1 The Audit of Defeat: Initial Conditions

As the guns went silent and the smoke evaporated in May 1945, the German landscape left little doubt among contemporaries that the country had hit Ground Zero. Almost 6 million German citizens had lost their lives in the worst of all wars; 12 million were held captive in Allied prisoner-of-war camps. Innumerable souls had perished at the hands of the Nazi terror or had found refuge abroad. After the Allies had dropped more than 2 million tons of bombs over German territory, the population that survived the carnage lived among ruins (Kramer 1991, 14). Even at the start of 1946, industrial production attained scarcely one-fifth of the pre-war level.[1] Total war had resulted in total collapse, and those who waged it were well aware of the damage they had caused. When Soviet and American soldiers shook hands at the river Elbe, they could see nothing but rubble around them. The architect of the Nazi war machine, Albert Speer, confessed in a letter to Hitler on 15 March 1945 that defeat was inevitable and forecasted the breakdown of war production within six to eight weeks.[2] In the same month, propaganda minister Joseph Goebbels scribbled these words into his diary:

> The air war still celebrates its wildest orgies. We are utterly defenceless against it. The Reich is gradually turning into a total desert … The situation becomes day by day more unbearable and we possess no means to defend us against this development.[3]

In the first post-war years, foreign observers from Isaac Deutscher to former US president Herbert Hoover reported of conditions unimaginable to the human senses that surpassed even the boldest military objectives of yesteryear.[4] The earliest scholarly accounts offered no

[1] OMGUS, *Industry*, No. 12, 1.
[2] *Memorandum von Rüstungs- und Bewaffnungsminister, Albert Speer an dem Führer, 15 März 1945*. In Ruhl (1982), Document No. 22, 73–6.
[3] My own translation from the German text cited in Krause (1997), 37.
[4] See the letter from Deutscher, 'Bavarian roads', in *The Economist*, 23 June 1945, reprinted in Kramer (1991), Document No. 11, 229. On the report of Hoover as special envoy of President Truman, see Vogelgsang (2016), 199–200.

less gloomy prophecies about the lasting economic impact of wartime destruction. They reckoned that the restoration of the transport infrastructure alone would take years, the rebuilding of the devastated cities and towns perhaps decades.[5] They were convinced that the occupying powers would dismantle large parts of an already decimated arsenal of industrial machinery and thus would effectively deindustrialise Germany. The defeated, disillusioned, and demoralised population had little hope for better days. Evacuated from their cities and towns during the war, their families annihilated or driven apart, their homes and businesses destroyed, their savings now all but worthless, they could hardly cherish dreams of prosperity. Initially, the presence of millions of refugees and internally displaced persons aggravated the situation further. Hunger, cold homes, and depression competed against one another in an evil race to create more misery.

For a while, it appeared that peace would turn the conditions created by war for the worse. As Figure 1.1 demonstrates, Germany lost a quarter of her territory within the 1937 borders. Almost two-thirds of the industrial production of the former Reich had concentrated in the west of the country, but the secession of the vast agricultural hinterland in the east deprived the German economy of its breadbasket, while the re-annexation of Alsace-Lorraine and the temporary control of the Saarland by France put the adequate supply of coal and iron for German industry in peril. The division of what remained Germany after the Potsdam Conference in July and August 1945 into four autonomously administered occupation zones and the carving up of Berlin into different sectors made the coordination of emergency measures and reconstruction attempts, if such were undertaken at all, nearly impossible. As long as the future of the country remained undecided, the internal borders made economic cooperation and trade across regions equally difficult (Spoerer and Streb 2013, 209–10).

Contemporary accounts of a crippled economy proved misguided. Historians gradually came to realise that the heritage that World War II and the post-war settlement bequeathed upon the western part of Germany was rather magnanimous. The fundamentals of the economic miracle that astonished those living at the time were laid in the 1940s. On the eve of its remarkable revival, the West German economy was endowed with more plentiful and modern productive assets than ever

[5] An OMGUS report in June 1947 forecasted that only repairing the dwellings damaged by war in the areas under its control would take approximately thirty years, but restoring the supply of housing to pre-war standards, accounting for the need to replace or renovate worn-down facilities and to expand the housing stock to accommodate an increased population, would require between forty and sixty years (OMGUS, *Industry*, No. 24, 28).

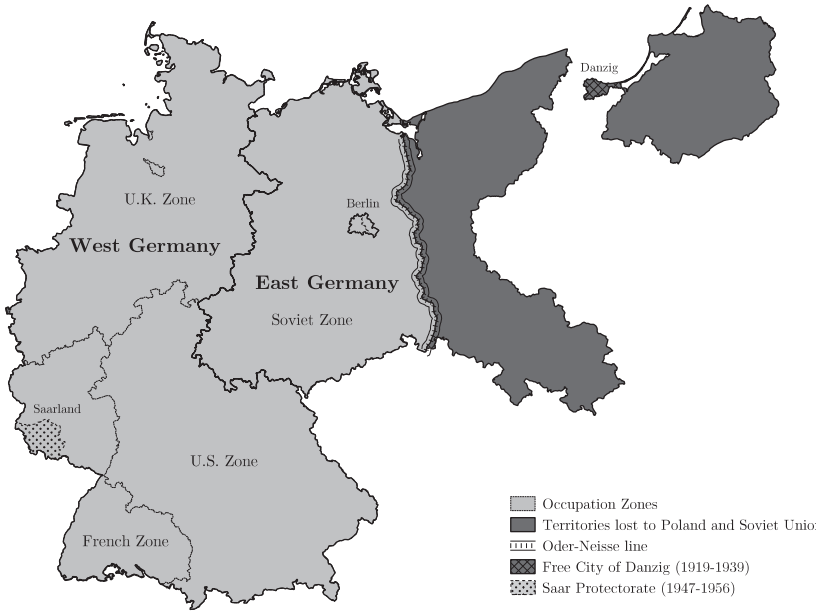

Figure 1.1 The territorial losses and division of Germany after World War II.
Source: Construction based on GIS shape files used for Figure 1 in Braun and Mahmoud (2014), 73. The authors have kindly shared their shape files.

before. The living conditions of the early post-war years hindered reconstruction, for certain and in more ways than one, but the war left behind ample supplies of labour, substantially greater than the pre-war working population. The consensus that has emerged from more recent historiography claims that economic recovery was held back by infrastructural bottlenecks and the restrictive institutions of occupied Germany that Carlin (1989) described as a system of 'vegetative control'. To unleash the expansive forces of the German economy required no more than the removal of these obstructions. As Abelshauser argued, 'West Germany was poor yet not underdeveloped. Given the political commitment to reconstruction, the resurgence of the West German economy was foreseeable, once the efforts sufficed to eliminate the institutional and infrastructural chaos' (Abelshauser 1983, 32). This chapter begins with an audit of the impact that the war and the peace had on the productive capital of German industry. It then describes their consequences for the size of the German population and the living conditions it endured

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during the occupation years. The final section reviews the literature and contemporary sources on the factors that delayed the revival of markets and stifled the revitalisation of industry.

1.1 Production Capacity

To reveal the impact of wartime destruction on industrial capacity in Germany was a chief concern already before the cessation of hostilities, when the United States Strategic Bombing Survey (USSBS) began one of the most monumental statistical crusades in history. It operated with more than 1,000 military and civilian staff from London and several regional headquarters in Germany (MacIsaac 1976, 68). Its personnel were often found in harm's way when striving to uncover and salvage the German government records that were dispersed across the country in the final phase of the war. The field teams often arrived at target locations before the advancing Allied army divisions. Their perhaps most adventurous and arguably most significant mission was an undercover raid into the Soviet sector of Berlin in July 1945 to abduct Rolf Wagenführ, the former chief economist and statistician of the German armaments ministry and undoubtedly the most knowledgeable expert on the Nazi war economy (MacIsaac 1976, 90–4).

The data collection was completed after the war at the Statistical Office for German Industries that the Office of Military Government for Germany (OMGUS) had created in Bad Nauheim in June 1945. Built on remnants of German ministerial divisions that had established contact with US authorities already in March, two months before VE-Day, Bad Nauheim was endowed with remarkable resources. Beyond the expertise of the former German government officials and the statistical material they had rescued from Berlin, the experts of the bombing survey had access to the Ministerial Collecting Center, the chief statistical facility of OMGUS in the vicinity of Kassel. The centre managed to get hold of all that was left of the Imperial Statistical Office staff in West Germany and amass the vast stock of records on which our knowledge of the German economy at war and under Allied occupation has been largely constructed even to this day. The Collecting Center was a real monster: its 300 buildings scattered over three villages, five camps, and a former munitions factory. It housed more than 1,000 tons of documents and an equal number of former German government personnel as well as 70,000 tons of film and scientific apparatus (Vogelgsang 2016, 165–71).

Of the 208 USSBS reports on the European war, the most important for economic historians are those prepared by, or with the assistance

of, the Overall Economic Effects Division (OEED), made up of no lesser scholars than J. Kenneth Galbraith (director), Burton Klein, Paul Baran, Nicholas Kaldor, and Edward Denison, among others. The *Over-all Report* (USSBS 1945) summarised the detailed division reports of USSBS cataloguing the effects of the bombing campaign on each of the major industries, military and public infrastructure, civilian defences, and civilian morale.[6] The final report of OEED, entitled *The Effects of Strategic Bombing on the German War Economy* (USSBS–OEED 1945), presented an extensive analysis of the development of industrial production as well as capital and labour reserves during the war and evaluated the impact of the air attacks on both armaments production and the supply of civilian goods. It owed much to the statistical work of Wagenführ and reflected his view on the trajectory of German armaments production.

