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## Chapter 5

### How peripheral was the periphery? Industrialisation in East Central Europe since 1870

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The origins of industrialization in Central and East Central Europe reach back into the eighteenth century (Good, 1984; Komlos 1983, 1989). Much of this part of Europe was under Habsburg rule until the demise of the Austro-Hungarian Empire at the end of World War I.<sup>1</sup> The Habsburg realm's geographical location at the cross-roads of Europe's west and east meant that the timing and spatial diffusion of industrialization mirrored the broader European experience. It was in the regions adjacent to western Europe, Alpine Austria and the Czech lands, where 'the growth impulses from England and of the continental northwest found fertile ground first' (Good, 1984, p.15) and where the shift from proto-industrial to modern forms of manufacturing began in the late eighteenth and early nineteenth century.

By the early 1870s, Austrian industrialization was well beyond the transitional phase that Komlos (1983) dated to have lasted to the mid-1820s and thus well into the 'machine-industrial phase' proper. However, as elsewhere in Europe, industrialization in the Habsburg lands, its timing and pace, was a process characterized by pronounced regional differences (Pollard, 1986). These gaps initially widened over the course of the nineteenth century, as industrial activity in Alpine Austria and the Czech lands gathered momentum. The western parts of Hungary followed significantly later with a first wave of industrial expansion in the late 1860s and early 1870s. Industrialization, though by 1913 well advanced in the western and north-western regions of the empire, diffused only slowly to its most eastern and south-eastern regions. This had profound implications for the structure and growth of the East Central European economies throughout the late nineteenth and twentieth centuries. It is the stark unevenness in the extent of industrial activity across the regions of East Central Europe that prompts the question of how peripheral this periphery was. We suggest that, at least in a European context, the imaginary line between the 'core' and 'the periphery' ran through the Habsburg economy

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<sup>1</sup> We use the labels *Imperial Austria* (or Cisleithania) and *Imperial Hungary* (or Transleithania) to distinguish the two main constituent parts of the Habsburg state after the 1867 constitutional compromise from the far smaller, post-1918 successor states of Austria and Hungary in their new borders. Following Good (1984, pp.15-17), the labels *Alpine Austria* (including the regions of Lower Austria, Upper Austria, Styria, Salzburg, Carinthia, Tyrol and Vorarlberg) and *Czech lands* (Bohemia, Moravia, Silesia) are frequently used to identify the western and north-western parts of the Habsburg Empire that were the most industrialized. Despite post-1918 border changes, these latter groupings correspond broadly with modern day Austria and the Czech Republic.

– from the west/north west to the east/south east, reflecting the pattern of diffusion of modern economic growth emphasized in the historiography (Good, 1984; Pollard, 1986). The Empire's unique position – being both close to and at the same time far away from the European industrial core – is, on the one hand, demonstrated by its prominent rank among the world's leading machinery producers: by 1913, Austria-Hungary's mechanical engineering industry, located mainly around Vienna and in the Czech lands, was in terms of output surpassed only by the United States, Britain and Germany (Schulze, 1996). Yet, on the other hand, the Habsburg economy included large, populous regions in the east where industrialization had made little, if any, headway by the time of the First World War. Galicia, for example, accounted for about 28 per cent of Imperial Austria's population in 1910, but contributed less than six per cent of manufacturing output.

In the early nineteenth century, the western half of the Habsburg Empire was economically in as promising a position as the territories of Germany proper (Freudenberger, 2003). At around 1820, per capita GDP was about 7 per cent higher than in Germany; the comparative income lead was even larger for the regions that form present-day Austria.<sup>2</sup> That lead, though, was to disappear fast over the following decades. In this sense, then, the evidence lends some support to Alexander Gerschenkron's pessimistic assessment of nineteenth century Austria as a case of 'failure' (Gerschenkron, 1977, p.54). Table 5.1 reports GDP per capita for Central Europe, expressed in percentages of the German level. Four initial, general observations stand out. First, in the late nineteenth century, the Habsburg Empire, especially its Austrian half, became considerably poorer in terms of per capita income than its newly unified German neighbour. To a large extent, this falling-behind was an outcome of lower output and productivity growth in Cisleithanian *industry* which, in turn, was linked to significantly lower *levels* of human capital than in Germany (Schulze, 2007a). Second, for the late nineteenth century, there is a large development gap between Imperial Austria and Imperial Hungary (in pre-1918 borders) on the one hand and the empire's economically most advanced regions located in what today constitute Austria and the Czech Republic, on the other. This is a reflection of the comparatively late onset of industrialization in Hungary and the eastern regions of the empire. Third, there is some evidence of modest intra-empire catching up before 1914: the income gap between Cisleithania and Transleithania declined and so did the differentials between the territories of modern Austria, Czechoslovakia and Hungary. Fourth, over the long run there is a remarkable absence of significant changes in the relative levels of economic development within the broader region that we study, including Poland for comparison. Though her initial income lead turned

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<sup>2</sup> Building on the estimates in Schulze (2000), Imperial Austria's GDP was extrapolated backward from its 1870 level drawing on rates of change in agriculture and services from Kausel (1979) and in industry from Komlos (1983). Likewise for *modern* Austria with the exception of industry which is projected backward using Kausel's rates of change.

into a lag between 1870 and 1913, Austria was broadly on a par in level terms with the German economy (in its 1990 borders) throughout most of the modern era, with the notable exception of the disastrous episode of the 1930s. The East Central European economies, on the other hand, lagged behind both Germany and Austria and, although the size of this developmental gap did not remain constant over time, it is today astonishingly similar to what it was more than a hundred years ago.

**Table 5.1. GDP per capita in Central Europe (Germany = 100)**

	1870	1890	1913	1929	1937	1950	1973	1989	2008
Imperial Austria	77	66	60						
Imperial Hungary	52	51	46						
Austria	111	95	86	91	67	95	94	99	108
Czechoslovakia	81	73	67	75	62	90	59	53	64
Hungary	59	58	54	61	54	64	47	42	52
Poland	51	53	48	52	41	63	45	34	49

Sources: a) Imperial Austria, Imperial Hungary: Schulze (2000), with some revisions; b) Austria, Czechoslovakia, Hungary for 1870-1913: preliminary new estimates based on revisions of regional GDPs from Schulze (2007b) and border adjustments; c) all other: Maddison Project (<http://www.ggd.net/maddison/maddison-project/home.htm>). The percentages are calculated from figures expressed in 1990 GK dollars and, except for Imperial Austria and Imperial Hungary, and refer to 1990 borders.

If there is one message to take away from studying the economic history of East Central Europe in the era of modern economic growth, then it is this absence of cross-country convergence in levels of economic development over the long run. East Central Europe had begun to industrialise before the rest of the global periphery, and thus it is better described as ‘half-periphery’. However, it has remained a half-periphery and has failed to catch-up to, or even significantly narrow the gap vis-à-vis the European core of advanced economies. East Central Europe thus failed to take advantage of its relative economic backwardness (Gerschenkron, 1962) and to exploit its catch-up potential (Abramovitz, 1986). After the collapse of the Soviet bloc and the following sharp depression that lasted into the mid-1990s, the income gap began to decline gradually, but so far this convergence only just sufficed to make up for the ground lost during the socialist era.

While some of the general patterns we describe prevailed in the wider region of East Central Europe, the geographical focus is limited to the Austro-Hungarian Monarchy and its three main successor states, whose post-1918 territory remained entirely within the borders of the Habsburg Empire. The aim here is to quantify the level, structure and trajectory of industrial development between 1870 and 2005 within, as much as possible, the borders of current day Austria, Hungary, and the Czech and Slovak Republics. The latter two will be referred to, for the most part, as

Czechoslovakia. Throughout the chapter, *industry* is defined as the sum of mining, manufacturing and public utilities, except when stated otherwise. For the inter-war period, in particular, currently available data do not allow us to separate manufacturing from the rest of the industrial sector. For the years between 1950 and 1989, substantial differences in industry classification between the three countries make such distinction similarly difficult. However, it is not just classification issues that pose a problem when it comes to setting out long-term patterns of industrial development: state borders changed after the First World War and with the formation of the three main successor states. In most cases, the new state-level borders were not drawn along pre-war region boundaries that typically identify the contemporary statistical units of observation.

Quantitatively, we have three specific aims. First, we present near complete time-series on industrial production and compare them to the growth of gross domestic product (GDP). Second, we account for the level of industrialisation by establishing the share of industry and other major sectors of economic activity in the labour force. Third, we gather evidence on the changing composition of industrial output to show how the role of modern manufacturing industries evolved over time. In this third task, we have to rely on data not entirely consistent between the pre-1914, inter-war, and post-1950 periods. This limitation is determined by post-1918 border changes, inter-temporal changes in industry classifications and, in general, by the extent to which disaggregated data on industrial production are available. Our discussion of the evidence is, therefore, structured chronologically focussing on three main periods: 1870-1914, 1920-38, and 1950-89. In the final section we briefly consider the years following the fall of communism and draw general conclusions about the achievements of industrialisation in East Central Europe.

