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Introduction: German Industry in the Nazi Period

German economic growth during the thirties was exceptional. Between 1932 and 1938 real gross national income rose at an annual average rate of roughly ten per cent. This was only little less than the growth rate in West Germany after the monetary reform of 1948 which in popular memory is still considered an economic miracle.¹ Industrial production increased even faster in both periods, rising on average by 15 per cent between 1932 and 1938, and by 18 per cent between 1948 and 1954.² However, in each case the level of industrial production was extremely low at the beginning; consequently the unusual growth of industrial output can at least partly be explained by huge reserves of unused capacity.

But other factors also played a role, especially after 1948. Living standards grew rapidly which is indicated by the fact that between 1948 and 1954 alone real weekly wages increased by 90 per cent.³ Private consumption therefore rose dynamically in turn leading to a tripling of the production of consumer goods during those years.⁴ In addition progressive liberalization of international trade in the West favoured German industry, because it could offer a large range of production goods which were in very high demand in that period of European reconstruction. Manufactured exports of West German industry thus rose fifteenfold between 1948 and 1954 and in the latter year its export quota already reached 30 per cent.⁵ On the supply side the ready availability of factors of production supported growth of industry. Qualified and unqualified labour was not yet scarce, given still considerable unemployment, migration from East Germany and the big labour reserve in unproductive German agriculture. There was a large productivity gap, especially relative to the United States, and therefore much potential for the use of improved technologies with little cost. Profitability also was high.

¹ Albrecht Ritschl, *Deutschlands Krise und Konjunktur 1924–1934*, Berlin 2002, table B. 9; Albrecht Ritschl/Mark Spoerer, *Das Bruttosozialprodukt in Deutschland nach den amtlichen Volkseinkommens- und Sozialproduktsstatistiken 1901–1995*, in: *Jahrbuch für Wirtschaftsgeschichte* 1997/2, p. 53

² Reichs-Kredit-Gesellschaft, *Deutschlands wirtschaftliche Lage in der Jahresmitte 1939*, Berlin 1939, p. 4; *Statistisches Jahrbuch für die Bundesrepublik Deutschland* 1952, p. 209; 1956, p. 217

³ *Statistisches Jahrbuch für die Bundesrepublik Deutschland* 1952, p. 428; 1956, p. 491; for a price index see *Statistisches Jahrbuch für die Bundesrepublik Deutschland* 2001, p. 639

⁴ *Ibid.* 1956, p. 216

⁵ Christoph Buchheim, *Die Wiedereingliederung Westdeutschlands in die Weltwirtschaft 1945 bis 1958*, München 1990, pp. 186–187; for the net value of industrial production compare *Statistisches Jahrbuch für die Bundesrepublik Deutschland* 1956, pp. 216, 224

Thus all preconditions for a high propensity to invest were given resulting in a flexible supply of capital.⁶

Although output growth of production was similar, in other respects the situation of German industry during the Nazi period was totally different. First, despite a great increase in working hours real weekly net wages rose very little between 1932 and 1938 because of higher wage deductions and price inflation that was not adequately reflected by the official cost of living index.⁷ Although purchasing power increased, due to a swift reduction in unemployment, it did so in a much more restricted manner than after 1948. This was reflected in slow growth of consumer goods production, an increase of only about 50 per cent between 1932 and 1938. The output of investment goods grew at a far faster rate, increasing by 400 per cent. This provides a sharp contrast to the years between 1948 and 1954 when the two sectors grew at similar rates.⁸ Exports also performed very badly, declining 50 per cent by volume between 1929 and 1934. Then they increased again, but in 1937 still stood at hardly 70 per cent of their former level. Manufactured exports fared only slightly better.⁹ To be sure due to protectionism and currency problems world trade also declined during the same period, but only by roughly six per cent.¹⁰ Even compared to manufactured exports of other industrialized countries the volume of which shrank by 13 per cent between 1929 and 1937 German industry lost market shares.¹¹

How is the contrast to the export performance of West German industry in the post-war period to be explained? In his contribution to this volume *Michael Ebi* calls attention to several factors as were German foreign economic policy and the persecution of Jews which provoked discriminatory measures against German exports. Crowding out of export orders by sales to the military was another factor as well as problems with quality. But the principal cause was the fact that the Reichsmark was not devalued in a situation when Sterling, the Dollar and many other currencies were. This placed German exporters at a great disadvantage in international markets regarding price competitiveness. Although the government tried to correct this by various export subsidization schemes these proved only partly successful, as is shown by *Ebi*, not least because of their bureaucratic nature and lack of financial means. However, the massive upswing of the German economy was dependent on rising amounts of raw materials imports, which since

⁶ Steven N. Broadberry, How Did the United States and Germany Overtake Britain? A Sectoral Analysis of Comparative Productivity Levels, 1870–1990, in: *Journal of Economic History* 58, 1998, pp. 375–407; Alan Kramer, *The West German Economy 1945–1955*, New York 1991, pp. 195–214; Rolf H. Dumke, Reassessing the *Wirtschaftswunder*. Reconstruction and Post-War Growth in West Germany in an International Context, in: *Oxford Bulletin of Economics and Statistics* 52, 1990, pp. 451–491

⁷ André Steiner, Zur Neuschätzung des Lebenshaltungskostenindex für die Vorkriegszeit des Nationalsozialismus, in: *Jahrbuch für Wirtschaftsgeschichte* 2005/2, pp. 129–152

