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UNIVERSITÉ DE MONTRÉAL

**ECONOMIC AND POLITICAL UNIFICATION OF GERMANY: 1815-1871**

**PART 2: THE SHARE OF THE PUBLIC SECTOR IN THE ECONOMY**

par

RAMZY YELDA

Département de sciences économiques

Faculté des arts et des sciences

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## INTRODUCTION

The German Sonderweg is one of these stereotyped notions that are deeply ingrained in our minds. It is the concept that the Germans and their history have deviated from the general course of European history, at least since the eighteenth century. Initially this idea had a positive connotation dealing with the Prussian mission in Germany and the German mission in the world. This elevation of the State started with Hegel and continued throughout the Second Reich, the Weimer Republic and the Third Reich. After 1945 the German Sonderweg became a negative concept corresponding to the Germans' peculiar tendency toward authoritarianism. This repressive tradition started with Bismarck's Prussia and her victory over France which led to the Second Reich. It then continued, causing two world wars, until German authoritarianism was crushed in 1945.

The crucial period corresponds to the decades preceding the unification of 1871. It was during that time that Germany's industrialization took off and Prussia became the leader of the German states, eclipsing Austria. Was there anything special about the economic and political development of Germany between the foundation of the Confederation in 1815 and the year 1871, when the Prussian King William I was declared Kaiser in the Hall of Mirrors in Versailles? One author, Leonard Dudley, provided an interesting answer to that question. This study presents Dudley's model. It then examines the intervention of the state in the German economy in order to determine whether it increased or decreased between 1815 and 1871. The synthesis of the available evidence is used to determine the validity of Dudley's argument.

**A - THE WORD AND THE SWORD<sup>1</sup>**

The largest and most pervasive social grouping is the autonomous political unit or state. A state may be viewed as a territory within which a leading group has the recognized right to raise taxes in exchange for providing public goods. The state is characterized by its power to tax and its exclusive right to use force over a specified area. Collecting fiscal revenues and applying force are specialized activities undertaken by the fiscal and military bureaucracies, respectively. These two hierarchies are interlocked, each being dependent on the other: the soldier relies on the tax collector for his wages while the fiscal authority depends on military force, or threat of force, to extract revenue from the population. The limit to the exercise of force, the territorial boundary, constitutes the external margin of the state. Any extension of this margin would trigger conflicts with contiguous political units. The limit to the fiscal power, the share of total income that is raised through taxes, constitutes the internal margin of the state. Any extension of this margin would increase the taxation of citizens, thereby causing internal conflicts within the country. Leonard Dudley builds his model upon several assumptions. First, population and production are spread uniformly over territory. Second, central authorities have a set of contracts with spatially distributed tax collectors and the supervisors hired to control them, on the one hand, and with spatially distributed soldiers and the officers appointed to supervise them, on the other hand. Third, the probability that fiscal supervisors and officers are able to observe the

efforts of tax collectors and soldiers as well as the probability that the central government can control its supervisors and officers both diminish with distance. That is information asymmetry increases with distance. The central authorities are less informed than fiscal and military supervisors who, in turn, are less informed than tax collectors and soldiers. Therefore, there is an incentive for the latter to bribe supervisors to distort the information reported to the central government in a manner favorable to them. Then the net tax receipts collected from each additional unit of territory will diminish. Marginal net tax revenues (free of collection costs) as a fraction of income decreases with the total area administered. And the cost of obtaining the necessary military effort to control each additional unit of territory will increase with the distance of that unit from the capital. The marginal cost of military supervision rises with the area of the state. If the central government tries to maximize its total tax revenues net of collection expenses and the cost of territorial control, then marginal net fiscal receipts will be equal to the marginal military cost. This can be illustrated by plotting the expected area of the state on the horizontal axis and the expected share of taxes in total income on the vertical axis. The marginal fiscal revenue curve (FF) is negatively sloped whereas the marginal military cost curve (MM) is positively sloped. The equilibrium values of the average tax share and the total area of the state are obtained thanks to the intersection of the two curves. These values are given by the coordinates of the point (G) on the average revenue curve (AA) corresponding to the intersection of the marginal curves (see Figure 1 in Appendix).

When a revolution in technology changes the capacity of people to control other people the state is profoundly affected. Such a technological shock modifies both the external and internal margins of the state. Military control of remote territory depends on the available hardware. The central authorities faced with a rebellion of an outlying region must consider not only the probability of a victory but also its costs. If both sides use the same military technology, the legitimate ruler will try to crush the revolt by sending a larger force than that of the rebels. The crucial factor for him will be the ratio of the expected cost of an enemy casualty for the smaller opposing army to the expected cost of his larger army when combat occurs. If this ratio is equal to one, regardless of the relative sizes of the forces, then there will be no economies of scale in military technology. The cost of controlling territory will be high and states will tend to be small. If the ratio is greater than unity for large armies up to a certain size, then there will be economies of scale. By maintaining a force of the optimal size the central authorities will control a wide territory around their capital, defeating any opposition at a reduced cost. The limits to the share of taxes in total income also depend upon technology. If migration is possible, the state may be considered as a network with voluntary membership. Taxes are the payment made by citizens to interact with each others, using the facilities offered by the state. Taxes may be raised to the point at which individuals are indifferent between maintaining their membership of the network and establishing themselves elsewhere. Benefits derived from network membership will vary positively with the economies of

scale in information processing. If the latter are slight, then a rudimentary organization will be sufficient (i.e. a nomadic agricultural society). If, however, there are significant economies of scale, then the information technology will permit large-scale organization. Network membership will provide considerable benefits in a complex urban society. The technology for storing, reproducing and transmitting information will therefore determine the capacity of the fiscal system to generate tax revenues.

Informational and military scale economies are the pillars of the state. An increase or decrease in the former will change the willingness of citizens to pay taxes. Similarly, a variation in military scale economies will alter the cost of controlling territory. New techniques for processing information or applying violence will change the optimal tax rate and the territorial boundaries of the typical state. In particular, the model of Leonard Dudley predicts that an increase in military scale economies will result in an expansion of a state's size and a contraction in the share of total income captured in the form of taxes. Figure 1 (see Appendix) illustrates this situation. The marginal cost (MM) and revenue (FF) curves are drawn for given technologies, with an optimal point, G, giving the equilibrium values of the average tax share and the total area. An increase in military scale economies lowers the cost of controlling a given territory, shifting the military-equilibrium locus inward to M'M'. At the new optimal point, G', the external margin has shifted upward ( $dx > 0$ ), the total area of the state increasing. And the



