containing ‘*-gemeinschaft*’). In contrast, NS racial ideology and language seem to play a minor role (rare use of words such as ‘*Rasse/rassisch*’, ‘*arisch*’ or ‘*Abstammung*’). This is in line with prior research on economics in Nazi Germany, where

Woll (1994) points out that racial politics plays only a minor role in the textbooks of the time.

Analysing the context in which the ideological terms are used, we have the impression that the content of these articles often reveals a more neutral, rather factual, maybe more technocratic style without an open ideological, discriminatory or racist attitude. This applies, for example, to the use of the words 'Jew/Jewish' (13 mentions in nine articles), where four articles only explain or refer to anti-Semitic laws. Erhard (1939, 273), for example, states only one sentence on a tax law exception: 'This favour does not apply to Jews'. This technocratic style tends to present political or ideological issues in seemingly neutral, functional formulations rather than placing them in an explicit ideological framework. In general, technocracy refers to the exercise of political authority or control of society (e.g. by scientists, technicians, or engineers) based on specialised expertise (Gunnell 1982, 392). This 'utopian social vision', however, conceals the fact that such claims to neutrality often mask implicit normative or ideological assumptions and serve to legitimise existing (power) structures under the guise of objectivity (Gunnell 1982, 392, 395).[42] In this light, the technocratic style mimics disinterestedness through formal neutrality, while aligning with ideological frameworks.

In contrast, three of the articles reproduce anti-Semitic ideas much more offensively. In an article on the NS worldview and its consequences for the economic system, Deutsch (1934, 151) directly quotes the party program of the NSDAP, which calls for combating the 'Jewish materialist spirit'. Thoms (1942, 28) refers to the Weimar Republic before 1933 as a 'Jewish empire on German soil' with an 'economy run by Jews for Jews'. Feld (1942, 141) uses several NS ideological words and writes about the 'deficiencies of the socio-economic conditions' that are due to the 'unsocial social order' and the 'individualistic-egoistic, international-Jewish and anonymous economic system'.

As seen in the word search, racial language is rarely used. Again, some mentions are rather neutral expressions, with reference to laws (Kallmeyer 1937) or curricula (Schmidt 1935).

42 Alternative theoretical interpretations of technocratic research are conceivable and can been discussed. For example, Horkheimer and Adorno (1947) interpret the rise of instrumental rationality, of which 'technocratic science' is a manifestation, as part of a broader process of dehumanisation, where reason becomes a tool of domination rather than enlightenment. Similarly, Arendt's (1963) exploration of the 'banality of evil' in her report on the Jerusalem trial of Adolf Eichmann suggests that evil can manifest through ordinary individuals who, devoid of critical thinking or moral judgment, comply with orders and the norms established by an authoritarian regime. A technocratic style in research articles can be interpreted as a reflection of this phenomenon. However, these perspectives are not pursued further here, as their focus only partially corresponds to the results of the analysis.

However, Nazi ideology is clearly expressed in certain statements on ‘racial based work ethic’ (Thoms 1942, 37), ‘racial disposition of the workforce’ (von Frydag 1937, 139) or the ‘destruction of the political, cultural and economic freedom of the white race’ (Lorch 1933, 308).

Feld’s (1942, 141) aforementioned depiction and criticism of the previous liberal system of the Weimar Republic exemplifies how this time is portrayed in ideologically tinged articles. In a similar way, some authors use words composed of the terms ‘liberalist’, ‘capitalist’, ‘individualist’, ‘egoist’, ‘unsocial’ or comparable to describe the liberal system (e.g. Deutsch 1934; Sandig 1935; Snyckers 1935, Fischer 1936c; von Wittich 1939). Terms such as ‘old’ or ‘bygone’ are used to clearly anchor it in the past (e.g. Arndt 1936; Sandig 1940b). The Nazi system, on the other hand, is described as ‘new’, ‘revolutionary’ or ‘ingenious’ (e.g. Nicklisch 1934; Sandig 1940b; Mand 1941). To criticise or question concepts, people or, in this case, the liberal system, the NS language employs what Klemperer (1947, 116) refers to as ‘ironic quotation marks’. Sandig (1940a, 114), who speaks of ‘the “free” economy of the *Systemzeit*’, provides an appropriate example. Taken together with the general increase in Nazi vocabulary, this points to a politicisation of academic language and suggests a weakening of disinterestedness. Even though the tone often remained technocratic, such language may have signalled adaption to the ideological environment rather than genuine neutrality.

Table 10. NS (ideological) words by journal.

		1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940	1941	1942	1943	1944
DBW	Word count	-	13	5	13	83	65	161	81	195	95	89	67	28	27	9	-
	Pages	-	196	137	242	186	107	160	151	207	145	165	91	81	101	36	-
	Words per page	-	*0.07*	*0.04*	*0.05*	*0.45*	*0.61*	*1.01*	*0.54*	*0.94*	*0.66*	*0.54*	*0.74*	*0.35*	*0.27*	*0.25*	-
ZfB	Word count	37	9	45	30	67	134	228	72	101	60	53	11	36	69	-	-
	Pages	519	443	468	304	357	267	269	182	207	197	102	66	133	109	-	-
	Words per page	*0.07*	*0.02*	*0.10*	*0.10*	*0.19*	*0.50*	*0.85*	*0.40*	*0.49*	*0.30*	*0.52*	*0.17*	*0.27*	*0.63*	-	-
ZfhF	Word count	24	16	22	3	10	8	198	74	84	115	76	37	41	7	3	14
	Pages	363	364	333	253	368	374	490	370	431	352	269	268	259	203	99	60
	Words per page	*0.07*	*0.04*	*0.07*	*0.01*	*0.03*	*0.02*	*0.40*	*0.20*	*0.19*	*0.33*	*0.28*	*0.14*	*0.16*	*0.03*	*0.03*	*0.23*
Total	Word count	61	38	72	46	160	207	587	227	380	270	218	115	105	103	12	14
	Pages	882	1,003	938	799	911	748	919	703	845	694	536	425	473	413	135	60
	Words per page	*0.07*	*0.04*	*0.08*	*0.06*	*0.18*	*0.28*	*0.64*	*0.32*	*0.45*	*0.39*	*0.41*	*0.27*	*0.22*	*0.25*	*0.09*	*0.23*