## **I. Industrialisation in the Habsburg Empire: Diffusion and Concentration in the Late Nineteenth Century**

The process of industrialization in the Habsburg lands after 1870 evolved within the context of an empire-wide customs and monetary union and against the background of the 1867 constitutional settlement that established the Dual Monarchy. An increasingly dense railway network connected the regional centres of economic activity, stretching from the empire's western border with Switzerland to its eastern border with Russia and from its northern border with Germany to the Mediterranean. The sheer geographical expanse of the empire brought with it a large degree of regional differences in broadly conceived resource endowments and in access to both domestic and foreign markets. These differences had a major impact on the location of industry and manufacturing in the empire and, by

extension, its successor states. The broader outlines of the spatial pattern of industrial activity that came to characterize the second half of the nineteenth century emerged over the previous hundred years or so. Four factors, in particular, shaped this regional pattern and its concomitant differentials in manufacturing activity. First, the western and north-western regions of the empire, i.e. those broadly corresponding with the territories of modern Austria and the Czech Republic, experienced the weakening of feudal institutions earlier than the more eastern regions, creating room for the rise of non-agricultural activity. It was here that domestic industry took hold first, that an entrepreneurial class emerged comparatively early, that foreign capital and expertise was attracted to and where, eventually, modern forms of manufacturing began to develop (Good 1984, pp.14-24).<sup>3</sup> In 1790, 280 manufacturing firms were counted in the empire (excluding Galicia, Vorarlberg and Tyrol), 50 per cent of these were located in Lower Austria and 30 per cent in Bohemia (ibid.) – foreshadowing the two regions’ pre-eminence in Austro-Hungarian manufacturing through to 1914, notwithstanding the changing composition of regional output over time. Second, at the time of initial industrialization the western and north-western regions of the empire were already significantly more urbanised than the rest of the country (ibid.), entailing agglomeration economies that were to intensify over the course of the nineteenth century.<sup>4</sup> Third, by 1870 the Alpine and Czech lands had a huge lead in the stock of human capital, built up over the preceding decades: new estimates suggest that the difference in average years of schooling compared to the least advanced regions in the empire was equivalent to about two and a half years, or 60 (75) per cent of the average years of schooling for Imperial Austria (Hungary) as a whole.<sup>5</sup> Finally, access to domestic and foreign purchasing power was crucial for the development of manufacturing and in this respect, too, industry in Alpine Austria and the Czech lands held an advantage over the more remote regions in the empire’s east.

**Table 5.2. Share of Manufacturing in Industrial, Sectoral and Aggregate Gross Value-Added (Per Cent)**

Imperial Austria	Imperial Hungary
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<sup>3</sup> By the eighteenth century, Bohemia and Moravia had become centres of the textiles (linen, woollen) and glass industries, while an internationally significant mining and metallurgy sector was located in Styria, Upper Austria and Carinthia. In the 1760s, for instance, Styria alone produced as much pig iron as England (Good, 1984, pp.20-1). The production of textiles in the Alpine lands was in the main located in and around Vienna, Upper Austria and Vorarlberg.

<sup>4</sup> By 1880 (1910), the proportion of the population resident in towns with more than 10,000 inhabitants had reached 47 (61) per cent in Lower Austria (including Vienna) and 10 (19) per cent in Bohemia (including Prague) compared to an average of 8 (14) per cent for the rest of Cisleithania; for the broader regions of Alpine Austria and the Czech lands the figures are 23 (34) and (10) 18 per cent, respectively. From the 1860s, Budapest became the major centre of Hungarian manufacturing. Here, too, a high initial degree of urbanization is observable: in 1870, the capital city alone accounted for 14 per cent of the Danube-Tisza-Basin region’s; by 1910, this proportion had increased to 29 per cent. (Bolognese-Leuchtenmüller, 1978, Table 14, pp.40-41; MSE 1895, 1913).

<sup>5</sup> New approximations of regional average years of schooling were derived using regional enrolment data and the coefficients from a regression of aggregate average years of schooling in Imperial Austria and Imperial Hungary on aggregate lagged enrolment; see Schulze and Fernandes (2009) for underlying data, methods and sources.

	<b>industry</b>	<b>secondary sector</b>	<b>GDP</b>	<b>industry</b>	<b>secondary sector</b>	<b>GDP</b>
1870	96.0	63.9	19.2	89.0	58.6	6.5
1890	93.1	65.5	21.0	90.8	59.5	9.7
1913	91.9	66.6	24.8	89.2	62.3	14.1

Gross value added in constant 1913 prices.

Industry: manufacturing, mining, utilities. Secondary sector: industry, construction, crafts.

Source: Schulze (2000), with some revisions.

Manufacturing in both halves of the empire expanded at significantly higher rates than the aggregate economy. Table 5.2 shows that by 1913, almost one quarter of Imperial Austria's GDP was generated in manufacturing, while in Imperial Hungary the proportion more than doubled from less than 7 per cent in 1870 to 14 per cent in 1913. This rise in manufacturing's relative importance was the outcome of an uneven process of accelerations and decelerations in industrial activity and investment as well as changes in the output composition broadly in favour of 'modern' sectors such as metal-making, engineering and (petro-) chemicals. Between 1870 and 1913, manufacturing output in Austria grew by about 2.3 per cent per annum compared with 4.0 per cent for the much less industrialized Hungary. Yet the growth rates of manufacturing (or, more broadly, industrial) output in Austria and Hungary were out of phase with one another over the period (Table 5.3): this had to do with the effects of the 1873 Vienna stock market crash. The crash led to an outflow of Austrian capital to Hungary and was a key factor in prolonging sluggish growth in Austria whilst stimulating the first major wave of industrialization in the Hungarian lands (Komlos, 1983). The repatriation of capital to Austria in the early 1890s sustained the resumption of manufacturing and aggregate growth there and was associated with a slow-down in the Hungarian half of the empire. This pattern of deceleration and acceleration was closely associated with changes in investment demand for plant and equipment, that are apparent in the temporal evolution of domestic machinery output and changes in the gross stock of machinery (Schulze 1997, 2007a). The pre-1873 upswing in Habsburg manufacturing was fuelled by an expansion in the money supply to finance the wars with Prussia and Italy and a record Hungarian harvest in 1867/8 coming at a time of poor harvests elsewhere in Europe (Matis, 1972, pp. 153-161). Buoyant cereal and flour exports initiated a dramatic expansion in the empire's railway network, providing a major stimulus to the domestic producer and capital goods industries that had developed in the western and north-western regions since the late eighteenth century. These industries – engineering and iron and steel, in particular – were located primarily in Alpine Austria and the Czech lands. As rural incomes rose in response to increasing grain and land prices, demand for consumer goods expanded and led to the installation of new productive capacity

in manufacturing. The associated growth in empire-wide demand for machinery provided a fillip not just to Austrian producers but also to Budapest's nascent engineering industry.<sup>6</sup>

**Table 5.3. Annual Growth, Gross Valued Added (Per Cent)**

	Imperial Austria				Imperial Hungary			
	manufac- turing	industry	sec. sector	GDP	manufac- turing	industry	sec. sector	GDP
1871- 1912	2.34	2.44	2.21	1.81	4.05	4.00	3.77	2.14
1871- 1895	1.71	1.84	1.55	1.37	4.42	4.30	4.21	2.21
1895- 1912	3.23	3.29	3.16	2.43	3.48	3.53	3.08	2.02

Gross value-added in constant 1913 prices.

Note: Peak-to-peak measurement. Since peaks in the individual series do not necessarily correspond exactly with one another, the periods of measurements are not always identical.

Source: Appendix A, Table A.1.

Austrian manufacturing output peaked in 1871.<sup>7</sup> Yet what started out as the downswing following the expansionary phase of a regular business cycle was transformed into a major recession in industry under the impact of the 1873 crash which changed longer-term expectations and investment decisions. From the late 1870s Austrian investors, seeking safe assets, engaged in large-scale purchases of new Hungarian debt. The Hungarian government was thus able to finance its regular expenditure and investment in infrastructure without crowding out private domestic investors (as much of the new debt was held in Austria). Further, the growth in Hungarian disposable incomes and in consumer demand was not constrained as the government was able to meet its fiscal targets without recourse to excessive taxation. This provided a major stimulus to both consumer and capital goods producers in a still largely agricultural economy. Hence, in Hungary the signs of depression were almost absent (despite a modest dip in activity in the 1870s). In Austria, though, the effects were rather different: 'the diminished stock of venture capital had a negative impact on industrial production until the 1890s. By attracting large amounts of Austrian capital, the Hungarian economy was therefore influential in prolonging the depression in Austria' (Komlos, 1983, p.218). The overall outcome was a painfully sluggish recovery in Austrian manufacturing from the 1873 trough through

<sup>6</sup> See Schulze (1996) on the development of Hungary's machine-building industry.

<sup>7</sup> According to Komlos' (1983, Table E.4) index Austrian manufacturing grew by 8.7 per cent per annum during 1867-1871 and 1.8 per cent for 1871-84. Whilst also showing a peak in 1871, the more comprehensive index documented here in Table A.1 increases by less than 1 per cent over the period.



to the mid-1880s and rapid expansion in Hungarian manufacturing into the late 1880s and early 1890s (Schulze 2000).

