

Cologne Economic History Paper

Universität zu Köln
Seminar für **Wirtschafts- und Sozialgeschichte**

No. 1 (2009)

Diane Dammers, Hendrik Fischer

The Performance of German Big Business in the 20th Century

Cologne Economic History Paper
Ed.: Toni Pierenkemper/Alfred Reckendrees

Seminar für Wirtschafts- und Sozialgeschichte
Department of Economic and Social History
Universität zu Köln – D-50923 Köln
University of Cologne – D-50923 Cologne – Germany
pierenkemper@wiso.uni-koeln.de

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pierenkemper@wiso.uni-koeln.de

Diane Dammers, Hendrik Fischer

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The authors are grateful for any comment: Diane.Dammers@statistik.rlp.de/fischer@wiso.uni-koeln.de

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Summary

The paper deals with the development of big business in Germany during the 20th century. It shows the first results of the German team of the research project “The Performance of European Business in the 20th Century”. The paper analyses how the structure of big business changed: it shows the decline of heavy industry and finally the rise of service sectors. Secondly the paper analyses the profitability of the German large scale enterprises and raises the question if German big business truly was less profitable than the English as suggested in literature.

A previous version of this paper has been presented at tenth Annual Conference of the European Business History Association (EBHA) in Copenhagen on August 19th 2006.

1. Introduction

The industrialization of the western hemisphere since the 19th century and the extraordinary growth of the European economies was accompanied by the emergence of large-scale enterprises. This observation leads Richard Tilly to ask if big business was the key for economic development in the industrial countries.¹ Considering the important role of big business it is surprising that – besides some listings of big companies² – the history of German big business in the 19th and 20th century has not been written yet.

This paper on German big business analysing the history of big business with new methods is due to the European research project “The Performance of European Business in the 20th Century”.³ It is neither focused on the development of national economies as a whole like economic historians use to do nor is the development of individual companies analyzed over a longer period as it is usually done by business historians. The object of explanation is the artefact “large-scale enterprise” hereby especially the development of structure and economic performance in the 20th century. In this respect the object is quite similar to the Chandlerian “modern business enterprise”.⁴ The main objective of this project is to create a European sample of data on large-scale enterprises to enable us to identify general tendencies in the development of European big business on one hand, and to look for national characteristics on the other hand.

Consequently, the following overview on German big business is only a small contribution within the large framework of the project which main focus lies on the cross-country analysis of different industrial sectors. In the following, after some methodological remarks, it is shown how the sectoral composition and the performance of German big business changed in the course of time. Firstly we will figure out how the structure of German big business changed throughout the 20th century, secondly we will have a look on the profitability of those large scale enterprises and compare our results to findings in business history literature.

1.1. Methods and Sources

In each participating country balance sheet data on large-scale enterprises were collected for five benchmark periods, 1911-1913, 1927-1929, 1954-1956, 1970-1972, and 1998-2000. According to the size of each national economy various numbers of companies were included in the European sample. For Germany the 25 biggest companies (five financial and 20 non-financial companies) of each benchmark period were chosen. Additionally, for each benchmark period the three biggest companies for a number of industrial sectors were assembled. The companies were selected according to their core business.⁵

The following analysis alternately draws results from both samples which are referred to as small sample (top 25) and large sample (sectoral choice) below. The companies were selected according to their total assets in the benchmark periods 1911-13 to 1954-56 and according to their turnover in the benchmark periods 1970-72 and 1998-2000.

¹ For a short overview about basic literature, especially the *Chandlerian* approach see: Tilly, *Großunternehmen* (1993).

² Fiedler, *Unternehmen* (1999); Fiedler, *Unternehmen Nachtrag* (1999), Kocka/Siegrist, *Industrieunternehmen* (1979), Siegrist, *Großunternehmen* (1980); Weder, *Aktiengesellschaften* (1968); Cassis, *Big business* (1997); Feldenkirchen, *Concentration* (1988).

³ For a brief description of the project see Cassis/Brautaset, *Performance* (2003) and for the German case Dammers/Fischer, *Performance* (2006).

⁴ See Chandler, *Scale and Scope* (1994), Chandler, *Visible hand*: (1977), Chandler, *Strategy and Structure* (1962). Chandler’s impact on business history was indubitable huge, for that purpose see Iversen, *Measuring Chandler’s Impact* (2008).

⁵ They are selected by using the latest version of the International Standard Industrial Classification (ISIC Rev. 3.1), designed by the UN Statistics division (UNSD), which is available online (<http://unstats.un.org/unsd/cr/registry/regcst.asp?Cl=17>).

The companies' economic performance was measured in a direct way by rates of return. Two different rates of return were selected allowing an analysis of performance from different perspectives: Return on equity (ROE) expresses the net income of a company as a percentage of its equity capital whereas holding return (HR) is the fictitious return an investor gains by holding a company's share for the observed year.⁶

This method applies best considered that research starts in the early 20th century. Other methods of measuring performance such as Balanced Scorecards, Total Quality Management (TQM) or Strategic Measurement Analysis and Reporting Technique (SMART) are not possible because adequate data are not available.⁷ As Gourvish points out: "While it remains true that balance sheets and profit and loss accounts offer us only an approximate window, and sometimes a deliberately distorted mirror of the enterprise, at least they attempt to express the impact of a complex web of activities as more precise measures. Provided that they are not used as tablets in stone, they probably offer the best indication of performance."⁸

The main sources for gaining balance sheet data on German companies were Salings Börsen-Jahrbuch⁹ for the two early benchmark periods and the Handbuch der Deutschen Aktien-Gesellschaften¹⁰ which was the most important source for the benchmark periods 1954-56 and 1970-72. For 1970-72 and 1998-2000 additionally the Handbuch der Großunternehmen was used. With this encyclopaedia it was possible to identify companies not listed at the stock-exchange and to include them in the samples systematically.¹¹ For the last benchmark period an electronic database was available which facilitated the selection process.¹²

If the required data was not available in these periodical publications we took them directly from the published balance sheets, which are collected at the Wirtschaftsarchiv (Economic Archive) of the Faculty of Management, Economics and Social Sciences of the University of Cologne.

1.2. Remarks on the German case¹³

Before we proceed with the analysis we look at some specialities of German big business. In contrast for example to the British case, in Germany large companies are not necessarily organized as joint stock companies ("Aktiengesellschaft", AG). Sure enough even at the beginning of the 20th century the majority of German large-scale enterprises were joint stock companies but in 1927 twelve out of the hundred biggest companies listed by Hannes Siegrist¹⁴ were organized as business partnerships or limited corporations. Others

⁶ The two measures are calculated as follows (examples for 1913):

$$\text{Return on equity} = \left[\frac{\text{Net Profits 1913}}{\text{Shareholders Equity 1913}} \right] \times 100$$

$$\text{Holding return} = \left[\frac{(\text{Share Price 31.12.1913} - \text{Share Price 31.12.1912}) + \text{Dividend(s)}}{\text{Share Price 31.12.1912}} \right] \times 100$$

See Brautaset, *Introduction* (2005), 5.

⁷ See Brautaset, *Introduction* (2005) 4-5.

⁸ Gourvish, *Business history* (2006), 388-389.

⁹ Salings Börsen-Jahrbuch (1881/82ff).

¹⁰ Handbuch der Deutschen Aktien-Gesellschaften (1896/97ff.)

¹¹ Handbuch der Großunternehmen (1952ff).

¹² Hoppenstedt Auskunfts-CD Großunternehmen (1996ff) and Hoppenstedt Aktienführer (1998ff). Our main source for the data was the Hoppenstedt Aktienführer 2002 (2001), where all German joint stock companies are listed with their balance sheets and other key data.

¹³ For more detailed information about the specifics in collecting and analysing data about German big business see Dammers/Fischer, *Performance* (2006).

¹⁴ Siegrist, *Großunternehmen* (1980), 86.

were joint stock companies in a formal sense but they were controlled by an entrepreneurial family and their stocks were not listed at the stock exchange.¹⁵

According to German law only joint stock companies had to publish their balance sheets. That is the reason why, for the early benchmark periods, it was impossible to include companies in our samples which were not listed at the stock exchange. For the later benchmark periods those companies could be taken into account but mostly their data were incomplete – especially holding return could not be calculated because share prices did not exist. That is why in this paper ROE is used as measure for performance and the HR is neglected.¹⁶ Several gaps especially in the 1998-2000 sample are caused by companies not publishing balance sheets as well. In some industries it was hardly possible to identify the biggest companies because most large-scale enterprises even today do not publish their figures, for example in the sectors “leisure and tourism” or “media”.

Consequently our choice of companies is distorted to a certain extent: For the early benchmark periods the choice is less representative because only joint-stock-companies could be taken into account, but the data for the chosen enterprises are almost complete. In the later benchmark periods it is more likely that the biggest companies are identified but the material is less complete.

The second characteristic to be mentioned here is the important role of the state in German business. Right from the beginning of the period under consideration all big railway companies were state-owned, so they were not included in our sample. The same is true for the German broadcasting stations. The biggest ones were not organized as private companies, but as so called “öffentlich-rechtliche Unternehmen”. These companies were run autonomously but they were financed by taxes, so they were not included in the sample either.

Finally it has to be stated that Germany had different currencies throughout the 20th century. Until 1923 the old Mark (the former Goldmark) was still valid. After the great inflation a currency reform was undertaken, which resulted in the implementation of the Reichsmark (RM). After the Second World War the RM was displaced by the Deutsche Mark (DM). That is the reason why it does not make sense to compare absolute values of different benchmark periods.

2. The performance of the German big business

2.1. *Structural Change of the sample*

As mentioned above the so-called large sample consists of the three biggest companies for a certain number of business sectors. Because of the changing economic structure the composition of the sectoral tableau was modulated from benchmark period to benchmark period. The following table shows which sectors were included in the sample in the different periods.¹⁷ Some new sectors were added in the course of time like “media” or “services to business” while others disappeared, for example “Freestanding Companies”. Other sectors were divided or merged. So the sectors “reflect the economic structure of the time of the benchmark years, however, each firm will be uniquely identified according to its core business activities by an ISIC code. Thus, while the sectors are flexible, the company identification is not and the ISIC codes are the same for all observation years.”¹⁸

¹⁵ See Colli, *Family Business* (2003), 36-37.; Pohl, *Geschichte* (1981), 165.

¹⁶ See Dammers/Fischer, *Performance* (1006) for details.

¹⁷ For detailed information see Cassis/Brautaset, *Performance* (2004), 8.

¹⁸ Cassis/Brautaset, *Performance* (2004), 8.