⁸ Reichs-Kredit-Gesellschaft, Deutschlands wirtschaftliche Lage in der Jahresmitte 1939, p. 4; *Statistisches Jahrbuch für die Bundesrepublik Deutschland* 1956, p. 216

⁹ *Statistisches Handbuch von Deutschland*, München 1949, pp. 392–395

¹⁰ *Statistisches Jahrbuch für das Deutsche Reich* 1941/42, p. 160*

¹¹ Alfred Maizels, *Industrial Growth and World Trade*, Cambridge 1965, pp. 432–433

1932/33 also had started to climb in price. Thus official gold and foreign exchange reserves of the Reichsbank were rapidly depleted; as early as the summer of 1934 they reached a low point of less than 100 million RM.¹² Therefore in September of that year Hjalmar Schacht, Reichsbank President and acting Minister of Economic Affairs, while still refusing to devalue the Reichsmark, took drastic measures instead, in order to tighten foreign exchange controls which had been introduced in mid-1931. These measures, termed the 'New Plan', created *Überwachungsstellen* (supervisory authorities) for each category of product. Thus every single import had to be approved by the authorities from now on. With this instrument at hand the acute foreign exchange crisis of 1934 could be overcome without choking the upswing. However, the German balance of payments situation remained precarious thereafter approaching crisis proportions again in 1936 and 1938.

The New Plan was used by the regime to favour import requirements of industries important for rearmament at the expense of those producing consumer goods. Thus it generalized a procedure which had first been adopted in spring of 1934, in order to control imports of textile fibres. *Gerd Höschle* argues in the present volume that the textiles industry was an obvious first candidate for restrictions of its raw materials imports, because textile fibres constituted the largest single product category of German imports and in 1934 there already were considerable stocks available in the country. Therefore negative effects of import restrictions on employment were not immediately to be expected. Nevertheless *Höschle* demonstrates that import curtailment soon provoked further measures, in order to ward off unwelcome consequences. Price controls were introduced for textiles to prevent their prices from rising fast in view of shortages to be expected. Capacity enlargement by textile firms generally was forbidden. In December 1935 the Law on Spinning Fibres (*Spinnstoffgesetz*) established a quota system to restrict the consumption of natural fibres by spinning companies, which was administered by the *Überwachungsstellen*. Thus the latter had soon extended their authority from controlling imports to becoming the principal agencies for the rationing of imported raw materials consumption of each individual firm. *Höschle* points out that the regulation of the textiles industry in fact was the model for regulation methods which later were applied to other branches of industry as well.

Domestically produced materials also became scarce before long, and the regime felt compelled to extend rationing to them. The most prominent case probably was the regulation of iron and steel consumption, addressed in this volume by *Ulrich Hensler*. When introduced at the beginning of 1937 it was intended as a short-term measure to overcome an acute shortage by establishing quotas for the largest consumers of iron and steel, such as the military. But it soon became clear that a new equilibrium in the market for iron and steel could not easily be established. In addition restriction of military purchases was against the major goal of the regime, i.e. preparation of war. Therefore the purpose of steel

¹² Statistisches Jahrbuch für das Deutsche Reich 1935, p. 348

rationing was totally reversed in the summer of 1937. Now its aim was to fully supply the needs of privileged consumers of iron and to satisfy other requirements up to a certain degree without undue delays. But to do so proved to be difficult; it led to a vast multiplication of detailed regulations without ever being fully successful, not least because, given the situation, hoarding became a favourite reaction of firms using iron and steel in their production.

When the Nazi regime came to power mass unemployment constituted the biggest economic problem in Germany. Although the beginning of the upswing out of the Great Depression in autumn 1932 and its continuation in 1933 mainly was the result of private economic forces,¹³ soon public orders became the principle demand factor which created further new employment. Thus in 1934 almost half the increase of the net value of industrial production was due to public orders for the purpose of rearmament.¹⁴ Therefore it is not astonishing that the speed with which unemployment was reduced differed largely among sectors, as is shown in the contribution of *Rüdiger Hachtmann*. Already in 1934 there occurred some shortages of skilled workers in the metal-working and construction industries, i.e. branches being especially favoured by rearmament. These were aggravated later on not least through the introduction of universal military service in 1935 and the enlargement of the army with its consequent demand for technically trained people. The result was increasing pressure on wages which, however, potentially contradicted the aims of the regime to contain wages in order to prevent cost inflation and to restrict private consumption with a view towards directing as many resources as possible into the preparation of war.

Another problem area with regard to labour availability was agriculture. The desire for greater autarky in food and the problems of the balance of payments demanded a reduction of agricultural imports, in contrast to the time of the Federal Republic. This moved the regime to fully exploit every possibility to enlarge agricultural production. On the other hand productivity growth in agriculture apparently was lower compared not only to the post-war period, but even the Weimar period.¹⁵ Therefore the outmigration of agricultural workers, which was stimulated by higher wages and helped to mitigate the labour shortage in industry, could not be tolerated by the regime either. As always the way out of these problems was sought through regulation characterized by *Hachtmann* as the change from labour market policy to labour allocation policy. Beginning in 1934 labour exchange offices became ever more involved in the control of labour fluctuation. In 1935 work books were introduced. Finally in 1938 compulsory labour service was enacted as a means to staff priority projects.

