

The background of the page features a large, detailed coat of arms of the University of Groningen. It is a shield-shaped emblem with a crown on top. The shield is divided into several sections: a top section with a lion, a middle section with a book and a banner, and a bottom section with a tree and a chalice. The banner contains the Latin motto 'VERBYM DNI LV CER NA'.

**The German Industrial Census of 1936,  
Statistics as Preparation for the War**

Research Memorandum GD-77

Rainer Fremdling

**The German Industrial Census of 1936,  
Statistics as Preparation for the War**

Research Memorandum GD-77

Rainer Fremdling

Groningen Growth and Development Centre  
August 2005

# The German Industrial Census of 1936, Statistics as Preparation for the War<sup>1</sup>

Rainer Fremdling

Groningen Growth and Development Centre

August 2005

## **Abstract:**

In 1936, the Imperial Statistical Office of Germany carried out an industrial census using the concept of net-production or value-added. In 1939, these statistics were published with strategic sectors such as aircraft industry being hidden. Originally, this census and its forerunner of 1933 had been designed to compile an input-output-table for Germany as a basis for managing the business cycle. Finally, these data were used for constructing detailed material balance sheets, which served as a statistical basis for preparing the war.

---

<sup>1</sup> Earlier versions of this article were presented at the 54th session of the International Statistical Institute in Berlin in 2003, at a SOM-workshop of the Faculty of Economics (University of Groningen) in 2004 and at a conference of the Centrum voor Duitsland Studies at Nijmegen in 2004. This research was supported by grants from the Dutch Research Foundation (NOW), the Deutsches Institut für Wirtschaftsforschung (DIW) and the Wissenschaftszentrum Berlin (WZB).

## 1. The Industrial Census of 1936 and its Publication in 1939

In 1939, the German Imperial Office for Economic Planning of Warfare (Reichsamt für Wehrwirtschaftliche Planung) published its first and only volume on the 'Gesamtergebnisse der amtlichen Produktionsstatistik – Die deutsche Industrie' (Outcome of the Official Census of Production – German Industry). For the first time, such an account of net production values was published. At first sight, it seems both comprehensive and detailed in comprising the entire German industry covering 30 sectors and a number of sub-sectors. In addition to net production, it offers information on employment, wage bills, sales as well as foreign trade broken down by sectoral shares and giving both the origin of imports and the destination of exports. It even contains a regional breakdown according to German federal states (Länder) and provinces, e.g. for Prussia.

Surprisingly frankly, the foreword puts forward that the industrial census of 1936 was used for planning the war. I quote the second paragraph: 'In the course of Germany's rearmament, the economic planning of warfare increasingly came to the forefront. As the experience of the World War has shown for a country as Germany a clarification of the economic problems of warfare is of paramount importance for the result of a war. In addition, there is no doubt that due to our endowment with natural resources a war economy in Germany will be by and large a planned one by its nature. Thus its preparation essentially has to be based on thorough statistical planning.' With this statement in mind, one wonders why the Imperial Office (Reichsamt für Wehrwirtschaftliche Planung) published the information at all. The foreword justifies the publication on the grounds that filling in the detailed enquiry had caused the industrial firms a lot of trouble. Their (and the public's) desire for a published summary account was therefore considered as understandable. As the main use of the census was the economic planning of warfare, the evaluation had to be kept secret from the public, though. But the detailed accounts also delivered valuable results for pure economic questions, which justified even their publication in parts as well.

Such a publication was not undisputed of course. The central command of the army accused the Imperial Office (Reichsamt für Wehrwirtschaftliche Planung) of having violated secrecy by this publication. It demanded the withdrawal of these data from public access. The respective letters are to be found in the Federal Archives in Berlin (Bundesarchiv Berlin-Lichterfelde = BA). In the letters exchanged between the heads of the two institutions, Wilhelm Lisse (in charge of the Imperial Office) rejected this accusation by arguing that aggregating industrial branches had made the performance of individual industries unrecognisable. In 1939, the Imperial Ministry of Economics, however, went over to prohibiting any publication and to refusing access to any statistical sources reaching back to 1914, e.g. for the German Institute for Economic Research (DIW).

