
ARTICLES

Economic Growth and Industrialization in Hungary 1830-1913

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Throughout the nineteenth century and into the twentieth, Hungary was predominantly an agricultural country. In the middle of the century manufacturing contributed 7-8 percent to her national product,¹ and by 1913 this share was close to 25 percent.² This was far from being a spectacular achievement. Nonetheless during most of the three and a half decades prior to World War I, her industrial sector was developing rapidly. In 1841 Hungary's manufacturing equalled 16 percent³ of Austria's output. By World War I it was 30 percent.⁴ Although in many respects Hungary remained an underdeveloped country, relative to her

* My gratitude is extended to the International Research and Exchanges Board for subsidizing the research for this project and to Professors Donald McCloskey, Arcadius Kahan, Emile Karafiol, William McNeill, Bert Hoselitz and Ira Glazier for commenting on an earlier version of this paper and editorial assistance.

¹ Without mining. LÁSZLÓ KATUS, "A Kelet-európai iparosodás és az önálló tőkés fejlődés kérdéséhez," *Történelmi Szemle*, 10, no. 1 (1967): 1-43, p. 9.

² FRIEDRICH FELLNER, *Das Volkseinkommen Österreichs und Ungarns* (offprint from the *Statistischen Monatschrift*, Vol. 21, September-October, 1917), p. 123.

³ NACHUM GROSS, "Industrialization in Austria in the Nineteenth Century" (Unpublished Ph. D. dissertation, University of California, Berkeley, 1966), p. 107.

⁴ FELLNER, *Das Volkseinkommen*, p. 133.

custom union partner her growth was creditable; she had ameliorated to a considerable extent her relative backwardness.

The first widely diffused spurt of industrial activity in Hungary took place in the late 1870s. Perhaps the most important finding of this paper is that the inflow of Austrian capital was instrumental in the beginning and in sustaining industrialization in Hungary. The Hungarian government played an important role in attracting Austrian funds by open market operations. At the same time the outflow of capital from Austria contributed to, and prolonged, the effects of the post-1873 depression there. The conclusions emerge that the Hungarian economy would have functioned less effectively without unencumbered access to the Austrian market, and that the economic ties that bound Austria to Hungary throughout the nineteenth century were less beneficial, and in the case of capital exports, even detrimental, to the Austrian half of the union.

Due to the small size of the manufacturing sector in Hungary before the 1870s, the accurate measurement of its rate of growth eludes us at this time. However, scattered evidence of modernization after 1825 does exist. For instance, the growth of Hungary's iron production (Table 1) and export of manufactures in the 1840s were positive signs of development. Yet these sectors cannot be assumed to have been indicative of the overall behavior of

TABLE 1
ANNUAL GROWTH RATES OF THE HUNGARIAN
IRON INDUSTRY 1830-1913

| Years | Percent |
|-----------|---------|
| 1830-1847 | 4.5 |
| 1847-1864 | 8.6 |
| 1864-1873 | 3.6 |
| 1873-1886 | 3.5 |
| 1886-1898 | 5.9 |
| 1898-1907 | 1.5 |
| 1907-1913 | 8.1 |

Source: Table 19.

industry or the economy. Mining, perhaps the most significant non-agricultural endeavor during the first half of the century, was growing slowly, at a rate of 2.1 percent per annum (between 1831 and 1847), and much of this growth took place in the late 1840s. The cotton, textile and sugar industries were too small to be measured meaningfully. Flour production, also part of the industrial output index (Table 18), was extrapolated linearly between 1841 and 1867 at the same rate as wheat and rye consumption in Hungary. Hence, ferrous metals is the only sizeable industry with reliable annual statistics in the index in this period. From this industry alone, one ought not draw definitive conclusions about the overall behavior of the industrial sector.

In the 1830s and 1840s the growth of the ferrous metals branch exceeded 4 percent per annum. Production was exclusively for domestic consumption until 1837. Thereafter trade developed with Galicia and Moravia in pig iron due largely to the demand for rails manufactured in Moravia. The increased export demand had a negligible impact on iron production until the elimination of the 10 percent export tariff to Austria in 1843. Whereas the net output of the iron industry was growing at 4.0 per cent per annum between 1830 and 1843, in the four years after the lifting of this tariff it averaged 6.3 per cent. Under the impact of the spread of railroads in the 1850s iron production expanded enormously. (See Figure 1.)

Despite the well known predominance of agricultural exports in Hungary's foreign trade, Hungary was exporting manufactured goods not only to the Austrian provinces but to a limited extent outside the monarchy as well. These exports increased by a third between 1841 and 1847, from 2.4 to 3.2 million gulden. This is another indication that manufacturing was perhaps not stagnant.

In spite of the growth of manufactured exports, and of the ferrous metal industry, one cannot formulate a thesis with respect to the development of manufacturing in Hungary prior to 1850

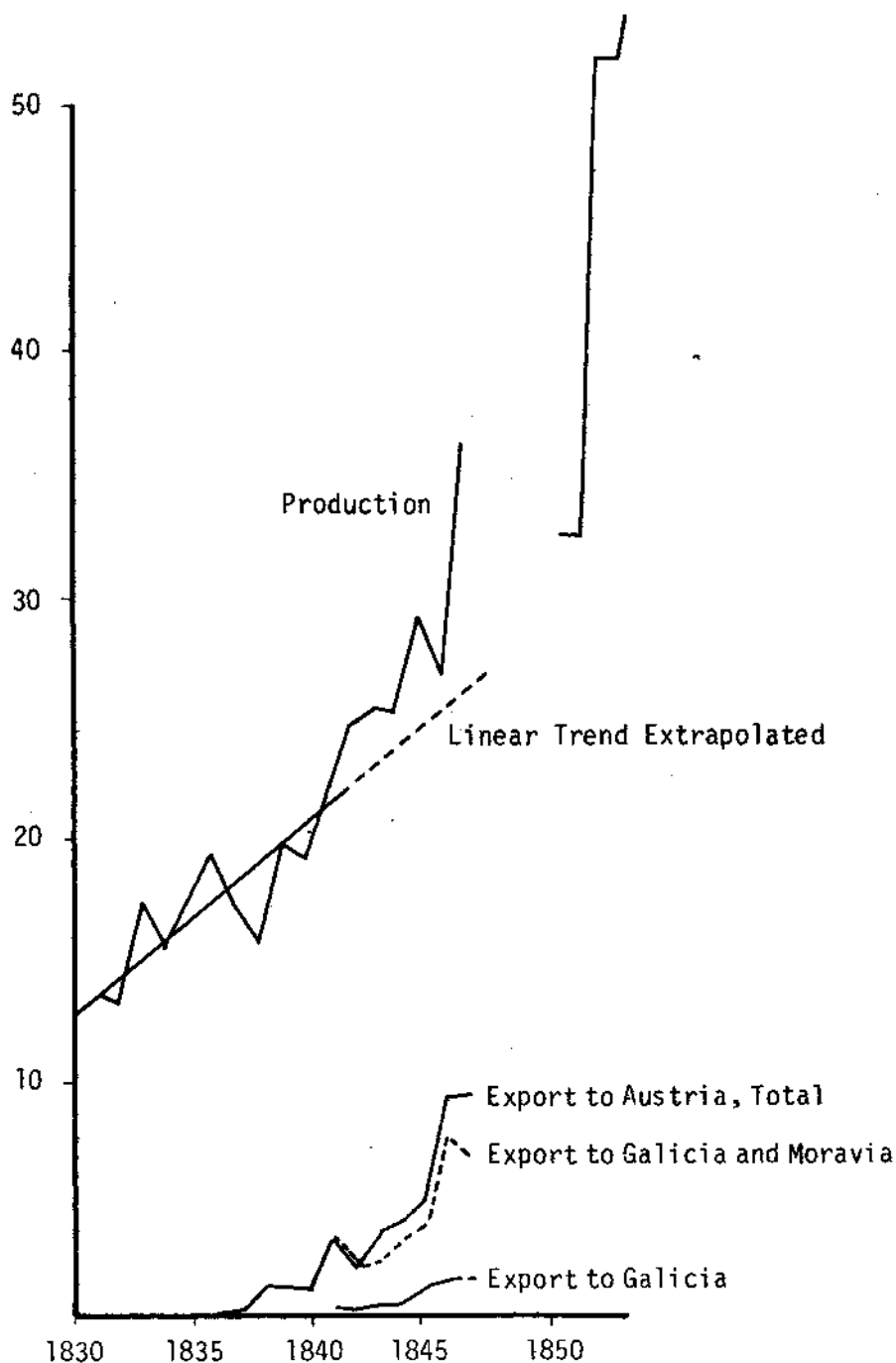


Figure 1 - Hungarian Production and Exports of Pig Iron, 1830 - 1854 (thousands of tons).

SOURCE: *Ausweise über den Handel von Österreich.*

except to intimate that the 1.3 per cent annual growth rate in manufacturing between 1830 and 1847, shown in Table 2, appears reasonable. In the 1850s, manufacturing accelerated somewhat, possibly as a response to railroad construction. Data from the iron sector do point in this direction (growth was 8.6 percent per annum), but the poor performance of mining, and the absence of Hungarian trade statistics in the 1850s hampers overall generalization.

One can be less equivocal about the behavior of manufacturing during the 1860s and early 1870s as the several indicators (iron, sugar, cotton textiles, flour) begin to move more closely together, and because the flour index becomes more precise. The worldwide upswing in economic activity of the early 1870s does not appear to have had a significant impact on Hungarian manufacturing. Though there was increased industrial activity compared to the slump of 1865 and 1866, production did not exceed greatly the previous peak of the early 1860s. Expansion of the iron industry even decelerated. Flour output, the most important manufactured good, could not have increased significantly because large amounts of wheat were exported from Hungary. (The average export of wheat in 1867 and 1868 was not only at an all time high, but was, in fact never to be surpassed.) The failure of both the flour and the ferrous metal industries to increase production substantially during this period renders the rapid advance of manufacturing in the late 1860s-early 1870s improbable.

The upswing and boom between 1867 and 1873 was nonetheless of considerable intensity, but was confined to expanding the real and financial infrastructure.⁵ Transportation and banking grew rapidly. Railroad mileage tripled,⁶ and the number of financial institutions increased by sixfold within the six years after

⁵ ALEXANDER MATLEKOVITS, *Die Zollpolitik der Österreichisch-Ungarischen Monarchie und des Deutschen Reiches seit 1868 und deren nächste Zukunft* (Leipzig: Duncker and Humblot, 1891), p. 9.

⁶ From 2,160 to 6,253 kilometers, *Ungarisches Statistisches Jahrbuch*, 1912, p. 245.

TABLE 2

GROWTH OF HUNGARIAN INDUSTRY, 1830-1913

| Business Cycle | Manufacturing | Manufacturing Mining | Manufacturing Mining Construction |
|---------------------------|---------------|-------------------------|---|
| 1) 1830-1847 | 1.30 | 1.93 | 2.38 |
| 2) 1847-1864 | 2.18 | 1.72 | 1.34 |
| 3) 1864-1874 | 1.37 | 1.38 | 2.16 ^b |
| 4) 1874-1883 | 5.47 | 5.10 | 6.07 ^b |
| 5) 1883-1896 | 3.45 | 3.69 | 3.77 |
| 6) 1896-1906 | 2.24 | 2.41 | 1.78 |
| 7) 1906-1912 ^a | 5.95 | 5.33 | 4.74 |
| 1867-1913 ^a | 3.18 | 3.16 | 3.18 |

^a includes woolens textiles.

^b The peaks of the construction cycles are different in this period. Because of lumpiness of the construction series the growth rates differ substantially if measured from the alternative peaks: 1861-1873: 3.28; 1873-1883: 3.42, and perhaps reflect better the intensity of railroad construction.

Source: Table 19.

1867.⁷ Large sums were expended by municipalities on enlarging and renovating urban centers.⁸ Although the number of corporations increased rapidly most of them were in banking and transportation,⁹ and those manufacturing enterprises which were incorporated often represented merely legal changes.¹⁰ The absence of contemporary reports pointing to significant advances in manufacturing during this upswing is a further substantiation, though indirect, that the advances were confined to enlarging the extent of social overhead capital.

Thereafter the Hungarian manufacturing index becomes less impressionistic since flour production can be estimated annually.

⁷ From 107 to 637 institutions, "A Magyar Szent Korona Országainak Hitelintézetek az 1894-1909. Években" *Magyar Statisztikai Közlemények, Új Sorozat*, 35, 73.

⁸ *Ungarns Handel und Industry, 1870-1872* (Budapest: Kereskedelmi és Iparkamara, 1873), p. 13.

⁹ Of the 1965 incorporations in 1872 only 15 were manufacturing enterprises. *Ibid.*, p. 17.

¹⁰ MATLEKOVITS, *Die Zollpolitik*, p. 9. The Ganz works is but one example.