As domestic demand began to pick up again in the second half of the 1880s, Austrian industrialists started installing new capacity again, going beyond mere replacement investment which had been characteristic of the preceding decade and a half. The beginning of this up-turn in the late 1880s and early 1890s coincided with the reversal of intra-empire capital flows. Austrian investors turned to domestic industrial equity again (Somary, 1902, Table II, p. 39) and investment in industrial machinery was aided by a fall in Austrian long-term interest rates (Schulze, 1997). While the repatriation of Austrian capital was associated with a significant increase in Austrian manufacturing (GDP) growth of about 1.5 (1.1) percentage points over 1871-95, Hungary ‘suffered less’ than ‘Austria gained’: growth in manufacturing declined by less than one percentage point and the observed decrease in GDP growth is probably within the margin of error (0.2 percentage points). We hypothesize that this had to do with, first, a much deeper and more sophisticated Hungarian domestic capital market than there was in the early 1870 as a result of significantly higher per capita incomes after more than twenty years of relatively fast economic growth; second, a shift into higher value-added manufacturing branches, and, third, comparatively high productivity growth in agriculture that sustained disposable income growth and demand for manufactured goods in a still largely agricultural economy. Throughout the late nineteenth century, agriculture in Hungary had a substantial revealed comparative advantage in crop production. The sector benefited from ready access to the higher income markets in Austria that were largely uncontested by foreign importers due to the Habsburg customs union’s external tariff (Katus 1970, Komlos 1983).<sup>8</sup> In addition, not only did crop production in Hungary lend itself more readily to mechanisation and machinery investment than most parts of the overall more mountainous and rugged Austria, but Hungary ran a trade surplus in *both* crops and livestock products with her customs union partner (Eddie, 1989).

While textiles and iron were at the centre of early industrialization in the Alpine and Czech lands, the process of industrialization in Hungary was driven initially by the agricultural processing industries, especially flour milling (Good, 1984, pp. 125-148), which drew on a productive domestic rural sector as main source of its inputs. Yet the structure of manufacturing changed significantly in the later decades of the century in both parts of the empire and became more diversified. This raises the question to what extent shifts to ‘modern’ industries were associated with changes in overall manufacturing growth. Here we consider iron and steel production, engineering (including mechanical and electrical engineering as well as transport equipment) and chemicals as representative

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<sup>8</sup> Cf. Schulze (2007a) on comparative sectoral productivity growth.

of the ‘modern sector’.<sup>9</sup> Of course, this is a simplification – technical change, product and process innovations occurred in other sectors, too. Table 5.4 sets out the comparative growth rates and the relative contributions to manufacturing growth made by the ‘modern sector’ compared to the rest of manufacturing branches. Three observations can be made: First, the ‘modern sector’ grew significantly faster than the rest of manufacturing in both Austria and Hungary. Second, this held over both periods under review. Third, the evidence for Austria-Hungary conforms broadly with the general finding that industrialization typically involved a growing share not only of manufacturing in aggregate output, but also of a rising weight of the ‘modern sectors’ in manufacturing as a whole. In Austria, the proportion of manufacturing growth attributable to the rise of the ‘modern sectors’ went up from less than 23 per cent (1871-95) to almost 40 per cent at a time of overall accelerating manufacturing growth. For Hungary, the corresponding figures are 17 per cent and 25 per cent, reflecting the overall less advanced state and structure of manufacturing in Transleithania.

**Table 5.4. Modern Manufacturing - Relative Contributions to Manufacturing Growth (Per Cent Per Annum)**

	<b>modern manufactg.</b>	<b>other manufactg.</b>	<b>modern growth contrib.</b>	<b>other growth contrib.</b>	<b>total manufact.</b>
<b>Imperial Austria</b>					
1871-1895	2.73	1.51	0.39	1.32	1.72
1895-1912	6.51	2.46	1.26	1.97	3.23
<b>Imperial Hungary</b>					
1871-1895	7.57	4.08	0.77	3.65	4.42
1895-1912	5.35	3.13	0.86	2.63	3.48

Note: measurement from peak to peak in total manufacturing output. For each period, relative contributions to manufacturing growth are computed as each sector's growth rate weighted by that sector's share in manufacturing at the start of the period.

Sources: See Table 5.2.

Table 5.5 reveals some key structural characteristics of the Habsburg economy. First, throughout the period under review the empire as a whole remained a largely agricultural economy, especially so in its eastern, Hungarian half. For comparison, less than half of the labour force in

<sup>9</sup> The category of non-engineering ‘metal-working’ industries, ranging from the production of nails and screws to metal furniture, has been excluded.

Germany was employed in agriculture in 1871 and by 1910 this proportion had fallen to less than 36 per cent, while manufacturing's share had risen to more than 29 per cent (Hoffmann, 1965).<sup>10</sup> Note, however, that Imperial Austria had a significantly higher share of manufacturing (or, more broadly, industrial) employment in 1870 than its southern neighbour Italy and maintained a slight lead until the First World War (cf. Chapter 6, Table 6.2). Second, the picture looks distinctly different if the focus is on those territories that after the First World War became parts of either the Austrian Republic or Czechoslovakia. Here the shares of industry and manufacturing in total employment were far higher than on average across the empire, on a par with those prevalent in Germany and well above the corresponding figures for Italy.<sup>11</sup> These data, then, confirm the notion of the Alpine and Czech regions as the industrial heartlands of the empire and as regions of industrial activity close to the European core.

**Table 5.5. Sectoral Composition of Labour Force (Per Cent)**

	1869/70		1890		1910	
	Imp. Austria	Imp. Hungary	Imp. Austria	Imp. Hungary	Imp. Austria	Imp. Hungary
agriculture	62.7	78.3	61.5	79.5	54.0	73.4
Industry	18.1	7.1	19.9	8.0	22.6	11.8
<i>manufacturing</i>	17.4	6.6	18.9	7.4	21.3	11.0
<i>mining</i>	0.8	0.6	1.1	0.6	1.2	0.8
<i>utilities</i>					0.1	
construction	2.2		2.4	0.9	3.3	1.5
Services	17.0	14.6	16.1	11.6	20.1	13.3
labour force (1000s)	10848.28	8248.48	12203.67	9121.60	14051.33	10732.56

Source: Schulze (2007a) with some revisions.

The level differences in manufacturing and industrial employment shares within Austria-Hungary reflect the regionally differential timing and sectoral basis of industrialization across the empire.<sup>12</sup> Hungary – whether in its imperial or modern guise – came late to the game. Here,

<sup>10</sup> Note that Hoffmann's (1965) figures refer to Germany in its pre-First World War rather than its post-1990 boundaries. In 1910, manufacturing (including crafts as for the Habsburg Empire) accounted for 29.1 per cent, mining for 2.8 per cent, utilities for 0.3 per cent and construction for 5.2 per cent of the total labour force.

<sup>11</sup> This assessment is grounded in new estimates for the successor states. They are based on the *regional* data underlying the reconstructed labour force estimates for Imperial Austria and Imperial Hungary and border adjustments; for sources and methods see Appendix A, Schulze (2007a). For modern Austria and Czechoslovakia the share of the labour force in manufacturing moves from c. 22 per cent in 1870 to about 28 per cent in 1910; for Hungary, it moves from less than 9 to almost 15 per cent. Note that the 1910 figures deviate slightly from those presented in Table 5.8; this is mainly due to corrections in the estimated agricultural labour force for 1870-1910.

<sup>12</sup> See Table A.3 in the Appendix for a more detailed breakdown by manufacturing branches.

industrialization in earnest had started only during the 1860s and 1870s, aided by the inflow of Austrian funds after the 1873 stock market crash. Budapest (in the central Danube-Tisza Basin), in particular, but also the Hungarian regions on the Danube Left and Right Banks as well as the Tisza Right Bank became progressively more engaged in manufacturing over time. However, compared to Austria or Czechoslovakia, and even Imperial Austria as a whole, manufacturing played a markedly less prominent role in the Hungarian economy right up to the First World War. This is borne out by the evidence on both regional shares in manufacturing output and regional manufacturing output per head (Table 5.6).

**Table 5.6. Manufacturing Gross Value Added by Region (1990 GK-€)**

	Output (m.)		Regional Share		Output per Capita	
	1870	1910	1870	1910	1870	1910
Lower Austria	1,295	3,634	0.20	0.18	644.3	1,028.9
Upper Austria	209	471	0.03	0.02	280.7	552.5
Salzburg	41	111	0.01	0.01	266.6	516.6
Styria	243	822	0.04	0.04	211.3	569.3
Carinthia	52	154	0.01	0.01	152.9	389.9
Carniola	47	154	0.01	0.01	98.8	293.0
Littoral	101	423	0.02	0.02	166.2	473.2
Tyrol/Voralbg.	172	500	0.03	0.03	191.8	458.0
Bohemia	2,266	5,499	0.34	0.28	436.7	812.3
Moravia	710	1,844	0.11	0.09	348.7	703.1
Silesia	180	496	0.03	0.03	347.7	655.7
Galicia	264	852	0.04	0.04	48.0	106.2
Bukovina	24	79	0.00	0.00	47.2	99.1
Dalmatia	7	60	0.00	0.00	15.1	92.4
Danube Left Bank	138	542	0.02	0.03	79.8	249.2
Danube Right Bank	178	585	0.03	0.03	73.3	189.8
Danube-Tisza Basin	198	1,379	0.03	0.07	91.5	365.9
Tisza Right Bank	105	408	0.02	0.02	69.9	230.4
Tisza Left Bank	85	372	0.01	0.02	44.7	143.3
Tisza-Maros Basin	93	394	0.01	0.02	52.9	184.0
Transylvaina	105	482	0.02	0.02	48.5	180.1
Croatia-Slavonia	62	418	0.01	0.02	33.1	156.6
Imperial Austria	5,610	15,101	0.85	0.77	272.5	540.7
Imperial Hungary	964	4,581	0.15	0.23	62.1	219.3

Source: Revised estimates based on sources and methods documented in Schulze (2007 b).