¹³ Cf. Christoph Buchheim, *Der Wirtschaftsaufschwung im Deutschland der NS-Zeit*, in: *Jahrbuch des Historischen Kollegs* 13, 2007

¹⁴ Institut für Zeitgeschichte (IfZ)-Archives Da 003.003, Reichshaushaltsrechnung 1934; Ritschl, *Deutschlands Krise*, table A. 2; *Die deutsche Industrie. Gesamtergebnisse der amtlichen Produktionsstatistik*, Berlin 1939, p. 55; Reichs-Kredit-Gesellschaft, *Deutschlands wirtschaftliche Lage in der Jahresmitte 1939*, p. 4

¹⁵ Mark Spoerer/Jochen Streb, *Guns and Butter – But No Margarine: The Impact of Nazi Agricultural and Consumption Policies on German Food Production and Consumption, 1933–38*

It has already been observed that the regime was prompted to control textile prices when they started to increase after the supply of imported fibres had been restricted. Although during its early phase in power the regime deliberately raised prices for agricultural products in order to improve peasants' incomes, from the beginning it was clear to those responsible for economic policy that the intended wage freeze was dependent on prices largely remaining constant. And indeed according to the official index of consumer prices this condition practically was fulfilled with an increase of only four per cent between 1932 and 1938.¹⁶ But that index was not to be trusted any more. The upward movement of true costs of living, however, would not go unnoticed and at times, given the policy of constant nominal wages, led to considerable unrest among groups of workers.¹⁷ So it became imperative that the regime at least demonstrated intensive activity to fight further price increases. Therefore in the autumn of 1936 a Reich Commissioner for the Formation of Prices was appointed who immediately decreed a general price stop. In the contribution of *André Steiner* it is demonstrated that this generalized intervention in the price formation processes again made necessary ever more detailed regulations, the administration of which required a huge apparatus. For as was the case with iron and steel rationing, enterprises constantly were searching for ways to circumvent the regulations. That could be for instance substitution of more expensive for cheaper products, the reduction of quality, abandoning old customers for new ones, combined sales of two products and so forth. These strategies obviously resulted in increased costs of living, even if not adequately reflected by the official price index. Furthermore it proved to be impossible for even a large administration to closely check the effective prices of thousands of firms, especially since buyers, in view of widespread shortages, often tacitly agreed to higher prices in order to get the desired products at all. Therefore the conclusion drawn by *Steiner* with regard to price control is quite negative which hardly comes as a surprise. Besides the massive distortions of the price structure, considerable price increases were observed, even after the price stop, not only for textiles, but also for paper, furniture, iron, construction materials and some sorts of machines.

Therefore in the Nazi period not only were war-related state orders the most dynamic factor of overall demand in industry – in contrast to the time after 1948 when exports, private investment and consumption were much more important –, but the supply of factors of production proved also to be much less flexible. Around the mid-thirties shortages already started to develop which then became more and more widespread. That was true for labour, but also for material inputs. In the post-war period shortages of inputs were overcome by liberalization. Thus parallel to the 1948 monetary reform, rationing and price control were abolished in most branches of industry. As a consequence markets began to function properly again and shortages quickly disappeared except in a few sectors, as for instance in electricity generation, where prices still were closely administered by

¹⁶ Statistisches Handbuch von Deutschland, p. 463

¹⁷ Günter Morsch, *Arbeit und Brot. Studien zur Lage, Stimmung, Einstellung und Verhalten der deutschen Arbeiterschaft 1933–1936/37*, Frankfurt/M. 1993

the state until 1952. In the Third Reich the opposite course was taken. Shortages bred regulation which because of reactions of firms affected often led, as *Hensler* argues for iron and steel, to intensified scarcities, in turn provoking more detailed regulation.

Surprisingly the policy responses of the Nazi regime to an ever more inflexible supply of economic resources may have been rational from its perspective. One always has to keep in mind its principal aim with regard to industry and the economy as a whole which was to gear them as quickly as possible to the needs of a major war. However, that meant above all that the output of weapons and autarky-related products had to be maximized making necessary massive state-sponsored investment in those sectors. Liberal and extensive dealings with foreign countries and unlimited consumer goods availability thus were considered nothing but distractions from armament requirements. From this viewpoint non-devaluation made sense first because, as Schacht never forgot, it reduced the internal burden, calculated in Reichsmark, of external foreign-currency denominated debts freeing resources for other purposes than debt service. But non-devaluation also kept internal prices of imported raw materials for armaments production low. And it made intensive exporting without state subsidization – and control – infeasible, thus shifted the focus of firms to the internal demand for their products and by doing so greatly aided the armament effort. The same was true of the wage freeze. Exports and consumption just had the status of side conditions. They had to be fulfilled only to the extent that absolutely essential raw materials imports for rearmament-producing industries could be secured and workers kept quiet. With respect to foreign trade it is characteristic that Schacht in a meeting of ministers once stated: “Importing commands first place. Exporting [only] has the function [...] to get hold of foreign raw materials.”¹⁸ Regarding potential labour unrest it helped that full employment was soon achieved, precisely through rearmament. Besides, as implied by *Hachtmann*, the regime extensively used ideology as a means to pacify labour. If that still was insufficient the instruments of terror were available.