Note: Word count represents absolute frequency of the following 95 German terms in the accounting articles (total frequency of the respective word in parentheses): *Führer (330), nationalsozialistisch (240), Volk (231), Gefolgschaft (205), Betriebsgemeinschaft (127), Volksgemeinschaft (118), Neuordnung (105), Betriebsführer (95), körperlich (87), Nationalsozialismus (70), Volksgenosse (65), Vierjahresplan (63), Weltanschauung (63), Führerprinzip (59), vernichten (52), Gemeinnutz (46), Eigennutz (45), völkisch (42), Propaganda (40), Revolution (39), Einsatzbereitschaft (35), Vernichtung (34), Arbeitseinsatz (30), Blut (22), Gleichschaltung (20), Lebensraum (19), totaler Krieg (19), Machtübernahme (18), Leistungsprinzip (17), Altreich (16), charakterlich (13), NSDAP (13), Überfremdung (13), HJ (12), Rasse (12), nationalpolitisch (10), Drittes Reich (10), gesamtdeutsch (9), Reichsautobahn (9), Kameradschaft (8), Jude (7), Entartung (6), großdeutsch (6), Hitler (6), jüdisch (6), rassisch (6), arisch (5), entartet (5), Musterbetrieb (5), Nationalsozialist (5), Sippe (5), Zersetzung (5), Abstammung (4), Arbeitsschlacht (4), Führergrundsatz (4), Großdeutschland (4), Hitlerjugend (4), Reichserbhofgesetz (4), Leistungsgemeinschaft (3), Reichskulturkammer (3), Vergeltung (3), volksfremd (3), Volkswohlfahrt (3), Abmeierung (2), Arbeitsdienst (2), Arisierung (2), artfremd (2), BDM (2), Blut und Boden (2), blutsmäßig (2), Endlösung (2), Endsieg (2), Gefolgschaftsführer (2), heroisch (2), Internationalismus (2), Leistungsgrundsatz (2), Leistungskampf (2), Machtergreifung (2), Volkstum (2), Betriebsappell (1), Charakterwert (1), germanisch (1), heldisch (1), kämpferisch (1), nichtarisch (1), parasitär (1), Rassenpolitik (1), Reichsbetriebsgemeinschaft (1), Reichsparteitag (1), überfremdet (1), Volksboden (1), Volksempfinden (1), Volkskörper (1), volkspolitisch (1), Volksschädling (1).* Of the 286 terms in the original word search, 191 were removed because they do not appear in the sample journals.

4.5.3. Ethical-normative research approach as a gateway to Nazi ideology

Methodologically, German accounting research in the first decades of the twentieth century was predominantly normative, with most articles explicitly or implicitly driven by value judgements (Fülbier and Weller 2008). However, the underlying values appeared to differ. A distinction is made between (early) ethical-normative and practical- or pragmatic-normative approaches (e.g. Schneider 2001; Seidel 2001; Mattessich 1995, 173–76). The former approach prioritised ethical value judgments, explicitly challenging the notion of value-free science. In contrast, the latter approach focused on overarching concepts, practical necessities, or regulations in business management, from which deductive conclusions were drawn. Historically, the ethical-normative approach emerged quite early in the twentieth century (esp. Schär 1890; Nicklisch 1912), with a strong focus on the common good and public welfare, rather than individual profit or benefit maximisation (Mattessich 1995, 173). The pragmatic approach gained popularity after WW II, including in the U.S. and other countries (e.g. Moonitz 1961; Chambers 1976), but its roots go back to the early twentieth century (Schneider 2001, 212; Mattessich 1995, 175 with reference esp. to Schmalenbach).

Ethical-normative research approaches were therefore not new in the Nazi era. Some researchers conclude that especially the idea of a market economy in German business and accounting research had increasingly been abandoned before 1933 – with certain tendencies towards the later Nazi era (Hundt 1977, 96; Schneider 2001, 233 partly disagrees). For example, the profitability principle, central to liberal economic thought during the Weimar Republic, was already subject to fierce criticism before 1933 (e.g. Isaac 1932; see also Hundt 1977, 92–95; Schneider 2001, 214 on the contradictions in Schmalenbach's theorising). The orientation towards the common good enabled ethical and moral arguments to be given greater consideration and paved the way for Nazi ideology within accounting research.

The influence of the ethical-normative approach increased significantly since 1933. This is less pronounced at topic level, where we identify a slight increase in the categories 'Ethical and political issues' in financial and management accounting (Table 11). However, the content analysis reveals an increase of ideology-driven value judgements in many areas of accounting, heavily connected to the ethical-normative tradition – very much in line with similar results in economics (Woll 1994; also Peukert 1999, 217). There are calls for ethical-normative research and orientation towards the attitude of the Nazi state. Deutsch (1934, 151) comments already during the early Nazi era:

> Business administration, as it will be possible in the new state, is a normative science with high educational tasks.