TABLE 3

GROWTH OF AUSTRIAN INDUSTRY, 1830-1913

| Business Cycle | Manufacturing | Manufacturing Mining | Manufacturing Mining Construction |
|----------------|---------------|-------------------------|---|
| 1) 1830-1846 | 2.64 | | 3.03 |
| 2) 1846-1861 | 2.62 | 3.08 | 3.09 |
| 3) 1861-1871 | 3.25 | 3.88 | 4.69 |
| 4) 1871-1884 | 1.84 | 2.42 | 2.12 |
| 5) 1884-1898 | 2.25 | 2.80 | 2.63 |
| 6) 1898-1907 | 3.89 | 3.77 | 3.38 |
| 7) 1907-1912 | 1.74 | 1.57 | 1.58 |
| 1867-1913 | 2.79 | 3.21 | 3.13 |

Source: Table 19.

During the next two business cycles, 1879-1883 and 1883-1896, Hungarian manufacturing production grew at a rapid pace. That is, while Austria and much of Western Europe were in the throes of the great depression, Hungary was undergoing its first widespread wave of industrialization. Value-added in industrial production is estimated to have grown at a rate of 5.5 per cent annually between 1883 and at a rate of 3.5 per cent between 1883-1896.¹¹ At the same time, Austria's industrial growth rate was extremely slow: in the neighborhood of 2 per cent. After 1896, the growth of industrial production in Hungary and Austria continued to be out of phase with one another. Hungary's industry slowed to a rate just over 2 percent per annum between 1896 and 1906 while Austria's accelerated to close to 4 per cent per annum. The-

¹¹ According to *Gyáripára*, Vol. 14, p. 85, "Our whole economic life, including agriculture, entered the road of intensive development only a few decades ago." Though the language of this assertion is quite imprecise it does nonetheless belittle the importance of the upswing which began in 1887 and which has been characterized as Hungary's "great spurt" by Katus in LÁSZLÓ KATUS, "Economic Growth in Hungary During the Age of Dualism 1867-1913. A Quantitative Analysis," in E. PEMLÉNYI (ed.), *Social-Economic Researches on the History of East-Central Europe* (Budapest: Akadémiai Kiadó, 1970), p. 56.

reafter Hungary's industry grew rapidly once again, reaching almost 6 per cent per annum, while Austria's decelerated to below 2 per cent (Table 4). The mechanism for this pattern is to be sought in the flow of capital between Austria and Hungary. Before discussion of that aspect of the relationship, however, the significance of the late 1870s in Hungarian economic development should be explored further.

Since Hungary was predominantly an agricultural country, her greatest comparative advantage lay in food processing. This was her largest manufacturing sector until World War I. The sector expanded enormously at the end of the 1870s. The production of spirits and beer (not included in the index) almost doubled in the early 1880s. Sugar production increased and flour milling was booming. This is not likely to be a statistical quirk: annual data reported by the mills situated in Budapest beginning in 1866 show a pronounced upsurge in flour output at the end of the 1870s. Alexander Matlekovits, a respected authority on the Hungarian economy, intimated that the flour industry had acquired worldwide significance by the late 1870s.¹²

Prior to the late 1870s, there was insufficient growth in grain production to allow a substantial development of flour production and little grain was imported into Hungary. Domestic consumption of wheat and rye grew at a rate of 1- $\frac{1}{2}$ per cent per annum and flour production could not have exceeded this rate in spite of the the 12 per cent annual growth of flour exports between the 1830s and 1870s.

The rapid growth of flour production in the late 1870s was based on the comparative advantage provided by the good quality of Hungarian wheat and its low relative price. In the mid-1870s, demand for flour in Austria and Germany increased sufficiently so that the exclusive reliance on domestic supplies of raw materials in Hungary for producing flour had become a constraining

¹² MATLEKOVITS, *Die Zollpolitik*, p. 531.

TABLE 4

HUNGARIAN AND AUSTRIAN MANUFACTURING
GROWTH RATES COMPARED *

| Business Cycle | Hungarian | Austrian |
|----------------|-----------|----------|
| 3) 1864-74 | 1.37 | 3.25 |
| 4) 1874-83 | 5.47 | 1.84 |
| 5) 1883-96 | 3.45 | 2.25 |
| 6) 1896-06 | 2.24 | 3.89 |
| 7) 1906-12 | 5.95 | 1.74 |

* The growth rates over a business cycle are measured from peak to peak. Since the peaks in Hungary may not correspond precisely to the peaks in Austria the periods compared are not exactly identical. The growth during the business cycle are the rates compared in this table.

Source: Table 2 and Table 3.

force. As a consequence, the importation of wheat commenced and the acceleration of domestic grain production was also induced. In order to increase grain output, investments were undertaken to enlarge the land under cultivation by 1.1 million hectares or by 13 percent between 1873 and 1880.¹³

Although the agricultural sector did respond to the stimulus of increased demand for grain by the milling industry, the latter was no longer constrained by the ability of the former to increase production after 1875 because a trade treaty was signed with Romania which allowed duty-free entry of Romanian grain. This increased the competitiveness of Hungarian flour on foreign markets not only because of the cheaper price of Romanian grain, but also because the mixture of the different qualities of wheat resulted in a grade of flour that was better suited to the tastes of Englishmen and Germans. Thus the access to Romanian raw materials was important to the flour industry as evinced by the increase in imports between 1876 and 1880 from 16 thousand to 130 thousand tons.¹⁴

¹³ "A Magyar Korona Országainak 1891. és 1892. évi mezőgazdasági Termelése," *Magyar Statisztikai Közlemények*, Új Folyam, Vol. 6, 1893.

¹⁴ MATLEKOVITS, *Die Zollpolitik*, pp. 48, 573.

In 1878 grain duties were eliminated entirely until 1882. Thereafter the mills could import wheat duty-free irrespective of country of origin as long as its flour-equivalent was exported within a year.¹⁵ Though the significance of the special treaty with Romania was therefore brief, Hungary continued to import large quantities of wheat from Romania until trade war erupted in 1886.¹⁶ By then, however, the mills were able to substitute for Romanian wheat because of the special grain import provision of 1882.

The pattern of Germany's flour imports shows well the increase in Hungary's competitiveness in this sector. In the late 1870s half of Austria-Hungary's exports were destined for Germany. Between 1874 and 1878 exports to Germany quadrupled to 125,000 tons. Soon thereafter Germany lost its short-lived significance as a consumer of Hungarian flour because increasingly burdensome tariffs were imposed. Outside the customs union England remained the sole important consumer of Hungarian flour, at least until the turn of the century. Thereafter, even tiny Bosnia consumed more Hungarian flour than England did.

In short, high profits (26% return on capital), brought about by increased demand for wheat flour in Austria and Germany and access to inexpensive wheat from Romania, induced an unprecedented advance of this branch in the late 1870s. The process was accompanied by technological breakthroughs: milling machinery invented and improved by András Mechwart became world famous in the 1870.¹⁷

Hungary's flour industry prospered until 1896 as exports to Austria were growing at a rate of 10 per cent per annum. There-

¹⁵ JOSEF GRUNZEL, *Handelspolitik und Ausgleich in Österreich-Ungarn* (Vienna and Leipzig: Alfred Holder, 1912), p. 50.

¹⁶ The trade war lasted 5 years. LUDWIG LANG, *Hundert Jahre Zollpolitik* (Vienna and Leipzig: Carl Fromme, 1906), p. 220. MATLEKOVITS, *Die Zollpolitik*, pp. 114, 115.

¹⁷ Ganz began producing an improved milling "stool" in 1874. "Magyarország Malomipara 1894-ben." *Magyar Statisztikai Közlemények, Új Folyam*, 13.

after, both exports and production stagnated until the outbreak of World War I. After 1896, exports to the world fell rapidly, caused to some extent by internal forces: the privilege to import wheat duty-free into Hungary was limited and then abolished.¹⁸ In addition, external forces also contributed to a decline in exports, viz, the low price of American flour. As a consequence of the decrease in foreign demand, and the stagnation of Austrian demand, the development of the flour industry in Hungary ceased, and in fact, never regained its vitality (Figure 2).

In spite of the relatively low value-added proportions of the flour industry, it is a paradigm of the development of manufacturing during the three decades after 1875. It was the largest industry by gross output. (In 1898, it accounted for one-fourth of total industrial production). Although the labor force employed in the flour industry ranked only sixth in Hungary, after the ferrous metal, machine and the (labour intensive) tobacco, brick and wood-working branches, it was the second largest industry in the amount of horse-power utilized, surpassed only by the iron industry. Even in value-added terms, the flour industry was equalled only by iron and machine production.¹⁹

The industrial production index which encompasses the flour, iron, sugar and cotton textile sector confirms this pattern. Although few in number, these sectors together employed one half of the power and one fourth of the labor force in Hungary's manufacturing industry in 1898 and accounted for 43 percent of the value of gross production.²⁰ The 5.5 per cent annual growth rate

¹⁸ "Die Kreditanstalten der Länder der ungarischen Heil. Krone in den Jahren 1894-1909," *Ungarische Statistische Mitteilungen* (Budapest: Kön. Ungarischen Statistischen Zentralamt, 1913), Neue Serie, 35, p. 9 (Hereafter referred to as *Kreditanstalten*.) In 1896 the percentage of flour that had to be exported in place of the wheat imported duty-free was increased from 70 percent to 100 percent and the time limit on re-export was decreased to six months. Four years later the privilege was abolished entirely. *Offergeld*, p. 12.

¹⁹ *Gyárpara*, p. 245.

²⁰ *Ungarischen Statistisches Jahrbuch*, 1900, p. 146.

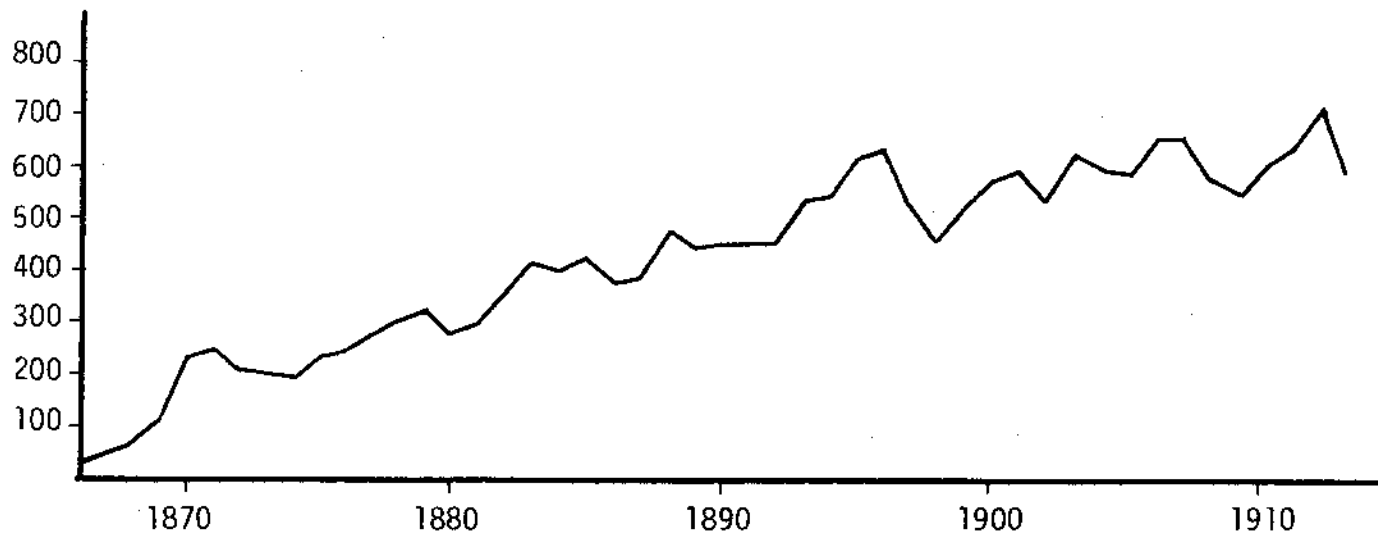


Figure 2 - Flour Production in Budapest, 1866 - 1913 (thousands of tons).

SOURCE: « A Magyar Szent Korona Országainak Malomipara az 1906. évban » *Magyar Statisztikai Közlemények* (Budapest: Statisztikai Hivatal, 1909) Vol. 26, p. 75. Alexander Mathekovits, *Das Monigreich Ungarn* (Leipzig: Duncker and Humblot, 1900), p. 108. Wilhelm Offergeld, *Grundlagen und Ursachen der industriellen Entwicklung Ungarns* (Jena: Gustav Fischer, 1914), p. 11.

Magyar Statisztikai Evkönyv, 1910, p. 186.

of these sectors during the decade after 1874, even if it were an overestimate of the performance of total manufacturing, is nevertheless indicative of the general advance in industrial production during this business cycle.

