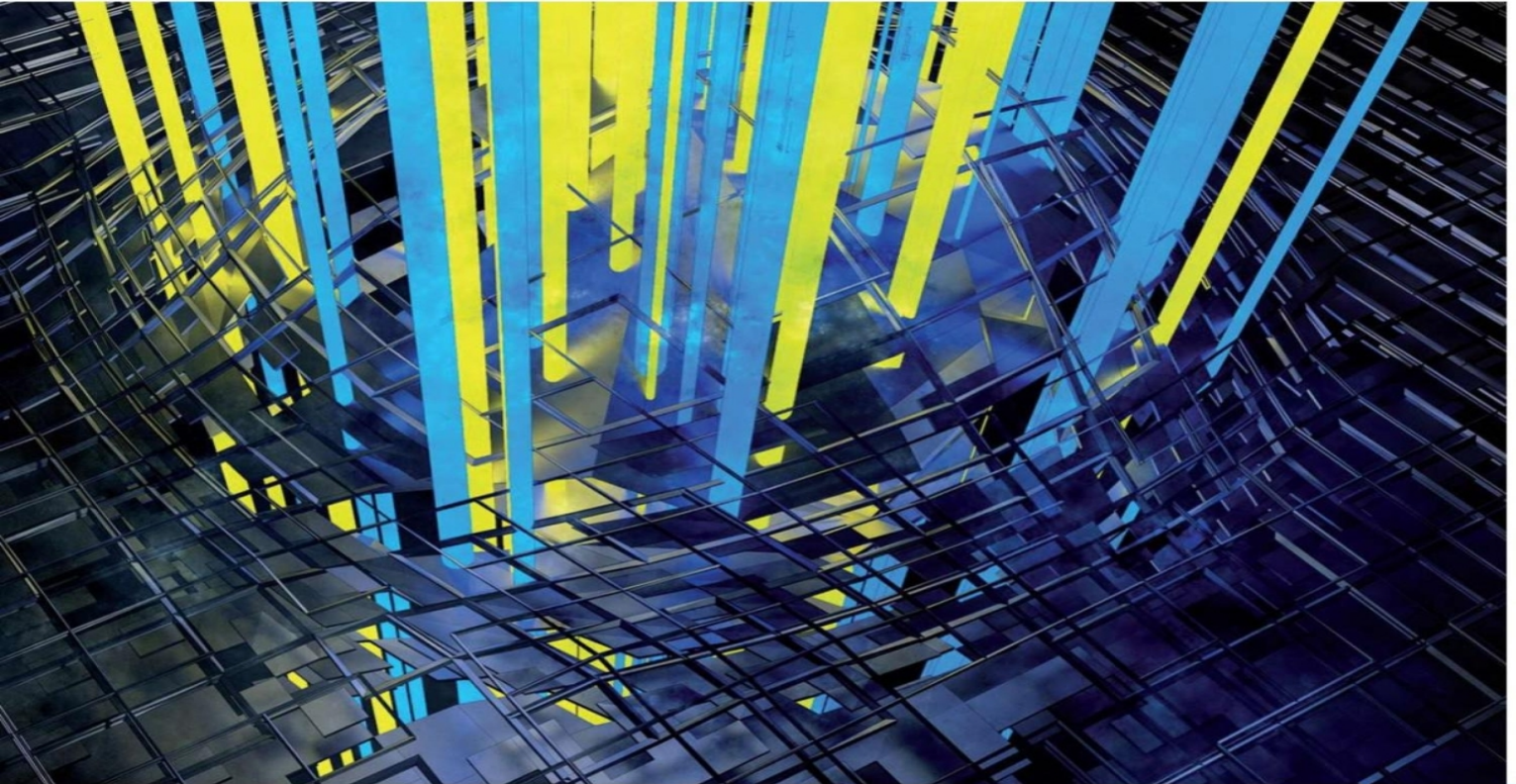


**Ellias Aghili Dehnavi
Mohammad Ghanbari Barzyan**

Realm Of Industry



**Probing the Roots of Germany's Economy
and Industry Development**



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Dear Kimia,

Thank you so much for being a never ending source of inspiration, without you and your celestial energy I could not be able to finish this demanding work!

With much love and respect, my little Star!

Ellias

*To Johannes and Regina who handled the fifth generation like two expert
captains!*

To my brother and sister, Roland and Anna who are at the helm!

You are forever eternalized in our hearts With so much love and peace

Ellias

Preface

The German economy is a highly developed social market economy. This country has the biggest economy in Europe, the fourth biggest economy in the world based on nominal GDP, and the world's fifth biggest economy based on GDP (purchase power parity). According to the IMF, Germany held 28% of the Eurozone economy in 2017. Germany is a founder member of the EU and Eurozone.