In Merton's conception, this is a shift from scientific autonomy to systemic conformity, in which methodological decisions are not guided by disinterestedness but by political ideology (Merton [1942] 1973). This subordination of science to the ideological goals of the state demonstrates anti-intellectualism and makes science the 'handmaiden' of the state (Merton [1938] 1973, 260). This becomes even clearer in Mand's (1941, 116–17) detailed and heavily Nazi ideology-influenced view of normative science:

> 1. the worldview is the norm of science.
>
> 2. the worldview is the reality of life.
>
> The National Socialist worldview is based on biology and is absolute. The demand for a national community is based on blood, and it demands the naturally given connection of all areas of life and expressions of life.
>
> The setting of a norm for German science does not mean its unfreedom. It is an appeal to the German scientist, to his racial sensibility, to his Germanness, an ethical obligation to place the basic laws of völkisch life above his scientific work.

Interestingly, DBW contains more articles with a strong ethical-normative orientation, likely influenced by its editors, especially Nicklisch, who was one of the pioneers of this methodological approach even before the Nazi era.

4.5.4. Ideological impact on topic and content level

The topical orientation of accounting research underwent several changes in the period from 1929 to 1945. Table 11 shows the distribution of topics subdivided into three periods: the end of the Weimar Republic (1929–1932), the first years of Nazi rule (1933–1938) and WW II (1939–1945).

The distribution of topics across the four main categories shifts noticeably only after 1939, with 'Management accounting' taking a dominant role during WW II (28.86 % to 47.06 %). This shift is mainly driven by articles on 'Pricing and price calculation' and 'Cost accounting'. Both topics gained importance following a series of regulations, reflecting the Nazi ideology's critical view of free markets (Hartmann et al. 2016, 563–77 with reference to Hitler 1925, 1927; Brockhoff 2017, 184–201; Mantel 2009, 37–39) and the practical demands of wartime. Market prices were replaced by cost-based prices and (cost) accounting became even more important than before (Hundt 1977, 101–4). In contrast, 'Financial

accounting and reporting' remains relatively stable over time (between 25 % and 30 %), whereas 'Auditing and governance' declines sharply in the WW II-period (14.77 % to 7.84 %). This is mainly due to the disappearance, after 1939, of articles on the 1931 and 1937 reforms of stock corporation law that dominated the first two periods. The second reform is reflected at the subcategory level mainly in 'Corporate governance' (4.55 %), where many articles address its NS reorganisation of stock corporations. 'Accounting regulation' (8.86 %) likewise peaks during the same period, driven by the same cause. In 'Other', an increase from the first to the second period can be seen in the subcategory 'Accounting and business education' (2.98 % to 4.55 %). The Nazis' focus on character-building and ideological training over intellectual education required a change in education in all areas of business administration. Overall, although accounting research was already practice-oriented before 1933, the proportion of practically useful topics appears to rise, likely linked to Nazi ideology, regulation, and wartime conditions.

At the same time, a decline in pure science is difficult to identify at topic level. Some indications in this direction may be seen in the decline of articles on 'Accounting (research) theory' (4.07 % to 0.68 %, 1.36 % to 0.91 %) and 'Accounting history' (3.79 % to 1.14 %) after 1933. However, this relative decline is based on small absolute numbers. Moreover, accounting history was well established in early twentieth-century Germany but was mainly published in books (Küpper and Mattessich 2005, 365) making a journal-based view necessarily narrow.

In addition to the patterns observed above, the content analysis highlights four thematic areas in which ideological influences become particularly visible. These are anti-liberal tendencies in pricing and cost accounting, anti-democratic governance, accounting and business education, and the general anti-intellectualism and practical usefulness. The first three areas are mainly tied to specific subcategories, while the last cuts across several topics.

Table 11. Distribution of accounting research topics.

	1929–1932		1933–1938		1939–1945		∑	
Financial accounting & reporting								
Terminology	6	1.63%	1	0.23%	2	0.98%	9	0.89%
Accounting regulation	14	3.79%	39	8.86%	7	3.43%	60	5.92%
Bookkeeping	21	5.69%	12	2.73%	8	3.92%	41	4.05%
Accounting for specific aspects	32	8.67%	37	8.41%	17	8.33%	86	8.49%
Public accounting	3	0.81%	15	3.41%	6	2.94%	24	2.37%
Accounting theory	15	4.07%	3	0.68%	3	1.47%	21	2.07%
Specific countries and industries	17	4.61%	21	4.77%	5	2.45%	43	4.24%
Ethical and political issues	0	0.00%	4	0.91%	3	1.47%	7	0.69%
	108	**29.27%**	**132**	**30.00%**	**51**	**25.00%**	**291**	**28.73%**
Management accounting								
Terminology	9	2.44%	4	0.91%	2	0.98%	15	1.48%
Cost accounting	44	11.92%	13	2.95%	22	10.78%	79	7.80%
Pricing and price calculation	10	2.71%	15	3.41%	29	14.22%	54	5.33%
Budgeting, planning, monitoring	13	3.52%	24	5.45%	10	4.90%	47	4.64%
Performance measurement	15	4.07%	22	5.00%	8	3.92%	45	4.44%
Specific countries and industries	23	6.23%	27	6.14%	13	6.37%	63	6.22%
Ethical and political issues	1	0.27%	22	5.00%	12	5.88%	35	3.46%
	115	**31.17%**	**127**	**28.86%**	**96**	**47.06%**	**338**	**33.37%**
Auditing and governance								
Auditing regulation	6	1.63%	9	2.05%	0	0.00%	15	1.48%
Profession	17	4.61%	3	0.68%	5	2.45%	25	2.47%
Auditing problems and technology	6	1.63%	22	5.00%	6	2.94%	34	3.36%
Corporate governance	7	1.90%	20	4.55%	2	0.98%	29	2.86%
Specific countries and industries	14	3.79%	11	2.50%	3	1.47%	28	2.76%
	50	**13.55%**	**65**	**14.77%**	**16**	**7.84%**	**131**	**12.93%**
Other								
Accounting history	14	3.79%	5	1.14%	1	0.49%	20	1.97%
Financial statement analysis	14	3.79%	9	2.05%	3	1.47%	26	2.57%
Tax and tax accounting	46	12.47%	74	16.82%	21	10.29%	141	13.92%
Accounting and business education	11	2.98%	20	4.55%	7	3.43%	38	3.75%
Valuation	6	1.63%	4	0.91%	4	1.96%	14	1.38%
Accounting research theory	5	1.36%	4	0.91%	5	2.45%	14	1.38%
	96	**26.02%**	**116**	**26.36%**	**41**	**20.10%**	**253**	**24.98%**
∑	**369**	**100.00%**	**440**	**100.00%**	**204**	**100.00%**	**1,013**	**100.00%**