Table 1: Sector Definitions

Sector	1911 - 1913	1927 - 1929	1954 -1956	1970 -1972	1998 -2000
1 Mining	♦	♦	♦	♦	♦
2 Utilities; Electricity, gas and water supply	♦	♦	♦	♦	♦
3 Construction					♦
4 Property companies					♦
5 Construction and property companies	♦	♦	♦	♦	
6 Commercial activities	♦	♦	♦	♦	♦
7 Financial intermediation	♦	♦	♦	♦	♦
8 Food, drink and tobacco products	♦	♦	♦	♦	♦
9 Textiles and leather goods	♦	♦	♦	♦	♦
10 Mechanical engineering	♦	♦	♦	♦	♦
11 Electrical engineering	♦	♦	♦	♦	♦
12 Transport equipment	♦	♦	♦	♦	♦
13 Basic and fabricated metals	♦	♦	♦		
14 Wood and paper products	♦	♦	♦		
15 Mature industries				♦	♦
16 Freestanding companies	♦	♦			
17 Water transport	♦				
18 Land transport (Railways)	♦	♦			
19 Transport and communication		♦	♦	♦	
20 Transport					♦
21 Post and telecom					♦
22 Oils and Chemicals	♦				
23 Oil, rubber and other non-metallic mineral products		♦	♦	♦	♦
24 Chemicals and pharmaceuticals		♦	♦	♦	♦
25 Leisure and tourism				♦	♦
26 Insurance				♦	♦
27 Media				♦	♦
28 Services to business					♦
29 Public administration and health					♦
Number of sectors per benchmark	16	17	15	17	21

2.2. Benchmark period 1911-1913

In the last years of the Kaiserreich big business in Germany was dominated by the heavy industry, disregarding the banking sector that cannot be compared to the others because of differing balance sheet structures.¹⁹ Six of the 25 biggest companies in 1911-13 six belonged to the mining or metal industry.²⁰ Heavy industry represented 28.8% of the sum of all assets of the whole large sample, exclusive the financial companies. In the second place was the transport sector with the huge shipping companies HAPAG and Norddeutscher

¹⁹ See Wengenroth, *Germany* (1997), 140-151.

²⁰ The tables concerning assets resp. turnover and performance figures (i.e. ROE) of the *small sample* can be found in appendix, p. 21ff.

Lloyd²¹. The four companies of land and water transport included in the small sample represented 17.6% of the sum of all assets. They were followed by electrical engineering. The three companies of this industrial sector held 14% of all assets. Other important sectors were utilities and the chemical industry. Admittedly the companies of these industrial sectors were not as large as those of the sectors mentioned above, but with three (utilities) respective two (chemicals) companies in the top 25 these two sectors still played an important role in German big business in 1911-13.

Considering the general development of the German economy between 1850 and 1913 these results are not surprising. According to Rostow the iron, steel and coal industry was among the leading sectors of German industrialisation.²² However in a European comparative perspective it is remarkable that, unlike for example the British case, there are no railway companies present in the German sample, although railways had played an important role in the economic development of the 19th century. This can be explained by the aforementioned fact that railways had gradually been nationalized after 1870 in Germany.²³ By 1912 only about one twentieth of the whole railway network of 60 521 km was still run by private companies which were too small to be included in our sample.²⁴

Table 2: Shares of the sectors of total assets and their performances (ROE) 1911-1913

Sector	Average share of the sum of assets represented in the large sample [%]	Average performance of all three companies represented in the large sample [%]
1 Mining	11.6	8.5
2 Utilities	6.8	11.7
5 Construction and property	2.8	-11.8
6 Commercial activities	1.6	9.6
7 Financial intermediation		10.6
8 Food, drink and tobacco	1.7	10.7
9 Textiles and leather goods	2.2	10.0
10 Mechanical engineering	4.0	12.5
11 Electrical engineering	14.0	15.8
12 Transport equipment	4.8	7.7
13 Metals	17.2	15.8
14 Wood and paper products	2.4	7.0
16 Freestanding companies	7.3	6.4
17 Water transport	10.8	9.9
18 Land transport	6.7	8.1
22 Oil and Chemicals	5.9	25.4

It is also not very surprising that the leading sectors of the second industrial revolution, the electrical and chemical industry, are also well represented in our sample.²⁵ The big players of these dynamic and “modern” industries (Bayer, BASF, Siemens and AEG) all appear in the top 25 sample and remarkably two of them (Bayer and Siemens) were still among the biggest in the last benchmark period.

²¹ See Cassis, *Big business* (1997), 26.

²² Rostow, *Stages* (1966), 52-55.

²³ In some German territories (e.g. Baden, Braunschweig, Württemberg, Oldenburg) railways were state-owned right from the beginning. See Stolper et al., *Deutsche Wirtschaft* (1966), 46.

²⁴ Stolper, *Deutsche Wirtschaft* (1966), 47. For a brief overview on the nationalization of the railways in late 19th century Germany see: Pierenkemper/Tilly, German (2004), 139-140.

²⁵ See e. g. Stolper, *Deutsche Wirtschaft* (1966), 28-30.

A quick view on the profitability of the top 25 companies shows that the performance of big business seems to mirror the general state of the economy. The best performing sectors in 1911-13 measured by return on equity were the then “modern” industries like chemicals (with an average ROE of 25.4%) and electrical engineering (av. ROE 15.8%). But also the companies of the leading sectors of the first industrial revolution in Germany – mining and metals – could keep up with the others. Therefore Youssef Cassis states the importance of chemicals and electrical engineering but warns “of over-emphasizing their weight in the world of German big business before 1914.”²⁶

Considering the size of the companies the heavy industry still was the strongest sector of German big business; the metal companies even were as profitable as the electrical engineering companies (av. ROE 15.8%). In fourth place came the companies of mechanical engineering (av. ROE 12.5%) followed by utilities (av. ROE 11.7%), another branch with a prospective future.

Table 3: Large Sample 1911-1913 – Best/worst performing companies

The best performing companies 1911-1913 (ROE)				
Rank	Company	Sector	ROE Average	Std.dev.
1	Bayer	Oil and Chemicals	26.7	0.7
2	Hoechst	Oil and Chemicals	26.7	5.5
3	BASF	Oil and Chemicals	22.7	1.6
4	Phoenix AG für Bergbau und Hüttenbetrieb	Metals	22.3	2.5
5	Siemens & Halske AG	Electrical eng.	20.1	7.3
6	Krupp	Metals	16.8	2.5
7	Berliner Elektrizitäts-Werke	Utilities	16.0	0.3
8	Maschinenbau-Anstalt "Humboldt"	Mechanical eng.	15.1	0.9
9	Siemens-Schuckertwerke GmbH	Electrical eng.	14.3	0.2
10	AEG	Electrical eng.	13.0	0.6

The worst performing companies 1911-1913 (ROE)				
Rank	Company	Sector	ROE Average	Std.dev.
1	Berliner Terrain- und Bau AG	Construction	-42.2	37.3
2	Tapeten-Industrie AG	Wood and paper	0.3	0.1
3	Handelsgesellschaft für Grundbesitz	Construction	1.6	2.2
4	Ostafrikanische Eisenbahngesellschaft	Freestanding	1.8	1.6
5	Vulkan-Werke	Transport eq.	4.6	2.9
6	Neue Boden-AG	Construction	5.3	4.4
7	Blohm & Voss KGaA	Transport eq.	5.8	1.1
8	Gesellschaft für elektrische Hoch- und Untergrundbahnen	Land transport	6.3	0.4
9	Harpener Bergbau AG	Mining	7.3	1.0
10	Schantung Eisenbahn-Gesellschaft	Freestanding	7.6	0.7

A look at the best performing individual companies of the large sample confirms these observations: The three best performing companies emanate from the chemical industry and the three biggest electrical engineering companies appear among the best performers as well.

²⁶ Cassis, *Big business* (1997), 24.

2.3. Benchmark period 1927-1929

The development of German business after the First World War was characterized by rationalisation²⁷ and the formation of big industrial conglomerates according to American lines.²⁸ Therefore it is not surprising that in 1927-29 the sample is dominated by two industrial sectors: basic and fabricated metals with 25.3% and chemicals with 19.5% of the sum of assets represented in the large sample excluding financial intermediation. In both sectors concentration was on a very high level: The biggest industrial company in the 1927-29 sample is the Vereinigte Stahlwerke AG with total assets of 2.073 billion RM in 1927. It exceeded the Friedrich Krupp AG, the second biggest company in the metal industry, more than four times. The biggest chemical enterprise was the IG Farbenindustrie AG with a balance sheet total of 1.818 billion RM. It was even more than six times larger than the second biggest chemical company, the Kali-Industrie-AG. These huge trusts were established in the middle of the 1920s by merging most of the former biggest players in their respective industrial sectors. The Vereinigte Stahlwerke included nearly all of the major metal and coal enterprises (e.g. Thyssen and Phönix). Only Krupp, Hoesch, Klöckner, Gutehoffnungshütte and Mannesmann remained independent.²⁹

The history of the second big trust of the Weimar era started earlier. In 1904 three big chemical enterprises (Agfa, BASF and Bayer) established the first so called Interessengemeinschaft (that is what IG stands for, meaning community of interests). The intended purpose of this association was to represent the common interests of its three members which were still independent companies. In 1925/26 these three companies merged with five other big chemical enterprises (e.g. Hoechst) and founded the IG Farbenindustrie AG.³⁰

Table 4: Shares of the sectors of total assets and their performances (ROE) 1927-1929

Sector	Average share of the sum of assets represented in the large sample [%]	Average performance of all three companies represented in the large sample [%]
1 Mining	3.8	6.1
2 Utilities	8.4	10.7
5 Construction and property	0.8	-0.1
6 Commercial activities	3.8	15.6
7 Financial intermediation		11.4
8 Food, drink and tobacco	2.3	12.5
9 Textiles and leather goods	4.3	8.8
10 Mechanical engineering	2.3	7.9
11 Electrical engineering	11.8	13.5
12 Transport equipment	1.7	0.3
13 Metals	25.3	10.4
14 Wood and paper products	1.7	11.9
16 Freestanding companies	0.1	7.0
18 Land Transport	3.3	4.7
19 Transport and comm.	7.3	7.0
23 Oil and rubber	3.7	7.8
24 Chemicals and pharma	19.5	8.5

²⁷ See: Feldenkirchen, *Big Business* (1987), 417-451 and Kleinschmidt, *Rationalisierung* (1993).

²⁸ Wengenroth, *Germany* (1997), 152; Cassis, *Big business* (1997), 48-49.

²⁹ For details see: Reckendrees, *"Stahltrust"-Projekt* (2000), esp. 149-275.

³⁰ For details see: Plumpe, *I.G. Farbenindustrie AG* (1990) or Plumpe, *Political Framework* (1991); Cassis, *Big business* (1997), 50-51.

The third biggest industrial sector in our sample was electrical engineering which represented 11.8% of all assets in the large sample excluding financial intermediation. But in contrast to the aforementioned branches here all three companies included in the sample were almost of the same size.³¹

A look at the performance of German large-scale enterprises in the 1927-29 benchmark period shows that the biggest companies were not necessarily the best performing ones. Measured by ROE the most profitable branch was commercial activities (av. ROE 15.6%). However, the significance of this value should not be overestimated because it was partly due to the extraordinary good performance of the small Deutsch-Russische Handelsgesellschaft with a balance sheet total of only 56 mill. RM in 1927. But anyway the two larger commercial companies (the department store companies Leonhard Tietz and Rudolph Karstadt) were also quite successful in these years.