Germany held the record of the biggest global trade surplus worth of 310 billion dollars which made the country one of the biggest exporters in the world, and its goods and services exports were 1448.17 billion dollars in 2017. The service sector, industry, and agriculture hold 70, 29.1, and 0.9 percent of the total share of Germany's GDP, respectively. Exports of Germany encompass 41% of its national output. Germany's top 10 exported goods are vehicles, machinery, chemical products, electronic products, electric tools, medical products, transportation equipment, base metals, food products, rubber, and plastic. The German economy is the biggest production economy in Europe, and it is less likely to take effect from the financial stagnation. The country conducts applied research with real industrial value. The German economy is considered as a bridge between the latest academic insights and product advancements and industry-oriented process, producing a big deal of knowledge in its laboratories. In July 2017, the IMF issued another "good health status" for the economy of Germany, providing recommendations for maintaining this level in long run.

Germany is rich in timber, lignite, potash, and salt. A number of minor natural gas resources are being exploited in the Lower Saxony state. The Democratic Republic of Germany continued to exploit Uranium in Ore Mountains up to the union of the Eastern and Western Germany (also see SAG/SDAG Wismut). The source of energy in Germany is primarily fossil fuels (30%) and secondly wind power. Nuclear power, gas, solar energy,

biomasses (wood and biofuels), and hydro are placed next. Germany is the first major industrialized country that has become committed to the replacement of renewable energies entitled Energiewende. Germany is the pioneering manufacturer of wind turbines in the world. Renewable energies produce 46% of the consumed electricity in Germany (according to 2019 statistics). 99 percent of the total German companies are owned by the German middle class, including small and medium-size enterprises mostly owned by families.

Among 2000 big companies of the world whose names are publicly listed by Fortune Global 2000 53 have their headquarters in Germany. The top 10 in the list are Allianz, Daimler, Volkswagen, Siemens, BMW, Deutsche Telecom, Bayer, BASF, Munich Re, and SAP.

Germany is the top venue of the world's trade fairs. About two third of the world's most important trade fairs are held in Germany. The biggest annual trade fairs and congresses are hosted in a number of cities in Germany including Hanover, Frankfurt, Cologne, Leipzig, and Dusseldorf.

Also, Germany is the most influential EU member country in terms of politics and economy. Angela Merkel, the chancellor of Germany who has been in power since 2005, retained the post for the fourth time in 2018, when her Centric Christian Democrat and Christian Social Union parties entered into a delicate coalition with the Social Democrat Party after the indecisive parliamentary election of 2017. The current political stalemate and general weaknesses of the centric political parties have led to the disturbed capability of the state in addressing key issues. The solid economy of Germany as the world's fourth biggest and Europe's biggest economy, is based on the exportation of high quality produced goods. Because of its low defense expenditure and establishment of its second gas pipeline linking to Russia, Germany is criticized by the rest of Europe and the US.

The rule of law

According to its registry commitment policy, or the national rights of foreign nationals, the foreigners' properties are under full legal support in Germany. Securing property rights, either chattel or real, are recognized and all these rights are protected by the law. The judiciary of Germany is fully independent with highly competent judges, and the rule of law applies. Instances of public corruption are very rare (for example in construction), but acts of corruption are usually prosecuted and punished.

The size of the government

Maximum rate of tax on personal income is 47.5% (including 5.5 surplus). The corporate federal rate is 15.8% (which in practice goes beyond 30% alongside other taxes). The tax load is equal to 37.5% of the total domestic product. The state expenditures during the past three years have been 43.9% of the national output (GDP) and the budget surpluses are equal to 1.2% of the GDP in average. The public liability is 59.8% of the GDP.

Regulatory efficiency

The law, regulatory, and auditing systems in Germany may be complex, but they are transparent and applied equally. The minimum legal wage throughout the country was increased again in 2019. The “dual educational system” of Germany trains and develops practical skills which are valued by the employers. The government continues to finance heavy expenses of green energy subsidies, especially in electric vehicles, although the reduced technology costs could make it possible to cut these subsidies.

Free markets

The total value of exportation and importation of good and services are 87.2% of the GDP. The average rate of tariffs applied on the weight of trade (common among EU members) is 1.8%, and according to the reports, there

are 637 nontariff measures in force under the governance of the EU. Germany has one of the extra nontariff obstacles specific to the country. In late 2018, the government expanded the scope of its mechanism of monitoring the direct foreign investment. The competing financial sector of this country provides a full range of services.