A comparison of the published data of the Imperial Office (Reichsamt für Wehrwirtschaftliche Planung) with the records then kept secret but being available now in the Federal Archives reveals that the published data seemed to be reliable at first sight. When I started this project some time ago, I was convinced that this was true indeed. If so, it would lend strong support to the accusations raised by the central command of the army. Publication policy, however, was a delicate matter. According to the correspondence between the Ministry of Economics and the Imperial Office it becomes clear that it was not intended to publish faked data. Although publication had been limited or forbidden the guideline of February 1939 said: '... however, all publications should still tell the truth. In case of doubt the

publication of statistical and other details should rather be dropped than to report wrong details'. For camouflage, however, certain industrial sectors being considered important for warfare were firstly hidden by way of aggregation (Leisse's argument). Basically, the data had been collected on the level of industrial units or plants (Betriebsstätten). They then were aggregated on an intermediate level for sub-sectors or branches. Concerning the delicate sector of iron and steel, statistics were published for the entire sector, whereas on the intermediate level four branches had been delimited. Concerning chemistry, the publication distinguishes merely among seven branches, whereas 38 are noted in the archival records. Secondly, certain industrial branches were hidden under misleading aggregates. The foremost example is the aircraft industry. According to the classification handled it should have fallen under 'vehicles' (Fahrzeugindustrie); it was, however, hidden under 'construction and others' (Bauindustrie und sonstige Industriezweige). As early as in 1936, aircraft industry employed at least 135 210 people. This means about 80 % of the published work force (166 534) for vehicles. A similar camouflage was applied to other branches onto which military importance was attached.

## **2. The Failed Construction of an Input-Output-Table and the (Ab-) Use of Statistics for Warfare**

The 1936 industrial census had its forerunner in 1933. Both censuses were designed according to the Anglo-Saxon concept of value-added or net production, whereas hitherto German industrial censuses (Gewerbezahlungen) had merely accounted for the number of firms and people employed. The new concept of net-production was embedded in Wagemann's business cycle approach of 1928. Ernst Wagemann had been head of the Imperial Statistical Office and of the Institute for Business Cycle Research (Institut für Konjunkturforschung, which from 1941 onwards was renamed as the still existing Deutsches Institut für Wirtschaftsforschung, DIW).

The original aim of compiling industrial censuses in such a way was to obtain a statistical basis for managing the business cycle. The then most advanced instrument to create a statistical tool for that purpose was the construction of an input-output-table (in German: 'Volkswirtschaftliche Verflechtungstabelle'). A large group of researchers of the Imperial Statistical Office compiled the necessary matrix (designed by von der Gablentz ) and gathered the needed pieces of statistical information beyond the census-data of 1933 and 1936. This table was planned to materialise as early as in 1935. For certain branches, such as automobile construction, input-output-relations were calculated indeed.

Within the Imperial Statistical Office, however, a severe conflict emerged. On the one hand, the proponents of the I-O-approach (the department headed by Bramstedt) wanted to pursue the goal based on monetary relations. On the other hand, the department headed by Leisse wanted to use the 1933-census and finally the 1936-data in order to compile physical input-output-relations as the statistical basis for the preparation of the war. It seems that the original plan of compiling an input-output-table based on monetary relations was dropped, as neither Tooze nor me have found such a table. We cannot be sure about that, though. In any case, Leisse won this 'battle on statistics' and in the following years his department (comprising 840 people in 1938 and 707 in 1939) compiled detailed balance sheets for commodity or raw material in the format of flow- or tree-diagrams (see appendix A1, A2). In a letter (dated 28.12.1937) to the Imperial Statistical Office the Minister of Economics made clear that the use of these statistics as preparation for war had priority. Any other activities such as publishing

or assembling new data had to be dropped if it would harm this goal. Finally, Leisse succeeded in obtaining total control over industrial statistics, and in 1938 his department was split from the Imperial Statistical Office as independent 'Reichsamt für Wehrwirtschaftliche Planung'.

The material balances were used for military exercises, e.g. in Bad Godesberg in May 1937. One conclusion of the exercise was the following: '...given our present economic situation we cannot pursue a longer lasting war. Only in the first weeks of fighting are there chances of success, which is to say, only as long as stocks support the supply base.' Thus not only the war itself was based on detailed statistical economic planning but furthermore even the strategy of the 'Blitzkrieg'.