Clearly, the spatial distribution of manufacturing across the Habsburg Empire changed over time and broadly so in line with the gradual intra-empire catching-up of the Hungarian with the Austrian economy. By 1910, Budapest was firmly on the map as a major manufacturing location. Yet just as striking as this is persistence: in terms of manufacturing output per capita, the most industrialized

regions in 1910 were still, by a large margin, Lower Austria and the Czech lands - just as they had been forty years earlier. In absolute terms, the per capita output lead of the established manufacturing regions over the others increased, even if it had marginally declined in percentage terms. Following New Economic Geography reasoning, regions' access to domestic and foreign markets (here: transport and tariff-cost weighted GDPs of main trading partners) is a central candidate factor accounting for a good deal of inter-regional differences in manufacturing activity. Habsburg regions' manufacturing output per head over 1870 to 1910 is indeed strongly associated with access to the home and European markets.<sup>13</sup> Further, regional differences in human capital endowments (average years of schooling) are strongly associated with regional differences in manufacturing output per head.<sup>14</sup> The critical issue here is the interaction between the two. The evidence would suggest that those regions that were comparatively well endowed with human capital were in a significantly better position to exploit their market potential, i.e. to realize benefits of economies of scale and specialization related to market size. The regions in the landlocked and remote east of the empire (e.g. Galicia, the Bukovina or Transylvania) were not only disadvantaged in terms of their limited access to Habsburg or foreign markets, they were also constrained by previous generations' lack of investment in schooling. The southern coastal regions had a large market potential because of their cost advantages of sea transportation to growing foreign markets but, in the case of Dalmatia or Croatia-Slavonia, poor schooling of the labour force. There was, then, little incentive for manufacturers to locate in these regions despite their favourable position in terms of market access. Where the human capital stock was higher, the response to the opportunities afforded by better market access was stronger as demonstrated by the region around Trieste (Littoral). Although enrolment rates rose faster in the least developed parts of the empire than in the more advanced regions (where levels were, by Habsburg standards, already relatively high), it took considerable time before that would feed into increases in average years of schooling. Those parts of the Habsburg Empire that were characterized by initially high levels of schooling, Alpine Austria and the Czech lands, were still well in the lead by 1910. Stark inter-regional differences in education investment prior to the 1870s had a lasting impact on regions' relative performance in manufacturing up to the First World War.

## **II. Industrialisation on hold: Central Europe between the Wars**

If John Maynard Keynes was correct in arguing that the economic consequences of the peace after World War I were detrimental for Germany, then their impact beyond Germany's eastern borders can be branded catastrophic. Unlike the territory of post-war Poland, Austria, Czechoslovakia and

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<sup>13</sup> On the underlying Harries-type market potential measures for the Habsburg regions see Schulze (2007b).

<sup>14</sup> See footnote 5 above on the construction of regional average years of schooling measures.

Hungary witnessed little, if any, destruction due to war activity. The only exception is the brief conflict between the short-lived Bolshevik regime in Hungary and the *Petite Entente* formed of Czechoslovakia, Yugoslavia and Romania that ended with the Romanian occupation of most of Hungary in 1920. Still, the post-war settlement dislocated the economies of Central Europe. The dissolution of the Habsburg Empire severely limited access to markets and resources for industrial firms both within and beyond the pre-1914 borders (Teichova, 1985, pp. 223-227).

Different regions of the empire had not differed solely in their level of industrialisation but also in what branches of manufacturing they had specialised in. Thus, the new borders, coupled with the animosity of the new nation states towards their neighbours, implied much-reduced market potential for many industries and the breakdown of crucial input-output linkages between firms. The milling industry of Budapest, the textile and clothing industry in Austria, or machine-tool producers in Bohemia and Moravia did not only face difficulties in accessing their once most important markets but also in securing the necessary intermediate inputs. Although, as recent research has revealed, the negative impact of economic nationalism on market integration was already felt before World War I, it became devastating after 1918 (Schulze and Wolf, 2011, pp. 652-673). As shown in Table A.2 in the appendix, the decline in industrial output across the war was comparable to, and in the case of Austria was even greater than, that of GDP – in a period when the rate of industrialisation was on the rise in rest of the global periphery.

Between the wars, industrial expansion was very moderate in Central Europe and it showed a path quite similar to what the literature has described for Germany and most of the advanced western economies. Following a relatively successful stabilisation that brought an end to hyperinflation in Austria and Hungary and restored state finances by 1924, all three countries recovered quickly until 1929. Industrial production grew by 4.5 per cent in Austria and by 8 per cent in Czechoslovakia and Hungary annually. However, approximately half of this growth was lost during the Great Depression, which in both Austria and Czechoslovakia affected the manufacturing sector more strongly than the rest of the economy. In both countries, the slump was prolonged by political forces. While extreme political fractionalisation leading to civil war tormented Austria, the government in Prague tried policies of import substitution as well as maintaining the gold standard of the crown, which continued to have a deflationary effect until the mid-1930s. Furthermore, the export-oriented nature of Czech industry and its relative success to replace exports to the former empire to exports to other markets in the 1920s made it more susceptible to shocks in international trade (Drabek 1985, page 408, 429-430). Indeed, Czech industry was hit hard by rising tariffs and administrative trade barriers that emerged across Europe during and after the Great Depression (Pryor et al., 1971, pp. 35-59, Drabek, 1985, pp. 432-433). As a result, industrial output remained well below 1929 levels until 1937.

Between 1938 and 1943, the expansion of the Nazi war economy gave a large impetus to industrial growth in Central Europe, particularly in the territories annexed by Hitler in 1938. In the first two years after the Anschluss, the Austrian economy grew by more than 30 per cent, industry by more than a half, reflecting the priority assigned to war preparations (Butschek, 1978, p. 65). After the announcement of rearmament in 1938, Hungary also experienced a growth spurt driven by industrial expansion. While total employment in the economy remained constant until 1943, it climbed from 330 thousand to 451 thousand in manufacturing, leading to a 37 per cent increase in industrial production (Ránki, 1964, p. 225; Berend and Ránki, 1960, p. 140). Recent research has revealed the staggering growth of German imports from the region after 1939, with particularly large increases from Austria and the annexed Czech lands (Schermer, 2011, pp. 79-113). Consequently, wartime industrial expansion focussed primarily on mining and the primary metal industries as well as machinery and armaments.

In terms of structural development, the region did not witness much action during the interwar period. Industrialisation was put on hold; the occupational distribution of the labour force remained almost unchanged in all three countries, as reported in Table 10. The most important factor holding back structural modernisation was that agricultural productivity remained very modest, due to the lack of technological innovation, the slow spread of chemical fertilizers, and low mechanisation. Thus, the farming sector had limited potential to release labour, further aggravated by the pro-agrarian political radicalisation of the 1930s.

**Table 5.7 Economically Active Population by Sector (Per Cent)**

	1910	1920	1930	1940	1950	1960	1970	1980	1990	2000	2008
<b>Hungary</b>											
Agriculture	55.8	58.2	54.2	50.0	51.8	38.1	25.0	18.4	15.3	8.4	4.9
Industry	19.4	18.1	21.7	23.2	23.6	34.8	44.7	43.9	39.7	36.8	35.5
Services	24.8	23.7	24.1	26.8	24.6	27.1	30.3	37.7	45.0	54.8	59.6
<b>Austria*</b>											

Agriculture	39.5	39.9	37.5	39.0	34.3	23.7	14.8	9.9	8.0	6.2	5.7
Industry	31.0	33.3	34.5	32.4	36.1	46.4	43.0	42.2	38.4	31.7	27.0
Services	29.5	26.8	28.0	28.6	29.7	29.9	42.2	47.9	53.6	62.1	67.3
<b>Czechoslovakia</b>											
Agriculture	42.0	39.6	37.5		37.8	25.7	16.9	13.3	12.8	6.3	3.4
Industry	34.1	33.8	35.7		37.5	46.1	48.3	49.3	45.6	45.0	39.1
Services	23.9	26.6	26.8		24.7	28.3	34.8	37.4	41.6	48.8	57.5

\* The entry for 1920 reflects 1923 data, that for 1930 is an estimate based on 1934 figures and sectoral growth rates.

Sources: Austria - Butschek (2001, p. 163); Czechoslovakia Teichova (1988, p. 9); Hungary - Eckstein (1955); for all countries after 1950: ILO (1986) and FAOSTAT Classic

(<http://faostatclassic.fao.org/site/550/DesktopDefault.aspx?PageID=550#anchor>).

The literature, however, has pointed to several other constraints on industrial expansion. Teichova emphasised the shortage of skilled labour, which was a crucial limiting factor of manufacturing growth in a period when European industry still heavily relied on craft production methods (Teichova, 1988, pp. 21-22). Eckstein stressed the decline in capital investment from the pre-1914 period, and more so after 1929, which increased the technological lag *vis-à-vis* advanced western nations (Eckstein, 1955, p. 220). As shown in Figure 1 and Figure 2 respectively, without sufficient investment in new equipment the main drivers of technological modernisation in the interwar period, electrification and motorization, made very little progress in Central Europe. This relative backwardness was not only noticeable in comparison with the United States but also with Germany, and it became more pronounced during the 1930s.