Similar processes of modernization are detectable in many other aspects of economic life, even in such unlikely areas as ocean shipping: seven steam vessels were added to the fleet in 1882.²¹ The growth of the mining sector in the 1880s surpassed 3 per cent per annum, which was faster than at any time previously in the nineteenth century. The increase in the volume of internal trade might be indicated by the growth in the value of postal money orders processed in Hungary: 86 million gulden in 1877 and 135 million by 1882.²² The accounts of several steel mills and engineering firms evinced a steep increase in the production in the early 1880s.²³

Moreover, Hungary's terms-of-trade (prices of exports/prices of imports) vis-a-vis Austria improved until 1898, perhaps as a consequence of the large transfer of purchasing power to Hungary.²⁴ In fact, Hungary's terms-of-trade continued to correlate positively with the index of manufacturing production and the transfer of funds from Austria. After improving until 1898, the terms-of-trade worsened until 1906 and improved again thereafter (Table 5). During periods in which Hungary's terms-of-trade were improving, her rate of industrial growth was relatively high. The favorable change in Hungary's terms-of-trade caused a rise in real income there and a fall in real income in Austria.

²¹ "Fiume hajo-és Áruforgalma az 1906. es 1907. években," *Magyar Statisztikai Közlemények, Új Sorozat*, 24, p. 24. (Hereafter referred to as *Fiume, 1906-0197*.)

²² Austria. K.K. Finanz-Ministerium, *Statistischen Tabellen zur Währungsfrage der österreichisch-ungarischen Monarchie* (Vienna: Hof- und Staatsdruckerei, 1892), p. 267.

²³ ALEXANDER MATLEKOVITS, "Die wirtschaftliche Entwicklung Ungarns seit 1867" *Zeitschrift für Volkswirtschaft, Sozial politik und Verwaltung*, Vol. 7, (1898), p. 545.

²⁴ This would have been the case if the sums of Hungary's and Austria's marginal propensities to import had been less than unity. RICHARD F. CAVES and RONALD W. JONES, *World Trade and Payments* (Boston: Little, Brown and Co., 1973), p. 457.

TABLE 5

HUNGARY'S NET BARTER TERMS OF TRADE WITH
AUSTRIA IN DOMESTIC PRICES, 1882-1913

| Year | |
|------|-------|
| 1882 | 82.7 |
| 1898 | 105.0 |
| 1906 | 89.5 |
| 1913 | 100.0 |

Source: SCOTT M. EDDIE, "The Terms and Patterns of Hungarian Trade, 1882-1913," *Journal of Economic History* 37, no. 1 (1977): 358.

Hence, if the transfer of funds from Austria on a relatively long term basis was the reason for the change in the terms-of-trade,²⁵ the transfer induced a "secondary burden" on Austria as the "price changes created an international redistribution of income additional to the initial loan."²⁶

Simultaneously, the state expanded its direct promotion of economic development and the formation of social overhead capital. The value of the infrastructure (public buildings, roads, state railroads, bridges, harbors) grew at a rate of 10 per cent per annum between 1874 and 1896 (Table 6). (In the 1870s, the

TABLE 6

THE VALUE OF SOCIAL OVERHEAD CAPITAL
IN HUNGARY,^a 1872, 1878, 1896
(millions of crown)

| Year | |
|------|---------|
| 1872 | 248.8 |
| 1878 | 581.6 |
| 1896 | 2,442.6 |

^a The valuation is at historical cost without allowance for depreciation. Note that the period was one of secular deflation.

Sources: *Statistisches Jahrbuch für Ungarn*, 1872, p. 701; 1879, p. 23. MATLEKOVITS, *Des Königreich Ungarn*, 2, 869-70.

²⁵ This conclusion may be warranted all the more since Hungary's terms of trade in world prices diverged significantly from this pattern.

²⁶ Caves and Jones, p. 457.

growth rate exceeded 15 per cent per annum). Total value of state property (which in addition to infrastructure, included forests, mines, estates, and industrial enterprises) increased more slowly than infrastructure alone, but it too reached a growth of 5.6 per cent per annum between 1873 and 1896 (Table 7). (During the 1870s, its growth was faster: 7.7 per cent per annum.)²⁷

TABLE 7
VALUE OF GOVERNMENT PROPERTY 1872, 1878, 1896
(Current prices, millions of crowns)

| | 1872 | 1878 | 1896 |
|-------------------------------|-------|---------|---------|
| Railroads | 150.0 | 417.8 | 1,885.2 |
| Bridges | 17.0 | 29.8 | 33.6 |
| Roads, harbors ^a | 1.1 | 26.9 | 346.5 |
| Public buildings ^b | 40.8 | 40.1 | 221.7 |
| Estates | 98.8 | 139.2 | } 271.2 |
| Forests | 50.2 | 207.0 | |
| Mines | 418.0 | 391.0 | 423.7 |
| Inventory ^c | 135.4 | 167.0 | 331.2 |
| Total | 951.2 | 1,485.8 | 3,535.0 |

^a Includes river embankments.

^b Includes other real estate and in 1896 industrial enterprises.

^c Includes other movable property.

Source: See Table 6.

The growth of government investment between 1874 and 1896 was accompanied by an increase in operating expenditures of 3.6 per cent per year. The extensive governmental spending was not accomplished by a proportional increase in taxation. Tax revenue increased only at a rate of 2.9 percent per annum (Table 8). The deficits were financed to a small extent by the profits from government enterprises but primarily by the expansion of the debt. The latter not only covered the servicing of the debt until the 1890s, but also a large portion of the investments under-

²⁷ MATLEROVITS, *Das Königreich Ungarn*, p. 700.

TABLE 8

ANNUAL GROWTH RATE OF GOVERNMENT EXPENDITURES
AND REVENUES, 1878-1912

| | State Debt | Expenditures ^a | Investments | Taxes ^d |
|------------------------|------------|---------------------------|-------------|--------------------|
| 1878-1896 ^a | 5.0% | 3.0% | 9.7% | 2.9% |
| 1896-1906 ^b | 0.8% | 2.0% | — 0.2% | 3.0% |
| 1906-1912 ^b | 2.5% | 10.9% | 11.7% | 3.7% |

^a For investments 1879 is the initial terminal point.

^b For investments 1905 is the final terminal point.

^c Does not include servicing the debt.

^d Does not include revenues from the post and telephone offices and government enterprises.

Source: *Ungarisches Statistisches Jahrbuch*.

taken by the state. Since most of the debt was foreign-owned in the 1870s and 1880s, government investments were not undertaken at the expense of private domestic investments. That is, the crowding-out effect must have been unimportant.

Some of the Austrian funds put at the disposal of the Hungarian government found their way into the agricultural sector. Agricultural production accelerated in Hungary after 1878. This was achieved to a large extent by increasing the amount of land under cultivation. Plow land in Hungary, and Transylvania (without Croatia) grew between 1873 and 1877 from 8.3 to 9.2 million hectares.²⁸ The necessary capital for this investment was provided by the government through the purchase of forests from the large estates. Between 1872 and 1878, government-owned forests increased fourfold and their purchase provided 150 million crowns to the large landowners, which could in turn be used by them to undertake the necessary investments and to increase the seed to land ratio.

Another beneficial aspect of the increase in government debt was that the influx of Austrian funds was tantamount to increasing

²⁸ "A Magyar Korona Országainak, 1891. és 1892. évi Mezőgazdasági Termelése," *Magyar Statisztikai Közlemények*, Új Folyam, VI, p. 16*.

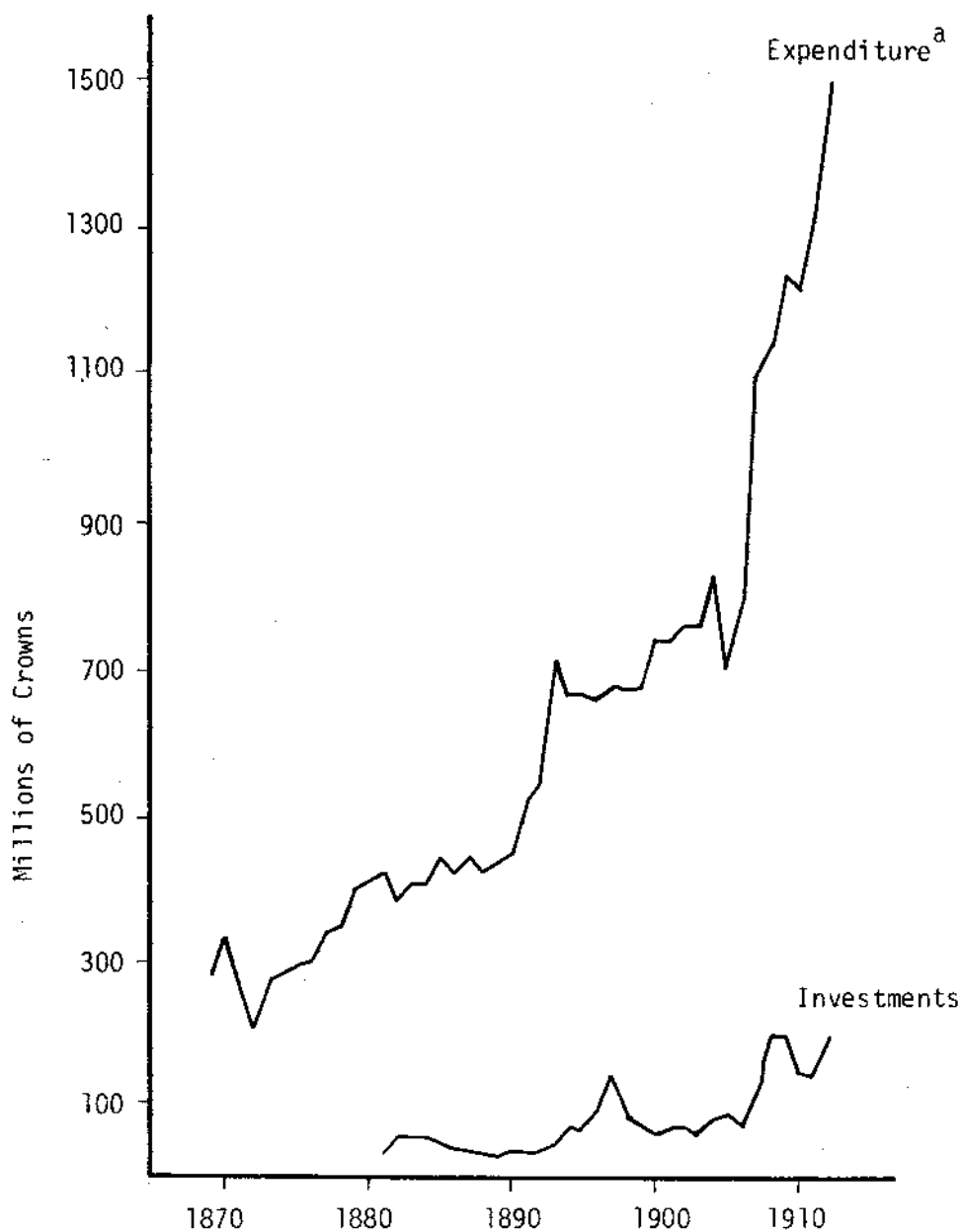
the supply of money in Hungary. Prices in Hungary were, on the other hand, determined not exclusively in Hungary but in the common market with Austria, and were even in secular decline due to worldwide deflation. Consequently, the increase in the quantity of money circulating in Hungary (assuming that the velocity of circulation did not decrease proportionately) put upward pressure on output and imports. Hungary's trade deficit in the 1880s (Table 9), financed by the transfer of funds from Austria, conforms to this pattern. Hence, even without an autonomous monetary policy the government, perhaps inadvertently, but no less effectively, did increase the quantity of money circulating in Hungary in the 1870s and 1880s. This, in turn, induced an increase in production and imports.

The expansionary governmental activity was reversed between 1896 and 1906. Fiscal policy was curtailed (Figure 3). The national debt expanded at a rate below 1 per cent per annum and was no longer underwritten by foreigners. Hence, government revenue was increasingly consumed in servicing the debt and government expenditures expanded more slowly than the increase in taxes. Government investments stagnated utterly. Consequently, the rate of growth of industrial production decelerated. During the next cycle (1906-1912), the growth of government expenditures exceeded 10 per cent per annum as did government investments. These growth rates are in nominal

HUNGARY'S BALANCE OF TRADE
ON MERCHANDISE ACCOUNT, 1882-1913
(millions of crowns, current prices)

| | Import Surplus | Export Surplus |
|-----------|----------------|----------------|
| 1882-1898 | 363 | |
| 1899-1905 | | 700 |
| 1906-1913 | 973 | |

Source: *Magyar Statisztikai Közlemények*, LVIII, 3.



Does not include investments or service of the debt.

Figure 3 - Hungarian Government Expenditures and Investments 1869 - 1913.

SOURCE: *Ungarisches Statistisches Jahrbuch*.

terms, but the increase in real terms was still substantial as the inflation rate was only about 2.5 per cent per annum.²⁹ Though the national debt grew in this period, it was underwritten only to a small extent by foreigners who were more interested in Hungarian municipal and mortgage bonds. Taxes increased more slowly than government expenditures; between 1907 and 1912 only 70 per cent of government spending was financed through taxes. This, too, put upward pressure on output.