### **3. The Relevance of the Census of 1936 for Post-War Germany**

Firstly, the census of 1936 provided the benchmark for the allied occupational command to determine the production limit in West Germany. The first industrial plan of March 1946 fixed the West-German production at about two thirds of the 1936-level. The allied forces, however, did not use the "secret" sources of Leisse's office; they took the published figures of 1939 instead. Secondly, the economic planning of East Germany (Büro Leuschner ) and later the GDR was based on the original data of the 1936-census. Because of its regional delimitation detailed plans were set up for East Berlin and the rest of the Soviet controlled area. The 1936-level of industrial production became the yardstick for failure or success of the East German planned economy for a long time. Thirdly, it seems to be no mere speculation that the reluctance of the West-German government to implement such tools as national accounting and input-output-tables may have arisen from the heritage of using and abusing economic statistics for both warfare and central economy planning. It became palpable after all that collecting and compiling statistical data has a clear-cut political dimension.

### **4. Outlook and Current Research**

Currently, Reiner Stäglin (DIW) and myself are compiling an input-output-table for Germany in the 1930s. What I have put forward here is background information concerning this current research project. We are busy keeping up the original intention of the Imperial Statistical Office (Statistisches Reichsamt) to construct an input-output-table for Germany for the 1930s. We mainly draw on the unpublished figures of the industrial census of 1936. Thus far we have completed a comprehensive set of input-output relations for 15 and aggregate figures for 29 industrial groups or sectors and construction (Baugewerbe) following the classification of the Imperial Statistical Office (see A3). We can rely on three sources: Q1 and Q2 are the figures gathered and partly compiled by the Imperial Statistical Office to be found in the Federal Archive; Q1 contains detailed information on 326 industrial branches or sub-sectors, which allows the quantification of the input-output relations. Furthermore information on e.g. employment, wages, intermediate input, gross production, sales, imports and exports are provided. Q2 summarises these latter figures on the same level of aggregation. Q1 is the preferred source for our detailed account, whereas Q2 serves for control and supplementary information. Q2 is obviously based on Q1 and was calculated by the Imperial Statistical Office itself. In case of diverging numbers we opt for Q1. Q3 comprehends the figures published in 1939. The following table shows figures on employment and the wage bill for the aggregate and those two sectors where the divergence between Q1 and Q3 is most significant.

**Table 1 Selected Data from the German Industrial Census of 1936**

		Vehicles	Textiles	Construction And Others	Aggregate 30 Sectors
Wage Bill	Q1	679.8	1695.4	842.1	13732.0
Mill. RM	Q3	368.9	1220.7	1192.0	13261.5
Employment	Q1	302.3	1290.3	1075.5	8346.2
1000	Q3	166.5	911.7	1220.0	7967.3

Source: Compiled by Rainer Fremdling and Reiner Stäglin, see A1.

We found deviations from the published figures not only for vehicles (hiding aircraft industry) but furthermore for some other sectors as well due to shifts among branches: notably fuel chemistry, electricity and as mentioned above construction reveal significant differences compared with the published figures. For some more industrial sectors differences in gross production are detected as well. We did not cancel out intra-sectoral deliveries. Although the total outcome, i.e. the aggregate, yields only a slight difference to that of the publication of 1939, we are sure, however, that the specific contributions of branches or sectors deviate significantly from the publication of 1939. The aircraft industry is thus not the only example.

**Verflechtungstabelle für das deutsche Reich 1936**

 Autoren **Rainer Fremdling u. Reiner Stäglin**

Mill. RM (Stand: 2. Juni 2005)