Also in other industrial sectors remarkable differences occurred between the performance of individual companies. For example the electrical engineering sector was the second best performing sector with an average ROE of 13.5%. But the ROE varied between 20.0% for the top company Siemens & Halske and only 7.8% for the worst performing electrical engineering company AEG.

Table 5: Large Sample 1927-29 - Best/worst performing companies

The best performing companies 1927-1929 (ROE)				
Rank	Company	Sector	ROE average	Std. dev.
1	Deutsch-Russische Handels-AG	Commercial act.	22.4	12.5
2	Siemens & Halske AG	Electrical eng.	20.0	6.4
3	Mannesmannröhren-Werke	Metals	19.1	14.0
4	Schultheiss-Patzenhofer Brauerei AG	Food, drink and tobacco	18.4	1.4
5	Hamburgische Electricitäts-Werke	Utilities	14.9	1.7
6	Rudolph Karstadt AG	Commercial act.	14.1	1.8
7	Jaluit-Gesellschaft	Freestanding	14.1	10.0
8	Feldmühle, Papier- und Zellstoffwerke AG	Wood and Paper	13.2	1.3
9	Darmstädter und Nationalbank	Financial int.	13.1	2.3
10	Siemens-Schuckertwerke AG	Electrical eng.	12.8	0.7

The worst performing companies 1927-1929 (ROE)				
Rank	Company	Sector	ROE average	Std. dev.
1	Industriebau-Held&Francke AG	Construction and property	-12.0	33.6
2	Henschel & Sohn AG	Transport eq.	-4.1	0.0
3	Adam Opel AG	Transport eq.	-3.7	0.0
4	Guatemala Plantagen-Gesellschaft	Freestanding	0.1	0.8
5	Rhenania-Ossag Mineralölwerke AG	Oil and rubber	1.5	5.8
6	Daimler-Benz AG	Transport eq.	1.6	0.2
7	Harpener Bergbau AG	Mining	3.9	2.3
8	Lübeck-Büchener Eisenbahn-Gesellschaft	Railways	4.2	0.1
9	Tempelhofer Feld AG für Grundstücksverwertung	Construction and property	4.3	9.6
10	Mansfeld AG für Bergbau und Hüttenbetrieb	Mining	4.5	2.9

³¹ On the electrical engineering sector see: Feldenkirchen, *Competition and Cooperation* (1997); Cassis, *Big business* (1997), 51.

But what about the two big trusts, the IG Farben and the Vereinigte Stahlwerke? Looking at the performance measured by return on equity they appeared in the higher (IG Farben; av. ROE 10.4%), resp. lower (Vereinigte Stahlwerke; av. ROE 6.6%) midfield. It is an interesting fact that they are both beaten by a better performing smaller company in their own sector: The Kali-Industrie-AG achieves an av. ROE of 11.2%, the Mannesmannröhren-Werke an av. ROE of 19.1%.

Regarding the worst performers amongst the large-scale enterprises in the late 1920s it is eye-catching that all three companies of the transport equipment sector appear on that list. Their average ROE amounted only to 0.3%. The companies of the construction and property sector perform even worse (av. ROE -0.05%), but the average ROE of this sector is strongly influenced by the outlier Industriebau Held & Franke which ROE of -59.5% was by far the lowest in the sample in this year. If we eliminate this outlier, we find the construction sector with an average ROE of about 8% in the midfield.

2.4. Benchmark period 1954-1956

After World War II the western allies, first and foremost the Americans, decartelized and deconcentrated German business. The 1954-56 sample is intelligibly affected by this policy. Three branches should be taken into consideration in more detail: the financial sector, the iron and steel and the chemical industry.³²

Because of the forced divestiture of the banking sector this is the single benchmark period in which the financial sector was not dominated by at least two of the three big universal banks Deutsche Bank, Dresdner Bank, and Commerzbank. Originally it was intended to split them up into as many as thirty regional banks. But after long proceedings in 1952 the allies agreed on splitting each of them up into three regionally organized banks. Four out of the five banking companies included in our sample were former parts of the three big pre-war banks: The Deutsche Bank AG West (total assets 2.675 bill. DM)³³ and the Süddeutsche Bank AG (total assets 2.538 bill. DM) were parts of the Deutsche Bank, the Commerzbank-Bankverein (total assets 1.793 bill. DM)³⁴ emanated from the Commerzbank and the Rhein-Main-Bank (total assets 1.604 bill. DM) was the biggest part of the former Dresdner Bank. The division of the three banks did yet not last for a long time. In 1956 an agreement was reached between the banks and the German government so that by the beginning of the year 1957 they were reconstructed under their former names.³⁵

The allies also broke up the big trusts that dominated the iron and steel as well as the chemical industry. This was done especially in view of the fact that these trusts had played an important role in the Third Reich. IG Farben, for example, exploited inmates of the concentration camp Auschwitz in their plants.³⁶ Vereinigte Stahlwerke as the biggest steel producer had profited from the armament in preparation for the war and from forced labour.

The Vereinigte Stahlwerke was therefore divided into 18 independent companies, amongst them the Gelsenkirchener Bergwerks-AG (total assets 1.746 bill. DM), the Dortmund-Hörder Hüttenunion AG (total assets 770 mill. DM), the Hüttenwerke Phönix AG (total assets 695 mill. DM), and the August Thyssen-Hütte AG (total assets 637 mill. DM).³⁷ The other big companies of the mining and metal industry, which did not belong to the Vereinigte Stahlwerke like Krupp, Hoesch or Klöckner were also divided into different firms in order to be allowed to remain independent. So the allied policy of dividing the big integrated coal and metal producing companies into smaller firms explains why all of a sudden nine companies of this old industrial

³² See Berghahn, *Americanisation* (1986), 94-100; Cassis, *Big business* (1997), 50-51.

³³ First in 1952 it was called Rheinisch-Westfälische Bank AG.

³⁴ First in 1952 it was called Bankverein Westdeutschland AG.

³⁵ See Pohl, *Zerschlagung* (1974), 21-32; Berghahn, *Americanization* (1986), 110; Cassis, *Big business* (1997), 48.

³⁶ For the discussion about the IG Farben in the Third Reich see Hayes, *Industry and Ideology* (2001).

³⁷ Herchenröder et. al, *Nachfolger* (1953), 57-118, esp. 110; Cassis, *Big business* (1997), 50.

sector appeared among the top 25, whereas in 1927-29 there were only five of them. But the increase in number did not correspond to a similarly high increase in importance compared to other industrial sectors in the German post-war economy. Their weight among the top 20 non-financial companies grew indeed, but not as much as one could expect: In the 1954-56 benchmark period coal and metal producing companies represented 45% of all assets in the small sample compared to 35% in 1927-29. If we consult the large sample with three companies of each sector there was no change in the weight of the heavy industry at all. The three biggest coal and metal producing companies represented 29.6% of the sum of assets in 1954-56, compared to 29.1% of all assets in 1927-29 – a surprising fact in the face of the divestiture of the Vereinigte Stahlwerke.

The deconcentration policy was similar in the chemical industry. The former IG Farben was divided into four smaller units: Bayer AG (total assets 1.318 bill. DM), BASF AG (total assets 990 mill. DM), Hoechst AG (total assets 823 mill. DM), and the much smaller Casella AG – the only one of the IG Farben offsprings, which does not appear in our top 25 list.³⁸ The companies of the chemical industry held 14.1% of all assets in the large sample, financial intermediation excluded, so there is a change in weight of about 5% compared to 1927-29. It is noteworthy that the utilities sector gained importance in the 1954-56 benchmark period. The Rheinisch-Westfälische Elektrizitätswerke AG (RWE) was the biggest German company measured by total assets (2.930 bill. DM) - even bigger than the banks. Though this can be explained by the temporary division of the banks, it is still a striking fact. Two other utility companies appear in the top 25 as well. So it is not astonishing that the utilities sector represents 17.9% of all assets included in the 1954-56 large sample.

Table 6: Shares of the sectors of total assets and their performances (ROE) 1954-1956

Sector	Average share of the sum of assets represented in the large sample [%]	Average performance of all three companies represented in the large sample [%]
1 Mining	14.7	3.0
2 Utilities	17.9	4.6
5 Construction and property	0.8	7.1
6 Commercial activities	2.1	6.5
7 Financial intermediation		6.1
8 Food, drink and tobacco	2.2	12.8
9 Textiles and leather goods	2.9	4.8
10 Mechanical engineering	3.4	5.4
11 Electrical engineering	11.5	5.4
12 Transport equipment	5.7	24.7
13 Metals	14.8	2.4
14 Wood and paper products	1.8	4.8
19 Transport and comm.	2.7	-9.9
23 Oil and rubber	5.4	3.0
24 Chemicals and pharma	14.1	6.1

Concerning profitability it is noteworthy that only one of the 25 biggest companies was among the ten best performers: the Bayerische Hypotheken- und Wechselbank (av. ROE 6.4%). The performance of the companies of the transport equipment industry was extraordinarily high with an average ROE of 24.7%.³⁹ Daimler Benz and Adam Opel AG were among the ten best performing companies of this benchmark period. Adam

³⁸ Berghahn, *Americanization* (1986), 93-95.

³⁹ Cassis, *Big business* (1997), 94 draws another less successful picture of the German transport equipment sector in the 1950s: they do not even appear in a list of the most profitable German companies.

Opel AG was even in the first place with an average ROE of 61.4%. Furthermore, the companies of the food industry (av. ROE 12.8%) and the construction sector (av. ROE 7.1%) were very profitable. These results correspond to the general economic situation of the 1950s, especially to the German reconstruction after World War II and the strong backlog demand for food and consumer goods in general and for long-lasting consumer goods in particular.

Table 7: Large Sample 1954-56 - Best/worst performing companies

The best performing companies 1954-1956 (ROE)				
Rank	Company	Sector	ROE average	Std. dev.
1	Adam Opel AG	Transport equipment	61.4	36.7
2	Margarine-Union AG	Food, drink and tobacco	26.8	1.8
3	Feldmühle, Papier- und Zellstoffwerke AG	Wood and paper	8.8	0.3
4	Rudolph Karstadt AG	Commercial act.	8.0	0.6
5	Philipp Holzmann AG	Construction	7.7	1.0
6	Beton- und Monierbau AG	Construction	7.6	0.7
7	Daimler-Benz AG	Transport equipment	7.5	0.8
8	Kaufhof AG	Commercial act.	6.7	0.8
9	Bayerische Hypotheken- und Wechsel-Bank	Financial int.	6.4	0.7
10	Vereinigte Glanzstoff-Fabriken	Textiles and leather	6.3	0.3

The worst performing companies 1954-1956 (ROE)				
Rank	Company	Sector	ROE average	Std. dev.
1	Deutsche Dampfschiffahrtsgesellschaft "Hansa"	Transport and comm.	-22.1	24.1
2	Hapag	Transport and comm.	-7.7	6.7
3	Dortmund-Hörder Hüttenunion AG	Metals	-1.0	5.9
4	Gelsenberg Benzin AG	Oil and rubber	-0.2	0.0
5	Hamburger Hochbahn AG	Transport and comm.	0.0	0.0
6	Aschaffener Zellstoffwerke AG	Wood and Paper	1.4	0.8
7	Rheinische AG für Braunkohlenbergbau und Brikettfabrikation	Mining	2.3	0.3
8	Bergwerksgesellschaft Hibernia AG	Mining	2.4	0.4
9	Esso AG	Oil and rubber	2.6	2.4
10	Christian Dierig AG	Textiles and leather	3.3	0.6

In 1951 for example only 1.3% of German households owned a car, this number increased up to 8.1% in 1961. So the good performance of industrial sectors such as transport equipment, construction, and food can easily be explained.⁴⁰ Amongst the worst performers we find all companies of the transport sector and two of the three mining companies.