The overall report reveals the paradox in the legacy of the air war. On the one hand, 'it brought home to the German people the full impact of modern war with all its horror and suffering' (USSBS 1945, 107). On the other, the magnitude of destruction in industrial plant and machinery directly caused by the air attacks was surprisingly small. Most industries were never prime targets, as production sites were too numerous, geographically dispersed, and often not identifiable from the air. Hitting strategic assets in the transportation system and the residential areas of major industrial cities proved to be a more effective means of reducing Germany's war potential. 'The Allies did not attempt to destroy the German economy as a whole. The bombing offensive sought rather to stop it from operating by damaging key points' (USSBS 1945, 37).

The reports demonstrated equally well the existence of ample capacities in both steel production and machine tools on the eve of the war. As a result, the German economy was never short of capital goods before the breakdown of the transport system. Even in the armaments industry, capacity reserves remained substantial throughout the war, thanks to the fact that more than 70 per cent of machine-tool production was sold to the armed forces or to munitions manufacturers.[7] In one of the first scholarly publications based on the statistical work carried out by USSBS, Kaldor (1946) emphasised that most of the primary metals and metal processing industries in Germany had operated with single work shifts during the war. The bombing survey estimated that the inventory of machine tools in Germany had grown from around 1.3 million to

[6] Before publication of the *Over-all Report*, OMGUS prepared a brief non-technical version, the *Summary Report*, which was aimed at senior politicians and the American press.
[7] See USSBS–OEED, 1945, Table 21, 49.

2.1 million pieces between 1938 and 1943.[8] These findings were 'in striking contrast with the experience of the United States and Great Britain, where machine tools were kept working 24 hours a day seven days a week', and where the machinery industry was pushed to the limits of its capacity (USSBS–OEED 1945, 8).

Much to the surprise of contemporaries, the reports also found German armaments production to be little affected by the bombing campaign, at least directly. Total munitions output was reduced by no more than 5 per cent until 1943 (USSBS–OEED 1945, 148). Even thereafter the main economic impact of aerial bombardment was the diversion of the labour force from production to rubble removal and repair work. It was the destruction of the railway network combined with concentrated attacks on key waterway targets in the second half of 1944 that brought the German economy to its knees (see Levin 1992, 163–9). By 14 October, coal transports from the Ruhr on the Rhine to the south ceased and the cargo capacity of the *Reichsbahn* had declined dramatically. Even though hard-coal production in the Ruhr fell from 10.4 million tons in August 1944 to 4.8 million tons in February 1945, stockpiles of both coal and coke in the mining district increased fivefold over the same period (USSBS 1945, 61–4). Based on a meticulous study of USSBS reports and archival records, Mierzejewski (1988) demonstrated how the production system of the German war economy had been built on the railways. As a consequence, the destruction of key railway hubs could effectively dismantle the input–output network of the war economy (Mierzejewski 1988, 162–76).

By contrast, productive capital in most industries suffered remarkably little damage. From the data reported by the bombing survey, post-war economists estimated that merely 17.4 per cent of the capital stock of West German industry was destroyed as a direct consequence of aerial bombardment and ground fighting. Even less, only 6.5 per cent, of industrial machinery and equipment was substantially damaged (Abelshauser 2004, 68). Even such strategic industries as steel, electrical power, and the electric supply system did not become primary targets for enemy forces. The most important exceptions, where strategic bombing proved to have notable impact, were the manufacturing of synthetic materials, electrical equipment, and especially military aircraft and naval hardware (USSBS–OEED 1945, 8–9). On 30 March 1945, Hitler issued one of his most diabolical orders that called for the demolition of all non-movable industrial assets in Germany prior to the arrival of Allied troops. The *Nero-Befehl* could have inflicted much larger damage on German

[8] Ibid., Table 18, 44.

productive capacity than what the Allied bombers managed, but, with the support of factory owners and often by arming the workers, armaments minister Albert Speer successfully sabotaged the implementation of this suicidal creature of a most monstrous mind (Müller 1993, 373–5). Following the disintegration of the war economy, industrial firms could divert resources from production to reconstruction work and essential repairs, while they built up large inventories of precious input materials. The enormous profits they had earned during the war also allowed them to retain their skilled workforce even at depressed levels of output.[9]

In the aftermath of World War II, capital accumulation in German industry was affected most strongly by reparations and, as part of that, the dismantling or transfer of plant and machinery. The Potsdam Protocols obliged Germany to pay reparations in the value of 20 billion dollars, half of which would serve as compensation for material damage in the Soviet Union (Maier 1991, 20). According to the agreement, each occupying power would exert its reparations claims from its own zone of occupation, but the USSR was to receive an additional 10 per cent of the equipment dismantled in the three Western zones and a further 15 per cent in exchange for deliveries of food and other agreed commodities from the Soviet occupation zone of the corresponding value.[10] The *Plan for Reparations and the Level of Post-war German Economy* (hereafter first level of industry plan) issued by the Allied Control Authority on 26 March 1946 limited industrial production until 1949 to about 50 to 55 per cent of the 1938 output level. It prohibited the manufacturing of armaments, synthetic oil, rubber and ammonia, primary aluminium and many other non-ferrous metals, ball bearings, heavy tractors and other types of heavy machinery, radioactive material, and radio transmitting equipment. Production in chemicals, primary metals, and the engineering industries was restricted to fractions of the pre-war levels. Capacities deemed unessential for attaining the output ceilings were to be dismantled.[11]

Initially, American occupation policy was shaped by national security concerns and particularly by the objective of reducing Germany's war potential. The blueprint for achieving this was the Morgenthau Plan, named after the Secretary of the Treasury who submitted a proposal that sought to convert Germany into a dominantly agrarian economy through the physical destruction of productive capacity, especially in industries critical to waging war. Directive JCS 1067 of the Joint Chiefs of Staff still reflected these objectives and instructed the military government

[9] OMGUS, *Industry*, No. 12, 5.
[10] OMGUS, *Three years of reparations*, 1.
[11] 'The Plan for Reparations and the Level of Post-war German Economy in Accordance with the Berlin Protocol', reprinted in OMGUS, *Reparations*, No. 48, Annex B, 21–5.

to demilitarise the German economy (Settel 1947, 14–15). The first level of industry plan earmarked about 1,800 manufacturing plants in West Germany for dismantling. The second, revised plan adopted by the British and US military governments on 29 August 1947 listed only 859 establishments, in addition to the list of 176 plants presented by the French authorities, thereby effectively exempting more than 700 plants from dismantling. On 13 April 1949, the three military governors of the Western occupation zones announced that their respective governments had authorised the partial or complete removal of an additional 159 factories or factory parts from the reparations schedules.[12] As the occupation forces failed to fulfil even these modest quotas, only a fraction of industrial machinery that had survived the war was actually dismantled. Estimates put the value of all assets affected by reparations and restitution at approximately 4 per cent of the gross capital stock of West German industry in 1950 prices (Plumpe 1999, 43; Spoerer and Streb 2013, 214). Arguably, occupation policies exerted a more negative influence on capital formation indirectly, as manufacturing firms had no incentive to invest in new machinery or even to carry out essential repairs in plants that were expected to close down. It has been estimated that this 'fear factor' reduced the industrial capital stock by almost 3 per cent between April 1945 and June 1948 and made the available machinery, on average, older and more poorly maintained (Abelshauser 1983, 22).

Geopolitics may have been the main driver behind the seemingly radical shift in US policy towards occupied Germany, but actions on the ground had already been at odds with the goals of the Carthaginian peace shortly after the war and certainly well before the announcement of President Truman's containment strategy and the Marshall Plan. Concerned by the catastrophic economic situation in the country as well as the deteriorating relationship among the occupying powers, Deputy Military Governor General Lucius Clay, an adamant adversary of the Morgenthau Plan, ordered the halt of all reparations deliveries to the French and Soviet occupation zones as early as 4 May 1946. This order came barely a month after the first transports had just left Bremerhaven for the USSR (Settel 1947, 15). On 6 September of the same year, in his famous address in the Stuttgart opera house, Foreign Secretary James Byrnes promised effective American assistance in the rebuilding of the country (Weimer 1998, 25–6). The notion that the economic recovery and security of Western Europe had depended on rebuilding German industry was common sense in the US administration during the war. The policy of a hard stance favoured by Roosevelt and Morgenthau had

[12] OMGUS, *Reparations*, No. 48, 4.

its strongest opponents in the War Department and the US Army that gradually gained the upper hand in the administration of OMGUS by late 1946 (Gimbel 1968).[13]

Vogelgsang (2016) gives a vivid illustration of this discrepancy between spirit and action through the case of IG Farben, one of the most emblematic enterprises of Nazi Germany. It had grown into the largest chemical corporation in the world, was a key supplier of the German war machinery, the exclusive supplier of Zyklon B, and one of the main profiteers from slave labour. As such, it was destined to become the prime object of destruction, de-concentration, and de-Nazification. However, history defied these odds.