internal margin has shifted inward ( $dy < 0$ ), the share of the public sector declining. Such a military innovation strengthens the capacity of the center to offset the effects of distance, thereby increasing the size of the state. Simultaneously, the increase in information loss due to the expansion of borders weakens the fiscal bureaucracy's hold over the economy: the tax level decreases. That approach provides a framework which helps to explain the German political unification that led to the Reich in 1871. The introduction of the railroad and telegraph in the 1830's and 1840's permitted the coordination of larger numbers of soldiers than had previously been possible. If rail and wire connections with the home state were maintained, then an army of a million men could now be supplied for very long in hostile territory. The impact of these innovations was particularly significant in Germany because of the population's density and degree of literacy and because of the size of the territory. The development of a railroad and telegraph network proceeded rapidly and at relatively low cost. The Prussian General Staff was the first military command in Europe to master this new technology, thereby enabling Prussia to defeat Austria in 1866 and France in 1870. The reduction in the cost of controlling territory of a given size permitted the creation of a German nation state. The timing and vigor of German expansionism in the nineteenth and twentieth centuries were therefore due to an excess of potential public resources over the amount required for territorial control. However, to prove the validity of his approach, Dudley has to show that relative tax levels or governmental spending fell following the introduction of railroads. He asserts that public intervention declined during the industrialization that preceded

political unification, but he fails to substantiate his argument due to the lack of national accounts data for that period. This study tries to fill that gap by gathering the available evidence supporting the view that the public sector's share in the German economy fell between the 1820's and the 1860's.

**B - STATE INTERVENTION**

The traditional historiography of German economic development prior to the political unification in 1871 has emphasized the active role played by the state. Existing society was relatively static and traditional whereas the new public bureaucracies were active and modern. Government policy stimulated development both directly (e.g. infrastructure investments, public enterprises) and indirectly (e.g. institutional change in money and banking, new legislation, industrial promotion).<sup>2</sup> Bureaucratic reform was a crucial impetus to industrialization. Prussia led the way: her entire tradition of state intervention from Frederick William III to William I encouraged and speeded economic growth.<sup>3</sup> As the German Confederation was constituted of sovereign states each of them was to a certain extent independent: there was no central public authority until 1871. Governments acted as legislators, providing the legal framework for trade and industry.<sup>4</sup> Following the military disaster of 1806, an administrative and social reform was achieved in Prussia between 1807 and 1812 under the direction of Stein and Hardenberg. The freedom to engage in trade or industry (Gewerbefreiheit) was introduced, thereby abolishing the restrictive powers of the guilds.<sup>5</sup> A Towns Ordinance established municipal self-government. The serfs were emancipated and their accession to the ownership of land was regulated; equality of civil rights was granted to the Jews. At the beginning of the nineteenth century there was no specific patent law in Germany. Technical inventions and commercial rights were protected in a similar way. Prussia was the first state to introduce a

patent legislation. A patent law, effective in 1815, protected genuinely new inventions providing considerable improvements or devices imported for the first time from a foreign country and put to practical use. The latter protection was intended to encourage the appropriation of foreign inventions in order for Prussia to overcome her backwardness in that area. A public technical authority determined whether the device was actually "new and genuine" and fixed the value of the claimed rights before granting them. Each of the Zollverein members organized its own patent system. The southern German states tended to adopt patent laws similar to Prussia's. Saxony did not establish any technical authority: the acceptance or rejection of inventions was left to private competition. Finally, economic legislation was harmonized by customs unions. The Prussian Tariff Act of 1818 and the foundation of the Zollverein in 1834 eliminated internal barriers, thereby increasing domestic trade and regional specialization and contributing to economic growth (see Part I of this study). But the Zollverein was a matter of fiscal, not economic policy. It coordinated the customs and their administration but failed to harmonize economic policy and legislation in Germany. The code of commercial law for the whole Zollverein was not in effect before the early 1860's, although it had been proposed by Wurttemberg in 1836.<sup>6</sup>

Governments also acted as administrators and entrepreneurs. The state relied on its enlightened bureaucracy to act for the common interest.<sup>7</sup> Civil servants appeared in Germany in the late eighteenth and early nineteenth centuries. The king's servants gained power at the

monarch's expense by making appointment conditional on formal qualifications and obtaining tenure as well as seniority and pension rights. The power of the high civil service was increased by constitutional reforms at the beginning of the nineteenth century. Those reforms limited the monarch's power without establishing strong representative institutions. The federal Diet of the German Confederation was weak and state parliaments, when they existed, were mostly ineffectual. Therefore, powerful public bureaucracies were already well established in the large states (Prussia, Saxony and Bavaria) when industrialization started in the 1840's. Higher civil servants became the sponsors of bureaucratically led reforms from above. The Prussian public bureaucracy, excluding the military, employed 63,000 persons by 1852, that is 1% of the labor force. Civil servants contributed to industrial promotion, organization and management. Early factories were plagued with problems of coordination and control, selection and motivation, discipline and organization. Entrepreneurs used bureaucratic models to solve these problems. Interdependencies were created between public bureaucracies and enterprises. Civil servants ran state-owned firms or were hired by the private sector; they developed technical and industrial education as well as scientific and industrial associations.<sup>8</sup> The Berlin Gewerbeinstitut was founded in 1821. It remained for a long time the most important institution for technical training in Germany and one of the most effective tools of the Prussian government in promoting economic development. Despite its importance the Gewerbeinstitut could not meet the demand for technicians: foreigners had to be brought in.<sup>9</sup> From the 1820's onward a series of public industrial and technical schools were established

throughout Germany in order to promote industry and to further the state's wealth and power. In the beginning there were few, if any, entrance examinations and many scholarships were available. Around the middle of the century a process of academization was started. Entrance qualifications were raised from elementary to secondary school background: by 1870 graduation from a Gymnasium or a similar establishment was a condition for application. Practical training was reduced and specialization was increased, with an emphasis on mathematics. Fees were raised and stipends were limited. The status of teachers was enhanced, sometimes reaching that of faculties. The schools were responding to increasing demands (production techniques became more scientific) as well as creating new demands. The academization process was a mean of social upgrading for teachers and graduates alike. As education was a very important criterion of social standing in Germany, the prestige of businessmen, managers and employees was raised. The profession of engineer emerged, first as the military personnel in charge of the construction of roads, bridges and weapons. Around the 1850's that profession became a collective name for civil technicians who were theoretically trained and engaged in non-manual work. The Prussian army employed many engineers in technical administration and in special military units. By 1850 the engineering corps comprised 4,000 men and 220 officers. Some of them switched to a civil career, either as managers or entrepreneurs. Werner Siemens, for instance, had received part of his training in a military school and had spent 15 years in the army before founding the Siemens & Halske electrical manufacturing firm in Berlin in 1847. Moreover, a significant number of that firm's salaried employees were

former Prussian civil servants. The Siemens management developed a high degree of bureaucratization modeled on the public bureaucracy: a system of written and generalized instructions provided fixed lines of communication within and between the offices.<sup>10</sup>