⁴⁰ See Abelshauer, *Deutsche Wirtschaftsgeschichte* (2004), 338-340.

2.5. Benchmark period 1970-1972

The companies for the 1970-72 sample were selected according to their turnover except for banking and insurance companies, which were furthermore selected according to their assets. Most of the enterprises present in the top 25 sample have already appeared in the 1954-56 sample, so the structure of German big business seems to have remained quite stable in these years.⁴¹ The 1970-72 sample is dominated by heavy industry, which gained 18.5% of the total turnover represented in the large sample and possessed 19.2% of all assets, financial intermediation excluded.⁴² Nevertheless, signs of the emerging decline of the “old” industries can already be observed: In 1969 many of the former integrated iron-, steel- and coal-companies divested their incremental inefficient coal business, which suffered from overcapacities, and “shifted it to the shoulders of the Ruhrkohle AG”.⁴³

The top 25 sample shows that other industrial sectors gained importance and formed the backbone of German big business in the 1970s. Five of the 20 non-financial companies in the small sample belonged to the chemical and the oil and rubber industry. These two branches held 25% of the total turnover and even 27% of total assets represented in the large sample. The other prospering branches were transport equipment (15.3% of the turnover resp. 9.7% of all assets)⁴⁴ and electrical engineering (13.8% of the turnover resp. 12.8% of all assets)⁴⁵.

Table 8: Shares of the sectors of total turnover and their performances (ROE) 1970-1972

Sector	Average share of the sum of turnover represented in the large sample [%]	Average performance of all three companies represented in the large sample [%]
1 Mining	6.2	-17.4
2 Utilities	6.9	13.3
5 Construction and property	2.4	25.7
6 Commercial activities	4.8	15.8
7 Financial intermediation		9.8
8 Food, drink and tobacco	3.3	16.7
9 Textiles and leather goods	0.5	-1.0
10 Mechanical engineering	5.1	7.7
11 Electrical engineering	13.8	8.4
12 Transport equipment	15.3	13.2
15 Mature industries	12.2	8.2
19 Transport and comm.	1.6	4.6
23 Oil and rubber	8.1	8.0
24 Chemicals and pharma	16.9	9.2
25 Leisure and tourism	2.3	9.2
26 Insurance		26.7
27 Media	0.5	22.5

The overall profitability of German big business in 1970-72 measured by the average ROE of all companies in the large sample had risen dramatically compared to the 1954-56 benchmark period. While the average

⁴¹ See Cassis, *Big business* (1997), 67-69.

⁴² All figures excluding financial intermediation.

⁴³ Wengenroth, *Germany* (1997), 164 and see Abelshausen, *Deutsche Wirtschaftsgeschichte* (2004), 203-211.

⁴⁴ See Wengenroth, *Germany* (1997), 165-168.

⁴⁵ See Wengenroth, *Germany* (1997), 168-170.

ROE was 5.8% in 1954-56 it increased to 10.6% in 1970-72. In 1954-56 an ROE of 6.3% was sufficient to reach the top ten performing companies, whereas in 1970-72 the Aral AG, with an ROE of 6.2%, was among the worst performers. These findings correspond to the results of Cassis who observed a doubling of the profit rates for German companies between the 1950s and the 1970s as well.⁴⁶

Amongst the best performing companies of the 1970-72 benchmark period we find only three of 20 biggest non-financial corporations included in the small sample: two of them were the automobile manufacturers Opel (ROE 19.1%) and Daimler-Benz (ROE 14.6%) and the third was VEBA AG (ROE 17.6%), the biggest German utilities company at that time.

Highly profitable were companies from other branches, the insurance companies with an average ROE of 26.70% and the construction companies with an average ROE of 25.69%. Two of the three companies of these branches presented in the large sample appear on the list of the best performers.

Expectedly, the Ruhrkohle AG heads the table of the worst performing companies. Amongst the worst performers we find all textiles and leather producers as well. This shows how the shrinking fabrication of elementary textiles since the 1960s affected the structure of big business in Germany.⁴⁷

Table 9: Large Sample 1970-72 - Best/worst performing companies

The best performing companies 1970-1972 (ROE)				
Rank	Company	Sector	ROE average	Std. dev.
1	Victoria Lebens-Versicherungs-AG	Insurance	50.2	2.2
2	Strabag Bau-AG	Construction	41.9	1.8
3	Deutsche Unilever GmbH	Food, drink and tobacco	24.6	7.2
4	Axel Springer Verlag AG	Media	22.5	17.9
5	Philipp Holzmann AG	Construction	20.8	6.0
6	Adam Opel AG	Transport eq.	19.1	1.6
7	Horten AG	Commercial act.	18.8	2.0
8	Gerling-Konzern Versicherung-Beteiligungs-Gruppe AG	Insurance	18.1	5.9
9	VEBA AG	Utilities	17.6	6.3
10	Karstadt AG	Commercial act.	14.6	0.4

The worst performing companies 1970-1972 (ROE)				
Rank	Company	Sector	ROE average	Std. dev.
1	Ruhrkohle AG	Mining	-44.6	43.6
2	Deutsche Rhodiaceta AG	Textiles and leather	-10.9	10.3
3	Deutsche Lufthansa AG	Transport and comm.	2.1	6.4
4	Salamander AG	Textiles and leather	3.8	1.2
5	Erba AG für Textilindustrie	Textiles and leather	4.2	2.7
6	Deutsche Dampfschiffahrts-Gesellschaft "Hansa"	Transport and comm.	4.2	0.6
7	AEG	Electrical eng.	5.2	1.8
8	Volkswagenwerk AG	Transport eq.	5.9	3.9
9	August Thyssen-Hütte AG	Mature industries	6.2	4.1
10	Aral AG	Oil and rubber	6.2	0.8

⁴⁶ Cassis, *Big business* (1997), 87.

⁴⁷ Lindner, *Faden* (2001), 137-153.

2.6. Benchmark period 1998-2000

Between the 1970s and our last benchmark period the composition of German big business changed dramatically. Now the transport equipment sector had finally taken the leading position with Daimler Chrysler⁴⁸ and Volkswagen as the biggest German enterprises. Together with the third big car manufacturer BMW, they represented almost 30% of the sum of assets or turnover in the large sample. As before, the chemical industry and the related pharma, oil and rubber industry are well represented with four companies in the top 25 sample. They generated 11.6% of the total turnover in the large sample (without financial intermediation). But the utilities sector with three companies in the top 25, which represented 11.8% of the total turnover, was just as important. Again, electrical engineering played an important role although only two electrical engineering companies were big enough to enter the top 25. The larger one, Siemens, was the third biggest German company at that time and the sector represents 10.8% of the summarized turnover.

The trend of privatisation is also visible in the small sample as two big former state owned companies appear. The Deutsche Telekom and the Deutsche Post emerged from the Bundespost, the former German Federal telecommunication and postal service. The Bundespost has not been included in our samples for the earlier benchmarks, because it had been state-owned and had not been run as a competitive business enterprise before.

Table 10: Shares of the sectors of total turnover and their performances (ROE) 1998-2000

Sector	Average share of the sum of turnover represented in the large sample [%]	Average performance of all three companies represented in the large sample [%]
1 Mining	2.0	10.7
2 Utilities	11.8	13.4
3 Construction	1.6	-3.2
4 Property companies	1.3	16.2
6 Commercial activities	9.6	9.6
7 Financial intermediation		9.6
8 Food, drink and tobacco	1.1	18.5
9 Textiles and leather goods	0.8	14.5
10 Mechanical engineering	2.5	15.1
11 Electrical engineering	10.7	14.9
12 Transport equipment	27.9	6.1
15 Mature industries	3.2	14.2
20 Transport	4.4	9.7
21 Posts and telecom	6.8	17.2
23 Oil and rubber	3.9	34.3
24 Chemicals and pharma	7.7	11.7
25 Leisure and tourism	1.5	15.4
26 Insurance		13.8
27 Media	1.8	19.2
28 Services to business	1.4	9.6
29 Public admin and health	0.1	21.1

⁴⁸ Daimler-Benz merged with the American car manufacturer Chrysler in May 1998. See Dohmen et al., *Industriepolitik* (2004), 25.

Also a merger wave in the 1990s changed the structure of big business in Germany.⁴⁹ Therefore two new conglomerates are among the top 25: the utility giant E.ON resulting from the merger of VEBA and VIAG in 2000, and ThyssenKrupp which combining three former big players of the German heavy industry: Hoesch (merged with Krupp in 1992), Thyssen and Krupp (merged in 1999).⁵⁰

Mergers were no longer a “national” phenomenon but large-scale enterprises were affected by the process of increasing globalization at the end of the 20th century. There was a huge rise in international mergers from 1998 to 2000 with German companies absorbing as well as being absorbed. Four mergers serve as examples here: Firstly, the hostile takeover of Mannesmann – that had turned from a heavy industry company to one of the leading cellular radio companies – by Vodafone in February 2000; secondly, the acquisition of Chrysler by Daimler-Benz in May 1998; thirdly, Rhône-Poulenc taking over Hoechst in November 1999 and finally Deutsche Bank buying Bankers Trust in November 1998.⁵¹ Associated with globalization the shareholder structure of many German companies changed since the 1990s. The consequence was the breaking-up of the old ownership structure called the “Deutschland AG” with the biggest amount of shares held by the big German banks or other German companies.