Output	Bergbau	Kraftstoff industrie	Eisenschaffende Industrie	Maschinenbau	Fahrzeugindustri e (einschl. Luftfahrtind.)	Elektroindustrie	Chemische Industrie	Chemisch- technische Industrie	Kautschukindust rie	Druck- u. Papierverarb. Industrie
Input	1	2	3	7	9	10	18	19	20	22
1 Bergbau	808.4	126.7	290.5	0.0	0.0	5.2	79.6	0.1	0.0	0.0
2 Kraftstoffindustrie	0.1	375.5	0.0	0.0	0.0	9.4	33.8	48.7	6.1	1.4
3 Eisenschaffende Industrie	100.3	0.0	2499.8	449.3	173.0	73.1	56.7	0.2	0.0	0.0
4 Nichteisenmetallindustrie	0.0	7.9	0.0	126.0	82.4	191.9	31.3	1.9	1.6	6.6
5 Gießerei-Industrie	47.1	0.0	31.1	302.3	113.0	39.7	0.0	0.2	0.0	0.0
6 Eisen- u. Metallwarenindustrie	15.4	2.7	140.3	71.1	245.7	30.5	14.9	9.7	6.2	0.0
7 Maschinenbau	0.0	0.0	67.9	221.1	122.2	42.8	0.0	0.0	0.0	0.0
8 Stahl- u. Eisenbau	0.0	0.0	39.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9 Fahrzeugindustrie (einschl. Luftfahrtind.)	0.0	0.0	25.4	0.0	160.9	0.0	0.0	0.0	0.0	0.0
10 Elektroindustrie	4.0	0.0	10.7	81.8	72.4	195.8	4.9	0.0	0.0	0.0
11 Feinmech. u. optische Industrie	0.0	0.0	1.3	0.0	33.4	0.0	0.0	0.0	0.0	0.0
12 Metallwareni. u. verwandte Gewerbe	0.0	0.0	7.6	2.5	1.0	0.0	1.8	5.4	1.2	5.3
13 Industrie der Steine u. Erden	2.1	1.3	241.2	0.0	0.0	3.1	39.2	5.9	1.4	0.1
14 Keramische Industrie	0.0	0.0	0.0	0.0	3.8	7.3	0.3	5.4	0.0	0.0
15 Glasindustrie	0.0	0.0	0.0	0.0	7.8	6.5	12.2	6.4	0.5	0.0
16 Sägeindustrie	110.4	0.0	0.0	0.0	22.0	0.0	0.3	0.0	0.0	2.3
17 Holzverarb. Industrie	1.5	1.9	0.0	14.4	5.4	7.3	23.8	29.9	1.2	5.1
18 Chemische Industrie	61.3	11.3	8.4	3.7	6.1	26.1	823.7	130.4	20.4	41.1
19 Chemisch-technische Industrie	0.0	1.0	0.0	12.8	36.5	90.4	54.5	52.4	0.9	7.1
20 Kautschukindustrie	0.1	0.0	0.0	17.8	79.7	13.3	1.6	1.4	14.1	0.5
21 Papier-, Pappe-, Zellst.- u. Holzstoffind.	0.0	10.4	0.0	0.0	4.3	12.3	2.0	24.4	1.2	471.2
22 Druck- u. Papierverarb. Industrie	2.9	0.0	0.0	7.0	0.0	8.6	23.5	3.3	0.0	89.8
23 Lederindustrie	0.0	0.0	0.0	7.1	7.6	0.0	0.2	1.5	2.0	3.5
24 Textilindustrie	4.2	8.9	0.0	0.0	25.8	20.4	30.2	17.2	59.4	8.1
