

# *A Note on the Efficacy of the German Steel and Coal Syndicates \**

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## I

The purpose of this note is to assess the efficacy of German cartels during the late nineteenth and early twentieth century. To this end we examine to what degree the *Stahlwerksverband*, the German Steel Syndicate, and the Rhenish-Westphalian Coal Syndicate restricted output. These two cartels were chosen because they were, according to many economic historians, relatively large and had a profound impact on the evolution of the German coal and steel industries. The major finding of this paper may be stated succinctly: the evidence does not justify accepting the hypothesis that the steel and coal cartels restricted output.

Historically, in Germany cartel agreements were not only enforceable in a court of law but were actually encouraged by the German State. The number of cartels proliferated during the 1870's and 1880's. Between 1879 and 1890 approximately 200 cartels were created.<sup>1</sup> This is indeed impressive when one considers that prior to 1857 there were only an estimated 33 cartels in Germany.<sup>2</sup> Cartels established before the turn of the century, though, were for the most part short-lived and unable to attract enough members to gain any meaningful control over industrial output.<sup>3</sup>

The Rhenish-Westphalian Coal Syndicate and *Stahlwerksverband* represented important deviations from this trend. Both of these organizations appear to have controlled sufficiently large amounts of output to have had substantial market power. The Steel Syndicate controlled an estimated 90 percent of domestic steel production.<sup>4</sup> The Rhenish-Westphalian Coal Syndicate controlled roughly 40 percent of total German coal output.<sup>5</sup> Beyond this, the

\* The author thanks John Nye, Andy Rutten and Mark Vaughan for comments.

<sup>1</sup> HENDERSON (1975), p. 179.

<sup>2</sup> MASCHKE (1969), p. 226.

<sup>3</sup> MASCHKE (1969), p. 229-233.

<sup>4</sup> WALKER (1906), p. 373.

<sup>5</sup> STOCKDER (1932) states that the Rhenish-Westphalian Coal Syndicate controlled about 85 percent of the coal output in the Ruhr district. According to Walker (1906) the Ruhr district produced over 50 percent of Germany's coal output.

German Steel Syndicate enjoyed considerable protection from international competition through tariffs. Webb (1980) indicates that these tariffs added anywhere from 15 to 25 percent to the price of imported iron and steel products.<sup>6</sup> In contrast the coal industry enjoyed relatively little protection from foreign trade.<sup>7</sup>

The Rhine-Westphalian Coal Syndicate, established in 1893, was the first cartel to establish a sales syndicate. This arrangement set production quotas for each cartel member. Each member was required to sell all of its output to the cartel which then sold the coal through its own distribution network.<sup>8</sup>

Maschke writes,

By its activities and longevity the Rhine-Westphalian Coal Syndicate greatly influenced further cartelization, serving as a model not only for coal industries outside the Ruhr, but for other branches of production capable of syndication.<sup>9</sup>

Upon discovery of this new and effective institutional arrangement other firms inside and outside of the coal industry soon adopted similar organizational structures. In fact by 1908, with some small exceptions, the entire German coal industry was organized in large regional syndicates.<sup>10</sup> The *Stahlwerksverband*, founded in 1903, followed the Rhenish-Westphalian Coal Syndicate's model very closely. It too established quotas for its members. The output of all member steel firms was then sold through the Steel Syndicate's sales network.<sup>11</sup> The institutional innovation of the sales syndicate seems to have allowed these cartels to achieve the market shares described above.

## II

Table 1 compares the rate of growth in the output of steel before and after the creation of the *Stahlwerksverband*. Table 2 indicates whether the differences in the rate of growth in steel output, before and after 1903, were statistically significant.<sup>12</sup> Germany, Austria and Great Britain all have lower mean annual growth rates in steel output after 1903. Although only the fall in Germany's mean growth rate is statistically significant, this need not be attributed to the creation of the German Steel Syndicate. The average annual growth rates for steel output in Austria and the United Kingdom are not significantly

<sup>6</sup> WEBB (1980), p. 310.

<sup>7</sup> STOCKDER (1924), p. 32.

<sup>8</sup> See STOCKDER (1932) for a full description of this arrangement.

<sup>9</sup> MASCHKE (1969), p. 232.

<sup>10</sup> MASCHKE (1969), p. 236.

<sup>11</sup> WALKER (1906) provides a detailed analysis of the Steel Syndicate.

<sup>12</sup> For the t-tests presented in tables 2 and 4, it is assumed that the underlying distribution is normal.

Table 1  
AVERAGE ANNUAL GROWTH RATES  
IN CRUDE STEEL OUTPUT

Country	Time Period	Average Growth	Rate (%)
Germany	1870 - 1903	14.03	[1]
	1904 - 1913	7.84	[2]
Austria	1870 - 1903	14.62	[3]
	1904 - 1913	8.65	[4]
U.K.	1870 - 1903	9.65	[5]
	Post - 1903	3.31	[6]

Source: Calculated using data from Mitchell (1980).