Bureaucratic patterns, when adopted, made a direct contribution to the success of businesses. They stressed accuracy, punctuality and regularity, thereby increasing the efficiency of work. Sufficient instruments of direct control, such as elaborate accounting and easy long-distance communications, did not exist. Therefore, the civil-service ideology of integrity, sense of duty and loyalty was useful. It limited the unreliability and fraud of employees and prevented collusion between the blue and white collar forces, the latter identifying with management and regarding the former as inferior. Bureaucratic structures and processes, based on the civil servant hierarchy, shaped the German industrialization.<sup>11</sup> Sometimes, states attempted to speed economic development by intervening more directly. Industrial promotion offices, such as the Gewerbeinstitut in Prussia and the Central Office for Trade and Industry in Wurttemberg, stimulated the spirit of enterprise and innovation in many ways. They gave scholarships to young technicians and artisans and bought new machinery at government expense for exhibition or for lease to businessmen; they cooperated with the Chambers of Commerce and assisted in the foundation of technical and commercial associations. The Prussian Seehandlung (Overseas Trading Corporation) established model factories in association with local entrepreneurs or banks. In the 1840's most of these

factories were located east of the Elbe in small remote towns and villages in order to diminish unemployment and underemployment. Similarly, the "Amortization-Office" in Baden promoted development by financing capital accumulation.<sup>12</sup>

Governmental intervention was considerable in the transportation sector, all the German states devoting a large share of their revenues to transport improvements. Most roads were built by the public sector. In the 1820's the Seehandlung financed the construction of some 600 miles of highways in Prussia. By 1852 nearly 90% of the Prussian road network had been built with central and local governments' funds. As for investment in waterways, states virtually monopolized it.<sup>13</sup> However, from the 1840's onward railways overshadowed all other means of transportation. Most of the public investment in transport went to railroad construction.<sup>14</sup> Due to German particularism railway ownership varied from state to state. In Prussia and Saxony private railroads dominated the system from the beginning. However, governments influenced private railway companies in many ways: they retained a substantial proportion of the shares issued, guaranteed minimum returns on capital and provided legal and administrative supervision. Other states (e.g. Baden, Bavaria, Brunswick, Hanover and Wurttemberg) built publicly-owned railroad systems. Differences between states' rail transport were so important that the construction of a suitable German network was prevented up until 1850. In the beginning the Prussian government did not support railway building. The State had constructed 482 miles of roads in 1816-31 and feared that railroad competition would



jeopardize its investment. Moreover, the constitutional rivalry between the Crown and the provincial estates limited the raising of governmental loans. The ceiling on the public debt had been reduced in 1820 by a law of national debt.<sup>15</sup> The Prussian Railway Act in 1838 entitled the government to supervise the founding, financing and the business operations of railway companies. The Act regulated main issues such as expropriations, freight rates and passenger ticket prices, the competition on one railway line by several companies and the connection of a new track to an existing one. Expert civil servants enforced this regulation. Railway promoters had to engage in long and tedious negotiations before obtaining a licence to enter the industry. This procedure contributed to the profitability of railroad companies, most of which had strong earnings from the beginning. Promoters had to rethink and rearrange their projects until they were approved by government officials, thereby sorting out the lucrative undertakings. Moreover, public regulation of the railroad industry contributed to the development of a capital market which provided investors' funds.<sup>16</sup> State ownership of the railways increased throughout Germany in the 1840's for several reasons. The Prussian government decided in the late 1830's and early 1840's that railroads were useful from a military point of view.<sup>17</sup> They could transport, supply and coordinate larger numbers of soldiers than had previously been possible.<sup>18</sup> As railroad building intensified in the 1840's, private companies were unable to mobilize the necessary funds. The Prussian government decided to subsidize these firms by the order of 1842 guaranteeing interest on approved railway bonds equal to that paid on state securities. Then, in 1847 the public authorities started the construction

of the first state-owned line from Berlin to East Prussia.<sup>19</sup> Moreover, governments built and operated railroad lines to derive extra receipts. Railways were a great financial success: in 1850-51 they provided 4.8% and 3.7% of the total budget revenues in Hanover and Hesse, respectively.<sup>20</sup> Finally, German states feared the diversion of trade routes if neighboring competitors had a better railroad network. Governments promoted the construction of lines in order not to fall behind and loose income.<sup>21</sup> In Prussia the combination of privately and publicly owned railway companies was advantageous: the former built and operated the most profitable lines, whereas the latter invested in tracks less lucrative but contributing to economic growth.<sup>22</sup> In 1848 there were still no railwlays either owned or operated by the Prussian state. Ten years later publicly-owned railroad companies possessed 27% of the network. Moreover, 23% of the total length of tracks were owned by private interests but operated by the state. That is, in 1858 the private sector controlled only 50% of the Prussian railroad network.<sup>23</sup> The state-owned Seehandlung, which had initially opposed railway companies, eventually bought large blocks of shares in those firms.<sup>24</sup>

German kingdoms and principalities as well as public financial institutions enjoyed a preferred position in capital markets. Savers were more confident in the governments' ability to raise fiscal revenues from their citizens than in the potential earnings of private industrial companies. On the one hand, the relatively undeveloped domestic market as well as the lack of technical skills made investments in industrial enterprises very risky, at least until the middle of the

nineteenth century. On the other hand, market imperfections on the supply side hampered the availability of capital for entrepreneurs. Banks of issue played a central banking role. The first such financial institution was the Bavarian Mortgage and Discount Bank in 1835, followed by the Bank of Leipzig in 1838. However, the main bank of issue in Germany was the Prussian Bank. Founded in 1846, it was a joint-stock privately-owned institution. But it was under such close bureaucratic controls that it acted as a governmental bank. Its initial capital was 10 million thalers and its note-issuing rights were not to exceed 15 million thalers. In the following years there was an increase in the circulation in Prussia of promissory notes issued by financial institutions located in other German states. As a result the Prussian government expanded the Prussian Bank in 1856, removing the statutory limit upon its note circulation. And seven new joint-stock banks of issue were granted charters. By 1865 there were 30 banks of issue in northern Germany, in addition to those in Prussia and Saxony. Their paid-up capital and reserves, their total note circulation and their overall earning assets amounted to about 63, 60 and 150 million thalers, respectively. In the Hohenzollern kingdom the Prussian Bank's notes prevailed in the paper money circulation by the end of the 1850's. Their share of Prussia's estimated stock of currency increased from 10 to 40% between 1855 and 1865. Some studies have observed a quantitative relationship between the Prussian Bank's circulation and the overall financial activity. The bank was supported by the government and by its large reserves of specie. From the point of view of liquidity preference its notes were therefore the closest substitute for specie. The Prussian