Capitalism and Bureaucracy in German Industrialization before 1914

Max Weber's analysis of western civilization has two central concepts of bureaucracy and capitalism. Nonetheless, Weber made uncertain conclusions about the association between the two concepts and their influence on western "rationalization". This scholar defined bureaucratic administration as

A concept identified by promotion, documentary procedures, salary, distinct jurisdiction areas, formal employment, hierarchical sub- and super-ordination, pension, as well as specialized training and functional division of labor. Bureaucratic administration can achieve the highest efficiency level and, in this regard, is officially the most sensible and recognized tool to prove superior to human beings. It is greater than another type regarding reliability, the strictness of its discipline, stability, and precision. Therefore, the concept enables a specifically great level of result computability for organizational directors and others involved in this area. In the end, bureaucratic administration is high-ranking regarding its operations' scope and rigorous efficiency. It also can officially use all types of administrative responsibilities. Bureaucratic administration is continually extended, which is seen in economic enterprises, clubs, church and state, interest groups, political parties, endowments, armies, and several other areas.

In this context, mentioned the inability of modern capitalism to function without **bureaucratic** administration, whether it is in big corporations or in the community as a whole, highlighting both **bureaucracy and** capitalism's anti-traditional rationality.

Conversely, both the conflicts and key differences between bureaucracy and capitalism were well known to Weber. While resources and coordination are mainly assigned and offered by the market's invisible hands in capitalist economies, the hierarchies' visible hands are involved in the

provision of coordination and allocation of resources in **bureaucratic** organizations. On the other hand, administrators are selected based on formal examinations and qualifications, whereas established regulations necessitate considering more market-oriented and less formalized criteria in hiring employees and workers in the market economy. Moreover, both employees and employers in the market economy have less secure and less predictable positions and rewards and more dependent on the market and quantifiable accomplishments, compared to administrators, who benefit from seniority rights and tenure in the areas of salary and raise. Even though rapid acceptance of change, innovation, risks, and initiatives are implied from capitalist success, the components guaranteeing the success of bureaucratic administrations include accomplishing the appropriateness criterion, handling individual constellations as cases of general and fixed regulations, and reacting as anticipated. Weber was anxious about the fact that the comprehensive expansion of bureaucratic structures might restrain entrepreneurial innovation and capitalist dynamics apart from individual self-realization and political leadership by and large even though he was captivated by bureaucratic organization's higher-level efficiency.

A more appropriate context, in which the association between bureaucracy and capitalism could be debated concretely, was German industrialization earlier than 1914. Similar to other industrialization examples prior to 1917, German industrialization had a capitalistic character without a doubt. Applying capital accumulation and profit as key indicators, private entrepreneurs made the most strategic decisions about the assignment of production factors. The privately-owned firms that were linked with each other mainly via market mechanisms were directed by these individuals. Wage functions on a clearly dominated contractual basis and various German society's aspects were formed by the conflicts and tensions between labor and capital.

Conversely, the incline in public bureaucracies set the scene for capitalist industrialization in Germany in stark contrast to Britain's situation. Ignoring regional differences, German industrialization (estimated based on

urbanization, enhanced growth, the development of the factory system and wage labor, improved labor force redistribution, and the establishment of a class of wage workers) began in the 1840s, which was more than half a century later, compared to Britain. Meanwhile, powerful public bureaucracies, which were outstandingly similar to one analyzed by Max Weber, later on, were properly established by the large German states, specifically Prussia, Saxony, and Bavaria. In the seventeenth and eighteenth centuries, they had instigated under absolutist regulation, and their continuity was broken by no revolution. The monarchical powers of patronage were repressed by the king's servants in the late eighteenth and early nineteenth centuries through gaining pension and seniority rights and tenure and making appointment conditional on formal qualifications. Thus, they had converted themselves into civic servants comparable to the kind explained by Weber. Through the limitation of the monarch's power without establishing powerful parliaments or other representative organizations, constitutional reforms increased the power of the high civil service at the beginning of the nineteenth century. The status, power, and some exclusiveness of a post-aristocratic type obtained by the higher civil servants was not primarily based on birth and was rather according to the assigned authority and official education, which obviously could not be accessed by lower classes, and then not limited to the descendants of the traditional élites either. The lead in the "reforms from above" was taken by the higher civil service considering the weak economic status of the majority of Germany, the underdevelopment of her representative organizations, and the immaturity of her bourgeoisie. This resulted in the moving of the larger states of Germany from the corporate-absolutist Ancien Régime to the nineteenth-century civil society, which would still show the impacts of its bureaucratically directed genesis even in Germany in the twentieth century. Needless to say, the emerging bourgeoisie, especially in the west, was one of the most notable supporters of change among others. Notably, in contrast to their beliefs about themselves, higher civil servants did not just represent the "common good" and also had their own distinct interests. In addition, they did not operate independently from

strong social classes, especially land-owning class. Evidently, the reform process promoted by these individuals had significant constraints: liberation cannot be obtained by decree in the last analysis, and the bureaucracy policy inclined to stagnate in the long run, hampering with change processes, the dynamics of which were susceptible to getting out of bureaucratic control. Strangely enough, though, the higher civil servants supported the bureaucratically led reforms from above (the relative success of which was jointly related to the failures of revolution from below in nineteenth-century Germany) under pressure from a competitive international system, impressed by West European models, and concerned to improve the positions of the state and their own. Meanwhile, there was not a consistent trend until the end of the nineteenth century: the early decades witnessed the strongest bureaucratic impact on social and economic change, which began growing again approximately in the last thirty years.