Table 2  
TWO TAILED T-TEST RESULTS  
(AT A 5 PERCENT LEVEL OF SIGNIFICANCE)

Null Hypothesis	t-Statistic	Is the Null Hypothesis Rejected?
[1] = [2]	2.336	YES
[3] = [4]	1.348	NO
[5] = [6]	1.224	NO
[1] = [3]	- 0.138	NO
[2] = [4]	- 0.279	NO
[1] = [5]	1.520	NO
[2] = [6]	0.896	NO

different from Germany's average growth rate, before or after 1903. Moreover, if the *Stahlwerksverband* was in fact monopolizing the domestic steel market this would have manifested itself in the price of steel.

Data on prices are limited. However, the data that exist do not suggest that the steel syndicate was effectively monopolizing the industry. The domestic price of steel in Germany was, it appears, lower than the domestic price of steel in both the United States and Great Britain. For example, Allen (1979) shown that from 1906 to 1913 the average price per unit of structural steel was on average 114 schillings in Germany, 133 schillings in America and 130 schillings in Great Britain.<sup>13</sup> The price data provided by Allen on other steel and iron products yield the identical conclusion. Also the domestic price of steel rails fell an estimated 14 percent between 1881 and 1906, while the

<sup>13</sup> ALLEN (1979), p. 912.

German wholesale price index for the same period rose slightly.<sup>14</sup> If the *Stahlwerksverband* was monopolizing the domestic steel market it was, to the say the least, an exceptionally efficient monopoly.

Table 3 and 4 allow one to assess the relative position of the German coal industry before and after the creation of the Rhenish-Westphalian Coal Syndicate. Table 3 makes clear that, if anything, growth in German coal output actually improved in the years following 1893. The inability of the Rhen-

Table 3  
AVERAGE ANNUAL GROWTH RATES  
IN COAL OUTPUT

Country	Time Period	Average Growth	Rate (%)
Germany	1870 - 1893	4.66	[1]
	1894 - 1913	5.53	[2]
Austria	1870 - 1893	5.91	[3]
	1894 - 1913	2.59	[4]
U.K.	1870 - 1893	1.62	[5]
	Post - 1893	2.93	[6]

Source: Calculated using data from Mitchell (1980).

Table 4  
TWO TAILED T-TEST RESULTS  
(AT A 5 PERCENT LEVEL OF SIGNIFICANCE)

Null Hypothesis	t-Statistic	Is the Null Hypothesis Rejected?
[1] = [2]	- 0.826	NO
[3] = [4]	2.931	YES
[5] = [6]	- 1.019	NO
[1] = [3]	- 1.060	NO
[2] = [4]	2.290	YES
[1] = [5]	2.707	YES
[2] = [6]	2.123	YES

<sup>14</sup> This calculation is based on the data Allen (1979) presents on p. 912. Allen shows that the domestic price of steel rails, for the years 1881-90, was on average 136 schillings per unit. The domestic price of steel rails for 1906-13 is not given. However the export price is provided. The export prices of steel and iron products for 1906-13 were between 94 and 100 percent of the domestic price. To obtain an estimate of the domestic price of steel rails the export price of steel rails is divided by .95.

ish-Westphalian Coal Syndicate to effect any real reductions in output is perhaps less surprising than the Steel Syndicate's ineffectiveness. The coal industry enjoyed relatively little tariff protection. As a result coal imports, especially from England, were significant. For instance, in 1913 about 28 percent of the coal consumed in Berlin was from England, while only 9 percent was from the Ruhr district.<sup>15</sup> Furthermore, the Rhenish-Westphalian Coal Syndicate was only a regional cartel. It was not even insulated against domestic competition.

### III

The evidence presented above suggests that the neither of these two relatively large and powerful cartels were able to affect any real reduction in output and increase in price. These results are enigmatic. If these collusive agreements were not allowing firms to monopolize markets, in any substantial way, why were such agreements so common?<sup>16</sup> What sort of benefits accrued to firms to justify the costs of organizing and maintaining syndicate arrangements? Numerous potential explanations quickly come to mind. Perhaps syndication was a primitive form of vertical or horizontal integration. Alternatively the cartellization of industry may have been associated with the unique relationship German bankers had with industrialists. Identifying the correct answer is left to future work.

<sup>15</sup> STOCKDER (1932), p. 73.

<sup>16</sup> MASCHKE (1969) indicates that official estimates place the total number of cartels in Germany in 1905 at 385. He adds that this official estimate was probably on the conservative side. See Maschke, p. 240. It is interesting to note that the sheer number of cartels may itself be evidence that cartels were providing members with benefits unrelated to a reduction in competition. In 1905, for example, there were 132 cartels in Germany's brick industry. It is not immediately obvious that there is any difference between 132 "firms" competing and 132 "cartels" competing.

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