“The comprehensive control features of Germany’s present day economy have proven remarkably successful and have enabled the Government to provide and tide over situations which in the natural course of events would be dangerous if not disastrous.”¹⁹ The foregoing quotation from a report of the American embassy in Germany voices a certain astonishment that German growth did indeed continue despite all difficulties and explains this as a result of state regulation. And indeed the Nazi economy may be considered a good example for what can be achieved in the short to medium term by a highly developed industry, if that is subordinated to an overriding state goal and accompanying regulation. To be sure the resulting distortions, such as repressed inflation, eventually would reverse the growth. In the case of Germany, however, this has been somewhat belated because the occupation of huge territories brought to her additional resources.

¹⁸ Akten der Reichskanzlei. Die Regierung Hitler, vol. 3 (1936), p. 325 (transl. C. B.)

¹⁹ Germany, Internal Affairs, 1930–1941. Confidential U.S. State Department Central Files (microfilm), Frederic, MD, 1984, Reel 28, [U.S. Embassy] Berlin to Secretary of State, 21.6.37

But state regulation did not necessarily imply that the Nazis established a kind of planned economy. Closer inspection reveals that the Nazi state even lacked the instruments for central planning. Admittedly there was an attempt to construct balances of the physical supply and demand for hundreds of raw materials, as is demonstrated in the paper of *Adam Tooze*. Originally this emanated from the 1936 census of industrial production, which had been on the agenda since the 1920s. It was mainly a group of statisticians who first recognized that the census data, arranged accordingly, could provide the basis for production targeting in a planned economy, and they succeeded in catching the interest of the military and the Four Year Plan. However, they could not deliver on their promises, not least because they did not have the necessary manpower for this ambitious project. Other statisticians designed other ways to attain the same aim, but also in vain. The article of *Tooze* shows that proposals to give central planning some substance primarily came from statisticians who obviously would have greatly enlarged the importance of their profession if their ideas had borne fruit. But this never happened. Rather state control always was pursued in quite an unsystematic way, trying to tackle never-ending problems through ad hoc changes of the regulatory framework and additional intervention. Clear examples of this can be found in the articles by *Hensler* on iron and steel rationing and by *Hachtmann* about the labour market.

There are good reasons to assume that Nazi functionaries generally did not even desire a centrally planned economy. For Nazi ideology held entrepreneurship in high regard and greatly valued the supposed creativity of the German race and what could be achieved by it in industry. Therefore nationalization of private enterprises, which can be considered another precondition of central planning, was no option for them. Furthermore private property itself was seen as an institutional device to achieve cost efficiency and technical progress beyond the capability of enterprises led by state bureaucrats. That was important because the goal of maximizing war-related production clearly was promoted by high efficiency and productivity increases through technical progress.²⁰ The preservation of private firm property, not just in a nominal way, and regulation which actively discriminated against production of consumer goods and integration into a global network of trade therefore can be considered the two sides of the same coin; for a certain time two forces which normally contradict each other were bound together with the sole purpose of leading war.

Thus it is characteristic that during the Third Reich direct commands or outright force rarely were employed to achieve production targets in industry. Rather the regime devised a multitude of incentives to further its economic aims. Again textiles provide a good example. As explained above a quota system was

²⁰ Christoph Buchheim/Jonas Scherner, The Role of Private Property in the Nazi Economy: The Case of Industry, in: *Journal of Economic History* 66, 2006, pp. 408–410; cf. Memo of the Economic and Statistical Department of the Reichsbank on Financing Rearmament (27.2.36): “The abolishment of private property is out of question. [...] For the production and perfection of military requirements makes private initiative an absolute necessity.” (Akten der Reichskanzlei. Die Regierung Hitler, vol. 3, p. 155)

established for imported textile fibres which became ever more restrictive. At the same time, as is demonstrated by *Höschle*, additional raw material was supplied for the manufacture of textiles ordered by state and military agencies or if the goods produced were destined for export. In that way a broad field for further entrepreneurial initiative was opened up and directed to priority objectives of the state without detailed production targets for individual firms. Besides firms could still purchase inputs for the production of other goods, subject to the regular quotas. Clearly, textiles production during the Third Reich was not a centrally planned activity, the less so as exceptions from the investment ban were numerous and, despite price control, prices increased considerably.²¹

The existence of a fair degree of entrepreneurial autonomy implied that during the whole of the Nazi period private firms were still taking into account longer-term profitability. For example, as made clear by *Ulrich Hensler*, companies in metal-working industries anticipated the re-establishment of more competitive conditions after the war and therefore tried hard not to lose market shares in their traditional fields of civilian business until then. With this in mind, when taking up armaments orders, they sought to get orders for weapons the production of which would bring some advantages for their peacetime goods. Furthermore they wanted to keep up at least a token production of peacetime goods under all circumstances and were eager to circumvent all requests to standardize these products across different firms.

Naturally, investment decisions also were dependent on expectations. With regard to this *Jonas Scherner* in his paper analyses contracts for autarky-related investments which were concluded between the Reich and private companies. An important result obtained is that quite often protracted negotiations were required to get an agreement on such a project; moreover sometimes firms refused entirely to engage in a certain investment activity desired by the regime – without any negative consequences to them. It therefore appears that freedom of contract generally was respected during the Third Reich even in dealings between state agencies and private industry regarding priority investments.²² Instead of using force the state offered firms a number of contract options and thus tried to induce them to decide in favour of a specific war-related project. Those options implied different degrees to which entrepreneurial risks attached to an investment were assumed by the state. *Scherner* convincingly argues that firms then chose that option which they considered best regarding their short-term *and* long-term profit expectations. This meant for instance that in case of domestic copper mining, where short and long run profit expectations were negative, a contractual arrangement was selected by which the government not only paid for the losses