(Figures 1 and 2 here)

In an environment increasingly characterised by resource scarcity and trade protectionism, industrialisation had several common features across Central Europe: industrial concentration to achieve economies of scale, cartelisation to secure preferential access to markets and foreign technology, and product specialisation to exploit market potential in niche areas. Both in Czechoslovakia and Hungary, the growth of industrial production was driven by the expansion of large-scale enterprise in primary metals, chemicals and engineering. The three largest metallurgical companies in Czechoslovakia increased their share in steel production from 65 per cent in 1921 to 90 per cent by 1936 and owned all the export quotas allocated to the country in the International Steel Cartel (Teichova, 1988, pp. 40-41). In Hungary, the leading firms in the electro-technical industry and railway engineering managed to increase their global market share despite shrinking domestic demand. They achieved this by integrating into German-led international cartels and by concentrating on very specialised products, such lamp and radio parts, or diesel multiple units used on small



railways in remote regions around the world (Hidvégi and Vonyó, 2012, pp. 61-62). By contrast, the more traditional branches of manufacturing, such as the milling industry in Hungary, or the sugar industry in Bohemia faced relative decline. Between 1924 and 1937, the share of metals, chemicals and engineering products in total industrial output in Czechoslovakia increased from 22.6 per cent to 31.7 per cent (Teichova, 1988, p. 34). The same level of disaggregation is not possible for Hungary, but the statistical evidence shows that while the contribution of mining, smelting, handicraft production and construction to national product did not change between 1924 and 1938, the share of manufacturing (which did not include metallurgy and construction materials) increased from 15.5 per cent to 21.4 per cent (Eckstein, 1955, p. 171).

Despite the overall sluggish industrialization of East Central Europe, the region recorded some examples of the implementation of modern productivity-enhancing technologies, though they were exceptions rather than the general rule. The best known case is the Baťa works in Zlín, the leading concern in the Czechoslovak shoe-making industry. The introduction of advanced American mass production techniques between 1924 and 1927 achieved a dramatic productivity increase that lasted into the early 1930. Shoe production jumped from 8.9 million pairs in 1926 to 15.2 million pairs in 1927 while employment expanded by ‘only’ 35 per cent in the same year. Between 1930 and 1933, average weekly output per worker increased from 37 to 48 pairs and Czechoslovakia became one of the world’s leading exporters of footwear (Teichova, 1985, pp. 275-276).

### **III. Planned industrialisation in a state-managed economy**

If the consequences of World War I were catastrophic for Central Europe, the impact of World War II was apocalyptic. Hostilities on the eastern front brought unprecedented destruction. The temporary demise of the German economy and the East-West tensions emerging from the post-war settlement untied the input-output linkages between the region’s industries. These were partially still the legacy of industrial development in the Habsburg Empire before 1914, but even more the product of Nazi economic imperialism. From the mid-1930s, German foreign policy considered the region as its natural backwater and tied its economies increasingly to the Third Reich through bilateral trade agreements. The economic dependence on Germany increased further during the war, especially for the territories temporarily annexed by the Third Reich.<sup>15</sup> By late 1945, in Austria and Hungary, industrial production plummeted to levels that had already been surpassed by 1900 (see Tables A.1 and A.2). However, the most detrimental economic outcome of the war was the immense loss it had

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<sup>15</sup> See Hirschman (1945), Ránki (1983), and Grenzebach (1988) among others.

caused in human resources. Besides the innumerable military and civilian casualties, more than a million Jews who had resided in the three countries before 1939 perished in the Holocaust. Lastly, one needs to account for the expulsion of minority Germans from East and Central Europe after 1945, in accordance with the Potsdam Agreement. Of the 16 million voluntarily fled or uprooted between 1944 and 1950, 3 million were expelled from Czechoslovakia and 210 thousand from Hungary. Most of the expellees were deported to post-war Germany, many died in the process, and 370 thousand settled in Austria (Reichling, 1989, p. 26).

While these deportations featured prominently in the literature on the post-war West German economy, their impact has been largely ignored in the economic history of Eastern Europe. The combined effect of wartime casualties, including the permanently wounded and the mentally debilitated, and the post-war settlement was enormous. Austria and Hungary witnessed practically no population growth between 1939 and 1950. The population of Czechoslovakia within its post-1945 borders declined in the same period from 14.7 million to 12.4 million (Maddison, 2006, pp. 416, 474-475). The *Sudetenland* was largely depopulated and thus important industrial districts had lost a vast share of their pre-war labour force.<sup>16</sup> Across Central Europe, the war had left behind an ill-balanced demographic structure with a notable shortage of able-bodied young and middle-aged men, who traditionally constituted the backbone of the industrial workforce. The Holocaust and the expulsion of minority Germans, in particular, together with substantial emigration in the bourgeois middle class bequeathed upon the tormented nations of Central Europe a plethora of industrial and commercial assets without owners and without the necessary skills and entrepreneurial know-how to operate them.

To rebuild and re-organise the war-shattered and dislocated economies required state management, which materialised already under the national-unity governments during the late 1940s, and under Allied military occupation in Austria. Popular land reforms were followed by large-scale nationalisation in industry. By 1948, all large enterprises and most middle-size firms were brought under state control; private property only continued to prevail in handcraft production. The state-managed economy operated with fixed prices and wages and through the centralised allocation of resources, including both material inputs and investment. Even in Austria, most assets in heavy industry, public transport and utilities were publicly owned, and the rest of the economy was subjected to tremendous red tape. From the immediate post-war years, governments in all three countries

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<sup>16</sup> The border region with Germany produced about 55 per cent of Czechoslovak hard coal, 93 per cent of brown coal, 61 per cent of textiles, 38 per cent of chemicals, 45 per cent of stone and clay products, and 30 per cent of engineering products. See Shute (1948), pp. 35-44.

pursued autarchic industrialisation policies with extensive planning. While central planning was never introduced in Austria, she served as the canonical example of a managed mixed economy (Berend, 1997, pp. 72-82; Seidel, 2005).

In many ways, in the early post-war period, Central Europe followed a similar path to that of Latin American countries during their flirtation with import-substituting industrialisation. In Austria, multiple exchange rates and targeted industrial subsidies were used to improve the competitiveness of domestic manufacturing. Although forced industrialisation in socialist command economies applied other tools to steer economic development that often reflected military-strategic motives, it also aimed at creating industrial self-sufficiency and accelerating the process of structural change. However, from the late 1950s, industrialisation in Central Europe owed much less to the East-West arms race than in the Soviet Union. According to data published by the Stockholm International Peace Research Institute (SIPRI), military spending in Czechoslovakia and Hungary rarely surpassed 3 per cent of GDP between 1957 and 1989.<sup>17</sup>

In establishing the quantitative record of socialist industrialisation we need to treat official output data with more than a modicum of suspicion. Government statistics were distorted to a large but non-quantifiable extent. Physical output indicators are considered comparatively trustworthy, but aggregates expressed in value terms reflect unrealistic producer prices, incorrect weighting inasmuch as industry was always attributed a higher than actual share in net material product, and inappropriate methods employed in the computation of index numbers.<sup>18</sup> Thankfully, independent western research revised official figures using data on physical output indicators exclusively and applying western accounting standards. The most substantial work was carried out by the *Research Project on National Income in East Central Europe* under the leadership of Thad P Alton. A long series of publications report index numbers on GNP by sector of origin of product and industrial value added for six countries including Czechoslovakia and Hungary. We use these data to determine the composition of gross value added and of industrial production using the same industry classifications and compare these results with statistics on Austria and Germany.

Economic growth in Central Europe after 1945 was industry-driven. From its post-war nadir, industrial production recovered to pre-1939 levels by 1950 and grew rapidly for another two decades, significantly faster than the rest of the economy. In all three countries, industrial value added measured in constant prices doubled during the 1950s and tripled between 1950 and 1970 (see Table A.2). In fact, industrialisation reached its peak only in the 1960s and 1970s when industry and

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<sup>17</sup> SIPRI, *Yearbook*, diff. vols.

<sup>18</sup> Net Material Product was the national accounting concept used by CMEA countries. It is conceptually similar to GDP, but excludes services deemed unproductive, especially housing and the government.

construction employed well over 40 per cent of the labour force, as shown in Table 10. By contrast, the share of agricultural employment declined to less than half of its initial level during the post-war golden age. In Czechoslovakia and Hungary, industry remained the largest sector of the economy until the late 1980s.

**Table 5.8. Share of industry\* in gross value-added in 1975 prices (%)**

	1955	1965	1975	1985	1995	2005
Austria	27.3	28.7	29.2	30.0	28.7	31.5
Czechoslovakia	26.4	35.9	38.6	40.7	34.6	37.1
Hungary	24.8	32.4	32.4	33.8	35.0	39.6
Germany	32.5	34.9	35.2	33.4	27.5	27.1

\* Mining, manufacturing and utilities

Source: Own calculations based on data from G. Lazarcik (1969), Czirják (1973), Alton et al. (1982), Alton et al. (1991), and from DIW (Germany), WIFO (Austria), and EU KLEMS ([www.euklems.net](http://www.euklems.net)).

