

Making of Modern Europe: State, Economy and Empire

Module 6

Industrialization in Continental Europe: Germany

Script

German Industrialisation in the 19th Century

The advent of industrial modernisation

In the post-Napoleonic era, the domination of the European market by British industry triggered responses almost everywhere in the continent, and thus ended up transforming all the concerned economies somewhat fundamentally. For instance, the principal problem for industrialisation in Germany happened to be the presence of several small markets instead of a single integrated market. Even after the Napoleonic reorganisation in the region, in 1815 the German lands divided into 39 separate states. This implied the existence of 39 customs systems, 39 judicial and currency systems. Given such impediments in the path of inter-state commerce, German transportation system was not developed either, which made transportation of merchandise an expensive proposition.

Hence, even after the inception of the idea of a German nation in academic circles and the creation of a German diet in 1815, the economic relations of the various German lands continued to be with their traditional economic partners in different parts of Europe – the Rhineland found its markets in the adjacent regions of northern France; states like Schleswig-Holstein and the port cities of the North Sea (such as Hamburg or Bremen) traded principally with Britain and the Netherlands; Prussian commerce was limited to the German states to the west of Elbe. As a result of all these various problems, it was difficult to mobilise capital that could be invested in technology in the German lands. To galvanise such an economy, a market had to be created which makes investment appear a lucrative proposition. The Zollverein, set up under Prussian initiative in 1830 was instrumental in doing just that by removing many of the standard problems.

The motivation behind Prussian initiative to set up the Zollverein was particularly simple. It had been resolved at the Vienna Congress that in acknowledgement of Prussian contributions in the continental struggle against Napoleon, French-occupied Rhineland was to be made over to Prussia. The growing demands for manufactured goods in Prussia could no longer be addressed by the industrial sector in Silesia alone, hence Prussia required access to the industrial resources of the Rhineland. However, the inland customs barriers made Prussian importation from

the Rhineland a fairly expensive proposition. Thus having gained access to the region, in 1818 Prussia abolished all internal tariff barriers within the kingdom of Prussia. Even then, the existence of the customs frontiers of other states lying between mainland Prussia and Rhineland prevented duty-free commerce between the two parts of the kingdom. Hence Prussia began to propose duty-free trade with all its neighbouring states. Quite apart from this, faced with stiff British competition, German merchants and industrial entrepreneurs began to realise that the only way to save indigenous industry was to accord it preferential treatment. Hence requirements of the Prussian state on the one hand, and pressure from the mercantile and industrial sectors on the other hand, together brought about the creation of the Zollverein.

The series of developments that led to the creation of the Zollverein (Customs Union) began in 1828 with the treaty ushering in duty-free trade between Prussia and Hesse-Darmstadt. In 1829 the Palatinate states adjacent to Rhineland joined this system. In 1828, a separate treaty brought together larger states like Saxony, Thuringia, Nassau and Hesse into a duty-free trading area. In 1834 all the latter four states, along with 14 other big and small states joined the duty-free arrangement of Prussia-Hesse-Darmstadt, and this marked the completion of the creation of the Zollverein. In 1854, Hanover and Oldenburg also joined it. Apart from removing all inward customs barriers among the signatory states,

the Zollverein also threw up high tariff walls against merchandise imported from outside the signatory states, so that indigenous industries of the signatory states could get some protection against British competition.

Among the states that stayed away from the Zollverein, Austria argued that the tariff wall was not high enough to save Austrian manufacture from British competition. On the other hand, the states along the North Sea, dependent on British trade, found the tariff wall too high, and thus refrained from joining it in the 1830s. But in 1867, as the prospect for a united German state grew brighter, Mecklenburg, Schleswig-Holstein, Lauenburg and Lübeck joined the organisation. In 1871, at the time of the foundation of the German Reich, only Hamburg and Bremen remained outside the Zollverein. After even these two port-cities joined the Zollverein, all the German lands apart from Austria became integrated into a single market.