25 Bekleidungsindustrie	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
26 Ind. d. Öle u. Fette, Futterm. u. tier. Leime	0.0	5.0	0.0	10.7	0.2	0.8	8.6	67.8	1.3	5.6
27 Spiritusindustrie	0.0	0.3	0.0	0.0	0.0	0.0	12.9	6.7	0.0	0.4
28 Nahrungs- u. Genußmittelindustrie	0.0	0.0	0.0	0.0	0.0	0.0	24.5	11.3	0.7	0.0
29 Baugewerbe										
30 Energiewirtschaft	118.0	33.2	191.4	79.1	51.0	43.7	164.0	18.9	17.6	12.4
1-30 Industriegruppen insgesamt	1275.9	586.2	3555.3	1406.7	1254.3	828.1	1444.5	448.9	135.7	660.4
31 Sonstige	122.3	2.4	0.0	53.1	66.1	0.0	44.0	23.7	0.0	26.5
32 Landwirtschaft	0.0	0.0	0.0	0.0	0.0	0.0	7.3	4.6	0.0	0.0
33 Forstwirtschaft, Fischerei	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.1	0.0	0.0
41 Heimarbeit	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0
42 Bezogene Lohnarbeiten	0.0	0.0	0.0	16.1	42.5	0.1	0.0	0.0	0.4	27.4
1-42 Inländische Vorleistungen	1398.2	588.6	3555.3	1475.9	1363.0	828.2	1495.9	480.3	136.1	714.3
43 Importe	1.8	74.0	196.5	11.4	1.0	22.9	108.7	75.2	76.3	6.5
1-43 Vorleistungen insgesamt (Q 1)	1399.9	662.6	3751.8	1487.3	1364.0	851.1	1604.6	555.6	212.4	720.9
Vorleistungen insgesamt (Q 2)	1399.1	660.0	3751.8	1488.0	1362.4	851.9	1604.1	554.9	212.2	721.5
Vorleistungen insgesamt (Q 3)	1395.7	503.1	1198.3	1382.8	991.4	653.0	1156.3	600.7	210.2	721.5
Löhne und Gehälter (Q1)	1220.2	87.1	492.7	1188.7	679.8	665.0	443.6	174.5	118.3	534.0
Löhne und Gehälter (Q3)	1219.0	76.2	493.0	1188.7	368.9	665.0	455.4	180.0	118.3	534.0
Bruttoproduktionswert (Q1)Lücken mit Q2 geschlossen	3622.5	936.6	4991.9	4049.4	2722.0	2315.2	3119.3	1277.4	517.3	1747.1
Bruttoproduktionswert (Q 2)	3622.5	936.6	4991.9	4049.4	2725.2	2348.8	3120.7	1277.4	517.3	1747.1
Bruttoproduktionswert (Q 3)	3630.5	748.1	2371.9	3998.1	1827.8	2155.6	2690.2	1342.8	480.6	1723.0
Beschäftigte (in 1000) Q2 (=Q1 Juni/Dez.)	579.2	36.7	205.7	572.8	302.3	309.8	177.7	87.6	58.1	287.8
Beschäftigte (in 1000) Q3	565.7	29.4	201.6	556.6	166.5	294.2	181.0	90.4	57.1	283.6
Betriebe	1137	842	232	4796	610	1284	2366	3726	341	5533