> From 1946 onwards Germany's industry in general and IG Farben in particular were increasingly less perceived as a threat to world peace. IG Farben was in the centre of attention again on 5 June 1947, when 24 executives were charged in the Nuremberg trials. Records on Farben … were destroyed before the process. Prosecutor Josiah E. DuBois was discredited as Jewish, i.e. partial, and a 'follower of the Communist creed'. The trial ended very favourably for the defendants and for IG Farben. They were found to have no collective responsibility for the war or war crimes and only some individuals were sentenced for crimes like participation in looting. The maximum sentence was eight years and some managers continued their career at IG Farben after their time in prison … When the chemicals giant was finally dismantled from February 1947 onwards, the outcome were not the dozens of small companies once envisioned, but three large corporations and a few smaller ones. The best-known successor companies of IG Farben are BASF, Bayer, Hoechst and Agfa (Vogelgsang 2016, 189–90).

Whereas American occupation policy in Germany reflected a change of hearts between 1945 and 1947, the British government never fully supported plans of crushing the German economy. However, in the immediate aftermath of the war, there were powerful advocates within both industry and the Board of Trade for punitive measures aimed at restricting production capacity in industries in which British manufacturers had key competitors among German firms. Transport vehicles offer a prime example. The first level of industry plan established annual quotas of only 20,000 cars and 21,000 trucks for the British zone, to be supplied exclusively by the Ford factory in Cologne. The Volkswagen plant in Wolfsburg was, therefore, listed as surplus to requirements and was scheduled for reparations. Its death sentence was quickly repelled. The revised level of industry plan adopted since January 1947 for the jointly administered British and American occupation zones (hereafter Bizonal Area) raised

[13] The actions of the occupation authorities diverged from the directives of Washington bureaus in similar ways in Japan under the command of General Douglas Macarthur, especially from 1947 (see Nishida 2007, 415–18).

the output ceiling for car producers from 40,000 to 160,000 and with that stroke of a pen exempted the German automobile industry from dismantling (Tolliday 1995, 290–6). The revised plan also increased substantially the production limits and the required capacity for iron and steel, steel constructions, and machine tools.[14] Although the prohibitive regulations pertaining to war-related industries remained in place, the plan stipulated that no factory in these industries would be available for reparations until the satisfactory conclusion of inter-Allied disputes over the future status of Germany, which appeared increasingly unlikely.[15]

Stalin was unmoved by the growing restraint that the Western Allies exercised in their reparations activity and Soviet leaders remained adamant on their demands for Germany to pay a price commensurate to the suffering that the Soviet people had endured as a consequence of Nazi aggression. This price had to be paid, in increasing part, by the Soviet occupation zone alone. The impact thereof on East German industrial capacity has played a prominent part in historical narratives, and finds support in some, even though by no means all, quantitative accounts. One estimate valued the productive assets dismantled between 1945 and 1953 at 50 billion marks, which would have been tenfold the losses that the several times larger West German economy incurred. Within the metal processing industries as well as chemicals, reparations are claimed to have reduced productive capacity by between one-third and one-half (Buchheim 1991, 57). In their testimony to the Bundestag after German reunification, Baar, Karlsch, and Matschke (1995) provided a dramatic account of the crippling effect that dismantling had exerted on the East German economy. They claimed that 30 per cent of the industrial capital stock that had survived the war was subsequently transferred to the USSR and Poland as reparations. Earlier estimates were often more optimistic (see Zank 1987 and Matschke 1988). The most recent revisions suggest that there was sharp reduction in the size of East German manufacturing capacity during the immediate post-war years in comparison with West Germany. Between 1936 and 1944, the stock of industrial fixed capital in the later German Democratic Republic (GDR) increased by more than 40 per cent, but by 1948 it fell back to scarcely four-fifths of the pre-war level (Ritschl and Vonyó 2014, 169). It is difficult to refute that, even if other factors were at play, it was above all Germany's division along the demarcation lines of the Cold War that saved West German industry from this crippling reparations burden.

[14] OMGUS, *Economic data on Potsdam Germany*, 37.
[15] Section IV in 'Revised Plan for Level of Industry: US–UK Zones of Germany', reprinted in OMGUS, *Reparations*, No. 48, Annex C, 32–3.

Even though the USSBS reports and the modest rate of dismantling in the Western occupation zones were known to contemporaries, they still misjudged the impact of the war on capital accumulation. The earliest accounts published in post-war West Germany estimated that by 1947 the industrial capital stock had been reduced to less than two-thirds of the 1936 or 1939 levels.[16] Not only were these gross overstatements of the extent of material damage caused by wartime destruction; they also overlooked the staggering expansion of industrial capacities during the late 1930s and the first war years. Contemporary views on the war economy were drawn from the conviction that Nazi Germany had not prepared for a long war. The overall report of USSBS itself stressed that the limits of productive capacity in the engineering industries were not seriously stretched before 1942 and that the machine-tool stock of manufacturers had expanded as a consequence of hoarding (USSBS 1945, 31–3). The *Blitzkrieg* hypothesis remained influential in the post-war literature, among others in the works of Klein (1959), Fischer (1968), and Milward (1965, 1975). Recent scholarship, however, has shown that from the launching of the Four Year Plan in 1936, and even more following the outbreak of the war, production capacity increased substantially both in the armaments industry and within heavy industry in general (Budrass, Scherner, and Streb 2010; Scherner 2010, 2013). In the course of the armaments boom, the growth of machine-tool production was remarkable. By 1944, the machinery stock of German industry had doubled relative to that in 1929. This accumulation of machine tools was not due to the disproportionate retention of old machinery, as once believed, but to new acquisitions, many of them high-volume production equipment. The growth of industrial output during the war was strongly capital intensive; it was not in first order the outcome of productivity miracles (Ristuccia and Tooze 2013, 963–5).

In the 1950s, the German Institute of Economic Research (DIW) undertook the task of quantifying capital formation in the West German economy. It was made clear immediately that the colossal investments of the early 1940s had substantially increased industrial capacity (Wagenführ 1954, 57–9). It was estimated that the gross value of industrial fixed capital had grown by 75 per cent between 1936 and 1943 and, despite wartime destruction, post-war dismantling, and disinvestment, was still considerably larger in 1948 than it had been before the war (Krengel 1958, 94). Measured in constant prices, annual gross investment in West German industry doubled between 1936 and 1939,

[16] See among others Niederschlag (1947), 41, Seume (1947), 143, and Eisendrath (1950), 126.

and then grew by an additional 20 per cent until 1942 (Baumbart and Krengel 1970, 75). Recently published evidence from revised investment statistics suggests an even higher rate of wartime capital accumulation (Scherner 2010, 438).

Structural shifts magnified these aggregate effects. From the late 1930s, investments in the Nazi economy focussed on machinery rather than buildings and on heavy industry at the expense of consumer goods. Annual gross investment in the producer goods industries in 1939 was two and a half times larger than it had been in 1928 (Petzina 1975, 80). Most investment went into metallurgy, chemicals, machine tools, transport vehicles, and electrical and precision engineering (Eichholz 1999, 343–4). The vigorous wartime expansion of productive capacity improved the technological standards of industrial machinery as well. The investment drive of the armaments boom had made manufacturing equipment, on average, younger and more modern. These vintage effects were notable even if firms continued to invest in established technologies alongside the innovations of recent years (Ristuccia and Tooze 2013, 965). The astonishing growth of industrial capacity in the late 1930s and early 1940s outweighed, by far, the diminutive impact of wartime hostilities and post-war dismantling in qualitative as much as in quantitative terms. Claims made at the time, which had accentuated fears of 'deindustrialisation' in Germany after 1945, were shown to be erroneous. West German industry was not only well-endowed with physical capital on the eve of its post-war growth miracle; it was much better endowed than it had ever been before World War II.

This overall assessment does not imply that the war did not have serious negative consequences on industrial development at the local level. Indeed, whereas West German industry as a whole had emerged from the defeat and disintegration of the German Reich with a productive base it could have never aspired to obtain in peacetime, the fortunes of several leading manufacturing firms were doomed. Precision attacks in the final year of the war destroyed much of the synthetic material and petroleum industries (USSBS 1945, 81–90) that, consequently, had to rebuild during the reconstruction years. The machinery of the electro-technical and shipbuilding industries was substantially, and that of aircraft manufacturing almost completely, dismantled (Baumgart and Krengel 1970, 48–9). The automobile industry had considerably larger production capacities after 1945 than before the war, but the experience of the main car producers was not uniform. Opel had dominated the German automobile market until 1939, but could not retain its leading position in the post-war era. It suffered greater damage than either Ford or Volkswagen, its factories in Brandenburg were overtaken by the Soviet

occupying forces, and parts of the Rüsselheim plant that had survived the war were dismantled by the US authorities, to be transferred to the USSR as reparations. By contrast, both the Ford works in Cologne and Volkswagen in Wolfsburg, after having suffered only small war scares, enjoyed more favourable treatment under British occupation. Their dispersed equipment was quickly retrieved and their production lines reassembled with the help of the occupying troops. Having retained essentially all their equipment, most of them recently installed, they were now destined to carve out much larger shares from the German and European car markets than they had commanded before the war (Tolliday 1995, 301–3).