Commenting on the history of German industrialisation, historians like Hoffman contend that Zollverein marks the take-off stage in the rise of German industrial economy. With the integration of the market, the market demand for German industry grew dramatically. Benefiting from the introduction of duty-free trade, the propensity of transporting merchandise from one part of the German lands to another tended to increase, which created the need to improve transport system.

Accordingly, during 1830-48, considerable developments occurred in the realm of riverine and road transport. Apart from numerous new roads that were built, canals were dug out of rivers like Rhine, Oder and Elbe to facilitate river transport. But the real breakthrough came with rail transport. During 1835-40, there were only 679 km of railway system; in the 1840s it increased to 6,000 kms. The need to cater to greater demand of the expanded market space propelled German industry to adapt modern industrial technology. As the coal and iron industries of Silesia, Rhine, and Ruhr began to adopt modern technology, the general character of entire industrial conurbations began to change. The realisation that development of transport and communication would further expand the market horizons encouraged wealthy banking concerns like Rothschild and Bethmann in Frankfurt am- Main, Schickler in Berlin and Heine in Hamburg to come forth and invest in railways.

But Gerschenkron, Clapham and others believe 1830-48 did not mark the take-off stage, rather the precondition for take-off stage. That is to say, they believe that while the impediments to industrial growth were indeed removed during this period, yet it would be incorrect that it marked the dawn of modern industry in the German lands. This was because, despite the onset of modernisation in many industrial ventures, traditional technology predominated majority of the industries. The

continued use of charcoal as the principal source of energy delayed the advent of steam-powered machinery, because charcoal remained the cheaper source as late as the decade of the 1840s. In Prussia in 1815, 73.5% of the people remained associated with agriculture; by 1871 the proportion had fallen by a mere 2%. Hence the money that was already invested in agriculture was not relocated into industry. Hence the industrialisation that began in the 1840s remained concentrated in the traditionally more advanced sectors where there was little need for any huge investment of fresh capital. Revolutionary industrial transformation in the German lands began, properly speaking, after 1848.

German Industrial Revolution

One of the principal features of Gerschenkron's argument about industrialisation in the continent of Europe had been that the absence of one or more factors crucial for industrialisation made an economy backward in comparison with others, especially Britain. In many cases, such backwardness could not be overcome by any natural progression; this could be remedied only with what an alternative arrangement, or what Gerschenkron calls the 'substitution effect.' The principal causes of backwardness in the German lands had been the absence of an integrated market, and the consequent lack of capital. Although the German state did not take any initiative in making capital available for

industrialisation (as the state did in France and Russia), yet it played a decisive role in creating an integrated market, helped create enclaves of modern industry in Silesia industry, and made available an adequate supply of labour by dismantling the vestiges of serfdom. Nevertheless, the state did not constitute the principal force behind German industrialisation. The revolutionary transformation which began in the German lands from the 1850s was driven by the German banks who successfully overcame the dearth of capital which characterised the German economy in the first half of the 19th century.

One of the most interesting features of the British industrial revolution was the gradual character of the transformation of industrial technology – it took place over a few decades (others say, centuries), hence they were absorbed into the system gradually. As the modernisation was spaced out over a few decades, there was no need for any huge outlay of capital at any one point. But once the industrial revolution had begun, other economies could not wait for such gradual transformation of their economies. It made far better business sense to buy British technology than to develop one's own technology. Thus, everywhere outside Britain, industrialisation proved an expensive proposition. Where a substantial market in capital already existed (such as in the Netherlands), this appeared fairly easy, but mobilisation of capital for modernisation of industry was not such a cakewalk for most of the other economies. In

the first half of the 19th century, the paucity of capital had become particularly poignant.