Note: Only articles classified as accounting research are included.

4.5.4.1. Anti-liberalism and price regulation

The determination of cost prices was widely discussed in the academic literature (e.g. Grunert 1935; Kalveram 1935; Schmaltz 1935; Sewering 1935; Fischer 1936a; Keilholz 1936; Weigmann 1936; Nicklisch 1937), particularly with regard to cost categories and cost calculation methods. One challenge seemed not to 'reward' inefficient cost structures and to find certain standards to prevent 'company specific prices' (e.g. Kalveram 1935, 8; Fischer 1939a, 8; Laaff 1940, 115; see also Hundt 1977, 103).

> The cost structure must be examined with new findings…This includes agreeing on the necessary terminology so that each company does not speak its own cost language, furthermore a more precise examination of all cost elements according to type, size and effect, especially from the viewpoint of influenceability and savings potential, and finally a reasonable breakdown of costs by cost centres or sub-enterprises to make a more refined breakdown possible. (Kalveram 1935, 9)

Like Kalveram (1935), most researchers recognised the need to complement and improve regulatory efforts through research. Some of them argued in a Nazi ideological way (e.g. 'duty of scientists to achieve the goals of the state') (e.g. Hasenack 1938; von Wittich 1939; Sandig 1940a), others simply adapted to the circumstances and challenges of the new system and wrote in a more neutral tone (e.g. Ruberg 1937; Walb 1940). Finally, various proposals for 'fair' prices were discussed in the literature (e.g. Grunert 1935; Kalveram 1935; Schmaltz 1935; Fischer 1936a), which, together with other cost-theoretical studies, served as the basis for the NS cost control laws. Walb (1940, 35) comments as follows:

> It should be noted that the entire body of legislation would not have been possible without the work that has been done in particular by theory research in business administration over the past 40 years or so…This should give great satisfaction to those scholars who have more or less dedicated their lives to researching these problems.

He emphasises the usefulness of 'theory research', i.e. pure science; not only since 1933, but of the last 40 years. While this reflects an effort to legitimise such research, it also highlights Nazis' ambivalent view of science, as utility always 'requires an unbanishable minimum of interest in science' (Merton [1938] 1973, 257).

The final regulation was too extensive to be presented in full, but important laws included the Guidelines for Cost-Based Price Determination for Public Authorities (*Leitsätze für die Preisermittlung aufgrund der Selbstkosten für öffentliche Auftraggeber* [LSÖ], 1938), the Guidelines for the Pricing of Public Contracts (*Richtlinien für die Preisbildung von*

öffentlichen Aufträgen' [RPÖ], 1938) and the Cost Accounting Principles (*Kostenrechnungsgrundsätze* [KRG], 1939). LSÖ and RPÖ were reactions to the sharp increase in public contracts. They were used to determine a 'fair' cost price and, through the KRG based on them, exerted an influence far beyond their original purpose (Fischer 1939a; Fischer 1939b; Sandig 1940a). Once adopted, the LSÖ and the other cost control laws became central topics of academic discussion. A word search reveals that in the period from 1939 onwards, 29.08 per cent of the accounting articles mention the LSÖ. We identify many articles on these legislation with a comparatively technocratic (cost accounting) content, which, however, largely repeat or at least implicitly support the anti-market price ideology (e.g. Lampe 1940; Sandig 1940a; Sandig 1941; Kalveram 1941; Breineßl 1942; Falkenroth 1942; Fischer 1942).

Especially the individual cost categories implemented by LSÖ and RPÖ have been discussed frequently in the literature. We find articles on imputed depreciation (Wagner 1941; Schmaltz 1941; Niens 1941), imputed risks (Sandig 1941), income taxes (Auffermann 1943; Sommerfeld 1940), imputed interest (Niens 1941; Eggemann 1942), imputed profit (Sandig 1942b; Fischer 1942) and imputed entrepreneurial wages (Flegler 1941). In this context, the discussion of imputed entrepreneurial wages and imputed profits is particularly interesting, as it is conducted between the NS 'anti-profit attitude' and the liberal 'concept of profitability'. However, the accounting literature largely agrees that an appropriate profit share must be included in the cost price and that incentives for cost-efficient production should remain (e.g. Huhle 1933 with his article '*Gewinn - nicht Profit*' or later Laaff 1940; Walb 1940; Fischer 1941; Schmidt 1941a; Fischer 1942). Fischer (1939a, 8), for example, sees no contradictions to NS economic policy in this:

> Even in the question of entrepreneurial profit and the differential rent, the guiding principles for price determination do not deviate from the economic policy of National Socialism. The initiative of the entrepreneur and every incentive to do so is retained, but the state control of the economy ensures that everything is purposefully and correctly subordinated to the great demands of state policy necessity.