²¹ Gerd Höschle, *Die deutsche Textilindustrie zwischen 1933 und 1939. Staatsinterventionismus und ökonomische Rationalität*, Stuttgart 2004, pp. 139–144, 298–305

²² Of course, freedom of contract was not respected in the same way regarding Jewish firms or domestic enterprises in occupied territories. There also were some exceptions with respect to German companies. For example the airplane producer Junkers was such a case being expropriated in 1933/35 albeit against full compensation of the former owner; cf. Lutz Budraß, *Flugzeugindustrie und Luftrüstung in Deutschland 1918–1945*, Düsseldorf 1998, pp. 320–335

incurred, but the state also became the owner of the mines. On the other hand synthetic fuel plants were generally constructed under a so-called *Wirtschaftlichkeitsgarantievertrag* which guaranteed sales at remunerative prices for the duration of the contract (ten years), but allocated property rights to the private firm for it was assumed that in the long run the synthetic product might become competitive. With IG Farben a contract of this kind was concluded as early as 1933. This was much to the relief of the company which thereby was saved from huge losses because at this time the costs already incurred for developing synthetic fuel would otherwise have been non-redeemable. Characteristically, as *Raymond Stokes* states in his paper, the IG management immediately made the strategic decision based on the firm's interest not to invest in any more wholly owned fuel plants; however, research continued in this technology, as it still was considered potentially lucrative and in any case could be sold to other companies making autarky-related fuel investments with state-guaranteed profitability.

The consideration by firms of long-term effects of any important decision could have dramatic consequences for the economy as a whole. For example, according to *Hensler*, the shortages of iron and steel, which caused the introduction of a rationing system, were the result of insufficient blast furnace capacity. However, despite high short-term profitability the private iron and steel works refused to massively enlarge their facilities for the production of pig iron because they realized that the enormous demand for iron and steel only was an effect of the state-induced rearmament boom. Expecting the end of this boom in the near future they were afraid of large overcapacities in case they had invested too much. The Reichswerke Hermann Göring founded in 1937 therefore had the double purpose of utilizing low-grade German iron ore, but also of simply enlarging the capacity for iron production. But because of its high inefficiency the experience with that state-led concern proved to be very costly. Thus it even strengthened the conviction of the Reich bureaucracy to better make use in the war economy of private enterprises,²³ although this meant their autonomous decision-making processes largely had to be respected.

Table 1 shows that the investment activity of industry measured as percentage of gross national product still stood at quite a low level in 1934. Of course one could argue that capacity utilization also was low. However, in the second half of 1948 it was even lower, but the investment quota was already much higher than in 1934. Although industrial investment rose considerably until 1938, its share in GNP always remained below the levels of the 1950s. That is the more surprising because all autarky- and armaments-related investments – even military stand-by plants – are included in the figures presented for the thirties. The entrepreneurial risks of most of the latter investments, however, were transferred to the state by the contractual arrangements described above. Therefore they are not comparable to normal capital formation undertaken by private industry and should rather be thought of a kind of public activity; in fact only about 40 per cent of industrial investment in 1938 was strictly private, i.e. not directly influenced by state

²³ Buchheim/Schermer, *Role of Private Property*, pp. 406–407

Table 1: Industrial Investment in the 1930s and 1950s Compared

	<u>1932</u>	<u>1934</u>	<u>1936</u>	<u>1938</u>	<u>1948</u> 2 nd half	<u>1950</u>	<u>1952</u>	<u>1954</u>
1. Industrial Investment (mill. RM/DM)	439	1,060	2,493	4,679	1,740	4,650	7,100	9,190
2. Share of Industrial Investment in GNP (%)	0.8	1.6	3.1	4.7	4.8	4.7	5.1	5.8
3. Capacity Utilization (%)	52	73	86 (84)	98	51	•	•	•

Sources: *Investment*: Statistisches Handbuch von Deutschland, München 1949, p. 605 (1932, 1934); Jonas Scherner, Nazi Germany's Preparation for War: Evidence from Revised Industrial Investment Series (1936, 1938); Rolf Krengel, Die langfristige Entwicklung der Brutto-Anlage-Investitionen der westdeutschen Industrie von 1924 bis 1955/56, in: Vierteljahrshefte zur Wirtschaftsforschung 1957/1, p. 171 (1948II-1954; without handicraft and small industrial firms). *GNP*: Statistisches Bundesamt (ed.) Bevölkerung und Wirtschaft 1872–1972, Stuttgart 1972, p. 260 (1932–38; exclusive of interest payments for public debts according to Albrecht Ritschl, Deutschlands Krise und Konjunktur 1924–1934, Berlin 2002, table A. 12); Statistisches Jahrbuch für die Bundesrepublik Deutschland 1952, pp. 452–453 (1948 II); Statistisches Bundesamt, Volkswirtschaftliche Gesamtrechnungen. Revidierte Ergebnisse 1950 bis 1990 (= Fachserie 18, Reihe S.15), Stuttgart 1991, p. 46 (1950–1954). *Capacity Utilization*: A.F. Mester, Eine Zeitreihe der Ausnutzung des Sachkapitals (1925 bis 1938 und 1950 bis 1957), in: Ifo-Studien 7, 1961, p. 81 (1932–1938; maximum capacity utilization of 100 % assumed); Werner Abelsbauer, Wirtschaft in Westdeutschland 1945–1948, Stuttgart 1975, p. 118 (1948II and figure for 1936 in brackets)