Bank held the financial system's cash reserves, with credit creation by other institutions depending upon the ease with which they could use those reserves. Even though there is no sufficient data to establish any causal link, it might be said that the Prussian Bank lending and rediscounting determined the overall rate of monetary expansion. The government had some control over monetary growth through this financial institution which served as a central bank.<sup>25</sup>

Recent studies have shown that state intervention, far from contributing to German economic development in the nineteenth century, actually hindered it. Civil servants had their own special interests and depended on the land-owning class. Moreover, the reforms they promoted had limits: in the long run the bureaucracy tended to oppose changes that were getting out of its control. And in order to be functional bureaucratic structures and techniques had to be mixed with personal, family-based managerial methods and with market mechanisms. The industrial enterprise depended on the market and private property was its main source of legitimate power. Therefore, there were clear limits to the bureaucratization process within the firm.<sup>26</sup>

The Prussian authority which examined the patent claims erred quite often. It rejected several significant inventions such as the Schonherr loom, which was accepted even in England, and it protected devices which failed or had no practical use.<sup>27</sup> Most of the industrial plants founded by the Seehandlung in the 1830's and 1840's turned out to be unprofitable unless they were granted favorable government contracts. They

did not stimulate development. After 1848 the activities of the Corporation were considerably curtailed. By 1854 most of its factories were sold, but only at substantial losses.<sup>28</sup> The Prussian government was more interested in social control than economic development. It considered all organizations outside its direct control as potential centers of political opposition to the monarchy. Therefore, it granted very few charters of incorporation in the first half of the nineteenth century, while limited liability corporations were increasingly necessary to finance and undertake large industrial projects.<sup>29</sup> After 1848 the Prussian government, under the influence of the Minister of Trade, August von der Heydt, was less hostile toward joint-stock corporations. However, the latter still required special governmental approval before being founded.<sup>30</sup>

The multiplicity of state forms that existed in Germany resulted in the regional fragmentation of governmental authority. Some entrepreneurs may have benefited from this situation by selecting the most favorable state with regard to their industry. However, regional rivalries often hindered business interests. The separate economic functions of the state were seldom coordinated, resulting in little public support in terms of technological change and specialization. The official promotion of exports and regional industrialization policies were generally a failure.<sup>31</sup>

State intervention often hindered the development of railways, particularly in the 1830's. In Prussia both the government and the Seehandlung initially opposed railroads: the former wanted to protect its road network and the latter feared the new transportation would compete

with its turnpikes. When authorized railways were subjected to very strict regulations, and they could not use the telegraph in the beginning because the government feared the transmission of unauthorized political messages.<sup>32</sup> Moreover, states considered that railways diverted trade instead of creating commercial relationships. Governments delayed granting concessions to private companies which wanted to build lines crossing state borders. Hampered by bureaucratic restrictions, railway entrepreneurs advocated national unification as the solution to speed the achievement of a German network. When a line was built in a neighboring state its rival felt compelled to counteract the assumed trade diversion effects by constructing a track as well. This competition among German rulers led to the railway boom in the 1840's.<sup>33</sup> Military reasons also contributed to the public authorities' interest in this new means of transport. The Prussian government became much more favorable to railways when their military value got recognized in the late 1830's and state-owned lines expanded considerably in the following decade under von der Heydt's influence.<sup>34</sup> However, official support of railways did not compensate for the obstacles placed by governments on the private sector, especially with regard to limited liability corporations. As they responded to an existing demand, most railroads were profitable from the beginning. Therefore, a comparable, and probably superior railway network would have been built by the private sector without any governmental interference. It is possible that railroad construction would have started earlier and proceeded more rapidly without state intervention.<sup>35</sup>

Until the mid-1850's Prussian banking and monetary policies were very restrictive. The government discouraged the foundation and expansion of joint-stock banks.<sup>36</sup> The Schaffhausen'schen Bankverein was one of the few financial institutions granted permission by the Prussian authorities to create an incorporated bank in 1848. As the security activity in railroad financing was concentrated in Berlin, the bank asked in 1853 for the permission to move to Berlin and to increase its capital. But the government refused on the ground that the institution's statutes did not include specific provisions permitting branches. To bypass the opposition of the Prussian authorities to incorporated financial intermediaries, Cologne financiers founded the Darmstadter Bank in Darmstadt, just outside Prussia's jurisdiction. The bank quickly opened several agencies in the Hohenzollern kingdom. Inside Prussia, many financial institutions were founded as limited partnerships with transferable shares.<sup>37</sup> States retarded the growth of industrial borrowers by putting restrictions on private enterprise. Firms could not incorporate freely until 1869, formal stock exchange trading was limited to certain kinds of securities and access to government funds was restricted. Most states maintained a strict control over the money supply, limiting the growth of the stock of currency (specie, government paper money and banknotes). The Hohenzollern kingdom restricted note issue, which was virtually monopolized by the Prussian Bank in 1846. That policy reflected the predominance of fiscal concerns over monetary and banking matters. Banknote circulation was relatively unimportant during the first half of the nineteenth century. The Prussian Bank maintained conservative specie

reserve rules, 50% of note liabilities being the normal minimum. It lent and discounted only to private bankers or against a banker's signature, with the exception of Junker landlords in eastern Prussia who also benefited from those services. The contribution of the bank to the supply of money was insufficient: the circulation of foreign banknotes within the Kingdom exceeded that of the Prussian Bank in the 1850's. Since 1820 any increase in the state debt necessitated the approval of a representative assembly. The Hohenzollern monarchs were opposed to a legislative control. Therefore, Prussian governments resisted the expansion of the money supply because currency was considered part of the state debt. There were frequent complaints of a "shortage of coin", especially in the Rhineland where the use of foreign coins was widespread. The limited supply of government paper money resulted in the latter bearing a premium relative to specie. The official supply of paper money and coin was inadequate for the demand, thereby restricting the growth of the volume of credit (even though the Prussian Bank did not govern credit creation by private bankers). After 1847 several banks of issue were established in states neighboring Prussia and Saxony in order to respond to the demand for money instruments in these two kingdoms. Notes were printed in Prussian and Saxon denominations to facilitate their circulation. The Prussian Bank was allowed to expand from the mid-1850's onward: the statutory limit upon its note circulation was removed in 1856, which resulted in the quick predominance of the bank's note in the Kingdom's stock of currency. However, the Prussian Bank played a restrictive role in the financial development of Prussia and Germany. Some studies even consider that the bank was an obstacle to nineteenth-century



German economic development.<sup>38</sup>

The traditional view holding that the role of the state increased during the German Confederation and led to the country's industrialization has been challenged by recent studies. State bureaucracy expanded markedly, improving the efficiency of public administration. But the role of the state in the process of industrialization was more circumscribed and less successful than previously thought.<sup>39</sup> As the nineteenth century unfolded private enterprise and entrepreneurship grew considerably.<sup>40</sup> The state bureaucracy failed to stimulate economic development. Governmental intervention, whether direct (foundation of industrial enterprises) or indirect (sponsorship of institutional change), had little beneficial impact or hindered growth.<sup>41</sup> German industrialization was not the product of state bureaucracy planning: it resulted from numerous decentralized decisions made by entrepreneurs.<sup>42</sup> The hero of Germany's take-off was the private, not the public sector.