Pre-NS theories were therefore explored and not categorically rejected, but justification or harmonisation with Nazi ideology seemed necessary. Another sign of the subordination of the scientific ethos (esp. the undermining of organised scepticism) to the ideology of the state (Merton [1942] 1973).

The War Economy Ordinance (*Kriegswirtschaftsverordnung* [KWVO], September 1939) declares LSÖ and RPÖ to be generally binding. Furthermore, 'excess profit absorption' ('*Übergewinnabschöpfung*') became an issue during WW II to prevent companies from making 'war profits' ('*Kriegsgewinne*'). Excess profits were defined as profits that exceed the profit components (e.g. appropriate entrepreneurial wages, appropriate return on operating capital, risk costs) integrated in the cost price calculation (Schmidt 1941b, 8). The absorption of excess profits during the war was of great political importance to the Nazi regime. Sandig (1940a, 113) quotes Hitler directly to justify the law: 'When the soldier is fighting at the front, no one should benefit from the war.' Steimle (1939, 140) quotes the program of the NSDAP, which calls for the 'confiscation of all war profits' and describes 'personal enrichment through war' as a 'crime against the people'. As expected, the assessment of excess profit absorption has met with little criticism in the literature; again, apparently a lack of organised scepticism (e.g. Colin 1941; Linhardt 1941; Faßhauer 1942; Fischer 1942). Although Schmidt (1941b, 14) mentions some practical challenges and important connections, he believes that:

> The absorption of excess profits corresponds to social justice, and a sensible business community will be prepared to do so if the forms are chosen in such a way that the performance of its companies is not damaged.

In conclusion, a pronounced orientation towards NS economic ideology can be identified regarding cost accounting and price calculation. The research articles cite the purported advantages of the new system over the market-based idea of the Weimar Republic with great frequency (in the period 1929–1932, these issues were argued much less regarding the political system). Nevertheless, this criticism on market economy was not new in 1933; even Schmalenbach (and others) complains about the 'market anarchy' before and criticises self-interest, profit maximisation and liberal laissez-faire (Hundt 1977, 80–88). However, the Nazi era appears to have intensified this trend, ending the debate that had existed between 1929 and 1932 on various aspects of market-oriented price policy (e.g. Isaac 1929; Schmidt 1929; Hellauer 1930; Kosiol 1930; Merian 1931; Fricke 1932; Hellauer 1932). The range of argumentative approaches is thus narrowing; scepticism and critical scrutiny among researcher appear to be diminishing, while the state's dominance over the ethos of science becomes evident.

4.5.4.2. Anti-democratic governance and the 'Führerprinzip'

The Stock Corporation Law of 1937 gave rise to a series of articles on this new accounting regulation. Nazi ideology is particularly recognisable regarding the corporate governance aspects of the law, as a new, highly hierarchical system with few(er) rights for shareholders and the general meeting was established and therefore discussed in the journals. The new law increased the power and responsibility of the chief executives and reorganised the relationship between them, the supervisory board and the annual general meeting (Sandig 1937). Democratic elements in the constitution of the corporation were abolished, explicitly seen in contemporary literature (e.g. Walb 1937, 1938a, 537). The core element of the new law, the *Führerprinzip*, the attempt to make the corporations less impersonal and to protect the interests of the public, is a core expression of Nazi ideology (Kessler 1938; Gmähle 1967, 254–61). The *Führerprinzip* is based directly on Hitler's leadership ideals. In '*Mein Kampf'*, he writes that the state must 'enshrine the principle of personality', allow 'no majority decisions' and 'bring the best minds of the national community to leading importance and leading influence', whereby the 'authority of every leader downwards' and 'responsibility upwards' are guaranteed (Hitler 1925, 1927, 493–501).

In the academic discussion preceding the introduction of the law, the implementation of the *Führerprinzip* was widely regarded as sensible and important. The discourse reveals a clear convergence and a decline in organised scepticism, mirroring the debate on price regulation. As early as 1933, Theisinger (1933, 658) points out that the concept has achieved 'unprecedented success in political life' and that it is therefore necessary to reorganise the leadership of the economy as well. Nicklisch (1935a, 25–26) directly mentions Hitler as an example of good leadership and describes the topic as 'one of the most important in organisational science'. The alleged shortcomings of the liberal system are often cited as reason for reform efforts. Sandig (1933, 177), for example, speaks of 'corruption, nepotism and irresponsibility' and observes a lack of 'community spirit' in companies, grounded in the 'view of the working person as a paid commodity, as a cost centre'. Bradtke (1935, 175) also sees problems in the governance of stock corporations and concludes:

> From the outset, it was unacceptable to place the stock corporation entirely on a democratic basis, a fact which, however, is well founded in the liberalist and democratic principles of the last century.

In line with Hitler's leadership ideal, the demands of the literature centre on the transfer of more responsibility to the leader of the company and thus eliminate the 'anonymity' of public

stock corporations. The leader of the stock corporation (as a 'real person') was to be responsible for ensuring that actions of the company were 'conscientious' instead of profit-oriented, that the workers, i.e. the *Volk*, were at the centre of the company and that, as a matter of principle, the common good was placed before self-interest (e.g. Sandig 1933; Nicklisch 1933a; Hundhausen 1935; Nicklisch 1935a). This was the antithesis to the demonised 'liberal, capitalist and profit-oriented system' of the Weimar Republic (e.g. Huhle 1933, 694).