Interestingly, the very political inequality that prevented the emergence of an integrated market was also indirectly responsible for the manner in which capital could be so effectively mobilised in the German lands. Before the emergence of a united Germany in 1871, in the various German states there were different forms of currency; thus every German city would have some money-changers, who changed foreign currency against local currency. People associated with the trade of money-changing also constituted the principal mainstay of the banking industry. Hence, almost every German city would have some local banks. Most such banking businesses tended to run along family lines, and their capital tended to be invested in commerce. For instance, one of the largest banking houses in 19th century, the Rothschilds, preferred overseas commerce for their investment. Relatively bigger organisations often invested in mining and even textiles, as did the Fuggers in the 16-17th centuries.

But owing to the limitations of the market, agriculture and a handful of proto-industrial ventures tended to be the preferred investment arena for most of the smaller banking organisations. When after 1815 German proto-industry was faced with fierce competition, the local banks tended

to consider agriculture as the safest investment arena. But the agrarian crises which afflicted Europe in the 1840s raised doubts about security of investment in agriculture. On the other hand, the possibility of colossal profits made industrial investment appear more promising. It was only at this stage that the German banking concerns became willing to invest their money in industrial sector, thereby removing the biggest obstacle from the path of German industrialisation.

The trend begun by the Rothschilds, Bethmann, Schickler and other such banking concerns in the 1830s began to be followed by many others after 1848. But in the 1840s, the textile sector was not considered the favoured destination for capital investment. Transport sector of the integrating German market, particularly railway construction was considered the most remunerative and effective. Railway build-up required import of state-of-the-art technology from Britain; modernisation of German iron, steel and coal production was also necessary to supply the railways with engine, coach, rails, fuel, etc. To mobilise the huge capital required for this purpose, German banking classes followed the Belgian firm Societe Generale de Belgique in resorting to joint-stock banking – i.e. a number of small banking firms brought their capital together to form a banking corporation with huge capital reserve. In 1848 came the first bank of this type, the Schaafhausen'scher Bankverein in Cologne, with the objective of investing in the coal and iron industry of Rhineland and Westphalia. In

1854, again in Cologne, was founded the Bank für Handel und Industrie zu Darmstadt, aimed at investing railways and modern industrial ventures. The Diskonto-Gesellschaft was founded in 1856 in Berlin with similar objectives. Gradually more and more German financial firms began to invest in industry rather than simply commerce – such as Mitteldeutsche Kreditbank, Leipziger Anstalt and Berliner Handelsgesellschaft. By 1970, the greatest concentration of capital in the continent of Europe could be seen in the German lands.

Availability of capital accelerated the pace of German industrialisation. Mechanisation of the industrial sector began to speed up as more and more factories began to emerge along capitalist lines of production. This phase of industrialisation was centred primarily around the development of railways. In 1850 the railway network spread across 6,000 km; by 1875, the network was extended by 21,000 km more of railway lines. Generally investment of social overhead capital, i.e. infrastructural investment like railways, tend to be undertaken by governments because of the high gestation period for returns. In this respect, German industrialisation was largely exceptional because almost the entire investment in social overhead capital in the 19th century came from the private banking firms. Knowing that the gestation period would be high, German banks resorted to the organisational structure of *Kommandite banking* – that is to say, investing banks tended

to become active partners in the concern they invested in, sharing in profit and loss alike, and participating in the decision-making process as well. On the other hand, to prevent losses on account of capital being tied down in projects with a high gestation period, the German banks took a leaf out of French and Belgian banking to start the practice of mixed-banking – i.e. apart from investment in industrial and commercial projects, they mobilised capital for investment by giving small consumers short-term banking services.

The development of railways in the German lands brought about a holistic transformation of the character of the economy. The accelerating demands for rail, wagon, engine etc required progressive increase in the production capacity of German iron, steel and coal industries, which propelled the modernisation of these sectors. Since the modernisation of these sectors was triggered by the needs of the railway sector, this development is called ‘backward linkage.’ On the other hand, the development of railways improved the state of German transport to such an extent that the market horizons before all industries extended nationwide. The prospect of having access to the whole German market proved so promising that all the concerned sectors of German manufacturing found it remunerative to modernise the mode of production. Such spin-offs arising from railway development, even

though these were not directly occasioned by the railways, are known as ‘forward linkage.’