In sum, government fiscal policy correlates well with the industrial production index. In the 1870s and 1880s, the ability of the government to attract foreign investments shifted the burden of the debt on to foreigners and enabled the state to pursue an active fiscal policy without stifling the private sector through excessive taxation. The pattern was reversed between 1896 and 1906 when the debt weighed heavily on the domestic economy.

The influx of foreign funds between 1878-1892 and again after 1906 enabled the government to finance a significant proportion of its day-to-day activities, its industrial promotion programs, and its investments in social overhead capital with foreign funds. Since the deficit did not have to be financed exclusively in the domestic money market, the private sector was not drained of capital. In addition, disposable income grew faster than it would otherwise have grown since the government did not have to resort to excessive taxation as a substitute for open market operations. Hence the growth of consumption was not restrained by the growth of taxes. As Table 8 shows, taxes grew faster than government expenditures and investments only between 1896-1906 a period of slow industrial growth in Hungary which was accompanied by a cautious attitude toward the Hungarian money market on the part of foreign investors. This suggests that to a large extent Hungary's ability to industrialize depended on unencumbered access to Austria's capital market, which, gi-

²⁹ DAVID F. GOOD, "The Cost of Living in Austria 1874-1913," *The Journal of European Economic History*, 5 (1976): 395.

ven the psychological milieu of the post-1873 depression, found Hungarian state securities quite attractive.

After the stock market crash of 1873, which was superimposed on the downturn of the business cycle in 1872, the confidence of Austrian capitalists in their domestic economy, particularly in its industrial sector, wavered.³⁰ This led to a decrease in investments in Austria relative to trend which lasted well into the 1880s. The funds that accumulated in Austrian savings institutions and mortgage banks³¹ increased, in effect, the demand for safe government securities.³² Both governments responded readily.³³

After the crash, the general banks in Austria developed into a new type of institution in which "regular bank business was the underlying basis of the bank's existence."³⁴ They also divested themselves of industrial equity as much as possible. Since the stocks had to be absorbed by an unwilling public prices were further depressed. New issues were seldom undertaken: "Insofar as promotional activity initiative in establishing new enterprises was concerned, not a thought was given to it in this

³⁰ Referring to the causes of the depression Rudolph states that "... an important key is the aversion to joint stock companies and industrial shares on the part of the government, the public, and the banks, which came to be part of the fact and folklore of the post depression period." RICHARD RUDOLPH, *Banking and Industrialization in Austria-Hungary. The Role of Banks in the Industrialization of the Czech Crownlands, 1873-1914* (Cambridge: Cambridge University Press 1976), p. 70.

³¹ The deposits at savings institutions in Austria increased by 45 percent between the end of 1873 and 1879. Austria. *Statistisches Jahrbuch für das Jahr 1879* (Vienna: k.k. Hof- und Staatsdruckerei, 1882), IX, p. 43.

³² Outside the banking system, government bonds were bought partly by "the propertied middle class who want to invest their savings without risk at constant interest, and partly by the very wealthy for whom the possible capital gains of other securities are not enticing." EUGEN PHILIPPOVICH, *Grundriss der Politischen Oekonomie* (5th Ed.; Tübingen: J.C.B., Mohr, 1915), II, Part II, 219.

³³ EDUARD MÄRZ, *Österreichische Industrie- und Bankpolitik in der Zeit Franz Josephs I. Am Beispiel der k.k. priv. Österreichischen Credit-Anstalt für Handel und Gewerbe* (Vienna: Europa, 1968), p. 220.

³⁴ FRITZ STEINER, *Die Entwicklung des Mobilbankwesens in Österreich* (Vienna, n.p., 1913), p. 265, as cited by Rudolph, *Banking and Industrialization*, p. 78.

time."³⁵ This attitude predominated in spite of the apparent profitability of some industries.³⁶

Until 1878, the majority of Hungary's creditors were in Western Europe. This pattern changed quickly thereafter and Austrian capital predominated, particularly until 1893. Fully 61 per cent of Hungarian state securities outstanding was in Austrian hands and less than a fourth was owned by Hungarians. Austrians effectively injected at least two billion crowns into Hungary's economy, which was responsible for the absence of signs of depression in Hungary.

Toward the end of the 1880s, Austrian banks as well as the general public began to turn their attention to industrial and bank stocks once again.³⁷ The shock of 1873 was beginning to wear off and the previous upswing of the early 1880s convinced investors that the depression they had been experiencing was a cyclical ra-

³⁵ JOSEF HORÁK, *Přehled vývoje českých obchodních bank* (Prague, 1913), p. 92, as cited by Rudolph, *Banking and Industrialization*, p. 78.

³⁶ In 1881, the profit rate of banks exceeded 8 percent, natural gas utilities 13 percent, machine producers 8 percent, distilleries 15 percent, sugar refineries 6 percent, shipping companies 7 percent, insurance companies 10 percent, and miscellaneous industrial enterprises 9 percent. These returns were characteristic of the 1880s in general for these branches except for the distilleries. One should also consider that the profits of some of the enterprises in branches that were not doing well in the 1880s surpassed the average return in their branch by quite a margin. For instance, in 1879, 55 corporations in Austria disbursed dividends of over 10 percent of their paid-up capital. In spite of these investment opportunities, the paid-in capital of enterprises in the above named branches increased by only 14.2 million crowns during 1881 (to 840.9 million crowns), while about 50 million crowns (71 million crowns nominal) were invested in Hungarian securities during the same year even though their return decreased to 5.6 percent. Contemporaries in fact noted that real investments lagged far behind savings and that the liquid position worked to Hungary's advantage as large amounts of funds were placed at the Hungarian government's disposal. Austria, k.k. Statistisches Central Commission, *Statistisches Jahrbuch für das Jahr 1879*, VIII, p. 67. Austria, k.k. Finanzministerium, *Tabellen zur Währungs-Statistik* (2d ed., Vienna: K.K. Hof- und Staatsdruckerei, 1900-1914), II, 651 ff. MATLEKOVITS, *Das Königreich Ungarn*, II, 888. Westphal, pp. 2, 11, 12. März, p. 368.

³⁷ *Kreditanstalten*, p. 12. Rudolph writes that after 1873 the banks "...lost most of their interest in industrial enterprises for years to come. It was only in the 1890s that such interest returned, ..." RUDOLPH, *Banking and Industrialization*, p. 70. Also see MÄRZ, pp. 295-297.

ther than a permanent attribute of the economy. Thus, by the early 1890s, the biases against industrial investment disappeared for the most part but not soon enough for Austria to undertake the investments that would have been necessary to allow manufacturing to reach its long-run growth rate during the cycle that peaked in 1896. But the repatriation of capital became crucial during the expansionary phase that followed (1896-1907) when Austrian industrial growth reached over 3 per cent per annum per capita, a rate unsurpassed in any cycle throughout the nineteenth century.

Between 1896-1907, the performance of Hungarian and Austrian industry reversed. While between 1873 and 1896 Hungary's industry grew relatively fast and Austria's did not, between 1896 and 1907 Austrian industry advanced rapidly while Hungarian industry stagnated. The growth of the national debt slowed and Hungary had to bear a much larger share of it than previously. Since the foreign holdings of the debt could no longer be increased (though German capital did replace Austrian capital to some

TABLE 10

DISTRIBUTION OF HUNGARIAN STATE SECURITIES
AND TOTAL NOMINAL VALUE OUTSTANDING, 1878-1913
(millions of crowns)

| | A | B | C | Total | | Austria | Hungary | Total Value |
|------|------|-----|-----|-------|-----------|---------|---------|-------------|
| | | | | D | W. Europe | | | |
| 1878 | 17.8 | 4.8 | 9.2 | 15.7 | 47.6 | 14.6 | 37.9 | 1,780 |
| 1893 | 0.3 | — | 2.5 | 13.8 | 16.6 | 61.0 | 22.5 | 4,380 |
| 1896 | 1.4 | — | 4.8 | 25.1 | 31.3 | 31.6 | 37.1 | 4,526 |
| 1905 | 1.5 | 0.3 | 7.4 | 30.5 | 39.7 | 20.9 | 39.6 | 5,147 |
| 1913 | 1.3 | 0.2 | 5.7 | 25.6 | 32.8 | 21.8 | 45.2 | 6,229 |

A = England
B = Holland
C = France
D = Germany

Source: FELLNER, *Das Volkseinkommen*, p. 135 and FRIGYES FELLNER, *Die Zahlungsbilanz Ungarns. Ein Beitrag zur Lehre von der internationalen Zahlungsbilanz im allgemeinen* (Vienna and Leipzig: F. Deuticke, 1908), Table III.

extent), this meant that the interest on the debt weighed heavily on the economy and necessitated a contraction in government spending (Figure 4). Until 1893, debt servicing was accomplished through expansion of the foreign holdings of government securities. After 1893, this was no longer possible, and the Hungarian economy had to bear the full burden of the previous expansionary epoch.

After 1906, the economic situation reversed once again: Hungary's industrial growth rate exceeded Austria's. This, too, was accompanied by an increasing inflow of capital; in the form of mortgage and municipal bonds and direct investments in industrial enterprises rather than in the form of state securities.

Table 11 shows the extraordinary increase in foreign, predominantly Austrian (including Czech), investment in Hungarian industry and banking between 1907-1913, the final business cycle in the monarchy's history. (However, in spite of the growth of foreign investment, foreign holdings of industrial and bank stocks in 1913 accounted for only 15 per cent of the stocks outstanding in this category). After the lull in Austrian investments in Hungary around the turn of the century, and the coincidental stagnation of Hungarian industry, the flow of capital between Austria and Hungary correlates well with the rate and pattern of industrial-

TABLE 11
FOREIGN INVESTMENT IN HUNGARY, 1905-1913
(million of crowns)

| | 1905 | 1913 | Increase | % Increase |
|-------|---------|---------|----------|------------|
| A | 4,321.6 | 4,712.5 | 390.9 | 9 |
| B | 1,429.9 | 2,135.9 | 706.0 | 49 |
| C | 76.1 | 416.1 | 340.0 | 447 |
| Total | 5,827.6 | 7,264.5 | 1,436.9 | 25 |

A = State securities, railroad stocks and obligations.
B = Municipal obligations and mortgage bonds.
C = Industrial and bank stocks.

Source: FELLNER, *Das Volkseinkommen*, p. 122.

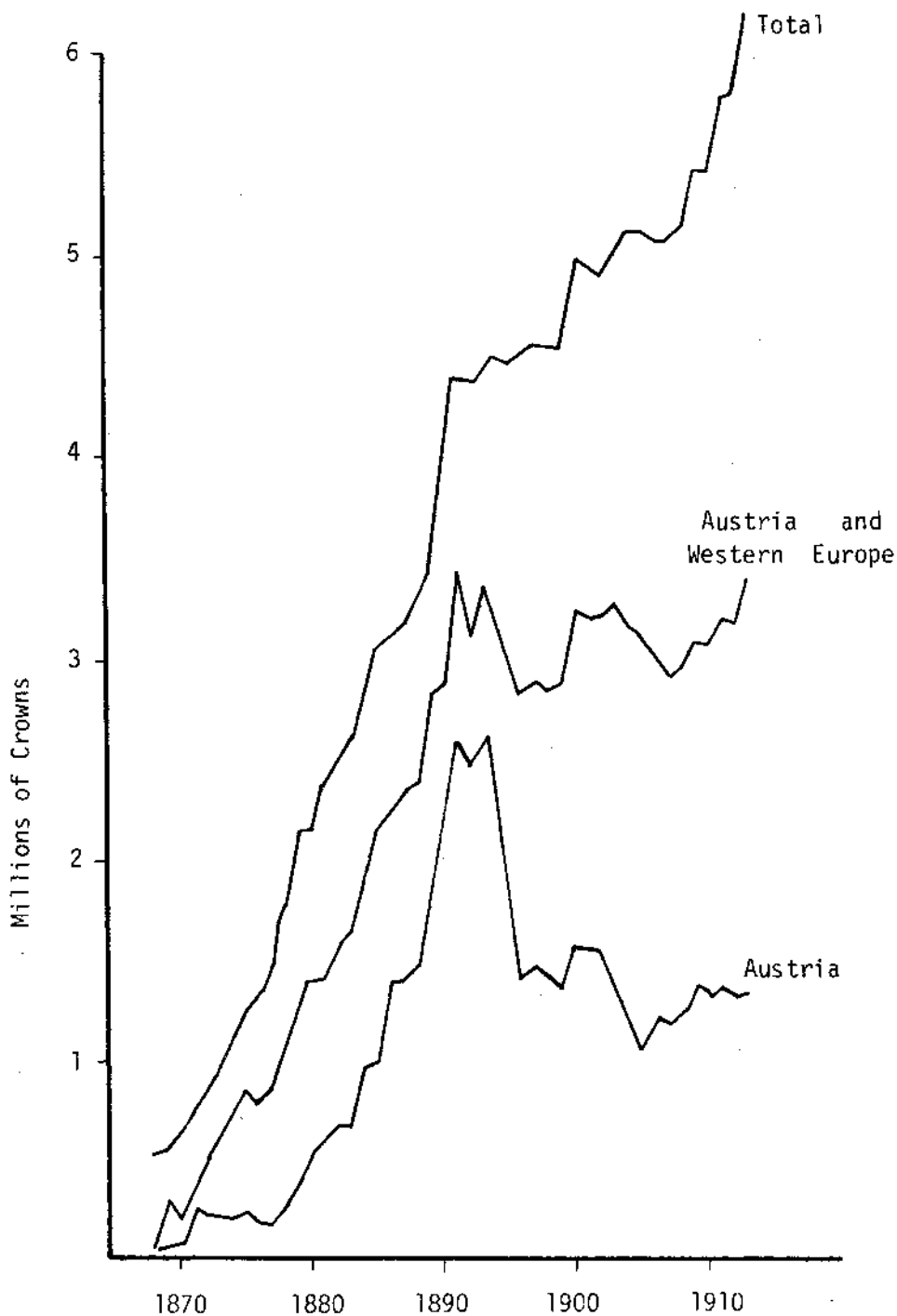


Figure 4 - The Nominal Value of Total Hungarian State Securities Issued and Those Held Abroad, 1869 - 1913.