1.2 Population and Living Conditions

The West German economy was endowed not only with enlarged industrial capacity after the end of the war but also with plentiful supplies of labour. War casualties were enormous for sure. No fewer than 4 million from the western part of the country had perished by 1945. Additional millions died in Soviet captivity or returned home severely wounded and mentally damaged. The adult male population that had traditionally formed the core of the industrial workforce suffered particularly severe losses. Yet, remarkably, the West German population – fewer than 40 million in June 1939 – grew to almost 48 million by the end of 1950. Even the male population had become larger, albeit very moderately (Steinberg 1991, 155–7). Despite the increased share of the economically inactive, the labour force expanded by more than 12 per cent in the same period (Ambrosius 1996, 47–8).

This paradoxical pattern was the product of the post-war settlement, perhaps the most important consequence thereof for the economic future of Germany. In accordance with Article XIII of the Potsdam Agreement, approximately 15 million ethnic Germans were uprooted from their historical settlements in East and Central Europe until 1951, as a means of collective punishment for the Nazi war crimes. One million were deported to the Soviet Union, with another 700,000 forcefully resettled from the European to the Asian territories of the USSR, and 13.3 million expelled to post-war Germany and Austria. Two million were killed or went missing during the years of these deportations (Reichling 1986, 29–30). The earliest comprehensive account estimated that 20 per cent of the German population in the affected areas had perished during and after the war. It put the number of post-war casualties at 2.3 million, but this figure included all the ethnic Germans never to return from Soviet

deportations, regardless of whether they had survived these calamitous years or not (Statistisches Bundesamt 1958, 37–47).

Quantifying the mass population movements invoked by the war and its aftermath is a monumental task and one finds it challenging not to get lost in the numbers, not least because of the inconsistencies between the different sources.[17] When the guns went silent in May 1945, 16.9 million ethnic Germans were de jure residents of East and Central European states west of the interwar Soviet borders, including the former Reich provinces east of the rivers Oder and Neisse. Of these, only 15 million lived in the same area in 1945 as they had in 1939. The remaining 1.9 million had migrated into the region voluntarily or by administrative resettlement during the war. Deportations to the USSR began in January 1945 as the Red Army advanced into German territory and reached their peak in March. Some 300,000 of the forcefully deported eventually returned from the Soviet Union, but many of them were subsequently expelled to Austria or Germany (Reichling 1986, 26–8). Most of the 9.5 million expellees from the eastern provinces of Prussia fled without official warning before the advancing Soviet troops. By the end of the war, about 5 million had already lived in what would become Potsdam Germany (Bundesministerium für Vertriebene 1954, 23E). Central European countries, recently liberated from Nazi occupation, began expelling ethnic Germans in their earnest even before the meetings of the Potsdam Conference commenced. In November 1945, the Allied Control Authority estimated the number of Germans de facto still living in the former eastern provinces at only 3.5 million (Steinert 1995, 558–60).

The evacuations from large cities in the region began in 1943. The naval strongholds Stettin and Königsberg, regularly pounded by the British and the Soviet air forces, had lost more than a third of their prewar population by the end of 1944. Even though the first Russian troops crossed the Memel into Germany in June 1944, the more densely populated eastern provinces were overrun only during the first months of 1945 (Bundesministerium für Vertriebene 1954, 9E–23E). Perhaps the most epic episode of the exodus that followed took place in the last war winter. In one of the very few exercises of humanity by the German armed forces, the *Kriegsmarine*, helped by an enormous merchant fleet, carried out the largest transport mission in naval history, one that dwarfed even the D-day landings. More than 1,000 vessels shipped 2 million Germans

[17] For the most comprehensive academic accounts, see Reichling (1986) and Steinberg (1991), 103–42. The population statistics of the German settlement areas affected by the deportations were first reported in Statistisches Bundesamt (1958).

from Baltic ports to western harbours between January and May 1945. Often travelling through frosty waters and under frequent attack from the Allied air forces, surface war ships, and submarines, they managed to bring more than 98 per cent of all those on board to safety. The vast majority of the desperate they had saved were civilians, many of them severely wounded; only 240,000 were soldiers and naval staff (Steinberg 1991, 131–2).

The population census of October 1946 registered 9.8 million expellees in the four occupation zones of Germany, including Berlin (Kornrumpf 1950a, 37). Until September 1950, their number had grown to 12.2 million: almost 7.9 million in the Federal Republic, 148,000 in West Berlin, and about 4.1 million in East Germany.[18] More than half of the expellees had lived in the eastern provinces of Prussia before the war, almost a quarter in Czechoslovakia, and 5 per cent in interwar Poland (Statistisches Bundesamt 1958, 38, 45–6). In addition, 1.56 million refugees with a permanent pre-war residence on the territory of the Soviet occupation zone and East Berlin had migrated to the West between 1944 and 1950.[19] In order not to spell confusion, we must clarify the distinction that official terminology has made between the two population groups. Immigrants of German ethnicity who in 1939 had lived outside of Germany or in the eastern provinces of the Reich are referred to as expellees; those who resettled from post-war East Germany are classified as refugees.[20]

The demographic impact of war-induced migration is recognisable not only in the size but also in the structure of the population. For one, the share of men and women of working age was substantially higher among the expellees and the refugees than in the indigenous population.[21] One in two refugees was twenty-five years of age or younger, and very few were elderly. Their favourable age structure made them an invaluable reservoir of labour during the following decades (Heidemeyer 1994, 48). Immigration was also responsible for the moderate growth of the male population, and thanks to that also growth of the industrial labour force, in West Germany between 1939 and 1950. In September 1950, within the total population, 62.8 per cent of the economically active were men. Among the expellees and the refugees, the corresponding shares were 64.6 per cent and 67.3 per cent respectively (Ambrosius 1996, 50). From

[18] StatBRD, Vol. 35.9 (1956), 68–72; Reichling (1989), 14.
[19] StatBRD, Vol. 114 (1955), 13.
[20] Children born into expellee or refugee families in post-war Germany had the same status as their father, children born out of wedlock that of their mother (see StatBRD, Vol. 34, 15–17).
[21] StatBRD, Vol. 35.9 (1956), 28–30.

an economic point of view, perhaps the key characteristic of the expellees and refugees was their exceptional occupational mobility. Between 1939 and 1950, 48 per cent of them changed occupation or their specific job within the same occupation, while the respective ratio in the rest of the population was only 34 per cent.[22]

Table 1.1 demonstrates the impact of mass migration on population growth in West Germany during the 1940s: it was large overall, but far from uniform across the country. Bremen and Hamburg both had fewer residents in 1950 than at the start of the war. By contrast, the population of agrarian states, most notably Bavaria, Lower Saxony, and Schleswig-Holstein, increased dramatically. Clearly, population growth after 1945 was driven by the influx of expellees and refugees. The West German population increased by almost 8.4 million between May 1939 and September 1950. This total comes 1 million short of the number of expellees and refugees living in the Federal Republic at the end of the period, which confirms that, in the absence of mass immigration, the population of the country would have declined during the 1940s. As the French government did not agree to the implementation of Article XIII of the Potsdam Agreement, the French occupation zone did not accept either expellees or refugees between May 1945 and the unification of the three Western zones in April 1949 (Granicky and Müller 1950, 4–5). Consequently, the population share of immigrants in the southwest of Germany was very modest at first, but increased sharply by 1950.

Chapter 2 will expose the economic geography of post-war dislocation in detail. At this point, it is sufficient to highlight that the livelihoods of the German population after 1945 were devastated by both mass migration and the urban housing shortage that resulted from the destruction of residential buildings during the war. The joint consequence of both factors was that despite the influx of millions into West Germany the urban population of the country suffered the most severe setback it had seen since the Thirty Years' War (Bauer 1947, 28–9). The number of residents in the largest cities fell considerably between 1939 and 1946, as Figure 1.2 demonstrates. By contrast, overpopulated villages and small towns reported astronomical rates of unemployment for many years to come. As I will explain in Chapter 2, the urban housing deficit was too large to surmount without extensive state intervention, which necessitated the creation of a sovereign West German government. In the late 1940s, the dire housing conditions were a constant source of human misery and social conflict, and an impediment to economic reconstruction.

[22] StatBRD, Vol. 211 (1958), 33–34, 70. See also Kornrumpf (1950b), 95–6.

Table 1.1 *Expellees and refugees in the West German population after World War II*

	Total population (thousands)		Share in total population (%)		
	1950	1939	Expellees		Refugees 1950
			1946	1950	
British occupation zone					
Hamburg	1,606	1,712	4.6	7.2	4.2
Lower Saxony	6,797	4,539	23.8	27.2	5.4
North Rhine Westphalia	13,196	11,934	6.1	10.1	2.9
Schleswig-Holstein	2,595	1,589	32.7	33.0	5.2
US occupation zone					
Bavaria	9,184	7,084	20.1	21.1	2.5
Bremen	559	563	5.4	8.6	3.8
Hesse	4,324	3,479	13.8	16.7	3.8
Württemberg-Baden	3,909	3,218	14.8	16.6	2.4
French occupation zone					
Baden	1,339	1,230	2.0	7.4	2.1
Rhineland-Palatinate	3,005	2,960	1.3	5.1	1.5
Württemberg-Hohenzollern	1,184	1,030	3.2	9.6	1.8
Federal Republic	47,696	39,338	13.9	16.5	3.3

Source: Braun and Mahmoud (2014), 77. Author's calculations. For a more detailed decomposition of the resident population by country and region of origin, see StatBRD, Vol. 35.3 (1953), 6–27.