Table 11: Large Sample 1998-2000 - Best/worst performing companies

The best performing companies 1998-2000 (ROE)				
Rank	Company	Sector	ROE average	Std. dev.
1	Deutsche Post AG	Post and telecoms	41.7	3.7
2	Gruner + Jahr AG & Co.	Media	39.6	0.0
3	Deutsche Shell GmbH	Oil and rubber	38.4	7.3
4	Deutsche BP AG	Oil and Rubber	38.0	6.6
5	Hugo Boss AG	Textiles and leather	29.3	4.6
6	RWE-DEA AG für Mineraloel und Chemie	Oil and rubber	26.5	2.9
7	SAP AG	Services to business	24.4	2.7
8	ZF Friedrichshafen AG	Mechanical engineering	22.6	9.7
9	Rhön-Klinikum AG	Public admin/health	21.1	3.5
10	Bertelsmann AG	Media	20.0	3.2

The worst performing companies 1998-2000 (ROE)				
Rank	Company	Sector	ROE average	Std. dev.
1	Philipp Holzmann AG	Construction	-32.2	31.3
2	BMW AG	Transport equipment	-11.6	36.5
3	Infineon Technologies AG	Services to business	-5.2	23.5
4	Alcatel SEL AG	Post and telecoms	0.5	16.8
5	Bilfinger + Berger Bau-AG	Construction	0.9	5.9
6	RAG Aktiengesellschaft	Mining	1.2	1.9
7	Deutsche Bahn AG	Transports	1.3	0.5
8	Adidas-Salomon AG	Textiles and leather goods	4.1	24.9
9	ThyssenKrupp AG	Mature Industries	4.7	1.4
10	Bayerische Hypo- und Vereinsbank	Financial	5.3	1.3

⁴⁹ See Berghoff, *Moderne Unternehmensgeschichten* (2004), 110-112; Prollius, *Deutsche Wirtschaftsgeschichte* (2006), 271-272.

⁵⁰ Prollius, *Wirtschaftsgeschichte* (2006), 271.

⁵¹ See Dohmen et al., *Industriepolitik* (2004), 8.

Only three of the top 20 non-financial companies performed well enough to reach the group of the top ten performers: the Deutsche Post AG with an extraordinarily high ROE of 41.7%, the Deutsche Shell GmbH (av. ROE 38.4%) and the Bertelsmann AG (av. ROE 20.0%). Among this group we find all three companies operating in the oil business. The media sector was the second sector that appears with more than one company: the journal publisher Gruner + Jahr and the big media holding Bertelsmann.

Among the worst performing companies we find two construction companies. BMW was in the second place on the list of worst performers because of the enormously lossy business year 1999. The company suffered from the debacle of the merger with the British car manufacturer Rover which was sold in 2000 so that BMW recovered again.

The general increase of the ROE level compared to every benchmark period before is eye-catching: The average ROE of all companies represented in the small sample was 13.9% and a company had to gain a ROE of nearly 20% to reach the top 10 of the best performers, which is enormously high with regard to the German historical data. These figures illustrate the rationalization activities of Germany big business since the fall of the iron curtain in order to meet the challenges of the increasing globalization.

3. Conclusion

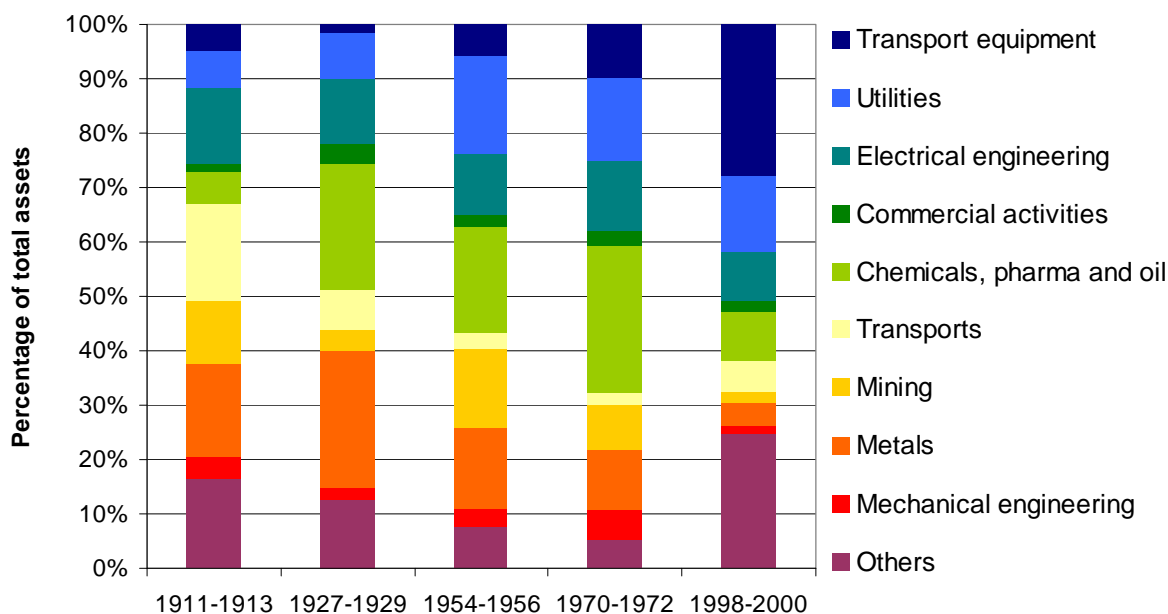
Until now we have analysed structure and performance of German big business on the basis of our samples of company data. Which general facts can be distilled from these observations?

For that purpose we can regard how the sectors' shares of all assets represented in the sample change develop during the 20th century; additionally for the last two benchmark periods the percentage of the total turnover can be observed as well (see figure 1). What do those figures reveal? First of all it is obvious that the importance of different industrial sectors within big business varies over time. German large-scale enterprises were dominated by heavy industry until the 1950s: Mining and metal companies held almost one third of all assets represented in the large sample in the three early benchmark periods.⁵² From the 1920s onwards we can follow the rise of the chemical and the related oil and rubber industry, that finally overtook all others in the 1970s – measured by assets and by turnover – and lost the top position to the transport equipment sector in 1998-2000. Another interesting point is the strong position of utilities measured by total assets, especially in the 1950s and 1970s, which was partly due to the high capital intensity of the power grid. However, the role of utilities within big business is not that crucial when measured by turnover.

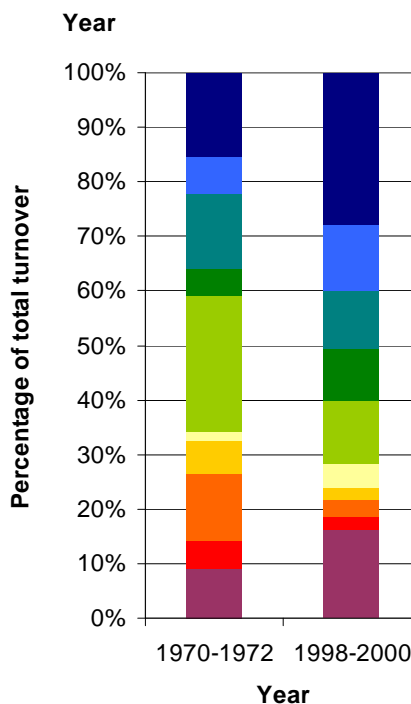
Furthermore, the group of “other” industrial sectors not namely listed in the diagram should also be considered briefly. They played an important role at the beginning and at the end of the 20th century. In 1911-13 it were the freestanding companies (i.e. German companies with business abroad) which held the lion's share of all “other” companies (7.3% of all assets in the large sample). In 1998-2000 the companies of the post and telecommunication companies held about 18.6% of all assets, which was mostly due to the former state-owned companies, the Deutsche Post and the Deutsche Telekom. Measured by turnover the share of these branches was only 6.8%, nevertheless this sector takes the biggest part of the “others” in this respect, too.

⁵² The apparent decline of the mining industry proportional to the metal sector in the 1927-29 benchmark period is triggered by the integration of mining and metal works under the roof of the Vereinigten Stahlwerke or the other big heavy industry companies which balloons the amount of metals industry. For details see p. 9.

Figure 1: Large Sample 1913-2000 - Sectoral Shares of total Assets/Turnover



Annotation: The banking and the insurance sector were excluded for that analysis. It would make no sense to integrate those branches because of their specific structure of preparing the balance sheet so that the values of the assets are not comparable to those of other sectors. Apart from that banking and insurance companies do not report turnover values.



In the following, we give a general overview on the development of profitability of German big business throughout the observation period. The table below shows the average return on equity of all companies in the large sample for each benchmark period. Our data are compared to the calculations of the “return on shareholders’ funds” offered by Cassis, who analysed a varying sample of large-scale enterprises, chosen by a combined criterion of workforce, share capital, and turnover.⁵³

⁵³ Cassis calls his measure for profitability “return on shareholders’ funds” but calculates it in the same way we did, so it should be comparable. Cassis, *Big business* (1997), 86. For the first three benchmark periods Cassis chose companies by workforce or share capital in order to include all top companies as well as to consider all sectors. For 1911-13 he included 39 German companies, for 1927-29 he analyzed 45 companies but only 41 were integrated in the analysis of profits, for 1953-55 he also picked 45 companies but only 32 were used to calculate the profit ratio (Cassis, *Big business* (1997), 238, 245-247, 255-257, 264-266) For his

Table 12: Average Performance (ROE)

	Project-Data	Cassis ⁵⁴
1911	9.9	10.7
1912	10.8	
1913	8.9	
	9.9	
1927	8.0	7.2
1928	10.0	
1929	7.4	
	8.5	
1954	6.9	3.0
1955	4.4	
1956	6.2	
	5.8	
1970	13.8	7.2
1971	9.9	
1972	11.0	
	11.6	
1987 - 1989	not available	10.5
1998	13.0	not available
1999	12.8	
2000	15.9	
	13.9	

Both statistical series show the same tendencies: The late German Kaiserreich was a period of high profitability for big business whereas profitability in the Weimar Republic was significantly lower. But the difference between the two values is significantly smaller in our project data than in Cassis' data. In the 1950s, the period of the so-called Wirtschaftswunder, German large-scale enterprises performed with the lowest profitability ratios in the whole 20th century, this general conclusion is supported by both figures. But again, our data suggests a much higher profitability of German big business as Cassis does, and the difference between the figures is even bigger than for the late 1920s: using the project data profitability appears to be almost twice as high. The 1970 values show a similar tendency. Both data series reveal a rising trend, yet Cassis' results are again lower than ours. Both studies show a rising profitability of German large-scale enterprises by the end of the century. By the 1980s German big business could keep up with its success in the Kaiserreich, when it was the global market leader in many industrial sectors. In the years following the reunification the profitability of large-scale enterprises reached a level it had never had before.

The result of this short national study is that Cassis' appreciation of German big business was perhaps too negative and consequently his conclusion that "British companies have consistently generated higher profits than their [...] German counterparts"⁵⁵ possibly has to be modified slightly. A preliminary comparison between the performance of big business in some European countries on the basis of the project data done by Cassis and Brautaset in a yet unpublished paper confirms this view.⁵⁶

fourth benchmark period Cassis chose 32 German industrial companies with a turnover bigger than \$ 500 million in 1972 (Cassis, *Big business* (1997), 96, note 37), he used the same criterion for his 1987-89 data, when 33 German industrial companies with more than \$ 2.5 billion turnover were included (Cassis, *Big business* (1997), 238, note 2).