### C - THE SHARE OF THE PUBLIC SECTOR IN THE ECONOMY

National account data are not available for Germany for the period prior to unification. However, an idea of the relative size of the public sector may be gained by looking at individual states. Prussia was the main German state in terms of her territorial, demographic, military and economic weight: she was the locomotive of the Confederation. The national unification process which led to the Reich in 1871 was orchestrated by the Hohenzollern kingdom. Data about Prussia's central-governmental spending are therefore representative of overall Germany. On the one hand, Table 1 and Figure 2 (see Appendix) show that per capita expenditures of the Prussian central government at 1913 prices declined between 1821 and 1853, with the exception of a sharp increase in 1849 due to the political upheaval. Central-governmental spending stabilized in the 1850's and rose significantly in 1866. On the other hand, Prussian per capita income at 1913 prices increased between 1816 and 1849; it fell in 1858, then stabilized in 1867. The share of the state in the Prussian economy, measured by central-governmental spending relative to income, declined from the 1820's to the 1850's, then rose in the following decade. The latter trend was due to the military build-up of the Hohenzollern kingdom in the 1860's: public expenditures increased considerably in order to finance the wars against Denmark, Austria and France.

Table 2 and Figure 3 (see Appendix) address the question of the share of the public sector in the economy from the point of view of fiscal receipts. Although Baden was a medium-sized state she compared

favorably with Prussia. Baden was one of the most industrialized area in 1871 Germany.<sup>43</sup> Her tax structure was similar to Prussia's in terms of the share of state income derived from direct taxation and the ratio of saving depositors per population.<sup>44</sup> Baden's per capita tax levels at 1913 prices decreased between 1850 and 1860, then increased in 1860-70. During that same period real per capita national product at market prices in Germany rose significantly. Even though tax levels in Baden increased considerably in the 1860's, the value of the net national product index remained superior to that of the State's fiscal receipts index. There was a fall in the effective tax rates of Baden in 1850-70. This indicates that there may have been a decline in German effective taxation in the 1850's and 1860's, that is during the economy's take-off.

One of the main arguments of scholars sustaining that the relative size of the German public sector increased from the 1820's to the 1860's has rested on railways. The share of total lines owned by private railroad companies declined from 92% in 1840 to 65% in 1850; ten years later that share was reduced to 55%.<sup>45</sup> Out of the 322 million thalers that had been invested in railroads by 1850, 132.5 million went to state-owned companies and 28.4 million were put into privately-owned but publicly-administered lines. Taking into account government shares in and subventions for private railways, the total public investment in railroad construction amounted to 155 million thalers by 1850; that is 48.2% of overall investment in that transportation network was made by the state. That amount was considerable: in the year 1850 government expenditures for

all Germany represented about 150 million thalers. However, ordinary state budgets could not finance railway construction by themselves. Therefore, states issued loans and paper money to the amounts of 97.2 and 7.9 million thalers, respectively. That is 105 million thalers of public investment in railroads was done through the private capital market or money creation and 50 million thalers through government budgets. The share of the public sector in railway investment by 1850 was, in fact, much lower than had been previously thought: it amounted to 15.5%, not 48%.<sup>46</sup>.

The Rhur coal industry may further illustrate the reduction in the share of the public sector in the economy. Until the middle of the nineteenth century this industry was regulated by very restrictive and traditional laws which interfered with every aspect of the mining operation, from wage rates to the installation of new machinery. The expansion of the Rhur area was handicapped by those regulations until they were gradually removed by a series of laws between 1851 and 1865.<sup>47</sup> Before the 1850's the Prussian government's economic policy toward the Rhur and its mining industry was characterized by what is called the Direktionsprinzip. The latter's implementation led to an elaborate bureaucratic administration and a complex system of regulation. The Rhur mining authority directed all aspects of the industry: mining codification, tax collection, field concessions, justice administration, supply of labor force, prices, wages, profit distribution, technology of operations... As the industry grew, so did the administrative bureaucracy which became increasingly incapable of accomplishing its supervising role in accordance with the Direktionsprinzip.

By 1838 there were about 130 officials in charge of 209 operations with an output of one million tons and a labor force of 8,100 workers. Tensions developed between the state and private enterprise. The government refused to adopt a more flexible policy whereas the industry was growing and economic conditions were changing. The Direktionsprinzip's principal aim was the development of the Rhur mining industry. The state and private enterprise were to be partners, the former supplying qualified personnel and the latter providing the necessary capital from the return on mining investment and profits. However, the 1830's and 1840's saw the introduction of new technologies that increased the required investment to start an operation. Shaft construction, steam engines used for water pumping and lifting as well as rail systems raised costs.<sup>48</sup> The Prussian government slowed the introduction of new mining and smelting techniques. The deep mining shaft, essential to the exploitation of the coal deposits extending north from the Rhur, was opposed for ten years by the bureaucracy. And a technique of smelting ore containing both coal and iron was delayed twenty years because only officially licensed coal miners could work the deposits.<sup>49</sup> Despite governmental opposition an increasing number of mines adopted the new costly techniques, thereby incurring rising losses. Capital for these investments and the financing of the losses could not be entirely covered from profits. Mining companies increasingly had to turn to loans. The industry's demand for capital exceeded the capacity of its self-financing regional system under the Direktionsprinzip. Moreover, special mining taxes intensified the conflict between the state and private enterprise. One of the Prussian government's goals was to derive a profitable income from its