SOURCE: See Table 10.

zation in the two halves of the monarchy. The influx of Austrian capital between 1907 and 1913 was accompanied by an acceleration of industrial growth in Hungary and a deceleration in Austria, similar to the pattern observed between 1873 and 1896.³⁸

The export of capital from Austria hurt its economic development between 1873 and 1898. The reason is not only that the terms-of-trade had turned against her, that the quantity of money circulating in Austria decreased, but also that her industrial sector was not in long run competitive equilibrium. Profits for a number

³⁸ Rough calculations show that Austrian investments in Hungarian bonds were large enough to have accounted for the relatively slower growth of Austrian industry during the 1873-1896 depression. Austria invested 600 million crowns in Hungarian state securities between 1871 and 1884. In 1885, the output of Austrian industry was 1.246 billion crowns. Extrapolating this backward at a rate of 1.8 percent per annum yields a net output of 1.148 billion crowns in 1871 (in 1885 prices). The value of capital invested in Austrian industry in 1885 can be estimated by assuming that wages absorbed 60 percent and capital 40 percent of total product. Assuming, moreover, a marginal return on capital of 10 percent suggests that Austrian capital stocks was on the order of: $K = \frac{4(1.246)}{.1} = 5$ billion crowns in 1885. If we were to assume that the initial 600 million crowns (746 million crowns assuming 80 percent discount) had been retained at home and invested in the industrial sector, the accumulated industrial capital stock would have been 5.6 billion. If, as a first approximation, the marginal product of capital and the share of capital in total output were constant, industrial output in 1885 would have been about $Y = \frac{1(5.60)}{4} = 1.4$ billion crowns. The rate of growth then between 1871 and 1884 would have been 2.7 percent, or 50 percent higher than the rate actually realized (and closer to the rate achieved between 1861-1871). The calculation is not sensitive to either the factor shares or the return of capital. (Since the industrial sector was not in long run competitive equilibrium, some investment opportunities existed which yielded a return well above this marginal rate. Consequently the marginal return on capital need not have decreased with the repatriation of funds from Hungary.) Given a growth rate of 2.25 percent in the following period (1884-1898) and assuming the same parameters, implies a hypothetical Austrian industrial capital stock in 1898 of approximately $K = \frac{4(1.972)}{.1} = 7.89$ billion crowns. Adding 1.33 billion crowns (1.66 billion crowns assuming 80 percent discount rate) that Austrians invested in Hungarian securities yields an output of 2.30 billion and consequently a rate of growth between 1884 and 1896 of 3.4 percent. Thus the rough calculations suggest that Austrian investments in Hungarian government bonds were large enough to have been capable of accounting for the relatively slower growth of Austria's industry during the depression of 1873-1897.

of industries were above normal and they persisted. Hence, there were economic rents to be earned which were foregone as a consequence of the flight of capital into Hungary. To be sure, measured in terms of utility the Austrians were better off holding Hungarian bonds than industrial equities, but a substantial part of this income consisted of non-pecuniary services of Hungarian bonds. Measured in physical units, the growth of national income was undoubtedly slower between 1873 and 1893 than it would have been if the Hungarian bonds had not been bought to the extent they were by Austrians.³⁹

It is readily admitted that even without the availability of Hungarian issues not all of the Austrian capital would have been placed in industrial enterprises. No doubt more would have been placed in industrial ventures however, and sooner. Though the capital flow into Hungary was sufficiently large to account fully for the slow industrial growth during the depression (1873-1896), the capital drain was also responsible for prolonging the depression in Austria. Therefore, Hungary's detrimental impact on the Austrian economy was probably more crucial during the later years (1884-1896) of the depression than during the earlier years (1873-1884) since Austrians would probably not have undertaken large scale domestic investments immediately after 1873 in any event.

Austrian investments were indispensable to the mobilization of Hungary's industrial sector. In 1893, the Austrian holdings of Hungarian securities amounted to 2.7 billion crowns. In contrast, the gross output of Hungarian industry in 1898 was only half this amount, and total fixed capital invested in industry other than buildings was one tenth of this sum as late as 1910.⁴⁰ Without

³⁹ Gerschenkron's suggestion that "... the government's demand for assistance from the banks in its credit operations was deflecting the banks from industrial financing" holds true for both the Austrian and Hungarian governments. ALEXANDER, GERSCHENKRON, *The Economic Spurt that Failed* (Princeton: The Princeton University Press, 1977), p. 50.

⁴⁰ FELLNER, *Die Zahlungsbilanz*, p. 71.

access to such huge foreign sums, Hungary could not have begun to industrialize in the late 1870s, and industrialization would undoubtedly have been delayed.

How easily Hungarians could have substituted foreign capital for Austrian capital in the absence of the common market is a question worthy of consideration. The more isolated Austria-Hungary was in the 1870s and 1880s from the world capital market the harder would it have been for Hungary to acquire foreign funds in order to engineer the beginning of its industrialization.

Table 12 provides some evidence that support Austria-Hungary's isolation from the world capital market. If the capital market had been fragmented, the movements in the interest rates in Austria would not correlate with the fluctuations of interest rates in the rest of the world, after allowing for the fluctuations in the exchange rate. More precisely, the domestic return on bonds (r) would be equal to the foreign yield (R) plus the expected percentage depreciation of the Austrian currency with respect to the foreign currency (e^*). Since the forward rate did not diverge appreciably from the spot rate,⁴¹ e^* might be replaced by the actual future rate (e). The correlation between Austrian yields on state securities not denominated in gold and $R + e$ shows no correlation with any of the major developed countries of Western Europe prior to the adoption of the gold standard in 1892 (Table 12). (Yet $R + e$ correlated highly among the countries as shown in Table 13). After 1892 the correlation between Austrian and foreign rates increased enormously. This pattern holds also for the correlation between r and R (Table 14) but not for securities denominated in gold (Table 15). The correlations in Table 15 do not increase as greatly after 1892. This suggests that the stability of the Austro-Hungarian currency blocked the

⁴¹ LELAND B. YEAGER, "Fluctuating Exchange Rates in the Nineteenth Century: the Experiences of Austria and Russia" in ROBERT A. MUNDELL and ALEXANDER K. SVOBODA (ed.), *Monetary Problems and the International Economy* (Chicago: The University of Chicago Press, 1969).

TABLE 12

CORRELATION BETWEEN r AND $R + e$, 1872-1900

| | | Germany | France | England |
|---------|---|---------|--------|---------|
| Austria | A | -.18 | .10 | .00 |
| | B | .55 | .93 | .96 |

Germany: A = 4% Imperial bonds 1878-1891
 B = 3-1/2% Imperial bonds 1892-1900

France: 3% bonds, A = 1872-1891
 B = 1892-1900

England: 3% consols until 1887 and 2-3/4 consols thereafter.
 A = 1872-1891
 B = 1892-1900

Sources: *Währungs-Statistik*, II, pp. 127, 130; *Währungsfrage*, p. 215; SIDNEY HOMER, *A History of Interest Rates* (New Brunswick: Rutgers University Press, 1963), p. 260. Austria, k.k. Finanz-Ministerium, *Statistische Tabellen zur Währungsfrage der österreichisch-ungarischen Monarchie* (Vienna: Hof- und Staatsdruckerei, 1892), p. 215. Austria, k.k. Finanz-Ministerium, *Tabellen zur Währungs-Statistik* (2d ed., Vienna: Hof- und Staatsdruckerei, 1900-1904) Vol. II, pp. 127, 130.

TABLE 13

CORRELATION OF $R + e$ FOR GERMANY,
 FRANCE AND ENGLAND, 1872-1900

| | France | England |
|---------|--------|---------|
| Germany | .74 | .99 |
| France | | .97 |

Source: See Table 12.

TABLE 14

CORRELATION OF AUSTRIAN (r) AND FOREIGN (R)
 INTEREST RATES, 1866-1900

| | | Germany | France | England |
|---------|---|---------|--------|---------|
| Austria | A | .42 | .20 | .01 |
| | B | .82 | .82 | .91 |

Germany: A = 1878-1892
 B = 1892-1900

France: A = 1866-1892
 B = 1890-1900

England: A = 1866-1900
 B = 1893-1900

The first differences of the series were correlated in order to adjust for trend.

Source: See Table 12.

TABLE 15

CORRELATION BETWEEN YIELD OF AUSTRIAN GOLD BONDS
AND YIELD ON FOREIGN SECURITIES, 1872-1900

| | | Germany | France | England |
|---------|---|---------|--------|---------|
| Austria | A | .75 | .44 | .66 |
| | B | .82 | .80 | .72 |

A = prior to 1892

B = 1892-1900

The first differences of the series were correlated in order to adjust for trend.

Source: See Table 12.

inflow of foreign capital into the monarchy prior to 1892,⁴² but there was a foreign market for the securities denominated in real terms.

Government securities guaranteed in gold served as the only investment on which foreigners did not expect to sustain large capital losses that would have offset the relatively higher return of Austrian bonds. As these securities were a greater burden on the government prior to 1892 their issue was limited and they could not have easily replaced the securities denominated in crowns. The low correlations reported in Table 12 prior to 1892 and the higher correlations thereafter suggest a fragmented capital market for securities in the 1870s and 1880s due to the instability of the florin.⁴³ With the adoption of the gold standard in 1892, con-

⁴² Milton Friedman and Anne Schwartz suggest that "highly variable inflation,... even if the average rate is largely anticipated... tends to destroy financial intermediation, rendering the capital market both limited and inefficient,... The result is that the real yield on physical capital may differ widely from one enterprise or industry to another, in addition to the yield to the holder of securities deviating widely from the yield on the physical capital to which the securities are linked." This holds for the fluctuations in the exchange rates as well. M. FRIEDMAN and A.J. SCHWARTZ, "Money and Interest Rates," paper presented to the Money and Banking workshop of the University of Chicago, January 13, 1976, p. 25. They mention lags of some to thirty years in the formation of anticipations, p. 32.

⁴³ *Kreditanstalten*, 1909, p. 12.

confidence increased and capital markets became less imperfect. The fragmented capital markets are but one more indication that Hungary could not have substituted easily for Austrian capital in the absence of the customs union.

The unencumbered access to the Austrian capital market was crucial to the beginning of industrialization in Hungary in the late 1870s. Until recently the first upsurge of industrial activity in Hungary was believed to have occurred after 1867 and to have come to an abrupt halt in 1873 after the crash of the stock market, only to begin anew after 1887.⁴⁴ From this pattern, especially from the upswing after 1867, scholars have concluded that the political consolidation that followed the compromise with Austria in 1867 was a significant element in Hungary's industrialization. No evidence was found to support this view. On the contrary, although transportation and banking did expand considerably during the post-1867 upswing, industrial production appears not to have been significantly affected. In this regard researchers might have been misled by the formation of corporations after 1867, which is not indicative of industrial production, especially during the early stages of development. The appearance of numerous large steam flour mills was also deceptive as they were initially substitutes for flour mills conventionally powered.⁴⁵

In contrast to the view that relegates the period between 1873-1887 to minor importance, the finding presented in this paper is that within a few years after the beginning of depression in Austria in 1873 the influx of foreign, predominantly Austrian, capital into Hungary was channeled, through the purchase of government securities, into investment in the infrastructure, and into increasing government expenditures. Without Austrian capital as a catalyst the beginning of industrialization in Hungary would have been unthinkable in the 1870s because the rate of

⁴⁴ KATUS, "Economic Growth in Hungary," pp. 55-56.

⁴⁵ *Ibid.*, pp. 56, 58.

domestic accumulation was insufficient. In 1896 the advances of industrial production practically came to a halt as a consequence of the recession of Austrian capital from Hungary. After a decade of stagnation the influx of new funds from Austria correlated well once again with the acceleration in industrial production between 1906 and 1913.