priorities.²⁴ Investment control might have been partly responsible for this. But it is implausible that much can be explained by it, for even in the textiles branch which was subject to stringent controls many firms could invest substantial amounts which in total approached the dimension of general investment activity between 1936 and 1938.²⁵ That industrial investment indeed developed less dynamically than one would have expected in view of huge profits, and that industrialists were especially careful when it came to strictly private investment, rather was a result of the distorted character of the Nazi boom. Propelled above all by state demand such growth was considered unsustainable by entrepreneurs. In order to avoid potentially great overcapacities in case state demand faltered, they were keen not to enlarge their capital stock too much as has been shown for the iron and steel industry. Instead of investing in material capital they utilized existing capacity to the utmost and used their earnings to repay bank credits, to purchase share holdings, or simply to hoard liquidity.²⁶

²⁴ Ibid., pp. 411–412

²⁵ Höschle, Textilindustrie, pp. 298–299

²⁶ For examples cf. Christoph Buchheim, Unternehmen in Deutschland und NS-Regime

The foregoing argument leads to an important conclusion. For the supply not only of labour but also of physical capital appears to have been much less flexible during the thirties than during the fifties. The reason for this was not any lack of financial means as one could think because of the absorption by the state of most funds coming up in the capital market. Rather the refusal of industry to invest more was reflecting its fear of overcapacities. This then was the real cause of shortages of material inputs which in theory could be domestically produced in much larger quantities, as for example iron and steel.

Ironically the options which were available to industrialists were in some respects even greater during the Third Reich than in West Germany. As *Hachtmann* shows the position of employers within their companies was strengthened, because trade unions and the former workers' councils were abolished, the German Labour Front being no substitute for these traditional workers' organizations. In addition the Nazi regime apparently was much more susceptible to corruption than a democracy like the Federal Republic. The principal reasons were, as *Frank Bajohr* argues in his contribution, the abolition of the orderly division of state power and the lack of a critical public opinion. Furthermore the Nazi system was characterized by a great importance of personal and clientele relationships which were relatively open to bribery. Finally the high significance of state orders as part of overall demand certainly provided an often irresistible incentive for firms to use bribes in order to participate in lucrative business with state agencies. More than that they even developed a form of systematic and permanent corruption which is illustrated in the *Bajohr* paper by the case of Philipp Reemtsma, who then was the predominant cigarette manufacturer in Germany. By generously, sometimes regularly, transferring considerable amounts of money to Göring and other influential figures of the regime, Reemtsma, a former top representative of the 'Weimar system', could not only provide a kind of political insurance for himself but also acquire great personal influence and quite a few official functions. In addition his firm was thriving, its share in cigarettes sales approaching two thirds of the total in 1939.

Of course, Reemtsma probably was an exception. However, it is clear that industrialists used their personal relations to high representatives of the regime, in order to attain certain objectives. That this strategy could be quite successful, is shown in *Gerald Feldman's* article. After Austria had been incorporated into the Reich, Krupp, IG Farben and some other German companies were eager to purchase the capital shares of specific Austrian firms which were held by the Creditanstalt. Although this Austrian bank as well as some Austrian Nazi functionaries did everything to resist transfers of Austrian capital assets into German hands, their efforts finally were frustrated not least because of the support the German companies received from German Nazi figures.

The foregoing is an important result regarding the main question which is dealt with in *Feldman's* paper. That is whether the stripping of the Creditanstalt

1933–1945. Versuch einer Synthese, in: *Historische Zeitschrift* 282, 2006, pp. 362–365; idem, *Die Wirtschaftsentwicklung im Dritten Reich – Mehr Desaster als Wunder*, in: *Vierteljahrshefte für Zeitgeschichte* 49, 2001, pp. 658–659

of substantial holdings amounted to a conscious restructuring of that institution according to principles followed by German banks, for at that time they displayed much less interest in themselves owning industrial stock. The episodes mentioned show that there probably was no such intention, because the initiative in the cases treated generally lay with the German industrial firms. But whereas private firms normally acquired shares very selectively, often only motivated by the desire to ward off competitors, the Reichswerke Hermann Göring seems to have overtaken the capital of many Austrian companies in a relatively indiscriminate manner. This, however, had nothing to do with any plan to restructure the Creditanstalt either which is proven by the fact that the bank in turn acquired new industrial and commercial holdings.

Private industrial firms seem to have mostly acted with some restraint regarding purchases of foreign firms in occupied territories. As was the case with decisions on capacity enlargement they were not easily prepared to take the risks involved in such purchases, even if short-term profit expectations were high; rather they pondered the long-term consequences of any move. Therefore, to the chagrin of the authorities, during the war they quite often were only willing to operate a foreign company, while leaving the fulfilment of substantial financing requirements to the state.²⁷

So far it has been demonstrated that regarding non-Jewish industrial companies operating within Germany property rights generally were respected by the regime and legal procedures for the conclusion and supervision of contracts still applied. Thus industrial life still developed largely under the rule of law. Therefore it is not astonishing that company leaders acted accordingly always placing the short- and long-term objectives of their enterprise before the priorities of the regime. On the other hand, because the Nazi dictatorship was prone to corruption, additional ways to attain their aims were opened up to managers which obviously conflicted with the rule of law and potentially also hurt other firms. Although preferential treatment of one firm compared to others certainly existed it is hardly conceivable that corruption overturned the rule of law in most cases. *Scherner* for example shows in his article that once a contract for an autarky-related investment had been concluded with a private firm no other company normally could get better terms for a similar investment, because by this principle the state wanted to protect itself against blackmailing. In that context the finding of *Johannes Bähr* also is interesting, namely that the Dresdner Bank, despite its closer ties with the Nazi regime compared to the other big banks, derived no competitive advantage from this, at least not within the Reich. Therefore it would be not astonishing if in economic matters the rule of law was much stricter adhered to by the regime in Germany (with regard to non-Jewish firms) than in occupied territories where foreign firms also were involved.²⁸