**Verflechtungstabelle für das deutsche Reich 1936 (continued)**

Autoren **Rainer Fremdling u. Reiner Stäglin**

Mill. RM (Stand: 2. Juni 2005)

Output	Lederindustrie	Textilindustrie	Bekleidungsindustrie	Nahrungs- u. Genußmittelindustrie	Baugewerbe	Energiewirtschaft	Industriegruppen insgesamt	Exporte	Absatz
Input	23	24	25	28	29	30	1-30	47	
1 Bergbau	0.0	0.0	0.0	4.1		289.2	1679.8	71.8	3744.9
2 Kraftstoffindustrie	0.0	0.0	0.0	0.0		182.9	669.1	136.8	806.2
3 Eisenschaffende Industrie	0.0	0.0	0.0	0.0		0.0	4761.0	331.5	4460.9
4 Nichtisenmetallindustrie	0.0	0.0	0.0	0.0		0.0	1775.0	136.6	1736.9
5 Gießerei-Industrie	0.0	0.0	0.0	0.0		0.0	713.3	41.0	1100.9
6 Eisen- u. Metallwarenindustrie	0.0	1.0	0.0	61.5		0.0	732.8	390.4	3071.6
7 Maschinenbau	0.0	0.0	0.0	0.0		0.0	486.0	676.8	3770.1
8 Stahl- u. Eisenbau	0.0	0.0	0.0	0.0		0.0	39.7	101.4	741.8
9 Fahrzeugindustrie (einschl. Luftfahrtind.)	0.0	0.0	0.0	0.0		0.0	201.3	114.9	2679.5
10 Elektroindustrie	0.0	0.0	0.0	0.0		0.0	425.6	268.9	2298.2
11 Feinmech. u. optische Industrie	0.0	0.0	0.0	0.0		0.0	81.7	137.9	531.0
12 Metallwarenind. u. verwandte Gewerbe	13.1	2.3	3.1	9.5		0.0	100.9	108.5	1232.8
13 Industrie der Steine u. Erden	0.4	0.0	0.0	5.2		0.0	498.1	44.2	1670.8
14 Keramische Industrie	0.7	0.0	0.0	0.0		0.0	18.1	55.7	335.2
15 Glasindustrie	0.0	0.0	0.0	27.0		0.0	122.1	62.6	344.7
16 Sägeindustrie	5.9	0.2	0.0	2.5		0.0	439.5	3.7	786.9
17 Holzverarb. Industrie	8.4	29.1	26.5	73.6		0.0	371.2	58.8	1296.1
18 Chemische Industrie	20.4	202.3	1.8	9.9		6.8	1569.8	541.2	2971.3
19 Chemisch-technische Industrie	34.0	0.0	0.1	2.8		0.0	358.5	85.3	1277.3
20 Kautschukindustrie	20.2	0.0	0.1	0.0		0.0	151.8	39.6	494.8
21 Papier-, Pappe-, Zellst.- u. Holzstoffind.	4.7	42.3	0.1	68.1		0.0	1007.8	107.3	1144.9
22 Druck- u. Papierverarb. Industrie	0.0	11.2	5.1	9.4		0.0	190.9	63.1	1723.0
23 Lederindustrie	392.4	6.9	8.1	0.0		0.0	441.7	114.9	1586.9
24 Textilindustrie	51.9	2446.7	676.4	66.0		0.0	3504.5	437.4	7035.0
25 Bekleidungsindustrie	0.2	0.0	27.7	0.0		0.0	27.9	61.4	1587.2
26 Ind. d. Öle u. Fette, Futterm. u. tier. Leime	15.4	9.4	0.4	26.5		0.0	606.2	16.0	1702.7
27 Spiritusindustrie	0.0	0.0	0.0	4.5		0.0	441.7	0.7	792.2
28 Nahrungs- u. Genußmittelindustrie	0.0	0.0	0.0	1093.6		0.0	1250.2	58.0	7774.0
29 Baugewerbe									6014.8
30 Energiewirtschaft	18.4	152.0	1.0	156.0		70.6	1899.6	2.1	2438.7
1-30 Industriegruppen insgesamt	586.2	2903.2	750.3	1620.2		549.5	24565.7	4268.5	67151.5
31 Sonstige	0.0	2.4	10.9	0.0		0.0	462.4		
32 Landwirtschaft	121.8	66.3	4.7	2488.5		0.0	2903.4		
33 Forstwirtschaft, Fischerei	0.0	0.0	0.0	30.2		0.0	431.8		
41 Heimarbeit	9.1	65.4	1.2	0.0		0.0	95.9		
42 Bezogene Lohnarbeiten	14.6	217.1	16.2	0.0		0.0	364.5		
1-42 Inländische Vorleistungen	731.7	3254.5	783.3	4138.9		549.5	28824.6		
43 Importe	169.0	934.0	39.3	521.5		12.8	3124.3		
1-43 Vorleistungen insgesamt (Q 1)	900.7	4188.4	822.6	4660.4	2380.9	562.3	34329.8		
Vorleistungen insgesamt (Q 2)	900.7	4193.6	823.0	4650.7	2380.9	562.3	34286.4		
Vorleistungen insgesamt (Q 3)	885.9	3741.3	833.8	4232.3	2884.0	347.4	29435.9		
Löhne und Gehälter (Q1)	292.6	1220.7	297.5	804.5	842.1	466.9	13257.3		
Löhne und Gehälter (Q3)	292.3	1220.7	297.5	804.2	1192.0	425.3	13261.5		
Bruttoproduktionswert (Q1)Lücken mit Q2 geschlossen	1581.0	7016.5	1599.4	7843.1	6014.8	2438.7	68810.2		
Bruttoproduktionswert (Q 2)	1585.3	7055.6	1599.4	7843.1	6014.8	2438.7	68891.8		
Bruttoproduktionswert (Q 3)	1533.3	6581.0	1587.8	7193.8	7151.0	2319.5	63621.4		
Beschäftigte (in 1000) Q2 (=Q1 Juni/Dez.)	196.9	914.3	233.2	513.2	1075.7	180.9	7970.2		
Beschäftigte (in 1000) Q3	196.0	911.7	229.7	549.7	1220.0	163.8	7950.2		
Betriebe	4262	10069	7168	11921		5784	118289		

## Papers issued in the series of the Groningen Growth and Development Centre

Papers marked \* are also available in pdf-format on the internet: <http://www.ggdc.net/>  
Hardcopies of other papers can be ordered (as long as available) from [ggdc@eco.rug.nl](mailto:ggdc@eco.rug.nl)