TABLE 16

MINING PRODUCTION IN HUNGARY, 1830-1913
(ten thousand ton)

| Year | Coal | | Gold | Silver | Copper | Lead |
|------|------------|---------|---------|--------|--------|-------|
| | Anthracite | Lignite | | | | |
| 1830 | .27 | .37 | .000012 | .00017 | .016 | .0012 |
| 31 | .16 | .22 | .000015 | .00021 | .020 | .0011 |
| 32 | .21 | .29 | .000014 | .00020 | .021 | .0014 |
| 33 | .15 | .21 | .000014 | .00013 | .021 | .0017 |
| 34 | .16 | .22 | .000014 | .00019 | .019 | .0022 |
| 35 | .12 | .16 | .000015 | .00019 | .019 | .0031 |
| 36 | .20 | .27 | .000016 | .00020 | .018 | .0023 |
| 37 | .16 | .22 | .000016 | .00020 | .022 | .0030 |
| 38 | .15 | .20 | .000017 | .00020 | .023 | .0028 |
| 39 | .33 | .45 | .000016 | .00019 | .021 | .0018 |
| 40 | .32 | .44 | .000018 | .00021 | .021 | .0035 |
| 41 | .34 | .47 | .000017 | .00020 | .020 | .0035 |
| 42 | .20 | .28 | .000017 | .00020 | .022 | .0038 |
| 43 | .21 | .29 | .000018 | .00019 | .022 | .0050 |
| 44 | .44 | .61 | .000019 | .00021 | .022 | .0051 |
| 45 | .21 | .28 | .000019 | .00021 | .022 | .0051 |
| 46 | .15 | .20 | .000021 | .00021 | .024 | .0023 |
| 47 | .39 | .54 | .000020 | .00020 | .028 | .0048 |
| 48 | .0 | .0 | .0 | .0 | .0 | .0 |
| 49 | .0 | .0 | .0 | .0 | .0 | .0 |
| 50 | .0 | .0 | .0 | .0 | .0 | .0 |
| 51 | .61 | .98 | .000017 | .00022 | .013 | .0018 |
| 52 | .69 | 1.40 | .000016 | .00020 | .019 | .0016 |
| 53 | .86 | 1.01 | .000017 | .00022 | .020 | .0040 |
| 54 | 1.04 | 1.15 | .000017 | .00022 | .021 | .0038 |
| 55 | 1.12 | 1.35 | .000017 | .00020 | .022 | .0061 |

TABLE 16 (continued)

| | | | | | | |
|------|-------|-------|---------|--------|-------|------|
| 1856 | 1.25 | 1.27 | .000013 | .00018 | .020 | .003 |
| 57 | 1.26 | 1.81 | .000015 | .00017 | .020 | .008 |
| 58 | 1.00 | 1.00 | .000010 | .00001 | .020 | .005 |
| 59 | 2.06 | 1.93 | .000016 | .00021 | .020 | .013 |
| 60 | 2.38 | 2.38 | .000016 | .00020 | .019 | .023 |
| 61 | 2.58 | 2.37 | .000016 | .00019 | .020 | .022 |
| 62 | 3.24 | 2.58 | .000017 | .00018 | .021 | .013 |
| 63 | 3.40 | 2.65 | .000015 | .00020 | .020 | .017 |
| 64 | 3.43 | 2.44 | .000018 | .00026 | .022 | .016 |
| 65 | 3.62 | 2.57 | .000018 | .00026 | .022 | .013 |
| 66 | 4.13 | 2.87 | .000016 | .00027 | .022 | .012 |
| 67 | 4.02 | 3.34 | .000018 | .00027 | .024 | .016 |
| 68 | 4.87 | 4.43 | .000017 | .00027 | .021 | .011 |
| 69 | 4.94 | 5.68 | .000016 | .00026 | .017 | .015 |
| 70 | 5.37 | 6.02 | .000015 | .00020 | .012 | .011 |
| 71 | 6.17 | 8.56 | .000014 | .00020 | .013 | .016 |
| 72 | 6.41 | 9.45 | .000014 | .00017 | .012 | .017 |
| 73 | 6.84 | 9.50 | .000012 | .00019 | .011 | .015 |
| 74 | 6.25 | 7.74 | .000013 | .00017 | .010 | .015 |
| 75 | 6.36 | 8.16 | .000016 | .00021 | .010 | .017 |
| 76 | 6.67 | 8.84 | .000019 | .00023 | .010 | .022 |
| 77 | 6.82 | 9.07 | .000017 | .00021 | .010 | .021 |
| 78 | 6.87 | 9.09 | .000018 | .00020 | .011 | .019 |
| 79 | 6.74 | 9.32 | .000016 | .00019 | .010 | .020 |
| 80 | 8.05 | 10.13 | .000016 | .00017 | .008 | .017 |
| 81 | 8.49 | 11.13 | .000016 | .00018 | .008 | .018 |
| 82 | 7.99 | 12.60 | .000017 | .00017 | .007 | .017 |
| 83 | 8.93 | 14.74 | .000016 | .00017 | .008 | .021 |
| 1884 | 9.40 | 15.84 | .000068 | .00015 | .0061 | .018 |
| 85 | 9.56 | 15.87 | .000017 | .00017 | .0050 | .040 |
| 86 | 8.59 | 15.68 | .000018 | .00016 | .0037 | .021 |
| 87 | 7.86 | 17.23 | .000019 | .00018 | .0034 | .018 |
| 88 | 8.51 | 18.74 | .000018 | .00017 | .0038 | .020 |
| 89 | 9.37 | 19.35 | .000022 | .00017 | .0031 | .024 |
| 90 | 9.95 | 22.52 | .000021 | .00017 | .0028 | .013 |
| 91 | 10.19 | 24.28 | .000015 | .00017 | .0024 | .022 |
| 92 | 10.52 | 25.54 | .000016 | .00018 | .0032 | .023 |
| 93 | 9.83 | 29.18 | .000017 | .00024 | .0034 | .025 |
| 94 | 10.37 | 31.75 | .000027 | .00020 | .0027 | .021 |
| 95 | 10.68 | 34.75 | .000032 | .00020 | .0029 | .023 |
| 96 | 11.33 | 37.62 | .000032 | .00020 | .0016 | .019 |
| 97 | 11.18 | 38.71 | .000031 | .00027 | .0021 | .025 |
| 98 | 12.40 | 42.07 | .000028 | .00019 | .0015 | .023 |
| 99 | 12.39 | 42.93 | .000031 | .00021 | .0016 | .022 |

Economic Growth and Industrialization in Hungary

TABLE 16 (continued)

| | | | | | | |
|------|-------|-------|---------|--------|-------|------|
| 1900 | 14.47 | 51.28 | .000033 | .00020 | .0018 | .020 |
| 01 | 13.65 | 51.80 | .000033 | .00024 | .0016 | .020 |
| 02 | 11.83 | 51.32 | .000034 | .00023 | .0008 | .022 |
| 03 | 12.33 | 52.72 | .000034 | .00019 | .0004 | .021 |
| 04 | 11.55 | 55.19 | .000037 | .00016 | .0006 | .021 |
| 05 | 10.88 | 60.89 | .000037 | .00016 | .0007 | .021 |
| 06 | 12.38 | 63.65 | .000037 | .00014 | .0006 | .019 |
| 07 | 12.74 | 64.91 | .000035 | .00013 | .0008 | .014 |
| 08 | 12.10 | 71.51 | .000033 | .00013 | .0017 | .015 |
| 09 | 13.97 | 76.59 | .000027 | .00011 | .0027 | .016 |
| 10 | 13.02 | 77.34 | .000030 | .00013 | .0021 | .021 |
| 11 | 12.90 | 81.55 | .000032 | .00011 | .0021 | .016 |
| 12 | 13.02 | 82.85 | .000028 | .00011 | .0024 | .016 |
| 13 | 13.20 | 89.54 | .000029 | .00009 | .0040 | .011 |

| Year | Salt | Total Value Added in Mining in 1913 Prices (Millions of Crowns) |
|------|------|---|
| 1830 | .64 | 14.39 |
| 31 | .94 | 19.07 |
| 32 | .76 | 16.88 |
| 33 | .89 | 18.26 |
| 34 | .91 | 18.22 |
| 35 | .82 | 17.60 |
| 36 | .84 | 18.01 |
| 37 | 1.03 | 20.68 |
| 38 | 1.17 | 22.52 |
| 39 | 1.11 | 21.83 |
| 40 | 1.09 | 22.39 |
| 41 | 1.07 | 21.65 |
| 42 | 1.04 | 21.04 |
| 43 | .88 | 19.66 |
| 44 | .90 | 20.70 |
| 45 | .98 | 21.26 |
| 46 | 1.09 | 22.86 |
| 47 | 1.34 | 26.60 |
| 48 | 1.00 | 11.30 |
| 49 | .90 | 10.17 |
| 50 | .82 | 16.87 |
| 51 | 1.11 | 22.42 |
| 52 | 1.21 | 23.82 |
| 53 | 1.15 | 23.67 |
| 54 | 1.18 | 24.47 |

TABLE 16 (continued)

| | | |
|------|------|-------|
| 55 | 1.37 | 36.67 |
| 56 | 1.95 | 31.95 |
| 57 | 1.43 | 27.05 |
| 58 | 1.49 | 24.86 |
| 59 | 1.30 | 27.36 |
| 60 | 1.15 | 36.58 |
| 61 | 1.25 | 27.81 |
| 62 | 1.10 | 27.18 |
| 63 | 1.10 | 27.06 |
| 64 | 1.16 | 29.06 |
| 65 | 1.10 | 29.69 |
| 66 | 1.00 | 27.74 |
| 67 | 1.46 | 34.20 |
| 68 | 1.37 | 34.00 |
| 69 | 1.48 | 35.78 |
| 70 | 1.55 | 35.88 |
| 71 | 1.69 | 40.41 |
| 73 | 1.46 | 38.47 |
| 74 | 1.21 | 33.49 |
| 1875 | 1.11 | 34.04 |
| 76 | 1.20 | 37.13 |
| 77 | 1.19 | 36.58 |
| 78 | 1.46 | 39.87 |
| 79 | 1.51 | 39.94 |
| 80 | 1.58 | 42.37 |
| 81 | 1.50 | 42.76 |
| 82 | 1.64 | 45.06 |
| 83 | 1.60 | 47.47 |
| 84 | 1.60 | 48.53 |
| 85 | 1.53 | 48.85 |
| 86 | 1.52 | 46.86 |
| 87 | 1.60 | 48.35 |
| 88 | 1.64 | 50.65 |
| 89 | 1.65 | 53.33 |
| 90 | 1.60 | 55.35 |
| 91 | 1.63 | 56.02 |
| 92 | 1.76 | 59.48 |
| 93 | 1.67 | 61.43 |
| 94 | 1.69 | 66.57 |
| 95 | 1.69 | 70.82 |
| 96 | 1.80 | 74.78 |
| 97 | 1.72 | 75.02 |
| 98 | 1.79 | 78.32 |
| 99 | 1.83 | 80.42 |

TABLE 16 (continued)

| | | |
|------|------|--------|
| 1900 | 1.89 | 90.79 |
| 01 | 1.84 | 90.03 |
| 02 | 1.75 | 86.77 |
| 03 | 1.83 | 88.95 |
| 04 | 1.88 | 91.22 |
| 05 | 1.95 | 96.00 |
| 06 | 2.01 | 100.53 |
| 07 | 2.17 | 102.93 |
| 08 | 2.24 | 107.87 |
| 09 | 2.31 | 113.47 |
| 10 | 2.30 | 114.00 |
| 11 | 2.75 | 122.42 |
| 12 | 2.96 | 125.13 |
| 13 | 2.95 | 130.72 |

TABLE 17

INDEX OF INDUSTRIAL PRODUCTION OF AUSTRIA-HUNGARY,
1830-1913 in 1913 PRICES (millions of crowns)

| Year | Hungary | | Austria | |
|------|---------------|---|---------------|---|
| | Manufacturing | Manufacturing Mining Construction | Manufacturing | Manufacturing Mining Construction |
| 1830 | 48.44 | 62.83 | 163.60 | 165.08 |
| 31 | 48.92 | 62.83 | 163.60 | 165.08 |
| 32 | 49.36 | 66.24 | 174.29 | 175.85 |
| 33 | 50.65 | 68.91 | 171.53 | 173.00 |
| 33 | 50.65 | 68.91 | 171.53 | 173.00 |
| 34 | 50.79 | 69.01 | 165.98 | 167.80 |
| 35 | 51.63 | 69.23 | 181.13 | 183.05 |
| 36 | 52.48 | 70.49 | 181.44 | 183.50 |
| 37 | 52.57 | 73.25 | 191.92 | 194.82 |
| 38 | 52.66 | 75.18 | 200.98 | 204.54 |
| 39 | 53.88 | 75.71 | 192.49 | 201.73 |
| 40 | 54.32 | 76.71 | 210.15 | 213.74 |
| 41 | 55.13 | 76.78 | 205.64 | 220.71 |
| 42 | 56.23 | 77.27 | 217.79 | 223.30 |
| 43 | 56.62 | 76.28 | 220.17 | 224.11 |
| 44 | 57.06 | 77.76 | 225.80 | 235.82 |
| 45 | 60.04 | 81.30 | 221.24 | 240.44 |
| 46 | 58.94 | 83.66 | 248.09 | 263.61 |
| 47 | 60.36 | 93.68 | 234.45 | 248.91 |