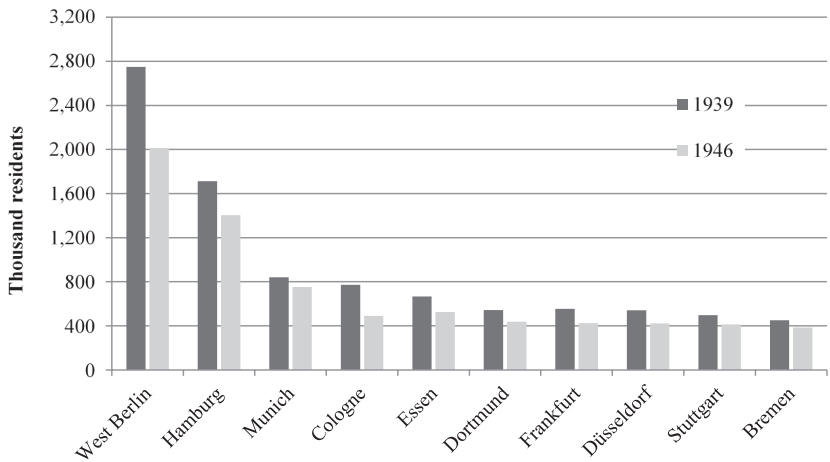

Figure 1.2 The population of the largest West German cities in 1939 and 1946.
Source: StatBRD, Vol. 35.9 (1956), 99–109.

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The war had turned Germany into a land of refugees, for immigration from the East was preceded by the mass evacuation of urban dwellers during the Allied bombing campaign. By the end of the war, close to 9 million residents of German cities had taken refuge in the countryside. One-third of them were unable to return until 1947. One million residents had abandoned Berlin alone. Almost the same number had been evacuated from Cologne and smaller towns in its vicinity by January 1945. The corresponding figures for Essen, Düsseldorf, and Hamburg each surpassed 300,000. Almost half of all the evacuees at the end of the war had fled from Berlin, Hamburg, and the Rhine-Ruhr agglomeration (Krause 1997, 175–8, 186). Expellees, East German refugees, and the internally displaced all competed for the scarce resources that the local population had to share with them, housing more than anything else. Administrative assignments and mandatory housing provisions were common practices across the country and remained in place until the early 1950s (Steinert 1995, 562–3). The increasingly hostile sentiments of the different population groups towards one another are richly documented in the historiography. The millions displaced by war, whom Kleßmann (1982) described as the post-war 'collapse-society', invoked social conflict in the communities that had to accommodate them. The presence of unwelcomed 'newcomers' in the villages and small towns of Germany in the 1940s, adhering to different customs and norms and speaking different dialects, undermined the hitherto organically evolved cohesion of the countryside (Erker 1988). That the impact of these tragic transformations shook the traditional life, morality, and Weltanschauung of rural society to its foundations after 1945 was already noted in the most canonical monograph on the German crisis (Meinecke 1946).

Many were anxious to escape this alien and intolerant environment, but returning to the cities was made difficult by several obstacles: poor living conditions in the still destroyed urban landscape, the policy of the occupation authorities to retain sufficient manpower on the farms, or simply the lack of finances required for the return journey (Krause 1997, 13). The end of the war did not bring an end to the evacuations either. Hundreds of thousands were relocated in both 1945 and 1946 from cities to the country, many of them more than once. The Allies requisitioned a vast number of buildings for military and administrative purposes and as living quarters for their staff. Other dwellings were 'made free' for essential reconstruction workers, or for former political prisoners and other victims of persecution during the Nazi era, in line with Law No. 18 enacted by the Allied Control Authority on 8 March 1946.[23] Public

[23] OMGUS, *Manpower, trade unions and working conditions*, No. 20, 12–13.

health authorities, fearing the outbreak of epidemics, evacuated those who had found shelter in bunkers and cellars. On similar grounds, the occupying forces often prevented evacuees from returning to their cities. In the summer of 1945, the British closed down the main bridge over the Elbe to Hamburg, forcing tens of thousands to camp outside the city for months. On 11 August 1945, OMGUS decreed that those who had returned to Stuttgart without authorisation from the mayor would not receive ration tickets for basic provisions (Krause 1997, 190–1, 201). Hundreds of thousands thus remained evacuated in rural counties until the end of the 1940s, especially children, women, and the elderly. The livelihoods of the most desperate were even more dire. The housing census of September 1950 registered almost 1 million residents still in refugee camps that the occupation authorities had intended only to function as temporary facilities. An additional 1.3 million lived in emergency shelters outside the camps, including ships, abandoned factories, or railway buildings.[24]

Although the historiography of the early post-war era has focussed on the conditions of ethnic German refugees, the presence of displaced persons brought to Germany during the war as prisoners of war (POW) and as foreign workers was an equally pressing concern. Thanks to the efforts of the United Nations Relief and Rehabilitation Administration (UNRRA), most were repatriated to their home countries until early 1946 (Jahn 1950, 101–2), but at the start of 1947 almost 1 million still lived in West Germany. One reason for their prolonged presence was that the British military government continued to employ foreign miners in the Ruhr to maintain coal production, but many forced labourers or POWs from Eastern Europe refused to return home for fear of political persecution. In April 1950, the refugee camps of the Federal Republic still sheltered 200,000 foreigners (Granicky and Müller 1950, 5).

The catastrophic living conditions and the unwelcome presence of refugees and expellees not only invoked social conflict and public distress; the inadequate housing supply was an impediment to economic recovery, too. With the millions displaced by war trapped in rural communities, urban industry could not find sufficient labour to lift production. Much of the working time and energy of the existing urban workforce was diverted to rubble removal and reconstruction efforts, often in the context of administrative work assignments under the command of the occupation authorities (Kramer 1991, 71). Given the congestion of living space and the desolate state of the public heath infrastructure, it is not surprising that the war-shattered cities of Germany were ravaged

[24] StatBRD, Vol. 41 (1955), 12–13.

by mass epidemics. According to the report of the British military government on 20 August 1946, the spread of diphtheria, tuberculosis, and typhoid had reached alarming proportions (cited in Weimer 1998, 13). Conditions in the Soviet zone were even more appalling. In 1947, the number of deaths from tuberculosis per 10,000 inhabitants in East Germany was three times, in 1949 still twice, as high as it had been in 1938 in Germany as a whole (Schwarzer 1995, 127).

The manifestations of poverty and desperation were plentiful, but in the collective memory of the post-war generation, the late 1940s were associated with hunger above all else. Daily food rations were officially limited to 1,550 kilocalories that corresponded to one-half of per capita food consumption in Germany in 1936. Children, pregnant women, essential workers doing heavy manual labour, and patients with certain medical conditions were to receive complementary rations, but the actual provisions depended on harvest results and the willingness of the occupying powers to supplement the inadequate domestic production with expensive food imports. Despite the efforts that the Allied military governments had made from the start of the occupation to support agriculture, food shortages were increasingly acute owing to the continuing influx of refugees into the Western zones.[25] Foodstuffs of high nutritional value were particularly scarce. Bread and potatoes made up more than 80 per cent of the calorific content of the basic rations in the Bizonal Area over the course of 1947, meat and fish accounting for 5 per cent, and fats for only 4 per cent.[26] The supply of animal fat and protein was drastically reduced by the mass slaughter of hogs and poultry in the most critical months of 1945, further aggravated by the restrictions of the occupation authorities on the use of grains as fodder. In addition, farmers were particularly reluctant to deliver animal products at official prices, and thus black markets became the key suppliers of eggs, meat, and dairy.[27]

The nutritional situation became most alarming during the winter of 1946–7, when the monthly average day rations fell below 1,300 kilocalories in both the French and Soviet occupation zones. Although basic rations in Berlin were more generous than in the rest of the country, the food supply was typically tighter in urban than in rural counties. In the early months of each year until 1948, rations fell to 1,000 kilocalories in large cities and often to as little as 800 kilocalories in the Ruhr (Schwarzer 1995, 126). According to an official survey, in June 1947, scarcely more than a fifth of urban dwellers in the American zone

[25] OMGUS, *Food and agriculture*, No. 9, 2–3.
[26] Ibid., No. 32, 13–15.
[27] Ibid., No. 20, 2–3, 8–9.

found the availability of food sufficient, as opposed to almost two-thirds among those living in the countryside (cited in Bignon 2009, 4). Despite improved organisation and increased transport capacity, the food supply remained insufficient and erratic until the later months of 1948. Imports from the Soviet zone that the Western Allies had counted on were not forthcoming. East German agricultural output collapsed after the war and its recovery was retarded by both the lack of chemical fertilisers and the vastly reduced stock of farm machinery.[28]

Malnutrition had dire consequences for public health. Surveys conducted in April 1946 in cities under US occupation found that adults were significantly below the reference weights for their age groups.[29] Over the course of 1946, different cohorts of adults living in the American zone lost, on average, between 1.8 and 6.3 pounds in bodyweight, elderly men being the most affected.[30] During the following winter, authorities in Hamburg recorded more than 20,000 deaths due to hunger and frostbite (Schwarzer 1995, 127). In West Berlin, in the first quarter of 1947, the annual death rate exceeded the birth rate by 28.5 to 10.7 per 1,000 inhabitants and nearly doubled the national average.[31] The most desperate took illegal means of acquiring food and other basic supplies, especially after Cardinal Frings, the archbishop of Cologne, had promised salvation to those committing theft out of necessity in his emblematic 1946 New Year mass (Schröter 2000, 360). To avert a humanitarian catastrophe, the British and American authorities spent 1.5 billion dollars on food imports in the first three years of the occupation. This nearly equalled the total value of the Marshall Plan deliveries that the Western occupation zones subsequently received (Giersch, Paqué, and Schmieding 1992, 22). The need to supplement domestic food supplies in Germany forced the British government to maintain rationing at home for several years longer than it would otherwise have been necessary (Leaman 1988, 27).