⁵⁴ His benchmark periods differ a little from ours: Instead of 1954-56 Cassis' data alludes to 1953-55. Additionally he analyses 1987-89. Cassis, *Big business* (1997), 86-87.

⁵⁵ Cassis, *Big business* (1997), 233.

⁵⁶ Cassis/Brautaset, *Performance* (2004), 12-14.

4. Appendix: Assets/Turnover and Performance table for the small samples

Table 13: Small Sample 1911-1913 Assets [Mill. Mark]

Company Name	Sector	1911	1912	1913
Deutsche Bank	Financial	2,137.25	2,259.96	2,245.68
Dresdner Bank	Financial	1,452.93	1,445.51	1,538.13
Bayerische Hypotheken- und Wechsel-Bank	Financial	1,307.86	1,337.05	1,379.48
Disconto-Gesellschaft (Direction der Disconto-Gesellschaft)	Financial	1,249.55	1,280.62	1,238.25
Preussische Central-Bodenkredit-Aktiengesellschaft	Financial	1,043.91	1,063.21	1,057.98
Krupp	Metals	526.28	575.64	599.57
AEG	Electrical eng.	333.08	378.04	463.05
Gelsenkirchener Bergwerks-AG	Mining	385.17	390.58	394.93
Hapag	Water transport	284.05	332.23	354.94
Siemens-Schuckertwerke GmbH	Electrical eng.	241.98	284.68	323.51
Deutsch-Ueberseeische Elektrizitäts-Gesellschaft	Freestanding comp.	251.11	279.84	304.66
Norddeutscher Lloyd	Water transport	256.73	268.20	283.01
Deutsch-Luxemburgische Bergwerks- und Hütten-AG	Metals	217.54	271.13	278.24
"Phoenix" AG für Bergbau und Hüttenbetrieb	Metals	215.82	221.42	223.99
Grosse Berliner Strassenbahn	Land transport	182.22	192.08	218.19
Siemens & Halske AG	Electrical eng.	160.33	188.11	189.66
Harpener Bergbau AG	Mining	182.90	183.32	185.94
Gesellschaft für elektrische Hoch- und Untergrundbahnen in Berlin	Land transport	128.58	140.00	170.03
Berliner Elektrizitäts-Werke	Utilities	154.43	163.70	168.38
Elektrizitäts-AG vormals Schuckert & Co.	Utilities	114.92	132.73	138.26
Bergwerksgesellschaft Hibernia	Mining	124.88	127.90	131.91
RWE	Utilities	108.31	118.09	130.80
Bayer	Oil and Chemicals	113.20	121.38	127.52
BASF	Oil and Chemicals	122.23	128.24	126.26
Vulkan-Werke, Hamburg und Stettin	Transport eq.	98.19	118.69	121.84

Table 14: Small Sample 1911-1913 Performance (ROE)

Company Name	Sector	Return on equity [%]				
		1911	1912	1913	Average	Std. dev.
Deutsche Bank	Financial	15.7	10.9	11.2	12.6	2.2
Dresdner Bank	Financial	9.4	9.6	10.1	9.7	0.3
Bayerische Hypotheken- und Wechsel-Bank	Financial	11.3	8.6	8.8	9.5	1.2
Disconto-Gesellschaft (Direction der Disconto-Gesellschaft)	Financial	9.2	39.9	9.1	19.4	14.5
Preussische Central-Bodenkredit-Aktiengesellschaft	Financial	10.7	9.8	9.3	9.9	0.6
Krupp	Metals	13.9	16.4	20.0	16.8	2.5
AEG	Electrical eng.	12.5	13.8	12.6	13.0	0.6
Gelsenkirchener Bergwerks-AG	Mining	7.3	8.5	10.3	8.7	1.2
Hapag	Water transport	8.1	8.9	9.5	8.8	0.6
Siemens-Schuckertwerke GmbH	Electrical eng.	14.5	14.1	14.2	14.3	0.2
Deutsch-Ueberseeische Elektrizitäts-Gesellschaft	Freestanding comp.	9.3	9.7	10.7	9.9	0.6
Norddeutscher Lloyd	Water transport	6.3	11.6	12.8	10.2	2.8
Deutsch-Luxemburgische Bergwerks- und Hütten-AG	Metals	9.1	7.3	8.2	8.2	0.7
"Phoenix" AG für Bergbau und Hüttenbetrieb	Metals	19.0	22.9	25.0	22.3	2.5
Grosse Berliner Strassenbahn	Land transport	9.9	9.4	8.4	9.2	0.6
Siemens & Halske AG	Electrical eng.	15.1	14.6	30.4	20.1	7.3
Harpener Bergbau AG	Mining	6.2	7.1	8.6	7.3	1.0
Gesellschaft für elektrische Hoch- und Untergrundbahnen in Berlin	Land transport	6.2	6.8	5.9	6.3	0.4
Berliner Elektrizitäts-Werke	Utilities	15.7	16.0	16.3	16.0	0.3
Elektrizitäts-AG vormals Schuckert & Co.	Utilities	8.6	8.6	8.9	8.7	0.1
Bergwerksgesellschaft Hibernia	Mining	7.0	9.1	12.3	9.5	2.2
RWE	Utilities	14.8	8.3	8.1	10.4	3.1
Bayer	Oil and Chemicals	26.0	27.7	26.5	26.7	0.7
BASF	Oil and Chemicals	20.5	23.9	23.8	22.7	1.6
Vulkan-Werke, Hamburg und Stettin	Transport eq.	7.9	5.1	0.8	4.6	2.9
Average		11.8	13.1	12.9	12.6	0.6

Table 15: Small Sample 1927-29 Assets [Mill. RM]

Company Name	Sector	1927	1928	1929
Deutsche Bank	Financial	2,488.90	2,919.30	5,533.83
Vereinigte Stahlwerke AG	Metals	2,072.98	2,087.37	2,145.79
Dresdner Bank	Financial	1,956.12	2,346.77	2,512.62
Darmstädter und Nationalbank	Financial	1,846.73	2,312.66	2,622.02
IG Farbenindustrie AG	Chemicals and pharma	1,817.57	1,851.87	1,792.97
Disconto-Gesellschaft	Financial	1,442.31	1,703.65	•
Commerz- und Privat-Bank AG	Financial	1,313.45	1,618.78	1876.53
RWE	Utilities	504.57	539.71	761.76
AEG	Electrical eng.	464.93	548.44	579.46
Fried. Krupp AG	Metals	431.26	448.04	472.78
Siemens-Schuckertwerke AG	Electrical eng.	357.81	415.75	420.75
Siemens & Halske AG	Electrical eng.	348.72	363.50	406.50
Norddeutscher Lloyd	Transport and communication	346.31	386.47	429.95
Gesellschaft für elektr. Hoch- und Untergrundbahnen in Berlin	Land Transport	338.32	•	•
Hapag	Transport and communication	306.06	346.34	379.46
Kali-Industrie-AG	Chemicals and pharma	287.26	387.66	0.00
Mannesmannröhren-Werke	Metals	224.44	248.88	251.00
Klöckner-Werke	Metals	223.32	235.91	233.82
Rudolph Karstadt AG	Commercial act.	184.50	266.75	336.95
Rhenania-Ossag Mineralölwerke AG	Oil and rubber	181.00	204.35	259.34
Norddeutsche Wollkämmerei und Kammgarnspinnerei	Textiles and leather	173.13	236.82	239.82
Vereinigte Glanzstoff-Fabriken AG	Textiles and leather	166.89	213.00	231.27
Harpener Bergbau-AG	Mining	165.10	179.80	224.49
Hamburger Hochbahn-AG	Railways	157.73	181.85	192.68
Hamburgische Electricitäts-Werke	Utilities	152.24	190.97	202.22

Table 16: Small Sample 1927-29 Performance (ROE)

Company Name	Sector	Return on equity [%]				
		1927	1928	1929	Average	Std. dev.
Deutsche Bank	Financial	11.3	11.3	12.0	11.6	0.3
Vereinigte Stahlwerke AG	Metals	6.6	6.6	6.6	6.6	0.0
Dresdner Bank	Financial	10.0	10.3	8.5	9.6	0.8
Darmstädter und Nationalbank	Financial	14.8	14.5	9.8	13.1	2.3
IG Farbenindustrie AG	Chemicals and pharma	8.1	12.3	10.9	10.4	1.7
Disconto-Gesellschaft	Financial	8.3	8.2	•	8.2	0.0
Commerz- und Privat-Bank AG	Financial	10.9	12.1	9.4	10.8	1.1
RWE	Utilities	8.0	8.3	9.3	8.6	0.6
AEG	Electrical eng.	5.9	7.9	9.6	7.8	1.5
Fried. Krupp AG	Metals	7.0	3.8	5.9	5.6	1.3
Siemens-Schuckertwerke AG	Electrical eng.	12.3	12.3	13.9	12.8	0.7
Siemens & Halske AG	Electrical eng.	28.8	13.7	17.5	20.0	6.4
Norddeutscher Lloyd	Transport and communication	8.0	6.9	7.6	7.5	0.5
Gesellschaft für elektr. Hoch- und Untergrundbahnen in Berlin	Land Transport	4.9	•	•	4.9	0.0
Hapag	Transport and communication	7.5	7.2	7.2	7.3	0.1
Kali-Industrie-AG	Chemicals and pharma	10.6	11.8	•	7.5	0.6
Mannesmannröhren-Werke	Metals	9.6	38.9	8.7	19.1	14.0
Klöckner-Werke	Metals	6.7	5.0	6.3	6.0	0.7
Rudolph Karstadt AG	Commercial act.	15.8	11.7	14.9	14.1	1.8
Rhenania-Ossag Mineralölwerke AG	Oil and rubber	-4.3	•	7.3	1.5	5.8
Norddeutsche Wollkämmerei und Kammgarnspinnerei	Textiles and leather	8.9	10.9	3.1	7.7	3.3
Vereinigte Glanzstoff-Fabriken AG	Textiles and leather	9.8	9.1	•	9.4	0.3
Harpener Bergbau-AG	Mining	6.3	0.8	4.5	3.9	2.3
Hamburger Hochbahn-AG	Railways	5.2	5.2	5.1	5.2	0.1
Hamburgische Electricitäts-Werke	Utilities	16.3	12.5	16.0	14.9	1.7
Average		9.5	10.5	8.9	9.4	0.7

Table 17: Small Sample 1954-56 Assets [Mill. DM]