There were around 63,000 civil servants in Prussia or approximately 1% of the labor force on top of about 134,000 members of the armed forces in 1852. However, approximately 4% of the labor force or 1.2 million public employees existed in the German Reich (such as military people) in 1910. According to the comparisons, the government employees' proportionate importance in Germany was almost twice that of Great Britain in 1890. Nevertheless, the mentioned educational background and political power were found only in a small minority of these civil servants. Even so, important features of the civil service status were shared by most of these individuals, as far as policemen and postal staff, even if on different levels. These features included a praising image aligned with power, formalized procedures, a sense of duty, high esteem, a certain legal status under public law, special privileges in and loyalties to the state, security, and hierarchy. In a way, they were not just private citizens and were part of the state and its authority. There was a very high demand for civil service positions at all hierarchy levels even though they had low salaries, and the request for these positions was often more than the needed amount. Since industrialization occurred after bureaucratization, the process and character of

industrialization were formed in Germany by bureaucratic values, structures, and processes, compared to the United States and Great Britain.

This can be established regarding the public authorities' role in the reaction to social protests, the government's share of capital stock and the total product, the role of public economic policy, the role of businessmen and officials in local reform movements, and several other approaches. Nevertheless, we only focused on two minor areas of German industrialization in the current research, which showed much wider procedures: 1) industrial organization and management, and 2) the appearance of a white-collar employee class. with regard to these issues, we set to determine the difference made by the bureaucratic tradition, the way industrialization affected the social and economic change, as well as the mechanisms used in this area and the results obtained.

In the early factory system, managers and entrepreneurs obviously dealt with critical issues of discipline and organization, selection and motivation, and coordination and control, which had been mysterious to craft shops' masters or the merchants in the domestic systems. However, primary managers and entrepreneurs reflected on traditional models to eliminate these issues. The bureaucratic models, belonging to the stock of tradition, were rational to be used in Germany.

Bureaucratic patterns were expanded to the developing factory system and its management through various channels in practice. The mercantilistic period was followed by different interdependencies between early enterprises and government agencies. Responsible for developing and managing roads and canals using a technically trained workforce, government department carried on with being and nurturing. In addition to civil servants operating as entrepreneurs, the government resumed managing some enterprises, specifically in the mining area and then in the area of the railroad. In the technical and industrial education system, which started in the 1820s and primary industrial and scientific associations, civil servants had a great influence. Engineering expertise focused on special military units and Prussian technical management. There were 220 officers

and 4000 men in the Prussian engineering corps in 1850. The private railroads and other firms hired skilled civil servants and military men and paid them higher wages, compared to the government. Evidently, their work was associated with the emergence of bureaucratic values, styles, and patterns in developing private businesses. Moreover, the stereotypes and preferences that ruled the culture and social climate of that time were regularly shared between the primary entrepreneurs and their employees. The above-mentioned content included the wide identification and concurring public image of German civil servants to a great extent.

Regarding an enterprise's experience, we can carry out a complete assessment of the bureaucratic impact on industrial organization. Developed in 1847, the Siemens & Halske electrical manufacturing company was the forerunner in the field of electrical engineering and installations and was able to stay in the lead up until now. In 1872, 1895, and 1912, the number of employees in Germany was 600, 4000, and 57000, respectively, without considering its foreign branches. The Siemens management had very obvious bureaucratic traditions. A considerably smaller part of the paid employees were previous Prussian civil servants. Werner Siemens (the founder of the company) had partially studied in a technical military school in Berlin. Before starting his own business, also, he worked in the military for 15 years. Shop instructions were developed and indicated in 1855 (the shop discipline's written and general guidelines were used by other factories in Germany no later than the 1830s). A system of written and generalized guidelines, which presented static communication lines within and between the offices was rapidly designed by the Siemens firm. The sources present a mature sense of hierarchy and occasionally deliver similar to a contemporary administrative agency's files. This great level of bureaucratization cannot be described only as a managerial reply to the enterprise's operational needs and it also followed the receiving of old organizational models designed outside the industry.

The status and self-image of the paid primary employees at Siemens showed an obvious impact of bureaucratic patterns from outside the