Hunger spurred public discontent, culminating in the general strike of 3 February 1948 that brought 3 million to the streets. People did not work assiduously even when not out on strike. Industrial labourers spent typically four or five of their six weekly workdays in the factories. The rest of their time was devoted to foraging for food and other necessities for the survival of their families (Nicholls 1994, 128). In the largest cities, worker absenteeism was rampant. Every morning, urban dwellers packed

[28] Ibid., No. 2, 8.
[29] OMGUS, *Public health and medical affairs*, No. 10, 18.
[30] Ibid., No. 22, 1.
[31] Ibid., 11.

the trains and rushed to the countryside in quest of farmers willing to sell them food that would supplement their inadequate rations. Actual hours worked across twenty-five industries surveyed in the American zone averaged around forty per week both in September 1946 and in the same month of 1947, well short of the forty-eight-hour official work-week. Since the workers of bottleneck industries, especially coal miners, were given generous extra rations, many other less preferred sectors of the economy suffered from critical labour shortages, in spite of the overall expansion of the labour force. Iron and steel, building materials, and the construction industry faced the most severe scarcity of manpower, partly because of their almost exclusive reliance on male labour, partly due to their concentration in large cities with inadequate housing.[32]

As often the case in the historiography written by men, the living conditions of women and children have long been an undeservedly overlooked aspect of the post-war humanitarian crisis. Not only were the consequences of the war and its aftermath particularly harsh on families; these consequences were often the most persistent. Roughly one-fourth of all children in post-war West Germany grew up without a father. In most cases, the fathers either died or went missing during the war, but the proportion of births out of wedlock also increased dramatically.[33] The share of incomplete families was highest in the cities and among the evacuees, expellees, and refugees. Families that could reunite after the war were not necessarily more fortunate, for they often had to welcome home physically incapacitated or mentally damaged fathers and husbands. Many among the millions of men brutalised by the oppressions of war brought terror into their homes, making the lives of innumerable women and children unbearable even through the years of economic prosperity that soon followed (Willenbacher 1988). Countless more lived in split families, in which the male breadwinners had to spend their workdays in faraway cities that could offer them jobs but no accommodation for their dependants (Granicky and Müller 1950, 4).

Without doubt, the darkest memories haunted those who had seen hell on earth during the first months of 1945 in the eastern parts of the country overrun by the Red Army. Sheer vengeance and the bloodthirsty propaganda campaign spearheaded by the influential writer Ilja Ehrenburg invoked unbounded brutality in Soviet soldiers. Their officers often explicitly ordered them to exercise revenge on the German

[32] OMGUS, *Manpower, trade unions and working conditions*, No. 32, 4 and 22. According to a confidential report of the Bizonal Economic Authority, throughout 1947, nearly 20 per cent of work hours were lost in the iron and steel industry of the British zone (ASE, *Statistical annual report 1947*, 50).

[33] See StatBRD, Vol. 35.9 (1956), 51–2.

population falling under their control. Hundreds of thousands of women, from young girls to their grandmothers, were savagely raped, often publically and often more than once, brutally tortured, and even murdered. Thousands died from sexually transmitted diseases or after illegal abortions of unwanted pregnancies carried out in primitive conditions. Many committed suicide, unable to carry on with the humiliation and the social stigma it implied. The Federal Ministry for the Expellees later estimated that, including the summary executions, between 75,000 and 100,000 civilians had perished from the Red Army rank and file running amok in the eastern provinces of the Reich in the first half of 1945 (Bundesministerium für Vertriebene 1954, 60E–65E). Those who survived their flight or deportation to West Germany were tormented by their experience for years to come and often until the end of their lives.

1.3 The Economics of Allied Occupation

In the immediate post-war years, the resurgence of industrial production in West Germany was not held back either by capacity shortages or by the supply of labour. It was retarded instead by infrastructural bottlenecks and institutional rigidities. The devastation of the transport and communications networks by the air war was the chief culprit in the sudden collapse of German industrial output from the second half of 1944. One-third of the 1.6 million tons of bombs that the Allies dropped over Germany during 1944 and the early months of 1945 hit the transport system and an additional 124,000 tons fell on seaports in the north.[34] The bombers destroyed most bridges. In the largest cities, water, electricity, and gas supplies had all but completely shut down by the end of the war; most radio transmitters were severely damaged. At the same time, the strategy pursued in the final phase of the bombing campaign enabled the occupying forces to remove the most critical bottlenecks with relatively little effort after the war. Their attacks had concentrated on damaging key points in the transport network and the energy-supply system, while most roads, railways, pipelines, cables, and transmitters, as well as most power stations, were left undamaged (USSBS 1945, 59–64, 82–4).

Traffic on the Rhine in the US occupation zone was reopened already at the end of August 1945.[35] Telegraph and telephone lines across the whole country were repaired until February 1946 (Settel 1947, 25–6).

[34] The calculations based on USSBS records were reported in Abelshauser (2004), 70.
[35] OMGUS, *Transport*, No. 2, 1.

All internal waterways had been cleared of rubble by April 1946 and until the summer, the British and US military governments managed to restore all railways and bridges in their occupation zones.[36] That insufficient capacity in rail transport still remained the greatest impediment to industrial recovery for another year was due to the fact that the rolling stock of the *Reichsbahn* was drastically reduced from its pre-war level. By May 1945, 31 per cent of the transport wagons and 39 per cent of the locomotives had been put out of use by war damage and the neglect of repairs.[37] Restitutions and reparations aggravated these losses. After industrial production in the British and American zones had approached 40 per cent of the 1936 level during the fourth quarter of 1946, the following winter brought the economy to its knees again.[38] In record low temperatures, the frost blocked all the major internal waterways on 20 December 1946. This meant that both passenger and cargo transport had to move exclusively on the railways, which also struggled to cope with the harsh conditions.[39] The outcome thereof proved the worst in the northwest and along the Rhine, as coal could not leave the pitheads in the Ruhr. The lack of fuel forced temporary shutdowns in several industries, while the lack of heating coal, combined with the difficulty of transporting food to the cities, was largely to blame for the urban health crisis described in the previous section (Abelshauser 1983, 42).

The result was the sharp decline of industrial production in the British and American zones between the last quarter of 1946 and the first quarter of 1947, as shown in figure 1.3. The occupying forces considered the supply of coal to be the most important bottleneck of economic recovery in the Western zones besides the food shortage.[40] Even though the number of miners employed in the Ruhr was 38 per cent higher in 1947 than what it had been in 1936, coal production was still substantially below the pre-war level due to poor productivity. The volume of coal extracted per man-shift averaged 1.6 tons in 1936; ten years later it was scarcely more than half thereof. The machinery of the coalmines was out of date and their capacity was reduced by the neglect of repairs during the war. The influx of unskilled labour mobilised by the British authorities from the countryside damaged the morale that had already been diminished by the extensive use of forced labour before 1945 as well as the dismal living conditions and the politically motivated purge of the management ranks thereafter (Roseman 1989, 100–1). However, the breakdown of

[36] OMGUS, *Industry*, No. 12, 2–3.
[37] OMGUS, *Transport*, No. 14, 26–7.
[38] OMGUS, *Industry*, No. 24, 10.
[39] OMGUS, *Transport*, No. 26, 2.
[40] See OMGUS, *Economic data on Potsdam Germany*, 37–8.

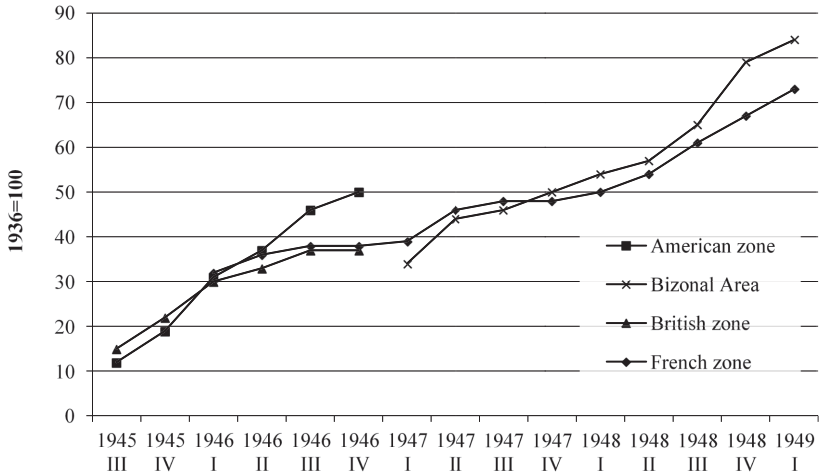

Figure 1.3 Indexes of net industrial production in the western occupation zones.
Source: Abelshauser (1983), Table 6, 34.

economic recovery during the winter of 1946 was not rooted in insufficient coal production. On the contrary, during the recession, between October 1946 and March 1947, coal extraction in the Ruhr increased by 24 per cent to 235,000 tons per day.[41] At the same time, stockpiles in the mining district jumped from 318,000 tons to 1.2 million tons. Not the lack of fuel but the lack of sufficient transport capacity thwarted the early revival of West German industry (Abelshauser 1983, 36).