In the case of British industry, the greatest cluster of backward and forward linkages had been found in the cotton textile industry – which constituted the first generation of industrial revolution. In the case of Germany, the first generation of industrial revolution did not have much resonance. By contrast, a far more significant role was played by the second generation of industrial revolution, relying on heavy industry like iron, steel and coal. Thus, Clapham and Gerschenkron argue that for Germany the ‘take-off’ took place in the period 1850-70.

The full-fledged support of German government after the German unification should logically have accelerated the course of industrial transformation. But this received a setback with what then appeared as a period of depression, and later turned out to be a period of retarded growth. In such an adverse situation, to keep the economy on the trajectory of growth, the Cartel system was born, where all the firms associated with a particular industrial sector came together to regulate all the production and distribution related issues to free the concerned industry from the vagaries of the market. It has been estimated that in 1890, the cartels dominated 90% of all paper production, 74% of the

mines and 50% of iron output in Germany. In 1896, as many as 12,000 factories were being regulated by 385 cartels.

Another feature of this period was the virtual cartelisation of the banking and investment services, which in turn resulted in something like a bank-industry nexus. What this implied was that some banks began to specialise in some specific industries. Thus from the 1870s railway investment became the specialisation of Darmstadter Bank; Diskontogellschaft specialised in iron and steel industry; Berliner Handels invested in other heavy industries. Such reorganisation of resources guaranteed that even though the industrial growth rate slowed down during 1870-92, growth nevertheless continued. Hence when in the 1890s, rapid transformation of technology in the heavy industrial sector spawned the electrical and chemical sectors as the new motors of economic development, Germany emerged in the forefront of this capital intensive third generation of industrial revolution. This was the time when engineering firms like Siemens, AG Farben emerged; in the chemicals sector organisations like Hoechst and Bayer gave Germany control over more than 90% of the global market.

To assess the revolutionary nature of transformation of German industrial sector, the issue has to be seen in perspective. Railways appeared first in Britain in the 1830s and then spread elsewhere. After 6

decades, Britain had a railway network of 32,300 km, France had 36,900 km and Germany 42,900 km. In 1913, on the eve of the Great War, Germany had the largest functioning railway network in Europe (63,700 km). In 1890 Germany produced 89 million tonnes of coal, which climbed up to 277 million tonnes in 1913 – which was double the coal output of France (40 million tonnes), Russia (36 million tonnes) and Austria-Hungary (47 million tonnes) put together. In 1914, only Britain (292 million tonnes) produced more coal than Germany. Britain was the largest producer of iron in the world. In 1870, on the eve of the birth of united Germany, Britain produced 6 million tonnes of pig iron, as against Germany's output of 1.3 million tonnes; in the 1890s, British production averaged at about 8 million tonnes, Germany at 4.1 million tonnes. In 1900 the figures for British and German output of iron stood respectively 9 million and 7.5 million tonnes; in 1910 10 and 9.5 million tonnes. In 1914, Germany (14 million tonnes) surpassed Britain (11 million tonnes) in terms of iron output. But still ore significant was the production of steel.

There were some major technological shifts in the 1870s and '80s at the forefront of which stood Germany. Consequently in the 1890s, organisations like Thyssen, Stinnes and Krupp powered German steel production at a remarkable pace. In 1900 British steel production stood at 5 million tonnes, while Germany stood at 6.3 million. In 1910 German steel output (13.6 million) was double that of Britain (6.5

million tonnes). In 1913 German steel output (17.6 million tonnes) was more than the combined steel output of Britain, France and Russia. In all, on the eve of the Great War, 14% of the global steel output came from Germany. As a consequence Germany in 1914 became the largest economy in Europe and the second largest in the world, next to the USA.