mineral rights. The Rhur mining industry was heavily taxed while it faced increasing costs of operation and need for capital. From 1766 to 1851 the taxes collected ranged between 14 and 20% of sales income. The Essen region comprised most of the deeper shaft mines. In 1843-47 it had the highest operating costs and taxes of any region in Prussia, and the lowest net income and profits. Taxes amounted to nearly two-thirds of net income. The fiscal weight became the greatest financial obstacle to the expansion of the Rhur mining industry. By lowering profits, taxes reduced the capital available to entrepreneurs, thereby delaying large-scale shaft mining. Between 1851 and 1861 four major laws slashed state controls, allowing market forces to regulate the industry. The shareholder and tax laws of 1851 were the cornerstone of the reform. Controls of production, sales and management of mining operations were transferred from the state administration to the private company, which became a viable economic organization. Taxes were either reduced or abolished: their amount dropped from 1.3 million thalers in 1850 to 158,000 thalers in 1852. Levies were further reduced after 1861. By 1865 all remaining special taxes were abolished. In that year total fiscal receipts from the Rhur mining industry amounted to 1.9% of sales versus 13% in 1850. Two other laws completed the major reforms in 1860 and 1861, the state retaining supervisory power over technical aspects of mining, safety of operation and the protection of miners' health. These four laws, together with several directives, became the basis for the General Prussian Mining Codification of 1865. Coal production increased from 1.7 to 9.2 million tons between 1850 and 1865, that is an average annual growth of more than 12%. The size of operations

increased. The average enterprise in 1850 produced 8,400 tons and employed 64 workers. Fifteen years later it had an output of 40,000 tons and an employment of 184. Productivity for all operations rose with the rapid increase in the use of machines and steam engines. Between 1850 and 1865 the total number of engines almost quadrupled from 123 to 462, while the average horsepower per mine increased from 53 to 120.<sup>50</sup> The Rhur coal production became the most important one in Germany: it amounted to 11.8 million tons in 1870, that is 44.7% of the overall output.<sup>51</sup>

### CONCLUSION

The available evidence indicates that there was a reduction in the share of the public sector in the German economy between the 1820's and the 1850's. The state relinquished its power of intervention in the production process, limiting itself to regulating the conditions under which enterprises existed and competed with one another.<sup>52</sup> The state provided the public services necessary for economic growth (legal and administrative framework, education, public security...) in return for its fiscal levies, without simultaneously sowing the seeds of an eventual economic decline. Nineteenth-century Germany avoided Douglass North's paradox.<sup>53</sup> The introduction of the railroad in the 1830's reduced the cost of controlling a given territory, thereby freeing public resources which enabled Prussia to unify Germany under her leadership. The railroad network started to take shape in the late 1840's while revolutions were threatening the established regimes. From that time on the Prussian monarchy and bureaucracy gradually adopted the nationalistic ideas previously held by the liberals. Nationalism became conservative, leading to the Reich in 1871.<sup>54</sup>

The customs union of 1834, the Zollverein, was founded under Prussian influence. The Union was expanded during the next two decades, including most members of the German Confederation with the exception of Austria. Then, in the 1860's Prussia used her excess of public resources to push out her borders. She annexed Schleswig-Holstein, formed the North German Confederation and, finally, founded the Empire. The problem for the rest of Europe was that Germany still had a large surplus of resources



beyond what was needed for the military control of her territory. She had the potential to continue her expansion. The end result of that process was Adolf Hitler and his peculiar interpretation of Friedrich Ratzel's lebensraum concept.

**APPENDIX**

TABLE 1

Per Capita spending (PCS) by Prussian central government, in 1913 prices (marks)

Year	PCS	Real PCS index (1849 = 100)
1821	26.4	108.6
1829	25.5	104.9
1838	22.5	92.6
1847	18.0	74.1
1849	24.3	100.0
1853	19.8	81.5
1856	20.7	85.2
1866	27.0	111.1

Per capita income (PCI) in Prussia, in current and 1913 prices (marks)

Year	PCI (current prices)	Wholesale price index (1913 = 100)	Real PCI (1913 prices)	Real PCI index (1849 = 100)
1816	198	124	159.7	41.1
1822	212	84	252.4	65.0
1831	232	82	282.9	72.8
1837	244	74	329.7	84.8
1840	252	80	315.0	81.1
1849	272	70	388.6	100.0
1858	304	91	334.1	86.0
1867	318	97	327.8	84.4

Sources: Per capita central-governmental spending from Tilly, 1966-67, pp. 492, 391. Per capita income from Hohorst, 1977, p. 276. Wholesale price index from Mitchell, 1980, pp. 772-3.

TABLE 2

Per capita taxes in Baden, in current and 1913 prices

Taxes	1850	1860	1870
Per capita taxes <sup>a</sup>	6.82	8.55	11.05
German wholesale price index (1913 = 100)	71	94	92
Per capita taxes in 1913 prices <sup>a</sup>	9.6	9.1	12.0
Real per capita taxes index (1850 = 100)	100.0	94.8	125.0

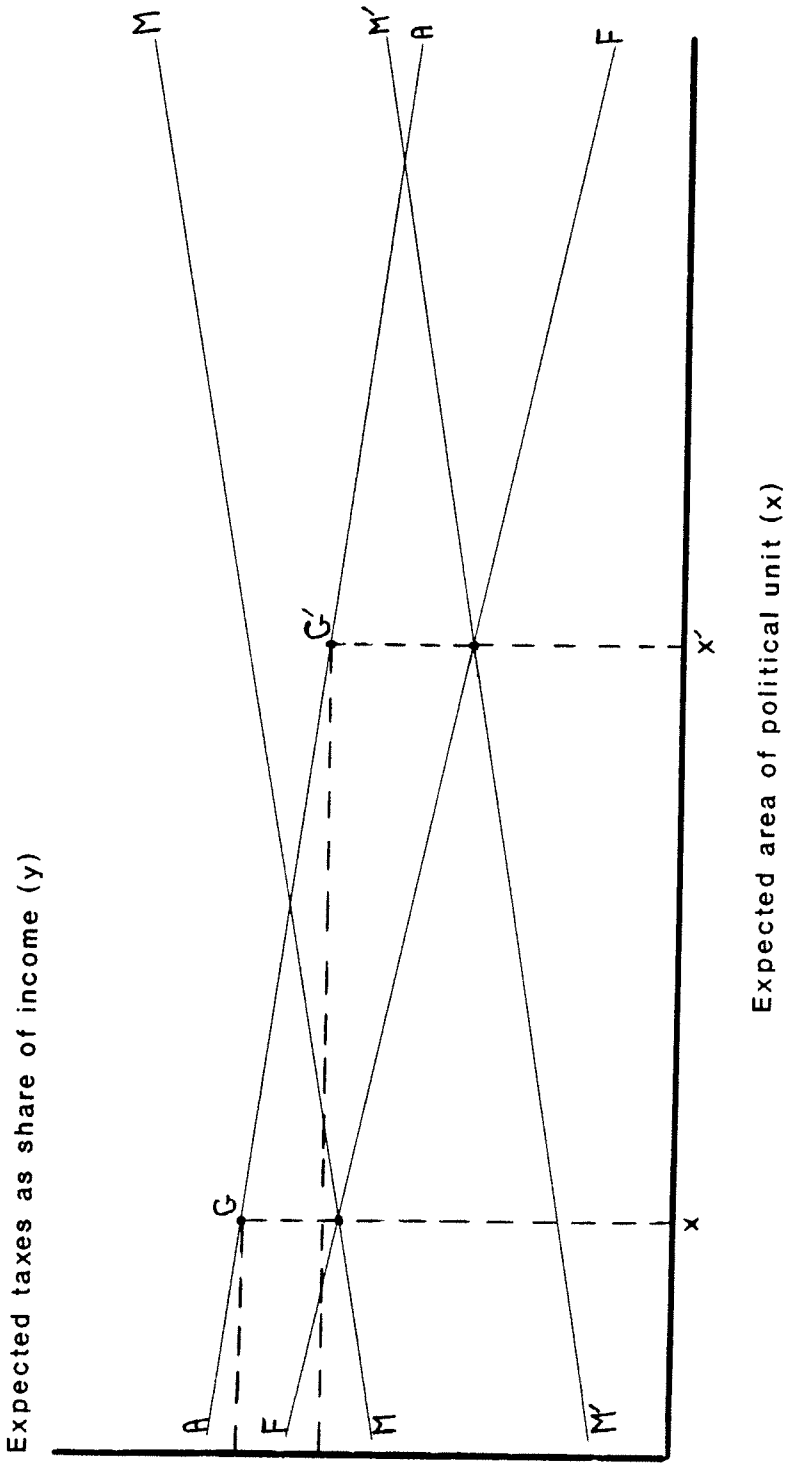
Total and per capita net national product at market prices in Germany (1913 prices)