TABLE 17 (continued)

| | | | | |
|------|--------|--------|--------|--------|
| 48 | 75.57 | 69.77 | 216.37 | 225.16 |
| 49 | 56.36 | 66.53 | 236.30 | 253.22 |
| 50 | 55.05 | 74.27 | 244.37 | 257.77 |
| 51 | 55.83 | 85.40 | 269.79 | 282.58 |
| 52 | 57.00 | 80.82 | 292.60 | 305.70 |
| 53 | 61.79 | 88.60 | 282.03 | 296.61 |
| 54 | 62.66 | 90.82 | 315.38 | 334.39 |
| 55 | 64.87 | 95.95 | 303.79 | 331.25 |
| 56 | 67.54 | 105.13 | 309.44 | 342.38 |
| 57 | 70.89 | 113.67 | 330.25 | 364.89 |
| 58 | 71.13 | 112.76 | 323.79 | 371.83 |
| 59 | 74.84 | 110.00 | 294.48 | 336.17 |
| 60 | 76.10 | 115.36 | 342.93 | 391.18 |
| 61 | 79.70 | 119.96 | 365.79 | 416.34 |
| 62 | 82.74 | 114.68 | 276.83 | 327.40 |
| 63 | 82.79 | 112.50 | 260.65 | 310.81 |
| 64 | 87.06 | 117.41 | 255.61 | 299.93 |
| 65 | 84.97 | 127.84 | 262.96 | 317.61 |
| 66 | 87.23 | 116.65 | 268.94 | 327.91 |
| 67 | 97.52 | 140.59 | 363.26 | 429.37 |
| 68 | 104.01 | 159.08 | 392.97 | 477.99 |
| 69 | 90.00 | 133.96 | 429.32 | 537.76 |
| 1870 | 81.96 | 160.04 | 426.36 | 546.12 |
| 71 | 84.80 | 177.26 | 503.51 | 658.56 |
| 70 | 76.36 | 171.64 | 488.76 | 641.31 |
| 73 | 68.33 | 176.60 | 409.26 | 556.64 |
| 74 | 99.73 | 145.35 | 429.58 | 554.82 |
| 75 | 93.20 | 130.81 | 428.70 | 577.06 |
| 76 | 77.96 | 133.85 | 418.04 | 560.66 |
| 77 | 91.06 | 135.67 | 440.99 | 587.46 |
| 78 | 125.19 | 178.40 | 477.65 | 606.07 |
| 79 | 110.52 | 165.98 | 480.95 | 621.35 |
| 80 | 101.16 | 153.10 | 450.57 | 600.84 |
| 81 | 123.10 | 189.25 | 529.10 | 701.19 |
| 82 | 151.98 | 239.59 | 568.56 | 741.71 |
| 83 | 161.04 | 247.08 | 629.36 | 821.10 |
| 84 | 152.94 | 230.68 | 638.58 | 864.79 |
| 85 | 157.27 | 231.94 | 549.39 | 742.55 |
| 86 | 159.30 | 233.04 | 571.12 | 777.19 |
| 87 | 165.33 | 264.99 | 613.18 | 840.99 |
| 88 | 180.05 | 254.53 | 619.11 | 869.66 |
| 89 | 165.34 | 254.61 | 656.92 | 901.58 |
| 90 | 184.13 | 274.97 | 689.77 | 944.15 |
| 91 | 204.98 | 313.82 | 702.97 | 976.22 |

Economic Growth and Industrialization in Hungary

TABLE 17 (continued)

| | | | | |
|------|--------|--------|---------|---------|
| 92 | 208.52 | 289.86 | 722.24 | 984.43 |
| 93 | 233.59 | 330.83 | 737.25 | 1019.83 |
| 94 | 240.64 | 259.68 | 804.20 | 1096.78 |
| 95 | 239.27 | 374.66 | 825.40 | 1118.89 |
| 96 | 250.16 | 399.58 | 781.61 | 1094.50 |
| 97 | 224.15 | 370.41 | 806.12 | 1154.26 |
| 98 | 234.82 | 372.55 | 872.17 | 1243.86 |
| 99 | 260.23 | 395.95 | 874.46 | 1249.43 |
| 1900 | 245.73 | 371.84 | 848.02 | 1206.80 |
| 01 | 245.75 | 375.83 | 872.95 | 1242.72 |
| 02 | 265.16 | 396.07 | 927.85 | 1297.77 |
| 03 | 283.48 | 420.71 | 901.01 | 1283.90 |
| 04 | 265.20 | 392.49 | 918.69 | 1377.71 |
| 05 | 276.29 | 430.05 | 970.61 | 1374.27 |
| 06 | 312.32 | 476.47 | 1039.51 | 1474.96 |
| 07 | 305.54 | 455.82 | 1229.78 | 1677.19 |
| 08 | 318.83 | 496.81 | 1199.86 | 1682.10 |
| 09 | 348.33 | 529.24 | 1205.95 | 1708.95 |
| 10 | 344.77 | 513.50 | 1168.86 | 1642.37 |
| 11 | 379.11 | 552.98 | 1250.10 | 1711.96 |
| 12 | 419.94 | 606.14 | 1340.67 | 1814.33 |
| 13 | 415.26 | 598.63 | 1285.51 | 1773.54 |

Source for Table 16-20: JOHN KOMLOS, "The Habsburg Monarchy as a Customs Union: Economic Development in Austria-Hungary in the Nineteenth Century" (Unpublished Ph. O. Dissertation, The University of Chicago, 1978), pp. 233-246.

SECTORAL BREAKDOWN OF AUSTRIA'S MANUFACTURING
PRODUCTION IN 1913 PRICES, 1830-1913

| Year | Iron | Sugar | Cotton Textiles | Woolen Textiles | Flour | Electricity |
|------|-------|-------|--------------------|--------------------|-------|-------------|
| 1830 | 11.21 | 0.700 | 18.420 | 81.270 | 52.00 | |
| 31 | 12.14 | 0.630 | 13.730 | 85.970 | 52.50 | |
| 32 | 11.93 | 0.720 | 20.790 | 87.850 | 53.00 | |
| 33 | 12.28 | 0.650 | 19.800 | 85.300 | 52.50 | |
| 34 | 12.88 | 0.700 | 21.570 | 76.830 | 54.00 | |
| 35 | 14.10 | 0.920 | 27.280 | 84.330 | 54.50 | |
| 36 | 14.03 | 0.920 | 34.160 | 77.330 | 55.00 | |
| 37 | 15.57 | 0.950 | 35.680 | 84.220 | 55.50 | |
| 38 | 15.54 | 0.960 | 37.240 | 91.00 | 56.00 | |
| 39 | 15.93 | 1.040 | 35.840 | 83.180 | 56.50 | |
| 40 | 16.84 | 1.110 | 45.550 | 89.650 | 57.00 | |
| 41 | 18.05 | 1.090 | 37.040 | 91.570 | 57.89 | |
| 42 | 18.40 | 1.240 | 42.380 | 97.770 | 58.00 | |
| 43 | 19.03 | 1.360 | 45.969 | 95.320 | 58.50 | |
| 44 | 20.93 | 1.420 | 47.510 | 96.940 | 59.00 | |
| 45 | 21.19 | 1.420 | 51.740 | 87.390 | 59.50 | |
| 46 | 24.67 | 1.580 | 66.980 | 95.869 | 59.00 | |
| 47 | 25.71 | 1.750 | 57.290 | 90.700 | 59.00 | |
| 48 | 24.16 | 1.330 | 45.570 | 86.310 | 59.00 | |
| 49 | 22.96 | 1.370 | 59.390 | 93.580 | 59.00 | |
| 50 | 27.08 | 1.730 | 66.060 | 90.500 | 59.00 | |
| 51 | 26.97 | 1.710 | 65.240 | 116.870 | 59.00 | |
| 52 | 30.93 | 1.990 | 84.130 | 116.050 | 59.50 | |
| 53 | 34.80 | 2.370 | 91.040 | 93.820 | 60.00 | |
| 54 | 35.84 | 1.920 | 76.250 | 141.370 | 60.00 | |
| 55 | 38.84 | 2.420 | 84.480 | 118.050 | 60.00 | |
| 56 | 41.81 | 2.400 | 100.170 | 105.060 | 60.00 | |
| 57 | 47.95 | 2.450 | 92.540 | 127.310 | 60.00 | |
| 58 | 49.26 | 2.920 | 101.250 | 110.360 | 60.00 | |
| 59 | 40.44 | 3.160 | 93.480 | 97.400 | 60.00 | |
| 60 | 41.53 | 4.020 | 123.44 | 113.940 | 60.00 | |
| 61 | 53.15 | 2.910 | 129.110 | 120.620 | 60.00 | |
| 62 | 59.11 | 3.070 | 57.820 | 96.830 | 60.00 | |
| 63 | 58.17 | 3.700 | 48.480 | 90.300 | 60.00 | |
| 64 | 46.35 | 3.360 | 52.160 | 93.740 | 60.00 | |
| 65 | 44.01 | 4.250 | 68.100 | 86.600 | 60.00 | |
| 66 | 37.60 | 3.630 | 71.260 | 96.450 | 60.00 | |
| 67 | 50.78 | 4.850 | 111.800 | 135.740 | 60.00 | |
| 68 | 81.81 | 4.150 | 117.330 | 129.390 | 60.29 | |
| 69 | 90.56 | 3.370 | 113.890 | 157.090 | 64.41 | |
| 70 | 91.13 | 5.520 | 119.880 | 135.750 | 74.08 | |

Economic Growth and Industrialization in Hungary

TABLE 18 (continued)

| Year | Iron | Sugar | Cotton Textiles | Woolen Textiles | Flour | Electricity |
|------|--------|--------|-----------------|-----------------|--------|-------------|
| 1871 | 99.98 | 1.030 | 163.420 | 160.070 | 79.01 | |
| 72 | 117.16 | 6.170 | 141.280 | 149.080 | 75.07 | |
| 73 | 126.50 | 8.310 | 125.420 | 83.570 | 65.47 | |
| 74 | 82.55 | 6.760 | 135.120 | 129.010 | 76.14 | |
| 75 | 74.67 | 4.700 | 148.390 | 118.760 | 82.18 | |
| 76 | 64.58 | 6.600 | 154.790 | 119.840 | 72.23 | |
| 77 | 64.59 | 7.620 | 159.280 | 131.200 | 78.30 | |
| 78 | 78 | 11.950 | 160.000 | 139.560 | 87.30 | |
| 79 | 71.76 | 14.790 | 172.520 | 140.760 | 81.12 | |
| 80 | 76.80 | 14.140 | 163.110 | 116.690 | 79.83 | |
| 81 | 97.14 | 23.820 | 181.210 | 135.850 | 91.08 | 0.00 |
| 82 | 116.29 | 24.120 | 171.340 | 164.890 | 91.76 | 0.17 |
| 83 | 138.74 | 27.630 | 237.130 | 138.330 | 87.13 | 0.40 |
| 84 | 171.19 | 23.740 | 212.410 | 142.450 | 88.12 | 0.67 |
| 85 | 110.90 | 25.130 | 182.190 | 134.920 | 95.42 | 0.8 |
| 86 | 11.86 | 15.130 | 201.650 | 146.800 | 94.58 | 1.10 |
| 87 | 115.70 | 25.340 | 228.710 | 144.280 | 97.81 | 1.33 |
| 88 | 139.96 | 19.290 | 202.900 | 153.860 | 101.43 | 1.67 |
| 89 | 151.18 | 28.690 | 210.410 | 177.310 | 87.13 | 2.20 |
| 90 | 150.51 | 37.050 | 250.740 | 159.630 | 88.77 | 3.07 |
| 91 | 163.33 | 39.490 | 248.870 | 153.650 | 93.80 | 3.84 |
| 92 | 167.77 | 38.950 | 254.770 | 163.480 | 92.83 | 4.44 |
| 93 | 176.10 | 42.620 | 253.540 | 165.390 | 94.63 | 4.97 |
| 94 | 203.10 | 38.990 | 290.100 | 172.050 | 94.15 | 5.80 |
| 95 | 218.43 | 52.980 | 296.020 | 158.280 | 93.22 | 6.47 |
| 96 | 228.57 | 33.390 | 268.200 | 151.330 | 92.92 | 7.20 |
| 97 | 256.85 | 46.180 | 271.250 | 134.580 | 88.85 | 8.41 |
| 98 | 277.75 | 40.470 | 321.650 | 134.230 | 88.73 | 9.34 |
| 99 | 287.48 | 44.880 | 292.340 | 140.750 | 98.67 | 10.34 |
| 1900 | 287.84 | 50.110 | 284.520 | 119.730 | 94.48 | 11.34 |
| 01 | 276.71 | 42.820 | 306.080 | 141.430 | 93.30 | 12.61 |
| 02 | 255.46 | 51.150 | 324.090 | 180.290 | 103.65 | 13.21 |
| 03 | 249.75 | 37.370 | 329.160 | 163.310 | 106.95 | 14.48 |
| 04 | 250.78 | 44.500 | 336.200 | 162.060 | 109.01 | 16.14 |
| 05 | 291.88 | 39.800 | 350.180 | 153.950 | 116.86 | 17.94 |
| 06 | 322.92 | 58.140 | 350.930 | 164.220 | 123.49 | 19.81 |
| 07 | 375.99 | 51.460 | 469.930 | 189.450 | 119.93 | 23.01 |
| 08 | 401.86 | 52.730 | 395.810 | 200.890 | 121.62 | 26.95 |
| 09 | 368.85 | 49.140 | 413.040 | 212.120 | 130.85 | 31.95 |
| 10 | 379.62 | 48.180 | 367.350 | 206.830 | 129.89 | 36.99 |
| 11 | 392.38 | 61.360 | 420.630 | 204.750 | 129.05 | 41.93 |
| 12 | 450.79 | 40.840 | 455.570 | 210.040 | 135.67 | 47.76 |
| 13 | 445.22 | 68.660 | 406.620 | 176.920 | 134.69 | 53.40 |