The *Führerprinzip* discussion also includes the question of what characterises a competent leader. This, again, clearly reflects Nazi ideals. Suitable leaders are described as strong in character, unselfish and responsible (Theisinger 1933, 658; Sandig 1934, 191; Bradtke 1935, 172; Nicklisch 1935a, 26; Sandig 1942a, 74). The latter was to be ensured through personal liability:

> The bankruptcy of the company must be a stain on the bad leader, a burden for life. (Sandig 1935, 147)

In return, Bradtke (1935, 171) demands autonomy and independence of decision for the leader, without imposing strong controls:

> Wanting to install fearful safety measures everywhere against possible wrong behaviour by the manager is a way of thinking that belongs to a bygone economic era.

The *Führerprinzip* discussion was strongly linked to ethical-normative research and took place largely in DBW and ZfB. Except for Bradtke (1935), the law reform is discussed in ZfhF more in descriptive or legal terms. The ideological influence seems to be less pronounced here (e.g. Spohr 1935; Walb 1937). Overall, this case again demonstrates how research aligned itself politically rather than engaging in genuine, disinterested discourse, thereby helping to embed Nazi ideology in accounting regulation.

4.5.4.3. Accounting and business education

The influence of Nazi ideology is also evident in accounting education. Before 1933, this was a minor topic, with only a few articles on teaching materials (e.g. Rost 1930; Sotke 1931) or foreign education systems (e.g. Meyer 1930; Schmidt 1930). After 1933, it gained new relevance, driven by ideological aims and practical demands. Nicklisch (1934, 281) points out that:

> The *Führer* demands of each of us that we serve the nation with our expertise…The *Volk* and the rulers of the Reich must be sure that everyone does their

> duty without fear of personal disadvantage and without seeking personal or group advantage.

and thereby calls for a new education agenda in line with Nazi ideology. This alignment enclosed also more general values from the Nazi hemisphere such as comradeship (e.g. Feld 1935, 275; Abraham 1936, 206; Feld 1938, 75). Nicklisch (1934, 282, 1935b, 121) and Feld (1935, 273, 1938, 75) repeatedly demand that *Gesinnung* and character education must play a greater role in the business and accounting education of Nazi Germany. With this, they align with the decree regulating economic studies from May 1935, which Schmidt (1935) reproduces and comments on.

> In the first two semesters, students should become familiar with the *völkischen* foundations of science; lectures on race and *Sippe*, *Volkskunde* and prehistory, on the political development of the German people, especially in the last hundred years, belong at the beginning of every humanities course. (Decree on the new regulation of economic studies, May 1935 as cited in Schmidt 1935, 210)

Students are urged to look for lecturers with the 'right' views when choosing a university:

> New universities cannot be built overnight. Therefore, give preference to universities with personalities who can be leaders and teachers in the new spirit in terms of *Gesinnung* and performance. (Decree on the new regulation of economic studies, May 1935 as cited in Schmidt 1935, 211)

The ideological turn in education has gone largely unchallenged in the literature, with more nuanced views remaining rare exceptions. Arndt (1934, 299) points out to the students, who come to the university 'filled with high national and social ideals, hungry for struggle and action', that ideas from before 1933 are also relevant to compare the NS system with others and to help shape good policy. However, in his article he shows how business administration (and accounting) can be aligned with Nazi ideals, thereby helping to legitimise the discipline and its lectures. Overall, the topic shows how a previously marginal topic became ideologically charged and gained new relevance. Only a few authors engaged with it, but those who did largely reflected Nazi ideology. Researchers with differing views avoided the topic, given its ideological predefinition by the regime.

4.5.4.4. Anti-intellectualism and practical usefulness

In contrast to other academic disciplines in 1933, accounting (as part of business administration) was still a very young science with only a few years of university history. Quite common at an early stage, accounting research concentrated in the first decades on systematic descriptions, the development of accounting systems, and the challenges of practical

accounting problems (e.g. Busse von Colbe 1996; Busse von Colbe and Fülbier 2013). Therefore, the distinction between pure and applied science was not nearly as pronounced as in other, more mature disciplines. At topic-level, the reduction in 'Accounting (research) theory' and 'Accounting history' indicates a move away from pure science. The content analysis reinforces this shift towards utility-driven research. Especially DBW, with its emphasis on an ethical-normative research methodology, shows a pronounced practical orientation towards the objectives of the Nazi regime. Quite early after January 1933, Nicklisch (1933b, 173) encouraged researchers there to:

> place all their forces at the service of the *Führer* of the new Germany, to set the objectives of their research according to the needs of policy-making.

Unsurprisingly, DBW, with Nicklisch as the influential editor, includes more articles clearly aligned with Nazi ideology than ZfB and ZfhF.

Usefulness for the Nazi system is shown in some articles on the war economy (e.g. Fischer 1936a, 1936b; Brockhaus 1940; Hintner 1940; Herzog 1941; Schmidt 1941) or on the handling (of companies) of occupied territories (e.g. Jakovsky 1939; Mathews 1942). Most of these, however, are phrased in a rather neutral and, again, technocratic manner. Yet the distance towards pure science is evident, as these articles clearly arise from the wartime needs of the regime. As previously discussed, the usefulness of accounting research for the realisation of Nazi ideology is also apparent in cost accounting, the *Führerprinzip*, and accounting education. Here, research not only supported but also mirrored the regime's ideological and legislative agenda, helping to elaborate and legitimise corresponding regulations. This illustrates Merton's (Merton [1938] 1973, 260) notion that once science is judged by political usefulness rather than the ethos of science, it loses its autonomy and disinterested character. This must be interpreted in light of the role that accounting played in supporting the objectives of the Nazi regime. As Cinquini et al. (2016) show for Fascist Italy, cost accounting rules were particularly important for the Nazi regime to exercise control and power over companies and the economy.[43] The same is likely to apply to the implementation of the *Führerprinzip* in stock corporations. Accounting researchers contributed to the development of a technology of power by shaping accounting rules and the necessary technical framework (as described by Walb 1940, 35).