- 536 (GD-1) Maddison, Angus and Harry van Ooststroom, The International Comparison of Value Added, Productivity and Purchasing Power Parities in Agriculture (1993)
- 537 (GD-2) Mulder, Nanno and Angus Maddison, The International Comparison of Performance in Distribution: Value Added, Labour Productivity and PPPs in Mexican and US Wholesale and Retail Trade 1975/7 (1993)
- 538 (GD-3)\* Szirmai, Adam, Comparative Performance in Indonesian Manufacturing, 1975-90 (1993)
- 549 (GD-4) de Jong, Herman J., Prices, Real Value Added and Productivity in Dutch Manufacturing, 1921-1960 (1993)
- 550 (GD-5) Beintema, Nienke and Bart van Ark, Comparative Productivity in East and West German Manufacturing before Reunification (1993)
- 567 (GD-6)\* Maddison, Angus and Bart van Ark, The International Comparison of Real Product and Productivity (1994)
- 568 (GD-7) de Jong, Gjalt, An International Comparison of Real Output and Labour Productivity in Manufacturing in Ecuador and the United States, 1980 (1994)
- 569 (GD-8) van Ark, Bart and Angus Maddison, An International Comparison of Real Output, Purchasing Power and Labour Productivity in Manufacturing Industries: Brazil, Mexico and the USA in 1975 (1994) (second edition)
- 570 (GD-9) Maddison, Angus, Standardised Estimates of Fixed Capital Stock: A Six Country Comparison (1994)
- 571 (GD-10)\* van Ark, Bart and Remco D.J. Kouwenhoven, Productivity in French Manufacturing: An International Comparative Perspective (1994)
- 572 (GD-11) Gersbach, Hans and Bart van Ark, Micro Foundations for International Productivity Comparisons (1994)
- 573 (GD-12)\* Albers, Ronald, Adrian Clemens and Peter Groote, Can Growth Theory Contribute to Our Understanding of Nineteenth Century Economic Dynamics (1994)
- 574 (GD-13)\* de Jong, Herman J. and Ronald Albers, Industrial Output and Labour Productivity in the Netherlands, 1913-1929: Some Neglected Issues (1994)
- 575 (GD-14) Mulder, Nanno, New Perspectives on Service Output and Productivity: A Comparison of French and US Productivity in Transport, Communications Wholesale and Retail Trade (1994)
- 576 (GD-15) Maddison, Angus, Economic Growth and Standards of Living in the Twentieth Century (1994)
- 577 (GD-16) Gales, Ben, In Foreign Parts: Free-Standing Companies in the Netherlands around the First World War (1994)
- 578 (GD-17) Mulder, Nanno, Output and Productivity in Brazilian Distribution: A Comparative View (1994)
- 579 (GD-18) Mulder, Nanno, Transport and Communication in Mexico and the United States: Value Added, Purchasing Power Parities and Productivity (1994)