Table 11 demonstrates the impact of forced industrialisation in the 1950s and early 1960s in a comparative perspective. The share of industrial value-added in GDP increased significantly faster in Czechoslovakia and Hungary than in Austria and Germany (GDR and Federal Republic combined). After 1968, when moderate economic reforms relaxed authoritarian controls and introduced greater flexibility for enterprise management, industrial growth slowed down considerably. However, while the rate of industrialisation was declining in Germany after the oil shocks, it continued to increase until the mid-1980s in Central Europe. East of the Iron Curtain, this was largely the consequence of the slow development of the service sector. In Austria, it reflected more the overheating of industrial growth by ever-increasing state subsidies that began to rock the federal budget by the 1980s and forced the government to begin privatising state assets.

**Table 5.9. The composition of gross industrial value-added\* in current prices (%)**

	1955	1965	1975	1985	1995	2005
	<i>Heavy industry</i>					
Austria	27.3	28.7	29.2	30.0	28.7	31.5

Czechoslovakia	26.4	35.9	38.6	40.7	34.6	37.1
Hungary	24.8	32.4	32.4	33.8	35.0	39.6
Germany	32.5	34.9	35.2	33.4	27.5	27.1
<i>Modern manufacturing</i>						
Austria			48.3	52.6	54.5	61.2
Czechoslovakia	56.3	58.4	57.4	63.8	53.4	62.4
Hungary	47.5	53.8	52.4	57.5	55.0	72.2
Germany	52.8	59.3	64.3	68.8	68.4	75.4

\* Mining and manufacturing

Note: Heavy industry includes mining, construction materials, chemicals, primary metals, and engineering products. Modern manufacturing includes only chemicals, primary metals, and engineering products.

Source: Own calculations based on data from Staller (1975), Czirják (1968), Alton et al. (1991), and from DIW (Germany), WIFO (Austria), and EU KLEMS ([www.euklems.net](http://www.euklems.net)).

Post-war data give us a deeper insight into the structural development of the economy and thus the nature of industrialisation than what we have been able to establish for earlier periods. Table 12 shows that the share of heavy industry and of modern manufacturing in gross industrial value added was similar across the region, but mining and the production of basic materials remained more important in Czechoslovakia and Hungary than in Austria and Germany. Whereas the share of modern manufacturing increased throughout the period in Austria and Germany, it stagnated in the two socialist countries from the late 1960s onward. This accords with the existing evidence pointing towards a growing technological lag between western nations and centrally planned economies after the golden age.<sup>19</sup> This pattern is commonly attributed to inefficient resource allocation and the ideologically driven preference for material production over services.<sup>20</sup> Additionally, the austerity policies introduced to combat the budgetary effects of rising oil prices and the debt crises that emerged in the 1980s (as a consequence of lavish borrowing during the 1970s and the worsening terms of trade after 1980) also led to a reduction in investment levels, particularly investment in new machinery.

In terms of growth, Central European economies performed similarly to other peripheral regions in Europe, with some notable exceptions. As in Southern Europe and as in other countries within the Soviet bloc, the growth of industrial production slowed down considerably from the 1970s and was disrupted by a temporary slump in the early 1980s. From the 1960s onward, Central Europe was lagging behind Southern Europe in terms of average growth rates, and from the mid-1970s Austria was also pulling away from Hungary and Czechoslovakia. During the golden age, average

<sup>19</sup> See among others Kalecki (1993), and Broadberry and Klein (2011).

<sup>20</sup> The perhaps most elegant exposition of this view is by Kalecki (1993).

rates of industrial expansion were also lower than in South-East Europe, which provides evidence for convergence within the Soviet bloc. After 1980, however, this process of convergence broke down: typically the most advanced socialist economies performed best, both in terms of aggregate growth and industrial development.

In Russia (not the whole Soviet Union), the increased price of hydrocarbons created new opportunities for growth in heavy industry, not least thanks to investment in natural gas exploration and in new transcontinental pipelines.<sup>21</sup> In Czechoslovakia and Hungary, growth could be maintained because the relatively more advanced economic structure of both countries made them more resistant to (although by no means unaffected by) the exogenous shocks of the early 1980s. Given that modern branches of manufacturing, such as electrical engineering, and services carved out a relatively larger share from their GDP, they were hit less severely by the oil shocks than the less developed socialist economies. Czechoslovakia and Hungary were also much less affected by the debt crises of the 1980s than Poland or South-East Europe. Since, unlike virtually every other socialist country, Czechoslovakia did not borrow extensively during the 1970s, it did not need to tighten the belt after borrowing costs rocketed following the second oil shock. Hungary would have had to, but it joined the IMF in 1982 (in a secret operation without the prior knowledge of the Soviet leadership), which improved her position as a debtor.<sup>22</sup> By contrast, Poland and Romania suffered prolonged depressions under severe austerity imposed by the repressive governments of General Jaruzelski and Nicolae Ceauşescu respectively; and, even if to a lesser extent, austerity also had harsh economic consequences in Bulgaria and Yugoslavia.

#### **IV. The legacy of industrialisation: Central Europe after 1990**

The collapse of the Soviet bloc and the socialist economic system caused a major depression in Eastern Europe, affecting both Czechoslovakia and Hungary. Between 1987 and 1992, industrial production declined by 37 per cent and 28 per cent in the two countries respectively. In Czechoslovakia, the reduction in value-added was more than twice as large in mining and manufacturing as in the entire economy. Austrian industry initially received a boost from the opening of eastern markets and German reunification, in particular, but this boom was short lived and turned into recession in 1991. From the mid-1990s, Central Europe enjoyed strong growth that, not unlike in earlier periods, was propelled by industrial expansion (see Table A.2).

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<sup>21</sup> Hence the faster growth in total GDP in Russia (see Ponomarenko, 2002, p. 151) than in the U.S.S.R. as a whole (see Maddison, 2006) after 1980.

<sup>22</sup> For a more detailed narrative, see Berend (1997), pp.195 ff.

Transition to a market economy delivered first a killer blow and then a blessing for Central European industry. The liberalization of markets, the removal of import restrictions and the introduction of hard budget constraints finally exposed the inefficiency of state industries, leading to a sharp fall in output and employment. In subsequent years, however, privatization and the massive inflow of foreign direct investment (FDI) led to technological modernization and the rationalization of production. Industry-level data reported by the EU KLEMS project shows that productivity growth since 1995 has stemmed largely from modern manufacturing, the strongly export-oriented engineering industries in particular, where most FDI has been concentrated. The timing of industrial development was quite the opposite of what Joan Roses describes for the Iberian economies. Since the launching of the Euro, comparative advantage in manufacturing has shifted from Southern to Central Europe. The growth impact of FDI was most noticeable in the automobile industry and electrical engineering, in which the Czech and Slovak Republics as well as Hungary emerged as major exporters within just a few years.

The quantitative evidence on structural change also reveals the relative importance of manufacturing in the growth of Central European economies. Albeit declining since the late 1980s, the share of industry in the labour force has remained considerably higher in the former Czechoslovakia and Hungary than in Austria (see Table 10). As shown in Table 11, the industrial share in gross value added has even increased in Hungary, where privatisation and the liberalization of capital markets were completed much faster than in the Czech and Slovak Republics that pursued a more gradual reform program and thus did not attract as much manufacturing FDI before the late 1990s. In recent years, Central Europe has experienced a period of re-industrialisation and, in fact, become proportionally more industrialised than Germany. Table 12 also reveals the impact of shifting comparative advantages on the structure of industrial production. The share of heavy industry and, to a lesser extent, of modern manufacturing in gross industrial value-added declined sharply following the fall of communism. By 2005, these shares have attained, or even surpassed, their highest previous levels; nevertheless the share of modern manufacturing in Central Europe has continued to lag behind Germany.

Although transition to a market economy has radically improved the development prospects of manufacturing in both Hungary and the former Czechoslovakia, they are still tormented by some legacies of socialism. The weakness of domestic small and medium sized enterprises remains the main problem for industrial policy. Whereas FDI helped modernise, restructure and often reposition large firms, small companies have had limited access to credit to finance investment in new equipment and lack both the technical and industry-specific entrepreneurial knowhow necessary to face up to the challenges of a new globalised market environment. The legacy of state management

has also been manifested in the response governments in the region have typically given to this key problem. Tax concessions and direct subsidies to small enterprises alongside strategic agreements with foreign multinationals offering indirect subsidies in exchange for self-imposed limitations on the share of imported inputs did not reduce the technological backwardness and lack of know-how that keep limiting the growth potential of domestic firms.

Nevertheless, Central European economies withered the storms of the transition shock more successfully than most other post-socialist countries, particularly the former Soviet and Yugoslav republics. This can only be explained by the confluence of several factors. Both their geographical vicinity to core European markets, particularly Germany, and their relatively rich endowments of skilled labour, but also their strong commitments to market reforms from the early 1990s, made Central European countries initially more attractive to western investors than East and South-East Europe. Czechoslovakia and Hungary, together with Poland, had already been way ahead most other socialist countries in economic reforms during the 1970s and 1980s. However, the comparatively much larger negative impact that the disintegration of the Soviet Union and the violent break-up of the former Yugoslavia had on Eastern and South-East Europe during the early 1990s cannot be overlooked.