Net national product (NNP)	1850	1860	1870
NNP <sup>b</sup>	10,534	13,604	16,706
Population <sup>c</sup>	34.0	36.2	39.5
Per capita NNP <sup>a</sup>	309.8	375.8	422.9
Real per capita NNP index (1850 = 100)	100.0	121.3	136.5

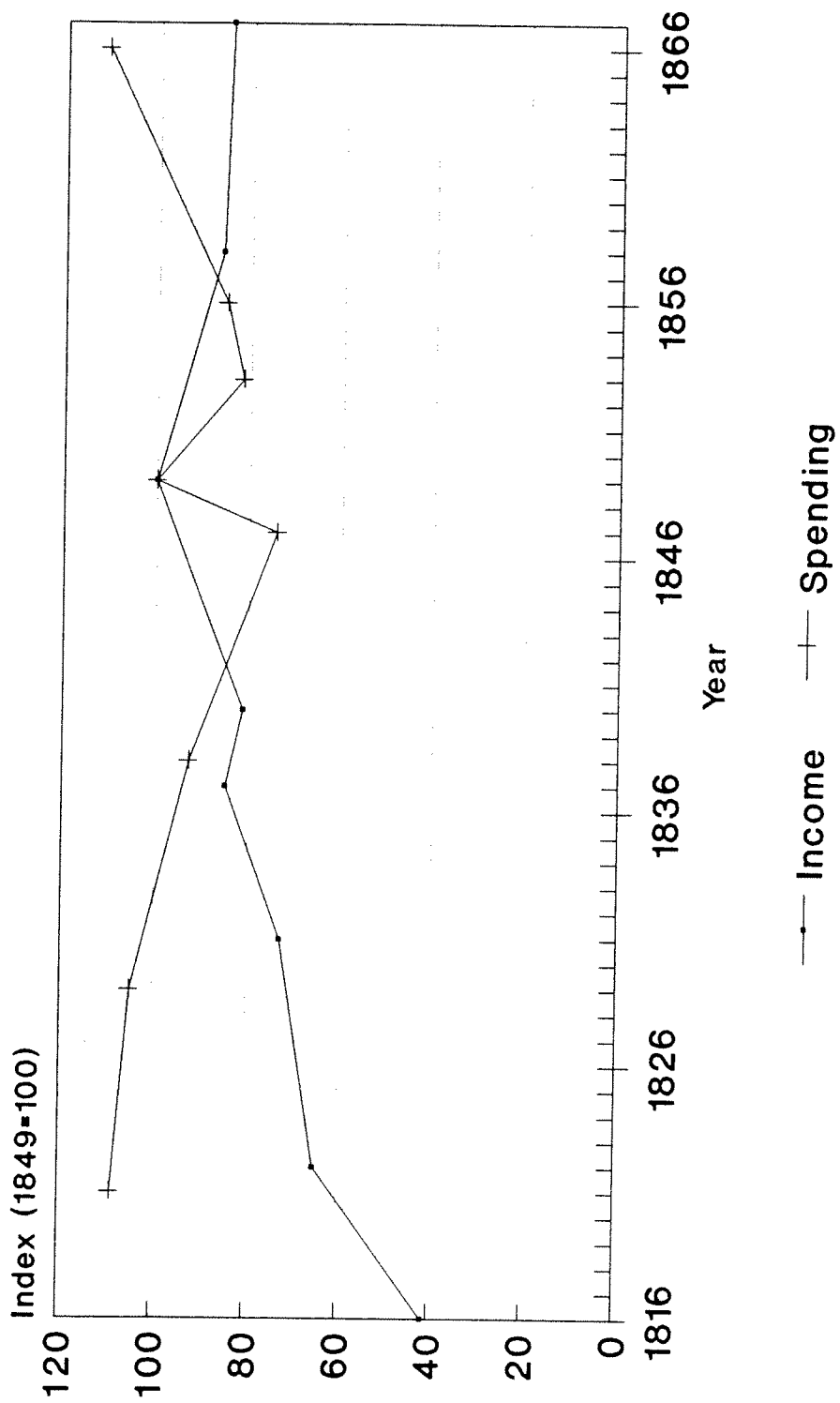
<sup>a</sup>: Marks<sup>b</sup>: Million marks<sup>c</sup>: Millions

Sources: Per capita taxes from Lee, 1975, p. 156. German wholesale price index from Mitchell, 1980, p. 773. Net national product from Mitchell, 1980, p. 817. Population from Trebilcock, 1981, p. 450 and Mitchell, 1980, pp. 71-2.