Learning from the catastrophe of the winter crisis, the Allied military governments made the railways their top priority in the following year. Using the blueprint of the Speer ministry during the war, concentrated planning developed capacities in parallel in all industries that were essential for the production of railway equipment. By November 1947, the number of working locomotives was brought back to pre-war standards, and thus the Ruhr coalmines could run down their inventories almost fully until February 1948 (Abelshauser 1983, 43). Unlike that of coal mining and transport infrastructure, the reconstruction of the iron and steel industry was not among the initial objectives of the occupying powers. Metallurgical capacity was to be reduced in order to limit Germany's ability to wage war (Settel 1947, 8). In reality, the administrative restrictions made little practical impact. Until late 1948, steel

[41] OMGUS, *Industry*, No. 24, 14.

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output never even came close to the 5.8 million ton annual quota set for the British zone in 1946, let alone the upward revised ceiling of 10.7 million tons for the Bizonal Area in 1947.[42] Instead, the recovery of the steel industry was held back by chronic shortages of raw materials, both iron ore and steel alloys. Before the war, two-thirds of the iron ore processed in Germany had been imported from Sweden. With stringent foreign-exchange controls in force, the occupation authorities prohibited all ore imports until 1948. As West German steel producers had to shift to lower quality domestic iron deposits, their production became more fuel intensive (Kramer 1991, 101–2). Since coal supplies were insufficient until late 1947, output in primary metals and steel products, including machinery, remained the lowest relative to available capacity among all industries in the Anglo-American zones.[43]

The division of Germany itself obstructed the rebuilding of the German economy. The unrestricted domestic transfer of goods and services was replaced after 1945 by complicated transactions akin to trade deals between nations. As relations among the former Allied powers deteriorated trade between the eastern and western parts of the country became difficult to revive. Although the disruptions in inter-zone trade were relatively less harmful for West German industry than for its counterpart east of the Elbe, as Chapter 3 will demonstrate, the input–output bottlenecks that it had created limited the growth of industrial production until the early 1950s. If there had not been enough obstacles to economic recovery, the Allied occupation imposed even more serious restrictions on external trade, which all but collapsed after 1945. While the industrial output of the Bizonal Area reached 40 per cent of the 1936 level in third quarter of 1947, industrial exports were still negligible. In 1947, West German exports totalled 315 million dollars, approximately 5 per cent of German exports in 1936 (Lindlar 1997, 233). Thirty years later, three work hours would have sufficed to generate the corresponding value of sales abroad (Weimer 1998, 22–3). The post-war settlement with Germany made the swift restoration of West German exports impossible. The country was deprived of its merchant fleet; the foreign assets of German companies as well as German patents, trademarks, and overseas investments worth billions of dollars were expropriated by the Allied powers. Later chapters discuss the role of exports and industrial restructuring in the resurgence of West German industry. In

[42] See OMGUS, *Economic data on Potsdam Germany*, 39.
[43] OMGUS, *Industry*, No. 12, 1, 8; Ibid., No. 24, 20.

the late 1940s, imports, particularly imports of food and industrial raw materials, were the more crucial limiting factor of economic recovery.

Even though this was not the stated objective of the occupying powers, they effectively sabotaged West German trade with the outside world until 1949. Under the occupation statuses, international trade was the monopoly of the Joint Export–Import Agency (JEIA) in the Bizonal Area and of the *Office du Commerce Extérieur* in the French zone. Their centralised bureaucracies prevented the restoration of pre-existing trade links between German companies and their partners abroad (Braun 1990, 156). The regulatory framework of West German foreign trade during the occupation that the Allied Control Authority determined in September 1945 imposed three damaging constraints on the West German economy (Buchheim 1990, 1).

1. The volume of imports was limited to the requirements of maintaining consumption at subsistence level in each of the occupation zones.
2. Importers of German goods abroad could purchase West German exports only in US dollars or other currencies accepted by the Allied Control Authority.
3. The export revenue generated in each occupation zone was used, in principle, to finance its own imports. Trade surpluses could be redistributed between the different zones only with the special permission of the Allied Control Authority.

Although these regulations were designed to be temporary, they remained in force practically until 1949 as the Western Allies were unable to come to an agreement with the Soviet Union over the economic future of Germany. The main objective of the 'dollar clause' was to allow West German producers and consumers to access the cheapest sources of imports using the hard currency earned from exports. Since most Western European currencies were significantly overvalued against the US dollar, imports from continental markets were not competitive. However, the dollar clause also limited the demand for West German exports in neighbouring countries, as they were equally short of hard currency reserves. This led to the dramatic, albeit temporary, distortion of pre-existing trade patterns. Before the war, 10 per cent of German industrial exports consisted of raw materials, 13 per cent of intermediary products, and 77 per cent of finished goods. The corresponding shares in 1947 were 64, 25, and 11 per cent respectively (Buchheim 1990, 24–5).

Besides the rigid regulatory regime, the other major force behind this transformation were the efforts of the Inter-Allied Reparation Agency

(IARA), established by the Paris Agreement on Reparations in January 1946, to extract forced exports of coal, coke, and primary metals from West Germany at below world market prices.[44] Between May 1945 and September 1947, Ruhr coal was exported at 10.5 dollars per ton, while international prices fluctuated between 25 and 30 dollars. The losses thus incurred by German exporters until the end of 1947 were estimated at 200 million dollars. One author labelled the forced exports of fuels and electrical energy 'reparations in disguise', as they became an integral, even if not official, component of the post-war reparations regime (Abelshauser 1983, 30–2). Without sufficient export revenue, West Germany could not pay for the food imports required to feed her starving population and the raw materials necessary to kick-start industrial production. Two-thirds of West German imports between 1945 and 1948 were paid for by the occupying authorities, hence effectively by British and American taxpayers (Kramer 1991, 109–10), even though developing a German economy that could be sustained without substantial foreign assistance was a key objective of the JEIA (Spaudling 1997, 300).

Limited access to imports was not the only major institutional obstacle to economic recovery. The misallocation of resources was equally prevalent within the country and even at the regional level as markets had become restricted and dysfunctional. Economists were concerned that after the war, the supply of industrial firms with raw materials and intermediate inputs would run into serious bottlenecks. In reality, manufacturers had begun to stockpile vast input and fuel reserves from the early months of 1945.[45] By the end of 1947, input inventories were often large enough to secure production for an entire year and would have allowed for much higher levels of output in most industries than anything achieved prior to the currency reform in June 1948 (Buchheim 1990, 55–6). What limited the growth of industrial production and the effective use of productive capacity was not the scarcity but the misallocation of available resources. West Germany under Allied occupation was essentially a shortage economy. Kornai (1980) described such an economy with excessive inventories of inputs and finished goods vital for firms to be able to respond to bottlenecks periodically arising from insufficient marketing. The accumulation of inventories, in turn, limits the volume of raw materials and intermediary products sold on the market, which creates new or aggravates already existing production bottlenecks, motivating firms to stockpile even larger inventories.

[44] On the history of the IARA and of the reparations claims filed by its member states, see Buxbaum (2013).
[45] OMGUS, *Industry*, No. 12, 5, 37.

Most of the existing studies found the root causes for the dysfunction of input markets in post-war Germany in the war years and, in particular, in the monetary conditions that war financing had left behind (see Spoerer and Streb 2013, 210–11). In the Nazi economy, monetary policy was subordinated to military objectives and the need to expand armaments production. Its sole purpose was to secure the liquidity required for the financing of the war effort. As defence expenditure had increased by a factor of 23 and government spending in total quadrupled between 1933 and 1939, increased taxation alone could not keep the budget in balance (Ambrosius 2000, 338–40). As in the case of other major military powers, the swelling deficit was financed predominantly through borrowing (see Boelcke 1975). From 1938, the expansion of government debt hugely outstripped the growth of national income and even the growth of military spending. Between 1939 and 1943, total expenditure on the armed forces increased by 160 per cent, while the cost of debt service grew nearly ninefold. According to official budgetary statistics, public borrowing covered more than half of military spending during the war (Hansmeyer and Caesar 1976, 401). Savings banks (*Sparkassen*) were the most important sources of credit. By 1944, their deposits had grown to 123 billion marks, while the external debt of the Third Reich amounted to 119 billion marks (Boelcke 1993, 98–114).