Company Name	Sector	1954	1955	1956
RWE	Utilities	2,930.43	3,316.64	3,926.08
Deutsche Bank AG West	Financial	2,674.84	•	•
Süddeutsche Bank AG	Financial	2,537.93	•	•
Bayerische Hypotheken- und Wechsel-Bank	Financial	2,102.99	2,531.21	2,864.55
Commerzbank-Bankverein AG	Financial	1,792.52	2,128.72	2,446.98
Gelsenkirchener Bergwerks-AG	Mining	1,746.32	1,812.67	2,092.31
Rhein-Main Bank AG	Financial	1,604.34	1,736.32	•
Mannesmann AG	Metals	1,365.63	2,014.17	2,379.20
Bayer AG	Chemicals and pharma	1,318.03	1,472.52	1,737.62
Hoesch Werke AG	Metals	1,119.30	1,301.28	1,758.34
Bergwerksgesellschaft Hibernia AG	Mining	1,107.04	1,135.31	1,202.30
BASF	Chemicals and pharma	990.71	1,373.38	1,638.64
Siemens-Schuckertwerke AG	Electrical eng.	931.68	1,165.60	1,440.44
Siemens & Halske AG	Electrical eng.	869.48	1,062.99	1,365.52
Rheinische AG für Braunkohlenbergbau und Brikettfabrikation	Mining	824.90	1,070.97	1,200.40
Hoechst AG	Chemicals and pharma	823.49	1,131.71	1,270.79
Dortmund-Hörder Hüttenunion AG	Metals	770.22	815.41	909.59
AEG	Electrical eng.	763.80	954.05	1,081.87
Bayernwerk AG	Utilities	712.36	791.57	896.77
Hüttenwerke Phoenix AG	Metals	694.64	1,262.89	1,442.22
Preußische Elektrizitäts-AG	Utilities	669.80	771.34	848.00
Klöckner Werke AG	Mining	667.05	731.42	804.83
August Thyssen-Hütte AG	Metals	636.57	741.83	957.23
Esso AG	Oil and rubber	497.36	545.68	649.03
Volkswagenwerk GmbH	Transport equip.	457.00	576.15	645.45

Table 18: Small Sample 1954-56 Performance (ROE)

Company Name	Sector	Return on equity [%]				
		1954	1955	1956	Average	Std. dev.
RWE	Utilities	6.0	6.3	5.6	6.0	0.3
Deutsche Bank AG West	Financial	4.7	•	•	4.7	0.0
Süddeutsche Bank AG	Financial	4.7	•	•	4.7	0.0
Bayerische Hypotheken- und Wechsel-Bank	Financial	5.8	5.9	7.4	6.4	0.7
Commerzbank-Bankverein AG	Financial	6.4	5.0	7.2	6.2	0.9
Gelsenkirchener Bergwerks-AG	Mining	3.9	5.5	3.0	4.2	1.0
Rhein-Main Bank AG	Financial	5.2	5.1	•	5.2	0.0
Mannesmann AG	Metals	4.1	3.9	4.9	4.3	0.4
Bayer AG	Chemicals and pharma	5.4	6.1	7.3	6.2	0.8
Hoesch Werke AG	Metals	3.4	3.8	4.7	4.0	0.5
Bergwerksgesellschaft Hibernia AG	Mining	2.0	2.4	2.9	2.4	0.4
BASF	Chemicals and pharma	5.5	5.6	7.5	6.2	0.9
Siemens-Schuckertwerke AG	Electrical eng.	4.1	6.8	6.2	5.7	1.2
Siemens & Halske AG	Electrical eng.	5.2	6.6	5.2	5.7	0.6
Rheinische AG für Braunkohlenbergbau und Brikettfabrikation	Mining	2.6	2.3	2.0	2.3	0.3
Hoechst AG	Chemicals and pharma	5.5	5.6	6.4	5.9	0.4
Dortmund-Hörder Hüttenunion AG	Metals	-9.3	2.8	3.5	-1.0	5.9
AEG	Electrical eng.	4.2	4.2	6.3	4.9	1.0
Bayernwerk AG	Utilities	3.3	4.1	3.8	3.7	0.4
Hüttenwerke Phoenix AG	Metals	2.6	3.6	4.7	3.6	0.9
Preußische Elektrizitäts-AG	Utilities	5.1	3.2	3.9	4.1	0.8
Klöckner Werke AG	Mining	2.0	3.2	5.4	3.5	1.4
August Thyssen-Hütte AG	Metals	0.0	0.0	3.6	1.2	1.7
Esso AG	Oil and rubber	0.1	5.9	1.9	2.6	2.4
Volkswagenwerk GmbH	Transport equip.	4.2	3.8	7.6	5.2	1.7
Average		3.5	4.4	5.0	4.3	0.7

Table 19: Small Sample 1970-72 Turnover/Assets [Mill. DM]

Turnover 1970-1972 [Mill. DM]				
Company Name	Sector	1970	1971	1972
Volkswagenwerk AG	Transport equip.	15,791.00	17,310.00	16,833.00
Siemens AG	Electrical eng.	11,763.00	13,635.00	15,147.00
Hoechst AG	Chemicals and pharma	12,199.00	12,717.00	13,563.00
Bayer AG	Chemicals and pharma	11,129.00	11,920.00	12,820.00
August Thyssen-Hütte AG	Mature Industries	10,881.00	10,380.00	11,872.00
BASF	Chemicals and pharma	10,520.00	10,233.00	11,861.00
Daimler-Benz AG	Transport equip.	9,025.00	9,705.80	10,950.90
AEG-Telefunken	Electrical eng.	9,154.00	10,042.00	10,740.00
VEBA AG	Utilities	8,060.00	9,405.00	10,332.01
Ruhrkohle AG	Mining	7,415.60	7,150.10	6,685.20
Friedrich Krupp GmbH	Mature Industries	7,190.00	7,440.00	7,678.00
Gutehoffnungshütte Aktienverein	Mechanical eng.	6,344.00	7,145.00	7,618.00
Mannesmann AG	Mature Industries	7,363.00	7,178.00	7,155.00
Adam Opel AG	Transport equip.	5,126.00	5,476.00	6,489.90
Esso AG	Oil and rubber	5,777.00	6,392.90	6,418.90
Deutsche Shell AG	Oil and rubber	5,057.90	5,741.50	6,269.10
Rheinstahl AG	Mature Industries	5,401.20	5,729.00	5,778.00
Robert Bosch GmbH	Electrical Eng.	5,500.00	5,600.00	5,765.00
Hoesch AG ⁵⁷	Mining	6,713.00	5,439.38	5,000.00
Metallgesellschaft AG	Mature Industries	5,098.00	4,459.00	4,309.00
Assets 1970-1972 [Mill. DM]				
Company Name	Sector	1970	1971	1972
Deutsche Bank AG	Financial	31,432.00	49,787.00	58,758.00
Dresdner Bank AG	Financial	28,124.00	41,478.00	48,415.00
Commerzbank AG	Financial	23,778.00	30,230.00	35,333.00
Bank für Gemeinwirtschaft AG	Financial	17,101.00	20,405.00	23,728.00
Bayerische Hypotheken- und Wechsel-Bank	Financial	15,581.00	18,666.00	22,683.00

⁵⁷ The turnover figure for Hoesch AG 1972 can only be estimated, because in may 1972 Hoesch AG merged with the Koninklijke Nederlandsche Hoogovens en Staalfabrieken NV. The turnover figure is estimated according to the part Hoesch had at the consolidated enterprise Estel-Hoesch-Hoogovens NV.

Table 20: Small Sample 1970-72 Performance (ROE)

Company Name	Sector	Return on equity [%]				
		1970	1971	1972	Average	Std. dev.
Volkswagenwerk AG	Transport equip.	8.3	0.5	9.0	5.9	3.9
Siemens AG	Electrical eng.	13.8	7.5	12.7	11.3	2.8
Hoechst AG	Chemicals and pharma	11.4	8.7	9.0	9.7	1.2
Bayer AG	Chemicals and pharma	9.2	8.6	11.5	9.8	1.3
August Thyssen-Hütte AG	Mature Industries	12.0	3.4	3.1	6.2	4.1
BASF	Chemicals and pharma	7.9	6.9	9.3	8.1	1.0
Daimler-Benz AG	Transport equip.	16.4	12.1	15.1	14.6	1.8
AEG-Telefunken	Electrical eng.	7.3	5.5	2.8	5.2	1.8
VEBA AG	Utilities	15.0	11.5	26.3	17.6	6.3
Ruhrkohle AG	Mining	2.1	-33.1	-102.9	-44.6	43.6
Friedrich Krupp GmbH	Mature Industries	18.2	2.5	2.1	7.6	7.5
Gutehoffnungshütte Aktienverein	Mechanical eng.	7.3	10.5	8.6	8.8	1.3
Mannesmann AG	Mature Industries	15.2	8.2	9.6	11.0	3.0
Adam Opel AG	Transport equip.	17.4	18.5	21.3	19.1	1.6
Esso AG	Oil and rubber	11.0	10.7	2.3	8.0	4.0
Deutsche Shell AG	Oil and rubber	17.9	11.2	0.0	9.7	7.4
Rheinstahl AG	Mature Industries	0.5	-2.7	-0.4	-0.9	1.3
Robert Bosch GmbH	Electrical Eng.	4.3	9.2	12.4	8.6	3.4
Hoesch AG	Mining	22.1	5.2	2.1	9.8	8.8
Metallgesellschaft AG	Mature Industries	11.7	3.3	3.2	6.1	4.0
Deutsche Bank AG	Financial	9.6	8.7	10.8	9.7	0.9
Dresdner Bank AG	Financial	8.0	11.8	11.1	10.3	1.6
Commerzbank AG	Financial	8.3	9.8	9.9	9.3	0.7
Bank für Gemeinwirtschaft AG	Financial	6.4	8.8	9.6	8.3	1.4
Bayerische Hypotheken- und Wechsel-Bank	Financial	4.0	7.0	5.9	5.6	1.2
Average		10.6	6.2	4.2	7.0	2.7

Table 21: Small Sample 1998-2000 Turnover/Assets [Mill. DM]

Turnover 1998-2000 [Mill. DM]				
Company Name	Sector	1998	1999	2000
Daimler Chrysler AG	Transport equip.	257,744.00	293,345.00	317,595.50
Volkswagen AG	Transport equip.	134,243.00	147,013.00	167,331.04
Siemens AG	Electrical eng.	117,696.00	134,134.00	153,329.25
E.ON AG	Utilities	76,365.00	95,763.00	144,825.30
Metro AG	Commercial activities	91,704.00	85,674.00	91,787.10
RWE AG	Utilities	65,125.00	66,267.00	82,978.00
Deutsche Telekom AG	Post and telecoms	69,861.00	69,373.29	80,069.72
REWE Handelsgruppe	Commercial activities	•	•	73,690.00
ThyssenKrupp AG	Mature industries	•	58,272.00	72,774.48
BASF	Chemicals and pharma	54,065.00	57,644.00	70,304.27
BMW	Transport equip.	63,134.00	67,284.00	62,636.50
Deutsche Post AG	Post and telecoms	28,690.07	43,738.23	63,971.29
Robert Bosch GmbH	Electrical eng.	50,333.29	54,579.39	61,717.00
Edeka-Gruppe	Commercial activities	57,305.82	58,479.32	61,021.90
Bayer AG	Chemicals and pharma	54,884.00	49,275.00	58,647.52
Tengelmann Warenhandels- gesellschaft OHG	Commercial activities	•	•	53,394.16
Preussag AG	Utilities	35,869.00	32,273.00	42,742.71
Degussa AG	Chemicals and pharma	15,905.30	24,163.00	35,592.19
Deutsche Shell GmbH	Oil and Rubber	23,000.00	25,164.00	34,102.00
Bertelsmann AG	Media	22,958.00	25,991.00	32,318.13
Assets 1998-2000 [Mill. DM]				
Company Name	Sector	1998	1999	2000
Deutsche Bank	Financial	931,937.00	1,642,633.00	1,838,544.74
Bayerische Hypo- und Vereinsbank AG	Financial	901,119.00	984,281.00	1,401,379.58
Dresdner Bank AG	Financial	714,807.00	776,163.00	945,639.89
Commerzbank AG	Financial	638,013.00	727,647.00	899,020.73
Westdeutsche Landesbank Girozentrale	Financial	693,027.00	770,116.00	782,410.23