Bähr demonstrates that a further factor affected the ability of industrial companies to act according to their own perceived interest. For not only the power of

²⁷ Buchheim, *Unternehmen in Deutschland*, pp. 380–381

²⁸ See also Frank Bajohr, *Parvenüs und Profiteure. Korruption in der NS-Zeit*, Frankfurt/M. 2001, p. 191

workers, but also the traditional influence of the Dresdner Bank and other big banks on German industry has been reduced during the Third Reich in several respects. Formally the new Stock Corporation Law of 1937 strengthened the executive board of companies and its independence from shareholders and supervisory boards. Basically these changes had nothing to do with Nazi ideology; rather they had been already planned since the days of the Weimar Republic. But they potentially weakened the influence banks could exercise through proxy voting rights in shareholders' meetings and through seats in supervisory boards. Probably more important, however, was that industrial companies, as has already been indicated, were not nearly as dependent on bank credit as before, because high earnings increased their possibilities of self-financing and through many investment contracts with state agencies they profited from public funds. Thus the influence of banks on investment decisions in industry became much less pronounced. Even if their importance for industrial firms as guides through the complex web of government regulations and as brokers in aryanization matters rose and even if personal relationships between bankers and industrialists continued, it is certainly right to state that industrial firms more and more emancipated themselves from banks, a process which after all increased their autonomy, too.

Finally, one further aspect of industrial life during the Third Reich is treated in the present volume, namely research and technical progress. At the beginning of this chapter it was mentioned that West German industry could tap an enormous potential for growth through imitating more productive foreign technologies. In that context the contribution of *Jochen Streb* about knowledge transfer in the plastics industry is important, because he explores different channels through which technological know-how could flow. In fact there were three such channels employed in the plastics branch during the Nazi period. One was vertical integration among firms producing basic plastics, those processing plastics and possibly firms making plastics processing machinery, as was the case with the IG Farben group. Economic policy of the regime was favourable to this channel, because cartelization and monopolization processes were not combated in any way, as long as there were valuable results, especially in form of products furthering autarky. Indeed, quite a few innovations did come up in that hierarchical network of cooperating firms. However, another hierarchical method of technology transfer employed during the war proved much less efficient. For compulsory knowledge-sharing in the committees and rings established under Speer greatly reduced the interest of innovative firms in developing new products and processes and as a consequence technical progress was potentially slowed down. The still existing autonomy of industrial companies clearly made such behaviour possible.

The final channel for technology transfer was through long-term contractual arrangements obliging an independent plastics processor to purchase the raw material from IG Farben in exchange for a continuous flow of new technical information. This kind of market institution, which was designed independently from the specific economic environment of the Nazi period, was used by plastics producers after the war with great success when the IG Farben concern had been dismembered. It would also have been an easy method by which German industry

as early as the thirties could have profited from American technical progress. But economic relations of Germany with the United States deteriorated very much during the Nazi period, especially after the U.S. threatened to apply antidumping measures against German exports in mid-1936.²⁹ Even more important was the fact that Germany lacked foreign exchange with which it could have paid for American technologies.

Thus in view of another severe balance of payments crisis in 1936³⁰ and given the eagerness with which the Nazi leadership undertook the preparation for war it seemed quite logical for them that everything had to be done to intensify the domestic production of substitutes for imported foreign technologies and products, especially raw materials. This then was the principal aim of the Four Year Plan which was inaugurated by Hitler personally in that same year. One consequence was, as pointed out by *Raymond Stokes*, a shift away from basic to applied research. And during the war the emphasis of R&D shifted again, this time towards incremental development of existing products and processes which of course implied a relative neglect of promising new areas. A further drawback of R&D concentrating on enhancing autarky and supporting military objectives was the fact that costs were only of minor importance. Therefore quite a few products and processes were developed with great effort the competitiveness of which on world markets was questionable. Among others *Stokes* mentions synthetic fuel from coal. After all, precisely because of its unprofitability under normal conditions – at least in the short and medium run – a *Wirtschaftlichkeitsgarantievertrag* was demanded by industry for the respective investments, as demonstrated above. Nevertheless *Stokes* comes up with a rather positive conclusion about R&D during the Nazi period, which in a number of ways proved very useful in the different economic and political context of the fifties.

But of course the effect on technical progress and productivity growth *during* the Third Reich is another question. In table 2 it is demonstrated that hourly labour productivity rose very little during the 1930s compared to its steep growth after 1949. Moreover from 1937 onwards it even slowly declined again, indicating an increasing overutilization of existing capacities (except stand-by plants). This then was another material effect of the low propensity of industrial firms to invest, if they themselves had to bear the financial risks involved.