The international literature attributed great importance to the exploitation of occupied lands in German war financing (see among others Ránki 1993; Eichholtz 1997; and Overy 1994, 1997). Recent scholarship has shown the expansion of domestic public debt to be more significant (Spoerer and Streb 2013, 204–6), even though Germany managed to fund more than one-third of its war effort with the resources of occupied countries, including the value obtained from the employment of their labour (Klemann and Kudryashov 2012, 367). The third principal source of public finance, especially in the final phase of the war, was the printing press. Between 1932 and 1945, money in circulation increased from less than 6 billion to 73 billion marks, and most of this growth took place after 1938, as Figure 1.4 demonstrates. Over the same period, the nominal value of bank deposits grew eightfold. The value of coins and banknotes per head of the population was almost ten times larger in 1945 than what it had been before the Nazis came to power (Boelcke 1993, 113). The money supply increased further with the 12 billion marks worth of new banknotes issued by the Allies during the first ten months of the occupation. The velocity of money was relatively high owing to the pent-up demand for consumer goods and unwillingness of cash earners to keep their savings in marks (Leaman 1988, 27–8). As long as real output was only a fraction of pre-war levels, the astronomic

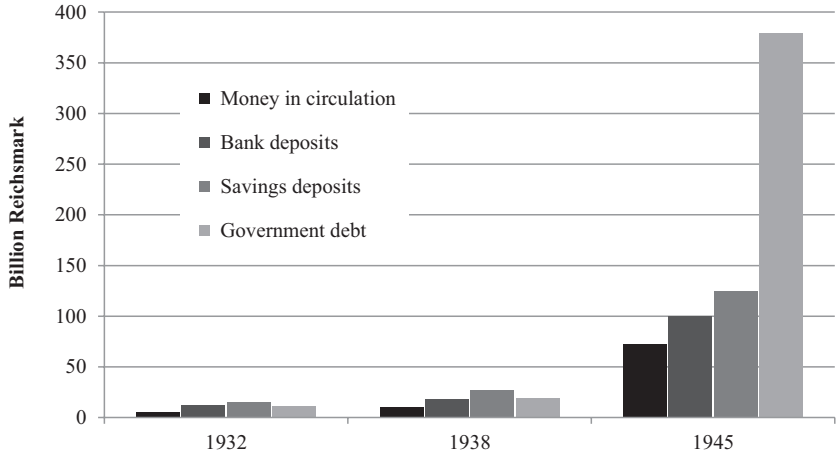

Figure 1.4 The growth of money supply and sovereign debt in Nazi Germany.
Source: Abelshauser (1983), Table 7, 46.

expansion of liquidity represented the danger of hyperinflation. To avoid the repeat of 1923, the Allies kept inflationary pressures under check by retaining the wartime system of price and wage controls. However, in the presence of surplus liquidity, money had lost most of its primary functions. Investors had no incentive to store their wealth in the banks and firms were increasingly unwilling to sell their products at official prices (Buchheim 1990, 394).

Effectively two economies operated side-by-side with one another. Within the official economy, the limited number of transactions took place on the basis of bureaucratically determined quotas and rations at artificial prices. The excess demand for consumer goods brought to life the other economy of grey and black markets with more or less free-market prices (Kramer 1991, 125). The discrepancy between official and real market prices was astounding and led to absurdly distorted terms of trade in the economy. Whereas the monthly average day rations of basic foodstuffs and other necessities were valued at less than 10 marks, consumers had to pay 40 marks for one cigarette and often as much as 3,000 marks for a radio on the black market (Weimer 1998, 31). The extent of excess liquidity is reflected in the fact that black market exchanges accounted for only 10 per cent of domestic trade but represented about 80 per cent of consumer spending (Owen Smith 1994, 16). Monthly reports of the US military governor reveal that illegal exchanges of foodstuffs accounted for 20 per cent of all trades. Six months later, this ratio increased to 50 per

cent for certain goods (cited in Bignon 2009, 5). As money was worthless, on illegal markets, American cigarettes and food rations became the most valuable mediums of exchange (Spoerer and Streb 2013, 211).

Black markets were widespread already in the early post-war months. In the US occupation zone, farmers refused to deliver food to the rationing system, even when armed soldiers accompanied the German officers.[46] The withholding of food from the official markets was the prime motive for urban dwellers to go foraging for food in the countryside. Illegal markets also emerged in large cities and near the train station of almost every town. Farmers were not only unwilling to accept official prices; most of them also insisted on being paid in kind. Thus workers or traders from the city travelled to the countryside with some valuables in hand and searched for farmers willing to buy these items. The need to find suitable partners meant that this type of trade incurred very high transaction costs. Even if buyers had access to information about local sellers, search costs were still substantial in the absence of money. Thus cigarettes gradually emerged as commodity money, universally accepted in post-war Germany as a means of payment. The use of cigarettes as money had become so widespread that in May 1947 the US Army prohibited the free import of tobacco by its members and appealed to the general public for co-operation (Bignon 2009, 9–17).

Official prices reflected real market values only for new products, whose prices were fixed after 1945. The presence of both pre-war and post-war prices for different types of manufactures severely distorted the structure of industrial production. While basic industries had little incentive to increase output, firms selling consumer articles that were seen as luxury items in these harsh times and that were rationed throughout the war were remarkably dynamic. Glass products, chinaware, and entertainment instruments recorded the fastest employment growth of all industries in the American zone between 1946 and 1948.[47] While the consumption of these luxuries absorbed a substantial part of national income, the insufficient supply of raw materials and intermediate inputs created bottlenecks in several industries, in building materials and construction above all else, delaying urban reconstruction and thus holding back economic recovery.[48]

Illegal transactions were equally present on producer markets. Despite regulations prohibiting barter trade between companies in place, compensation deals became increasingly widespread and by early 1948 accounted

[46] The problem was already highlighted in the first confidential reports of the US Military Governor (OMGUS, *Food and Agriculture*, No. 2, 6).
[47] OMGUS, *Manpower, trade unions and working conditions*, No. 32, 30.
[48] OMGUS, *Industry*, No. 24, 28–9.

for more than half of all transactions between industrial enterprises. This is another typical means by which firms operate in the shortage economy. Bartering with other companies allows them to supplement their own inventories of input materials. For this purpose, however, firms also had to keep large stocks of their own products that could serve as inputs for others. Furthermore, inventories of finished goods, especially processed foods and other consumer necessities, were vital to create incentives for workers by supplementing their money wages with provisions in kind. In 1948, industrial enterprises spent one-sixth of their revenue on such provisions (Kramer 1991, 125). To manage their compensation deals, large firms had to establish complex barter networks, which was enormously time consuming and increased transaction costs (Buchheim 1989, 395).

In the prevailing monetary environment, the banking system could not fulfil its functions of allocating capital and disseminating information. In the absence of effective financial intermediation, new temporary institutions were required to manage financial transactions between firms, which increased transaction costs further, but could not allocate savings as efficiently as well functioning banks do (Klump 1989, 409–14). The lack of real market prices and the collapse of the banking system also increased information asymmetries and thus undermined the rational expectations of investors. With few incentives to invest and without the institutions capable of concentrating savings, bottleneck industries could not expand their capacities, nor could they carry out substantial repairs on rundown and damaged equipment. Investment decisions did not depend on profit expectations and access to credit. Instead, they were determined by the ability of enterprises to acquire scarce raw materials and intermediate inputs. The rationing system gave priority to bottleneck industries and exporting firms, and their ability to retain their premiums hinged on them meeting their output and export targets. As their production could run into input shortages at any time, maintaining inventories was particularly important for firms in these high-priority industries.

According to Buchheim, it was the inconsistency between existing institutions and the policies of the military governments more than the direct consequences of the war that crippled the West German economy after 1945. The rationing of consumer goods and industrial inputs as well as fixed prices and wages were incompatible with the adherence to the market economy. Firms had no real incentives to increase production beyond levels necessary to secure key raw materials, especially imports, and to retain their skilled workforce. Instead of producing for the market, they turned to compensation deals that required excessive inventories and increased transaction costs (Buchheim 1991, 61–2). However, historians also recognised the influence that expectations about future

economic reforms made on the behaviour of private firms in the early post-war years. Businesses were well aware of the intentions of Allied governments to reform the monetary system, which were strongly supported by German experts. The main obstacle for the currency reform they envisaged was that the Soviet government opposed the extension of the reform to the whole of Germany, which the US administration continued to prefer until early 1948 (Roeper and Weimer 1997, 20–1). The expectation that an effective financial system would soon emerge was perhaps the main motive for West German enterprises to survive by maintaining production and to retain their equipment, their core workforce, and their supplier network. The objective of preserving productive capacities far larger than what were put into effective use in the years after 1945 contributed significantly to the modest growth that the capital goods industries achieved already before the economic reforms of June 1948 (Buchheim 1990, 56–8).

At the same time, these expectations also held back production, especially production for the market, in the first half of 1948, as firms went into overdrive to acquire as much input materials as possible on the cheap before their prices would rise and to delay selling their own products until the introduction of the new currency. Under the conditions that prevailed in post-war Germany, such behaviour from firms was perfectly rational. Unlike in the Soviet occupation zone, the Western military governments did not guarantee the survival of firms with the exception of strategic enterprises that were often publicly owned, which meant that businesses had to remain liquid and profitable after the currency reform. Excessive inventories served this very purpose. On the one hand, they enabled firms to secure sufficient liquidity by bringing products to the market in large volumes once they were paid in a currency that had real value. On the other, they made the supply side of the economy more flexible, so that producers would not run into bottlenecks immediately after the reintroduction of free markets. All in all, the bureaucratic allocation of scarce resources, the flourishing of illegal markets, and the coexistence of excess liquidity with administratively fixed prices generated high transaction costs, low productivity, poor capacity utilisation, and abnormally high inventory–output ratios in an economy in which the inadequate supply of raw materials and intermediary inputs prevented faster recovery in the first place. The elimination of production bottlenecks and institutional inconsistencies were thus vital for the revival of West German industry. Both were soon accomplished with the economic reforms and new forms of international cooperation initiated in 1948, but they will be the subjects of later chapters.