The quantitative evidence presented in this chapter allows us to derive several conclusions about the history of industrialisation in Central Europe. First, the region stepped into the industrial age before most of the global periphery, but it has not been able to narrow the developmental gap *vis-à-vis* the West European core. Second, economic growth in the region has been and still is industry-driven: periods of strong growth were marked by even faster industrial expansion, whereas the major calamities of the twentieth century, the world wars and the collapse of state socialism, dislocated industry more than other sectors of economic activity. Economic development in Central European countries during the last one hundred years has been shaped by these major calamities, and their response was always strongly linked to industrialisation and industrial modernization. Third, growth in the contribution of industry to gross value added was in strong correlation with the rising share of heavy industry and especially the modern branches of manufacturing in industrial production. Finally, industrialisation in Central Europe has always been characterised with more direct state involvement than in the most advanced western economies. In this aspect, Gerschenkron was right: under relative backwardness the state had to substitute for the lacking prerequisites. However, interventionist policies did not help Central European nations to exploit the advantages of their relative backwardness. Falling behind the European core, not catching up, marked periods of strong state management.



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## Appendix

**Table A.1. *Indices of Gross Value-Added* (constant 1913 prices, 1913 = 100)**

	Imperial Austria				Imperial Hungary			
	manufac- turing	industry	sec. sector	GDP	manufac- turing	industry	sec. sector	GDP
1870	35.4	33.9	36.9	45.8	19.0	19.1	20.3	41.4
1871	41.1	39.2	42.8	48.7	20.6	20.8	23.1	40.5
1872	40.4	38.6	41.9	48.4	19.4	19.8	22.4	40.1
1873	36.4	35.0	37.5	46.4	19.6	19.9	21.3	39.7
1874	36.9	35.6	37.5	48.2	20.1	20.1	20.2	39.3
1875	37.5	36.2	39.0	48.7	18.3	18.5	17.9	39.7
1876	37.4	36.0	38.6	48.8	17.5	18.0	17.4	38.4
1877	38.2	36.9	39.4	50.2	19.5	19.8	19.2	42.5
1878	38.4	37.1	38.6	51.3	24.7	24.5	23.3	43.3
1879	38.8	37.6	39.4	49.7	22.9	22.8	21.9	43.5
1880	37.8	36.8	38.6	49.9	22.3	22.6	23.2	45.8
1881	42.2	41.0	42.8	52.4	26.9	26.7	28.0	49.8
1882	44.0	42.7	44.6	53.0	33.0	32.3	34.7	55.8
1883	45.7	44.5	46.2	54.1	37.2	36.3	41.1	54.9
1884	46.7	45.4	48.7	56.0	37.3	36.5	41.5	56.6
1885	43.2	42.3	44.0	54.7	37.7	36.8	41.2	56.9
1886	43.3	42.4	44.6	55.3	36.2	35.4	40.8	55.5
1887	47.5	46.4	49.0	58.0	37.0	36.2	39.9	58.1
1888	46.6	45.9	48.9	58.0	41.8	40.7	44.9	60.1
1889	48.2	47.5	49.7	58.0	39.1	38.5	43.5	56.8
1890	51.0	50.3	51.8	60.3	41.2	40.4	43.1	59.9
1891	53.1	52.3	54.2	61.4	47.1	45.9	48.5	62.6
1892	54.1	53.1	54.3	62.9	47.6	46.5	47.2	61.6
1893	56.9	56.0	57.7	63.3	56.4	54.6	57.6	66.4
1894	59.6	58.6	60.2	66.6	56.9	55.4	59.2	64.7
1895	61.8	60.7	61.9	67.5	59.8	58.3	63.6	71.6
1896	62.1	61.1	63.1	68.2	60.9	59.7	64.6	71.1
1897	64.6	63.7	66.1	69.4	57.2	56.6	62.3	65.9
1898	68.3	67.3	70.1	73.4	57.5	57.2	60.8	70.8
1899	69.3	68.4	70.9	75.0	62.0	61.4	65.2	73.9
1900	69.4	68.5	70.8	74.6	61.8	61.5	65.0	75.0
1901	70.4	69.7	71.7	76.4	56.4	56.6	58.2	72.7
1902	74.0	73.0	75.1	78.4	60.8	60.4	62.0	77.1
1903	74.6	73.7	75.7	78.8	64.2	63.6	64.8	80.7
1904	76.7	76.0	77.6	80.1	62.8	62.6	64.2	70.8
1905	79.3	78.5	79.9	84.4	67.1	67.0	68.7	80.2
1906	85.4	84.5	86.6	88.5	76.7	76.0	77.3	89.1
1907	92.0	91.4	91.7	91.7	78.6	77.9	80.2	84.7
1908	94.5	94.3	94.7	93.9	79.7	79.4	82.0	86.2
1909	95.4	95.4	96.2	95.1	84.6	84.3	86.6	89.4
1910	94.4	94.3	95.2	94.8	89.3	89.0	90.3	95.3
1911	99.5	98.9	98.8	96.6	95.9	95.4	94.8	94.2
1912	106.1	105.3	105.1	101.5	105.3	104.0	105.0	100.7
1913	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Sources: Schulze (2000), with minor corrections.

**Table A.2. Indices of Gross Value-Added (constant prices, 1950 = 100)**

	Hungary		Austria		Czechoslovakia	
	Industry	GDP	Industry	GDP	Industry	GDP
1913	37.1	71.0	84.3	91.2	48.7	64.0
1920	30.0	58.7	49.4	60.6	42.5	57.9
1921	30.0		54.4	67.1	45.5	62.5
1922			60.0	73.1	43.1	60.9
1923			59.9	72.4	47.5	65.9
1924	35.2	68.0	68.6	80.7	60.3	72.8
1925	38.5	73.1	75.3	86.2	69.3	81.3
1926	42.2	78.3	77.0	87.7	68.6	81.0
1927	47.2	81.7	78.6	90.3	76.5	87.1
1928	51.2	88.9	83.8	94.5	84.8	94.8
1929	51.2	91.8	85.6	95.9	90.3	97.4
1930	48.3	89.8	79.9	93.2	86.2	94.2
1931	44.5	85.4	71.9	85.8	80.1	91.0
1932	41.2	83.2	63.8	76.9	67.7	87.4
1933	43.5	90.7	60.7	74.4	64.0	83.6
1934	49.5	91.3	62.5	75.0	64.9	80.4
1935	56.8	95.9	64.7	76.5	66.9	79.7
1936	64.6	102.3	65.7	78.7	73.6	86.2
1937	67.0	100.0	70.2	82.9	84.3	95.9
1938	70.5	105.2	82.8	93.5		
1939	80.3	113.1	107.6	106.0		
1946	32.3	67.2	47.2	53.3		
1947	49.3	69.5	54.3	58.8		
1948	66.3	87.0	72.4	74.8	88.3	87.9
1949	78.1	94.0	86.6	89.0	91.9	92.7
<b>1950</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>
1951	113.1	109.7	114.5	106.8	102.8	101.8
1952	129.9	113.4	115.2	106.9	104.3	105.2
1953	136.9	115.4	117.2	111.6	105.2	104.8
1954	141.8	119.5	133.8	123.0	109.3	109.1
1955	152.4	130.3	161.4	136.6	122.7	118.4
1956	139.3	124.4	174.7	146.0	133.3	125.4
1957	154.6	134.7	183.7	154.9	146.8	133.1
1958	170.3	143.7	187.0	160.6	162.9	143.2
1959	183.2	149.5	195.8	165.1	175.7	149.5
1960	198.9	157.3	216.8	178.7	191.6	160.8
1961	216.8	165.3	227.3	188.2	203.9	167.2
1962	232.0	172.2	232.8	192.8	213.3	169.5
1963	243.1	181.6	241.7	200.6	212.3	166.3
1964	261.1	191.8	260.5	212.7	217.3	174.1

1965	275.9	193.3	271.2	218.8	230.7	180.5
1966	295.6	204.3	284.3	231.1	234.1	188.3
1967	305.3	216.1	287.5	238.1	249.1	196.4
1968	311.3	218.7	305.7	248.7	253.3	205.5
1969	314.5	225.2	342.1	264.4	257.7	209.3
1970	327.7	224.4	371.7	283.2	283.0	213.5
1971	333.0	234.4	394.7	297.7	290.4	220.8
1972	337.2	239.5	420.6	316.1	303.3	228.6
1973	351.0	251.9	443.5	331.6	315.1	236.2
1974	359.2	258.5	462.2	344.7	326.6	244.8
1975	372.9	264.0	436.1	343.4	342.2	252.0
1976	385.2	264.8	460.2	359.1	356.6	256.1
1977	403.1	281.4	481.0	375.9	369.3	267.6
1978	417.6	288.2	484.0	374.6	378.2	270.9
1979	421.7	288.8	511.4	395.0	384.0	273.2
1980	416.1	291.7	528.0	404.1	393.6	280.8
1981	422.4	293.8	509.5	403.7	401.1	279.4
1982	427.7	304.3	510.7	411.4	406.2	284.8
1983	431.8	301.2	530.3	423.0	413.8	289.1
1984	444.1	309.1	533.4	424.4	419.6	295.9
1985	444.4	301.5	560.6	433.9	427.5	298.2
1986	454.5	307.5	579.5	444.1	432.9	303.7
1987	460.9	312.3	575.2	451.5	439.8	305.2
1988	457.5	317.0	595.4	465.8	445.2	312.0
1989	442.6	309.9	619.3	485.5	445.2	314.6
1990	424.4	289.3	655.4	507.6	429.9	305.7
1991	377.7	254.9	668.3	524.6	362.6	267.3
1992	344.9	247.0	665.9	534.5	343.8	261.3
1993	356.2	245.6	654.5	536.5	306.4	262.8
1994	380.2	252.9	668.3	548.4	314.7	271.7
1995	410.2	256.6	694.7	563.7	350.1	287.7
1996	424.2	257.0	708.7	577.6	380.4	302.9
1997	466.4	265.1	734.7	590.9	365.7	305.2
1998	496.6	275.9	765.0	613.3	346.7	308.9
1999	516.6	284.7	806.2	635.0	369.3	312.4
2000	556.2	296.7	855.5	658.3	386.1	322.7
2001	557.9	307.7	882.6	664.0	391.1	333.1
2002	570.7	321.6	893.7	675.2	405.0	342.8
2003	607.9	334.0	900.6	681.1	419.8	356.8
2004	629.7	350.0	926.0	698.7	474.2	374.1
2005	657.2	363.9	949.6	715.5	520.6	399.2

Sources: GDP from Maddison (2006), industrial value-added from: WIFO [Austria]; Eckstein (1955), p. 171, Czirják (1973), and Alton et al. (1982) [Hungary]; Pryor (1975), Lazarcik (1969), and Alton et al. (1982) [Czechoslovakia]; after 1975, from Alton et al. (1991), and EU KLEMS ([www.euklems.net](http://www.euklems.net)).