43 Further critical and interdisciplinary accounting research on this topic is mentioned in our literature review.

Regarding theory, almost all articles in the sample referring to this topic explicitly address the link between practice and theory as a necessary condition (e.g. Großmann 1931; Schmidt 1933; Lisowsky 1937; Hasenack 1941; Walb 1943) – very much in the tradition of Schmalenbach (e.g. 1931) as one of the most influential protagonists of accounting theory. So, practical applicability of the young accounting research discipline was held in high esteem, before and after 1933. Nevertheless, a tightening of the demands for practical suitability is noticeable. Deutsch (1934, 151) states that business research must not 'develop theories in a vacuum'. This led to some critical considerations of Schmalenbach's academic school (and of the more pragmatic scholars), for example, when Thoms (1942), in his work on business management research, critically examines the understanding of research by Beste and Walb, who both refused the link between economic order and accounting research and devoted themselves to 'timeless' problems and research questions. With reference to this discussion, Weigmann (1942, 121–22) comments that accounting and business theorists should become 'more modest' and instead of 'feeling set back' after the 'abandonment of the self-legislated economy', they must accept the new 'political science'.

4.6. Conclusion

Using a sociology of science perspective to decode accounting research in Nazi Germany, we analyse the German business journals DBW, ZfB and ZfhF between 1929 and 1945. In total, we extract 1,830 scientific articles from the journals, of which 1,013 can be assigned to the field of accounting. After the Nazi seizure of power 1933 accounting research remained in the application-oriented tradition of a young science but turned more towards political and ideological views. Merton's ([1942] 1973) ethos of science was restricted in many ways and accounting research had to subordinate itself to the goals and ideology of the Nazis. We trace the development of accounting research under NS, from its prominence in the early twentieth century to its decline after WW II. As Beyerchen (1992) concludes for other fields, the damage inflicted cannot be quantified, yet its presence is evident.

The analysis of changes in authorship reveals restrictions on the principle of universalism. Young scholars of Jewish origin were prevented from pursuing academic careers, and established researchers were excluded from the scientific discourse, appearing less often or not at all in the journals after 1933. However, we find almost no direct personal attacks within the research articles and no rejection of theories or research results due to the Jewish origin of

authors, as described by Merton ([1938] 1973) in other scientific fields. Schmalenbach's theories, for example, continued to be widely used, particularly in the development of cost accounting regulations, despite him facing personal disadvantages due to his marriage to a Jewish woman (Kruk et al. 1984). An increased use of NS language can be observed in the research papers, with timing and extent varying between the three journals. In ZfhF, it emerges later and to a lesser extent, mainly through the discussion of accounting regulation reforms at the time, while in DBW and ZfB, it appears earlier and more strongly driven by ideological influences. Some articles use specific NS words embedded in a more neutral language in a factual, rather technocratic manner. However, an increasing politicisation and a stronger focus on content aligned with Nazi interests becomes evident. Methodologically, this is reflected in a rise of ethical-normative studies, which incorporate ethical value judgements and, thus, serve as a gateway for Nazi ideology. This illustrates Merton's ([1938] 1973, [1942] 1973) observation that the ethos of science is subordinated to the goals and ideology of the regime, leading in particular to violations of the principles of disinterestedness and organised scepticism.

When analysing the development of research topics, it becomes evident that, even though accounting research before 1933 was already strongly application-oriented, the proportion of practically useful topics increases, whereas pure science (e.g. accounting theory, accounting history) decreases. A strong ideological influence is particularly noticeable in the areas of cost accounting, the introduction of the *Führerprinzip* in stock corporations and business and accounting education. In these areas, the content closely reflects core tenets of Nazi ideology, including the rejection of liberal market principles, prioritising the common good and promoting specific character traits. Approaches that do not correspond to Nazi ideology largely disappear. Therefore, rather than expressing open opposition to the regime, most authors exhibit a stance of passive conformity, similar to what Cinquini (2007) observes in Fascist Italy. The ideological focus identified above is confined to areas directly relevant to accounting; other core elements of Nazi ideology, such as racial politics, played almost no role. This was driven by the regime's needs, which positioned accounting as an instrument of power and control, particularly to control the economy. Accounting researchers contributed to this by helping to shape regulations that functioned in this way. As Cinquini et al. (2016) demonstrate for Fascist Italy, this influence extended beyond research to direct involvement in commissions for accounting standardisation. Future research could investigate

the extent to which German accounting scholars participated in comparable committees and legislative processes.

Extending beyond the specific historical case, our findings support Merton's ([1938] 1973, [1942] 1973) view that totalitarian regimes severely constrain academic freedom, and that ideology can profoundly influence research outcomes. However, this influence is not limited to authoritarian contexts; even in liberal democracies, dominant political or economic ideologies can influence research agendas (Kalleberg 2010). This might also be relevant to the field of accounting which is closely associated with economic ideals of the prevailing economic and political system. Future research could extend this perspective by examining other historical or contemporary cases in which political or ideological pressures have influenced accounting research and offer a comparative insight into how resilient Merton's norms remain in these contexts.