TABLE 19

SECTORAL BREAKDOWN OF HUNGARY'S MANUFACTURING
 PRODUCTION IN 1913 PRICES, 1830-1913
 (millions of crowns)

| Year | Iron | Sugar | Cotton Textiles | Flour | Woolen Textiles | Electricity |
|------|-------|-------|--------------------|-------|--------------------|-------------|
| 183. | 2.44 | | | 46.00 | | |
| 31 | 2.42 | | | 46.50 | | |
| 32 | 2.36 | | | 47.00 | | |
| 33 | 3.15 | | | 47.50 | | |
| 34 | 2.79 | | | 48.00 | | |
| 35 | 3.13 | | | 48.50 | | |
| 36 | 3.48 | | | 49.00 | | |
| 37 | 3.07 | | | 49.50 | | |
| 38 | 2.66 | | | 50.00 | | |
| 39 | 3.38 | | | 50.50 | | |
| 40 | 3.32 | 0.00 | | 51.00 | | |
| 41 | 3.45 | 0.04 | | 51.64 | | |
| 42 | 4.19 | 0.04 | | 52.00 | | |
| 43 | 4.08 | 0.04 | | 52.50 | | |
| 44 | 4.02 | 0.04 | 0.00 | 53.00 | | |
| 45 | 4.44 | 0.04 | 2.06 | 53.50 | | |
| 46 | 3.52 | 0.05 | 2.37 | 53.00 | | |
| 47 | 5.20 | 0.05 | 2.61 | 52.50 | | |
| 48 | 3.36 | 0.05 | 2.16 | 52.00 | | |
| 49 | 3.45 | 0.05 | 1.36 | 51.50 | | |
| 50 | 3.29 | 0.05 | 1.71 | 50.00 | | |
| 51 | 5.10 | 0.10 | 1.63 | 1.63 | | |
| 52 | 5.19 | 0.16 | 1.65 | 50.00 | | |
| 53 | 8.74 | 0.13 | 1.92 | 51.00 | | |
| 54 | 8.69 | 0.20 | 1.77 | 52.00 | | |
| 55 | 9.57 | 0.20 | 2.10 | 53.00 | | |
| 56 | 11.09 | 0.30 | 2.15 | 54.00 | | |
| 57 | 13.48 | 0.30 | 2.11 | 55.00 | | |
| 58 | 12.35 | 0.40 | 2.38 | 56.00 | | |
| 59 | 15.11 | 0.40 | 2.33 | 57.00 | | |
| 60 | 13.70 | 0.50 | 2.90 | 59.00 | | |
| 61 | 15.06 | 0.53 | 3.11 | 61.00 | | |
| 62 | 17.47 | 0.61 | 2.66 | 62.00 | | |
| 63 | 19.55 | 0.40 | 2.84 | 60.00 | | |
| 64 | 21.18 | 0.79 | 3.09 | 62.00 | | |
| 65 | 18.12 | 0.47 | 3.38 | 63.00 | | |
| 66 | 19.02 | 0.57 | 3.64 | 61.00 | | |
| 67 | 16.77 | 0.70 | 4.05 | 76.00 | | |
| 69 | 24.26 | 0.80 | 6.29 | 76.33 | | |
| 70 | 23.79 | 1.38 | 1.21 | 61.96 | | |

Economic Growth and Industrialization in Hungary

TABLE 19 (continued)

| Year | Iron | Sugar | Cotton Textiles | Flour | Woolen Textiles | Electricity |
|------|--------|-------|--------------------|--------|--------------------|-------------|
| 1871 | 25.74 | 1.19 | 5.10 | 55.58 | | |
| 72 | 25.94 | 1.32 | 3.70 | 52.77 | | |
| 73 | 29.17 | 0.86 | 2.67 | 45.40 | | |
| 74 | 28.57 | 1.64 | 4.55 | 55.63 | | |
| 75 | 29.74 | 1.34 | 3.81 | 64.97 | | |
| 76 | 22.98 | 1.65 | 5.88 | 58.31 | | |
| 77 | 23.61 | 1.72 | 7.69 | 47.45 | | |
| 78 | 25.73 | 3.08 | 9.25 | 58.04 | | |
| 79 | 21.46 | 2.87 | 10.82 | 87.13 | | |
| 80 | 26.17 | 3.79 | 12.37 | 75.37 | | |
| 81 | 29.57 | 3.33 | 13.89 | 58.83 | | |
| 82 | 32.30 | 3.80 | 14.67 | 76.31 | | |
| 83 | 35.65 | 4.20 | 18.55 | 101.21 | | |
| 84 | 40.95 | 3.85 | 14.71 | 102.64 | | |
| 85 | 39.78 | 3.37 | 12.33 | 93.43 | | |
| 86 | 45.72 | 3.56 | 14.46 | 101.79 | | |
| 87 | 36.27 | 2.90 | 15.35 | 95.56 | | |
| 88 | 37.53 | 4.74 | 15.85 | 110.81 | | |
| 89 | 45.12 | 6.72 | 16.81 | 121.93 | | |
| 90 | 57.90 | 5.95 | 16.69 | 96.69 | | 0.00 |
| 91 | 58.85 | 8.13 | 19.14 | 103.59 | | 0.85 |
| 92 | 60.36 | 8.35 | 20.67 | 118.01 | | 1.16 |
| 93 | 63.36 | 9.83 | 22.12 | 117.98 | | 1.59 |
| 94 | 67.80 | 9.35 | 19.64 | 136.69 | | 2.05 |
| 95 | 72.12 | 8.15 | 20.33 | 141.80 | | 2.71 |
| 96 | 81.01 | 9.92 | 24.32 | 135.97 | | 2.91 |
| 97 | 83.31 | 9.36 | 26.11 | 132.00 | | 3.10 |
| 98 | 91.01 | 9.96 | 27.22 | 102.27 | | 3.77 |
| 99 | 87.75 | 11.29 | 26.35 | 102.86 | | 4.18 |
| 1900 | 78.57 | 13.77 | 25.34 | 130.66 | | 4.60 |
| 01 | 87.42 | 13.70 | 28.49 | 123.45 | | 5.08 |
| 02 | 83.70 | 14.03 | 34.64 | 111.06 | | 5.67 |
| 03 | 80.00 | 16.60 | 37.49 | 127.12 | | 6.59 |
| 04 | 74.57 | 12.20 | 39.09 | 142.80 | | 7.63 |
| 05 | 80.57 | 14.78 | 39.93 | 131.71 | | 8.24 |
| 06 | 81.15 | 20.60 | 49.70 | 132.78 | 10.0 | 9.79 |
| 07 | 103.94 | 18.55 | 42.22 | 151.00 | 18.0 | 11.54 |
| 08 | 130.73 | 16.26 | 43.26 | 129.29 | 21.0 | 12.96 |
| 09 | 135.96 | 20.15 | 48.32 | 115.63 | 29.0 | 12.77 |
| 10 | 124.22 | 22.02 | 43.19 | 129.13 | 33.0 | 16.91 |
| 11 | 133.23 | 22.51 | 51.96 | 138.44 | 38.0 | 19.57 |
| 12 | 152.75 | 37.34 | 58.72 | 151.84 | 36.0 | 21.91 |
| 13 | 165.93 | 37.48 | 46.87 | 140.68 | 38.0 | 24.30 |

TABLE 20

VALUE ADDED IN RAILROAD CONSTRUCTION
AND REPAIR IN AUSTRIA AND HUNGARY IN 1913 PRICES, 1830-1913

| Year | Hungary | Austria | Year | Hungary | Austria |
|------|---------|---------|------|---------|---------|
| 1830 | 0.00 | 0.00 | 1871 | 52.02 | 71.98 |
| 31 | 0.00 | 0.00 | 72 | 54.87 | 66.84 |
| 32 | 0.00 | 0.00 | 73 | 49.80 | 50.01 |
| 33 | 0.00 | 0.00 | 74 | 12.13 | 22.93 |
| 34 | 0.00 | 0.00 | 75 | 3.58 | 41.55 |
| 35 | 0.00 | 0.00 | 76 | 18.77 | 30.86 |
| 36 | 0.00 | 0.00 | 77 | 8.03 | 33.66 |
| 37 | 0.00 | 0.75 | 78 | 13.35 | 12.52 |
| 38 | 0.00 | 0.96 | 79 | 15.52 | 15.70 |
| 39 | 0.00 | 5.98 | 80 | 9.56 | 15.66 |
| 40 | 0.00 | 0.00 | 81 | 15.61 | 28.00 |
| 41 | 0.00 | 11.05 | 82 | 39.68 | 26.34 |
| 42 | 0.00 | 1.44 | 83 | 38.57 | 30.84 |
| 43 | 0.00 | 0.00 | 84 | 29.21 | 64.05 |
| 44 | 0.00 | 5.09 | 85 | 25.82 | 24.77 |
| 45 | 0.00 | 13.65 | 86 | 26.88 | 31.71 |
| 46 | 1.87 | 9.38 | 87 | 51.30 | 43.90 |
| 47 | 6.73 | 8.10 | 88 | 23.83 | 50.42 |
| 48 | 0.91 | 1.70 | 89 | 35.93 | 32.31 |
| 49 | 0.00 | 10.07 | 90 | 31.40 | 25.30 |
| 50 | 2.35 | 6.22 | 91 | 49.95 | 34.45 |
| 51 | 7.15 | 2.51 | 92 | 21.87 | 22.78 |
| 52 | 0.00 | 0.99 | 93 | 35.81 | 32.27 |
| 53 | 3.14 | 1.22 | 94 | 43.86 | 39.13 |
| 54 | 3.69 | 3.61 | 95 | 55.96 | 26.61 |
| 55 | 4.41 | 9.73 | 96 | 65.63 | 36.95 |
| 56 | 5.63 | 12.48 | 97 | 61.82 | 52.16 |
| 57 | 15.73 | 12.09 | 98 | 49.18 | 64.38 |
| 58 | 16.76 | 24.26 | 99 | 46.70 | 56.33 |
| 59 | 7.80 | 14.70 | 1900 | 26.31 | 45.63 |
| 60 | 12.68 | 17.16 | 01 | 26.54 | 38.29 |
| 61 | 12.45 | 15.50 | 02 | 26.54 | 44.12 |
| 62 | 4.76 | 11.23 | 03 | 36.00 | 45.71 |
| 63 | 2.66 | 11.24 | 04 | 27.47 | 37.00 |
| 64 | 1.29 | 4.72 | 05 | 38.51 | 44.99 |
| 65 | 13.18 | 10.95 | 06 | 52.57 | 57.14 |
| 66 | 1.89 | 17.84 | 07 | 37.53 | 31.86 |
| 67 | 8.87 | 13.58 | 08 | 60.28 | 38.31 |
| 68 | 21.07 | 25.03 | 09 | 56.79 | 51.46 |
| 69 | 8.10 | 44.04 | 10 | 44.49 | 41.85 |
| 70 | 42.20 | 49.56 | 11 | 42.46 | 33.76 |
| | | | 12 | 49.60 | 35.50 |
| | | | 13 | 44.05 | 34.81 |

Source for Table 16-20: JOHN KOMLOS, "The Habsburg Monarchy as a Customs Union: Economic Development in Austria-Hungary in the XIXth Century" (Unpublished Ph. D. Dissertation, The University of Chicago, 1978, pp. 233-246).