Table 22: Small Sample 1998-2000 Performance (ROE)

Company Name	Sector	Return on equity [%]				
		1998	1999	2000	Average	Std. dev.
Daimler Chrysler AG	Transport equip.	15.9	15.7	18.4	16.7	1.2
Volkswagen AG	Transport equip.	12.3	8.6	18.3	13.1	4.0
Siemens AG	Electrical eng.	3.0	10.8	30.8	14.9	11.7
E.ON AG	Utilities	8.6	16.7	12.2	12.5	3.3
Metro AG	Commercial activities	9.1	9.6	10.2	9.6	0.5
RWE AG	Utilities	11.1	15.2	16.3	14.2	2.2
Deutsche Telekom AG	Post and telecoms	9.8	4.3	14.1	9.4	4.0
REWE Handelsgruppe	Commercial activities	•	•	•	•	•
ThyssenKrupp AG	Mature industries	•	3.2	6.1	4.7	1.4
BASF	Chemicals and pharma	12.6	8.8	9.0	10.1	1.7
BMW	Transport equip.	7.1	-62.6	20.8	-17.4	36.5
Deutsche Post AG	Post and telecoms	46.4	41.3	37.4	41.7	3.7
Robert Bosch GmbH	Electrical eng.	7.2	6.9	•	7.0	0.1
Edeka-Gruppe	Commercial activities	•	•	•	•	•
Bayer AG	Chemicals and pharma	12.6	13.3	11.3	12.4	0.9
Tengelmann Warenhandels- gesellschaft OHG	Commercial activities	•	•	•	•	•
Preussag AG	Utilities	15.1	12.7	12.3	13.4	1.2
Degussa AG	Chemicals and pharma	21.1	10.6	6.4	12.7	6.2
Deutsche Shell GmbH	Oil and Rubber	37.6	29.8	47.6	38.4	7.3
Bertelsmann AG	Media	24.4	17.0	18.5	20.0	3.2
Deutsche Bank	Financial	9.8	11.1	18.0	13.0	3.6
Bayerische Hypo- und Vereinsbank AG	Financial	6.4	3.5	6.0	5.3	1.3
Dresdner Bank AG	Financial	8.7	9.3	13.3	10.4	2.0
Commerzbank AG	Financial	8.9	8.8	10.7	9.4	0.9
Westdeutsche Landesbank Girozentrale	Financial	2.9	2.4	2.6	2.6	0.2
Average		13.8	9.0	16.0	12.5	2.9

5. References

- W. Abelshausen, *Deutsche Wirtschaftsgeschichte seit 1945*, München 2004, 338-340
- V. R. Berghahn, *The Americanisation of West German industry. 1945-1973*, Leamington Spa, New York 1986, 94-100
- H. Berghoff, *Moderne Unternehmensgeschichte. Eine themen- und theorieorientierte Einführung*, Paderborn 2004
- C. Brautaset, Introduction, in: Idem (ed.), *Essays in European Business Performance in the 20th Century* (LSE Business History Unit Occasional Paper Nr. 1/2005), London 2005, 3-10
- Y. Cassis, *Big Business. The European Experience in the Twentieth Century*, Oxford 1997
- Y. Cassis/C. Brautaset, *The Performance of European Business in the Twentieth Century*, Paper presented at the International Colloquium on Business Performance in the 20th Century: A Comparative Perspective, Milan 14th-16th October 2004
- Y. Cassis/C. Brautaset, *The Performance of European Business in the Twentieth Century: A Pilot Study*, *Business and Economic History On-Line*, 1 (2003)
- A. D. Chandler, *Scale and Scope. The Dynamics of Industrial Capitalism*, 3. ed. Cambridge (Mass.)/London 1994
- A. D. Chandler, *Strategy and Structure. Chapters in the History of the American Industrial Enterprise*, Cambridge/Mass. 1962
- A. D. Chandler, *The visible hand: The managerial revolution in American Business*, Cambridge/Mass. 1977
- A. Colli, *The History of Family Business. 1850 – 2000*, Cambridge 2003
- D. Dammers/H. Fischer, *Die Performance der deutschen Wirtschaft. Die Entwicklung der Großunternehmen im 20. Jahrhundert im europäischen Vergleich*, in: *Jahrbuch für Wirtschaftsgeschichte*, 1/2006, 145-158
- F. Dohmen et al., *Industriepolitik: "Kämpfen Sie!"*, in: *Der Spiegel*, 6/2004, 22-25
- W. Feldenkirchen, *Concentration in German Industry 1870-1939*, in: H. Pohl (ed.), *The Concentration Process in the Entrepreneurial Economy since the Late 19th Century*. Lecture held on the 9th International Congress of Economic History in Berne, Switzerland, on August 28, 1986, Stuttgart 1988
- W. Feldenkirchen, *Big Business in Interwar Germany: Organizational Innovation at Vereinigte Stahlwerke, IG-Farben and Siemens*, in: *Business History Review* 61 (1987), 417-451
- W. Feldenkirchen, *Competition and Cooperation in German Electrical Industry in Home and World Market*, in: H. Pohl (ed.), *Competition and Cooperation of Enterprises on National and International Markets*, Stuttgart 1997, 13-34
- M. Fiedler, *Die 100 größten Unternehmen in Deutschland – nach Zahlen ihrer Beschäftigten – 1907, 1938, 1973 und 1995*, in: *Zeitschrift für Unternehmensgeschichte* 44 (1999), 32-66
- M. Fiedler, *Die 100 größten Unternehmen von 1938 – ein Nachtrag*, in: *Zeitschrift für Unternehmensgeschichte* 44 (1999), 235-242
- T. R. Gourvish, *What can business history tell us about business performance?*, in: *Competition & Change*, 10 (2006), 4, 375-392
- Handbuch der Deutschen Aktien-Gesellschaften. Das Spezial-Archiv der Deutschen Wirtschaft*, Darmstadt, Wien, Zürich, 1896/97ff.
- Handbuch der Großunternehmen. Anerkannt durch den Adreßbuchausschuß der Deutschen Wirtschaft*, Darmstadt u.a. 1952ff.
- P. Hayes, *Industry and Ideology. IG Farben in the Nazi Era*. 2. ed. Cambridge 2001
- K. H. Herchenröder et. al, *Die Nachfolger der Ruhrkonzerne*, Düsseldorf 1953
- Hoppenstedt Aktienführer, CD, Darmstadt 1998ff
- Hoppenstedt Auskunfts-CD Großunternehmen, Darmstadt 1996ff.
- M. J. Iversen, *Measuring Chandler's Impact on European Business Studies since the 1960s*, in: *Business History Review* 82 (2008), 2, 279-292.
- Chr. Kleinschmidt, *Rationalisierung als Unternehmensstrategie. Die Eisen- und Stahlindustrie des Ruhrgebiets zwischen Jahrhundertwende und Weltwirtschaftskrise*, Essen 1993
- J. Kocka/H. Siegrist, *Die hundert größten Industrieunternehmen im späten 19. und 20. Jahrhundert. Expansion, Diversifikation und Integration im internationalen Vergleich*, in: N. Horn, J. Kocka (eds.), *Recht und Entwicklung der Großunternehmen im späten 19. und 20. Jahrhundert*, Göttingen 1979, 55-122
- S. Lindner, *Den Faden verloren. Die westdeutsche und französische Textilindustrie auf dem Rückzug. 1930/45-1990* (Schriftenreihe zur Zeitschrift für Unternehmensgeschichte, vol. 7), München 2001
- T. Pierenkemper/R. H. Tilly, *The German Economy during the nineteenth Century*, New York, Oxford 2004, 139-140
- G. Plumpe, *Die I.G. Farbenindustrie AG: Wirtschaft, Technik und Politik 1904-1945*, Berlin 1990
- G. Plumpe, *The Political Framework of Structural Modernisation: The IG Farbenindustrie AG, 1904-1945*, in: W. R. Lee (ed.), *German Industry and German Industrialisation*, London 1991, 220-264
- H. Pohl, *Zur Geschichte von Organisation und Leitung deutscher Großunternehmen seit dem 19. Jahrhundert*, in: *Zeitschrift für Unternehmensgeschichte (ZUG)* 26 (1981), 143-178
- M. Pohl, *Zerschlagung und Wiederaufbau der deutschen Großbanken, 1945-1957*, in: *Beiträge zu Wirtschafts- und Währungsfragen und zur Bankgeschichte* 13 (1974), 21-32
- M. v. Prollius, *Deutsche Wirtschaftsgeschichte nach 1945*, Göttingen 2006
- A. Reckendrees, *Das "Stahltrust"-Projekt. Die Gründung der Vereinigte Stahlwerke A.G. und ihre Unternehmensentwicklung 1926-1933/34* (Schriftenreihe zur Zeitschrift für Unternehmensgeschichte, vol. 5), München 2000
- W. W. Rostow, *The Stages of Economic Growth. A non-communist Manifesto*, 14. ed. Cambridge/Mass. 1966
- Salings Börsen-Jahrbuch. Ein Handbuch für Bankiers und Kapitalisten*, Berlin, Leipzig, Hamburg, 1881/82ff.

H. Siegrist, Deutsche Großunternehmen vom späten 19. Jahrhundert bis zur Weimarer Republik. Integration, Diversifikation und Organisation bei den 100 größten deutschen Industrieunternehmen (1887-1927) in international vergleichender Perspektive, in: *Geschichte und Gesellschaft* 6 (1980), 60-102

G. Stolper et al., *Deutsche Wirtschaft seit 1870*, 2. ed. Tübingen 1966

R. Tilly, Großunternehmen: Schlüssel zur Wirtschafts- und Sozialgeschichte der Industrieländer?, in: *Geschichte und Gesellschaft* 19 (1993), 530-548

D. Weder, Die 200 größten deutschen Aktiengesellschaften. Beziehungen zwischen Größe, Lebensdauer und Wettbewerbschancen von Unternehmen, PhD Thesis Frankfurt am Main 1968

U. Wengenroth, Germany: Competition abroad – cooperation at home, 1870-1990, in: A. D. Chandler, F. Amatori and T. Hikino (eds.), *Big business and the wealth of nations*, Cambridge 1997, 139-175