The figures therefore lead to the conclusion that the rise of industrial output until the outbreak of war was mainly input- rather than productivity-driven. Indeed the fact that the Nazis took over only months after the upswing out of the Great Depression had set in, gave them the chance to prepare for war by simply directing formerly unemployed or underemployed resources towards rearmament. This could be achieved quite effectively, although the accompanying growth of state demand and build-up of state regulation bred scepticism among entrepreneurs regarding the future viability of the business upturn. However, there were clear limits for such growth dependent on the size of the workforce

²⁹ Akten der Reichskanzlei. Die Regierung Hitler, vol. 3, p. 452 n. 4

³⁰ Cf. *ibid.*, pp. 266–272, Die gegenwärtige Rohstoff- und Devisenlage (= Memo of the Economic and Statistical Department of the Reichsbank, 22.4.36)

Table 2: Hourly Labour Productivity¹ of (West-)German Industry, 1936 = 100

<u>1933</u>	<u>1934</u>	<u>1935</u>	<u>1936</u>	<u>1937</u>	<u>1938</u>
92.3	92.3	99.6	100	99.1	98.3
<u>1949</u>	<u>1950</u>	<u>1951</u>	<u>1952</u>	<u>1953</u>	<u>1954</u>
91.9	106.4	113.6	117.4	125.1	131.9

1) Value of net industrial production (excluding handicraft sector) per working hour of all wage earners

Sources: Reichsamt für wehrwirtschaftliche Planung, *Die deutsche Industrie. Gesamtergebnisse der amtlichen Produktionsstatistik*, Berlin 1939, p. 33; Reichs-Kredit-Gesellschaft, *Deutschlands wirtschaftliche Lage in der Jahresmitte 1939*, Berlin 1939, p. 4; Statistisches Handbuch von Deutschland, München 1949, p. 480; Bruno Gleitze, *Ostdeutsche Wirtschaft. Industrielle Standorte und volkswirtschaftliche Kapazitäten des ungeteilten Deutschland*, Berlin 1956, p. 173; Statistisches Jahrbuch für die Bundesrepublik Deutschland 1953, p. 238; 1956, pp. 191, 216–217

and that of the industrial capital stock which, given low productivity increases, were almost binding.³¹

But things changed during the war when industrial productivity appears to have risen quite a bit. At least that is the result of a careful calculation presented in a special report of the United States Strategic Bombing Survey (USSBS). There it is made plausible that hourly labour productivity in German industry increased by about 23 per cent between 1939 and 1944.³² Although at first sight this might be quite surprising in view of the substitution of a great part of the German workforce by forced foreign workers and prisoners of war, there is other evidence, even besides structural changes favouring the more productive branches of industry, making the result plausible.³³ For example with longer runs of certain types of weapons produced massive learning effects occurred. Increased sub-contracting also contributed to the rise in productivity, as did organizational changes combined with new investments which resulted in greater use of flow production methods.³⁴

³¹ Even in the first report of the Sicherheitshauptamt on the year 1938 a warning was expressed that overutilization of capacity would lead to an above-average production only in the short term, but in the medium run would bring deterioration of the capital stock and lower productivity; cf. Heinz Boberach (ed.), *Meldungen aus dem Reich 1938–1945. Die geheimen Lageberichte des Sicherheitshauptamtes der SS*, Hersching 1984/85, vol. 2, p. 158

³² The figure is for Germany including Austria and the Sudetenland; USSBS, *Industrial Sales, Output and Productivity. Prewar Area of Germany. 1939–1944* (= Special Paper no. 8), 1946; see also J. Adam Tooze, *No Room for Miracles. German Industrial Output in World War II Reassessed*, in: *Geschichte und Gesellschaft* 31, 2005, pp. 439–464

³³ USSBS, *Industrial Sales*, pp. 12–13

³⁴ For productivity in the production of weapons see Jonas Scherner/Jochen Streb, *Das Ende eines Mythos? Albert Speer und das sogenannte Rüstungswunder*, in: *Vierteljahrschrift für Sozial- und Wirtschaftsgeschichte* 93, 2006, pp. 172–196; for an individual company compare Neil Gregor, *Daimler-Benz in the Third Reich*, New Haven 1998, pp. 120–125

Nevertheless the increase of hourly labour productivity during the war has to be seen in perspective. First the most important contribution to total productivity growth before 1944 was derived from the metal working branches, i.e. the armament producing sector of industry, where productivity rose fastest and which also doubled its sales during the war whereas those of all other industrial sectors increased but little.³⁵ But after the war the structure of industry changed to normal with the weight of metal working in total industry shrinking a lot. This obviously was an important reason for the fact that the wartime productivity gain had again disappeared in 1949/50. Furthermore, while between 1939 and 1944 productivity grew by an average annual rate of 4.2 per cent, this rate rose to 7.5 per cent in the period 1949 until 1954 and was 6.6 per cent from 1955 to 1960.³⁶ Finally between 1930 and 1950 the German-American labour and productivity gap widened very considerably.³⁷ Therefore, if the Third Reich is considered as a whole one cannot but conclude that the pursuit of autarky and the fighting of war resulted in German industry losing instead of gaining ground in the international productivity race. In contrast, the period of the fifties brought peaceful development and the reintegration of West German industry in the world markets not only for goods, but also for technological knowledge, and with it much greater productivity advances.

³⁵ USSBS, *Industrial Sales*, pp. 3, 65

³⁶ Cf. table 2; *Statistisches Jahrbuch für die Bundesrepublik Deutschland 1961*, pp. 208, 224–225

³⁷ Broadberry, *How Did the United States and Germany Overtake Britain?*