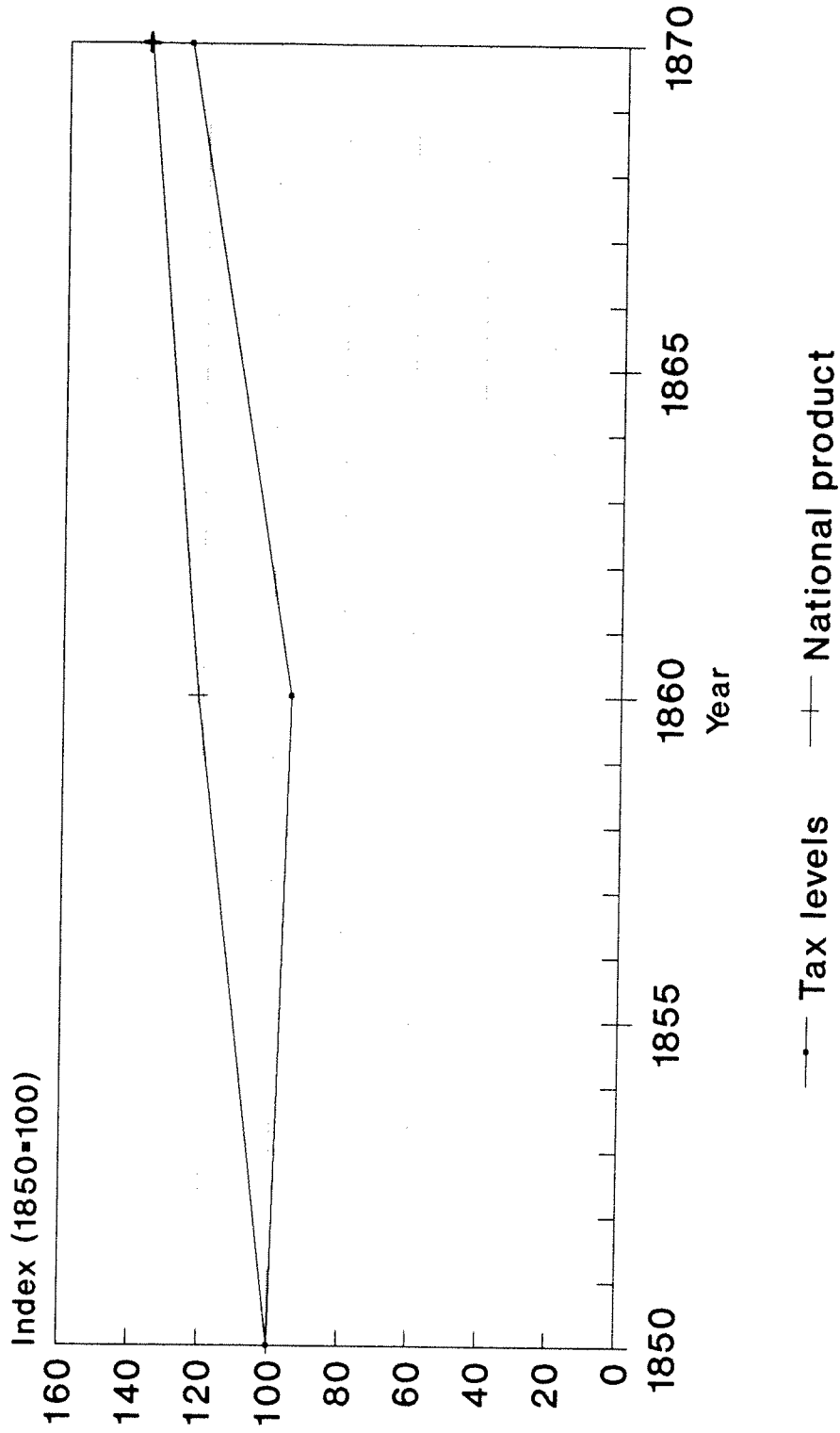
**Figure 1**  
**The effect of an increase in military**  
**scale economies on state's frontiers**



**Figure 2**  
 Per capita income and central-gvt  
 spending in Prussia (1913 prices)



**Figure 3**  
 Per capita tax levels in Baden and  
 national product in Germany (1913 prices)



National product: net at market prices

FOOTNOTES

1. This section is based on Dudley, 1990, pp. 232-8 and Dudley, 1991
2. Fischer, 1963, p. 83; Tipton, 1981, p. 139
3. Tipton, 1974a, p. 218
4. Fischer, 1963, pp. 84-5
5. Kiese Wetter, 1987, pp. 88-9
6. Fischer, 1963, pp. 85-7
7. Fischer, 1963, pp. 84, 89-90
8. Kocka, 1981, pp. 454-7
9. Fischer, 1963, p. 94; Hoffmann, 1963, p. 106
10. Kocka, 1981, pp. 456-7, 462-4
11. Kocka, 1981, pp. 458-9
12. Fischer, 1963, pp. 90, 93-4
13. Fischer, 1963, p. 93; Tilly, 1978, pp. 411, 413
14. Fischer, 1977, p. 438
15. Brinkmann, 1933, p. 139; Fremd ling, 1983, p. 122; Kiese Wetter, 1987, pp. 100-1
16. Bongaerts, 1985, pp. 332-3, 342-3
17. Tipton, 1974a, p. 205
18. Dudley, 1991
19. Fremd ling, 1983, pp. 121-2; Kiese Wetter, 1987, pp. 100-1; Tipton, 1974a, p. 205
20. Bongaerts, 1985, p. 343
21. Kiese Wetter, 1987, p. 101
22. Bongaerts, 1985, p. 344



23. Fremdling and Knieps, 1990, Table 1
24. Fischer, 1963, p. 93
25. Tilly, 1967, pp. 154-9, 167-9; one thaler is worth three marks
26. Kocka, 1981, pp. 455, 461
27. Fischer, 1963, p. 87
28. Henderson, 1975, p. 76; Tipton, 1981, p. 142
29. Tipton, 1981, pp. 141-2
30. Tipton, 1974a, pp. 204-5
31. Lee, 1988, pp. 359-60
32. Tipton, 1981, p. 141
33. Berdahl, 1972, p. 79; Fremdling, 1983, p. 122
34. Tipton, 1974a, pp. 204-5
35. Fremdling, 1983, p. 122
36. Tipton, 1981, p. 144
37. Kindleberger, 1974, pp. 24-5
38. Tilly, 1967, pp. 155-8, 166, 169, 181; Tipton, 1974a, pp. 205, 219; Tipton, 1981, p. 144
39. Lee, 1988, pp. 359-60
40. Fischer, 1963, p. 94
41. Tipton, 1981, pp. 139-40
42. Kindleberger, 1974, p. 25
43. Kiesewetter, 1987, p. 104
44. Lee, 1975, pp. 155, 158
45. Hoffmann, 1963, p. 113
46. Fischer, 1977, pp. 438-9

47. Fischer, 1963, p. 88; Tipton, 1974a, pp. 204-5
48. Jankowski, 1973, pp. 689, 695-6, 702, 704, 706
49. Tipton, 1981, pp. 141-2
50. Jankowski, 1973, pp. 706, 708, 710-1, 723-7
51. Henderson, 1975, p. 134; Tilly, 1967, p. 153
52. Bohme, 1966, p.119
53. Lee, 1988, pp. 358-9; North, 1981, p. 20
54. Tipton, 1974b, p. 953

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