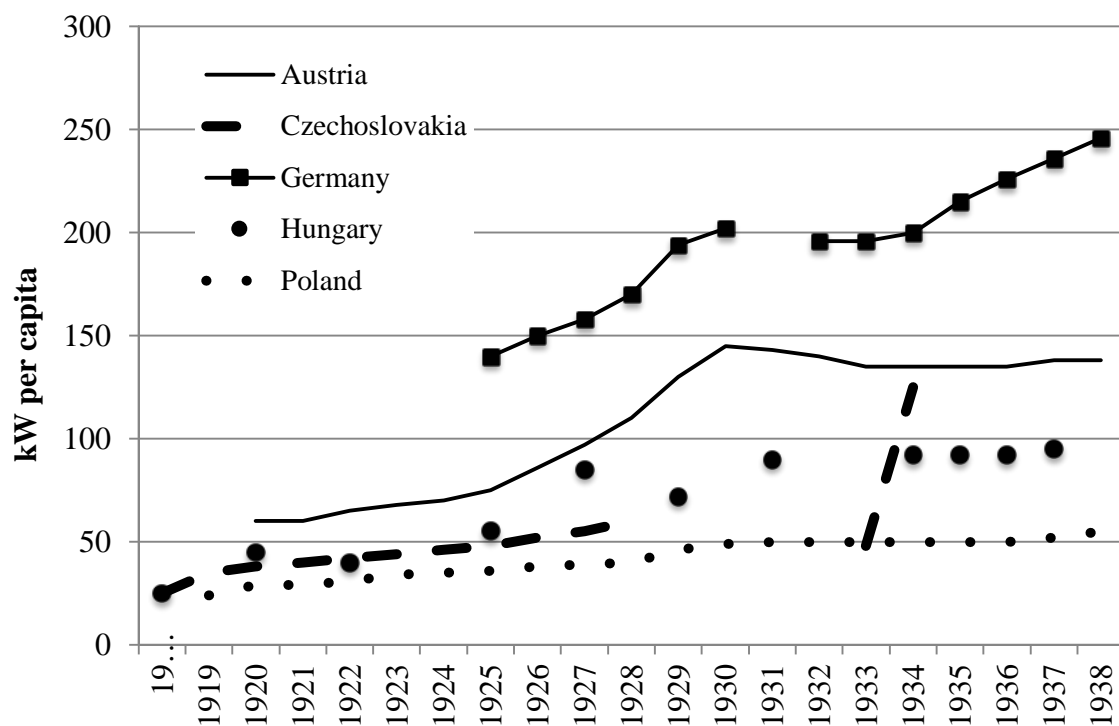
**Table A.3. Branch Shares in Total Manufacturing Gross Value Added (Per Cent)**

	<b>food &amp; beverage s</b>	<b>textiles &amp; clothes</b>	<b>iron &amp; steel</b>	<b>metal- working</b>	<b>engineerin g</b>	<b>brick, clay, glass</b>	<b>petro chemical s</b>
1870							
Imperial Austria	29.2	31.6	2.0	2.8	2.9	14.2	
Imperial Hungary	56.8	0.6	2.9	1.7	2.6	10.7	
1890							
Imperial Austria	31.1	30.4	3.0	3.4	4.4	9.9	0.5
Imperial Hungary	46.8	3.6	5.9	3.2	5.3	10.5	
1913							
Imperial Austria	25.0	22.0	5.5	8.6	11.1	7.4	3.0
Imperial Hungary	34.4	7.5	8.0	7.0	11.1	6.8	1.4

Gross value-added in constant 1913 prices.

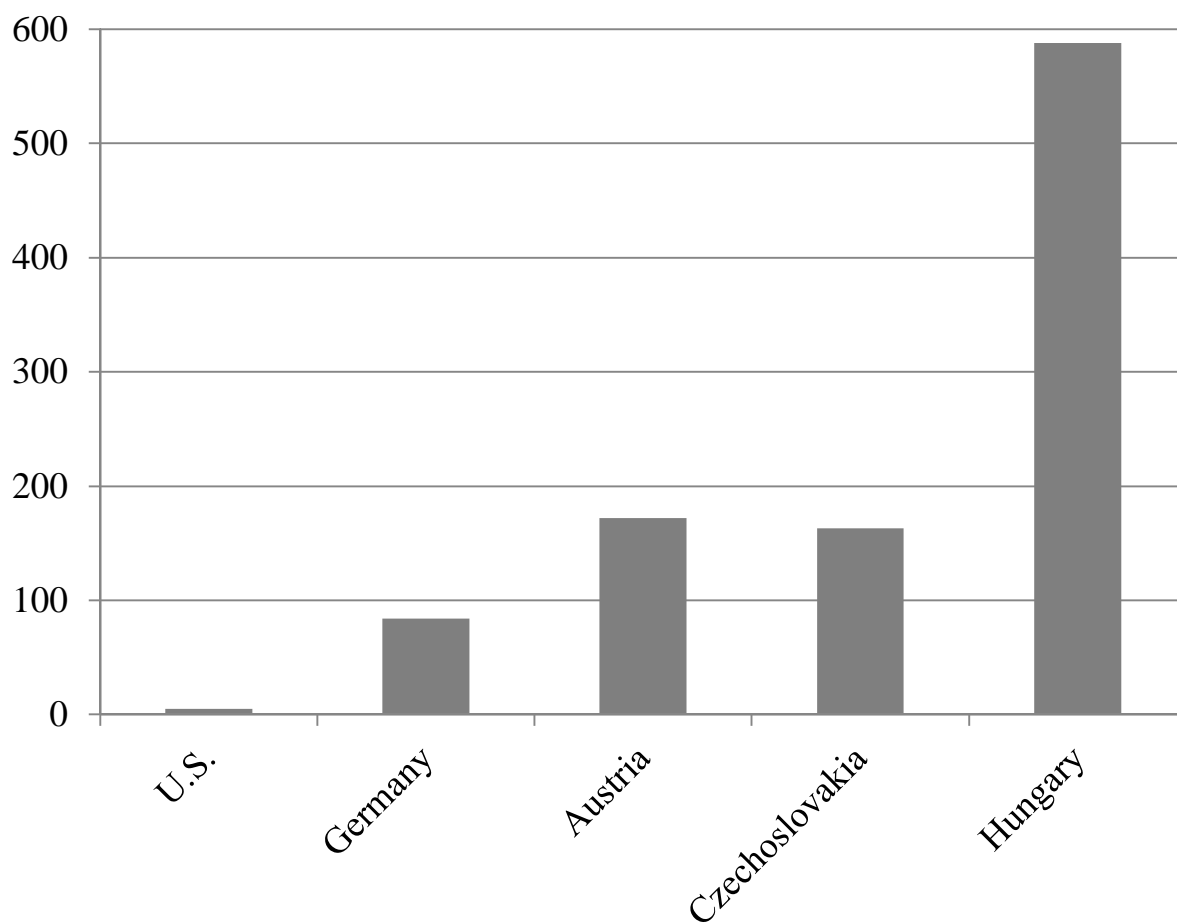
Source: Schulze (2000), with minor corrections.





**Figure 1**  
 Installed capacity in electrical power generation per head of the population

Source: Hidvégi and Vonyó (2012)



**Figure 2**  
Number of residents in the country per registered automobile in 1935

Source: data from Hidvégi and Vonyó (2012)

	food & beverages	textiles & clothes	iron & steel	metal- working	engineering	brick, clay, glass	petro chemicals
1870							
Imperial Austria	29.2	31.6	2.0	2.8	2.9	14.2	
Imperial Hungary	56.8	0.6	2.9	1.7	2.6	10.7	
1890							
Imperial Austria	31.1	30.4	3.0	3.4	4.4	9.9	0.5
Imperial Hungary	46.8	3.6	5.9	3.2	5.3	10.5	
1913							
Imperial Austria	25.0	22.0	5.5	8.6	11.1	7.4	3.0
Imperial Hungary	34.4	7.5	8.0	7.0	11.1	6.8	1.4

Gross value-added in constant 1913 prices.

Source: Schulze (2000), with minor corrections.