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Chapter 5
Concluding remarks

This dissertation has examined German accounting history in three studies. The first study reconstructs the accounting practices of Friedrich Krupp's cast steel factory between 1811 and 1826 and provides one of the first systematic analyses of accounting practices in a German firm of the pre-industrial period (Chapter 2). Drawing on Scott's (2014) three-pillar framework, it shows that regulative forces exerted little continuous pressure on Krupp's daily practice and that the more influential normative and cultural-cognitive forces were tied to specific individuals. The system that emerged was remarkably differentiated for an enterprise of this size, yet it failed to consolidate into stable routines (Burns and Scapens 2000). The weak regulative environment increased the weight of the normative and cultural-cognitive forces, yet it also made them vulnerable, because no institutional mechanism could offset the loss of the individuals who carried them. For institutional accounting research, the case thus shows how accounting emerges, and how it can fail to take hold, under conditions of incomplete institutionalisation. Although the study takes a first step, the accounting practices of German firms before and during early industrialisation remain largely unstudied. Case studies of other enterprises of the period, in the Ruhr region and beyond, could show whether the practices observed at Krupp were typical of their time. Within Krupp itself, the decades after 1826 would show how the accounting practices developed under Alfred Krupp, and whether they became institutionalised as the firm grew.

The second study reconstructs the value added generated by Krupp from 1811 to 1998 and traces its distribution among employees, shareholders, creditors and the state (Chapter 3). Employees received the largest share over almost the entire period. The shareholders' share behaved as a residual, the state's share rose sharply in times of war and rearmament, and the creditors' share remained low outside episodes of expansion or distress. Beyond the case, the study establishes value added distribution as a workable instrument for long-run accounting history and makes its methodological choices and limits explicit. Two extensions appear promising for future research. Reconstructions of value added for other companies would allow the distributional patterns found here to be compared and their explanations to be tested. More granular reconstructions for shorter, well-defined periods would ease such comparisons and refine the calculations; the forced-labour years in WW II in particular invite closer quantification and analysis.

Together, the two Krupp studies also contribute to the understanding of the accounting records themselves. The first study examines the early records in depth, providing a technical reconstruction of how bookkeeping (and accounting) worked in the founding years. The

second study presents the accounting records for the remainder of the firm's lifetime, showing how the heterogeneous sources develop and relate to each other, and demonstrating how they can be used. In doing so, the two studies facilitate future research that approaches the Krupp Historical Archive with different research questions.

The third study analyses 1,013 accounting articles published in the three leading German academic business journals between 1929 and 1945 (Chapter 4). Accounting research retained its application-oriented character after 1933, but increasingly aligned itself with the regime's ideological priorities, above all in cost accounting, the *Führerprinzip* and business education, while ethical-normative studies gained ground as a gateway for this influence. The principle of universalism was curtailed, as Jewish scholars were forced out of academic careers, yet this rarely surfaced as open attack within the articles themselves. The language of most articles remained factual and technocratic. For accounting history, the study fills a gap in the literature on German accounting research, which often skips the Nazi period, and applies Merton's ([1938] 1973, [1942] 1973) sociology of science to the field of accounting. This line of research can be taken further in the future. For example, the involvement of German accounting scholars in commissions and standard setting under the Nazi regime remains to be studied (see e.g. Cinquini et al. 2016). Furthermore, drawing comparisons with accounting research in other totalitarian systems could deepen the understanding of the developments observed here.

Despite their different topics, the three studies share a common premise. Accounting, and research about accounting, cannot be understood apart from the context in which it takes place. This premise runs through the dissertation, from the emergence of a bookkeeping practice to the distribution of value added and the developments in the academic discipline. The theoretical lenses differ, because each study follows the demands of its own research question. Such theoretical plurality is common in accounting history, which often draws its analytical vocabulary from neighbouring disciplines depending on the problem at hand (see e.g. Marisca 2024). The findings of the three studies are not only of historical interest. How accounting practices emerge in young organisations, and under which conditions they stabilise, is a question that institutional research continues to ask of firms today (see e.g. Scott 2014). The distribution of value added among stakeholders reappears in contemporary sustainability reporting (Haller and van Staden 2014; Haller et al. 2018). Questions of distribution and inequality are also becoming a subject of accounting research more broadly (Tweedie and Hazelton 2019). The third study, finally, is a reminder that research agendas

are not formed in a political vacuum. Ideological influence on research is not confined to totalitarian regimes; dominant political and economic ideas shape research agendas in liberal democracies as well (Kalleberg 2010). Accounting research is closely tied to the ideals of the prevailing economic and political system and is therefore no exception. The Nazi era shows, in extreme form, how far such influence can reach.

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Declaration of own contribution

This dissertation comprises three research papers. My contribution to each paper is set out below.

The first paper is single-authored.

The second paper is co-authored with Thorben Bonn, Rolf Uwe Fülbier and Bernhard Pellens. The contributions of the authors were as follows: the data collection, preparation and analysis were carried out jointly by Thorben Bonn and me. The framing and theoretical orientation of the paper were developed jointly by all four authors. Structuring and drafting of the manuscript was undertaken predominantly by Thorben Bonn and me.

The third paper is co-authored with Rolf Uwe Fülbier. The manuscript was written jointly by both authors, with a larger share on my side. Within the write-up, my main focus was the results section. I was principally responsible for the data preparation and analysis, although the broad focus of the analysis was discussed between both authors throughout. I acted as corresponding author during the submission process.