- 580 (GD-19) Mulder, Nanno, Transport and Communications Output and Productivity in Brazil and the USA, 1950-1990 (1995)
- 581 (GD-20) Szirmai, Adam and Ren Ruoen, China's Manufacturing Performance in Comparative Perspective, 1980-1992 (1995)
- GD-21 Fremdling, Rainer, Anglo-German Rivalry on Coal Markets in France, the Netherlands and Germany, 1850-1913 (December 1995)
- GD-22\* Tassenaar, Vincent, Regional Differences in Standard of Living in the Netherlands, 1800-1875, A Study Based on Anthropometric Data (December 1995)
- GD-23\* van Ark, Bart, Sectoral Growth Accounting and Structural Change in Postwar Europe (December 1995)
- GD-24\* Groote, Peter, Jan Jacobs and Jan Egbert Sturm, Output Responses to Infrastructure in the Netherlands, 1850-1913 (December 1995)
- GD-25\* Groote, Peter, Ronald Albers and Herman de Jong, A Standardised Time Series of the Stock of Fixed Capital in the Netherlands, 1900-1995 (May 1996)
- GD-26\* van Ark, Bart and Herman de Jong, Accounting for Economic Growth in the Netherlands since 1913 (May 1996)
- GD-27\* Maddison, Angus and D.S. Prasada Rao, A Generalized Approach to International Comparisons of Agricultural Output and Productivity (May 1996)
- GD-28 van Ark, Bart, Issues in Measurement and International Comparison of Productivity - An Overview (May 1996)
- GD-29\* Kouwenhoven, Remco, A Comparison of Soviet and US Industrial Performance, 1928-90 (May 1996)
- GD-30 Fremdling, Rainer, Industrial Revolution and Scientific and Technological Progress (December 1996)
- GD-31 Timmer, Marcel, On the Reliability of Unit Value Ratios in International Comparisons (December 1996)
- GD-32 de Jong, Gjalt, Canada's Post-War Manufacturing Performance: A Comparison with the United States (December 1996)
- GD-33 Lindlar, Ludger, "1968" and the German Economy (January 1997)
- GD-34 Albers, Ronald, Human Capital and Economic Growth: Operationalising Growth Theory, with Special Reference to The Netherlands in the 19th Century (June 1997)
- GD-35\* Brinkman, Henk-Jan, J.W. Drukker and Brigitte Slot, GDP per Capita and the Biological Standard of Living in Contemporary Developing Countries (June 1997)
- GD-36 de Jong, Herman, and Antoon Soete, Comparative Productivity and Structural Change in Belgian and Dutch Manufacturing, 1937-1987 (June 1997)
- GD-37 Timmer, M.P., and A. Szirmai, Growth and Divergence in Manufacturing Performance in South and East Asia (June 1997)
- GD-38\* van Ark, B., and J. de Haan, The Delta-Model Revisited: Recent Trends in the Structural Performance of the Dutch Economy (December 1997)
- GD-39\* van der Eng, P., Economics Benefits from Colonial Assets: The Case of the Netherlands and Indonesia, 1870-1958 (June 1998)

- GD-40\* Timmer, Marcel P., Catch Up Patterns in Newly Industrializing Countries. An International Comparison of Manufacturing Productivity in Taiwan, 1961-1993 (July 1998)
- GD-41\* Ark, Bart van, Economic Growth and Labour Productivity in Europe: Half a Century of East-West Comparisons (October 1999)
- GD-42\* Smits, Jan Pieter, Herman de Jong and Bart van Ark, Three Phases of Dutch Economic Growth and Technological Change, 1815-1997 (October 1999)
- GD-43\* Fremdling, Rainer, Historical Precedents of Global Markets (October 1999)
- GD-44\* Ark, Bart van, Lourens Broersma and Gjalte de Jong, Innovation in Services. Overview of Data Sources and Analytical Structures (October 1999)
- GD-45\* Broersma, Lourens and Robert McGuckin, The Impact of Computers on Productivity in the Trade Sector: Explorations with Dutch Microdata (October 1999, Revised version June 2000)
- GD-46\* Sleifer, Jaap, Separated Unity: The East and West German Industrial Sector in 1936 (November 1999)
- GD-47\* Rao, D.S. Prasada and Marcel Timmer, Multilateralisation of Manufacturing Sector Comparisons: Issues, Methods and Empirical Results (July 2000)
- GD-48\* Vikström, Peter, Long term Patterns in Swedish Growth and Structural Change, 1870-1990 (July 2001)
- GD-49\* Wu, Harry X., Comparative labour productivity performance in Chinese manufacturing, 1952-1997: An ICOP PPP Approach (July 2001)
- GD-50\* Monnikhof, Erik and Bart van Ark, New Estimates of Labour Productivity in the Manufacturing Sectors of Czech Republic, Hungary and Poland, 1996 (January 2002)
- GD-51\* van Ark, Bart, Robert Inklaar and Marcel Timmer, The Canada-US Manufacturing Gap Revisited: New ICOP Results (January 2002)
- GD-52\* Mulder, Nanno, Sylvie Montout and Luis Peres Lopes, Brazil and Mexico's Manufacturing Performance in International Perspective, 1970-98 (January 2002)
- GD-53\* Szirmai, Adam, Francis Yamfwa and Chibwe Lwamba, Zambian Manufacturing Performance in Comparative Perspective (January 2002)
- GD-54\* Fremdling, Rainer, European Railways 1825-2001, an Overview (August 2002)
- GD-55\* Fremdling, Rainer, Foreign Trade-Transfer-Adaptation: The British Iron Making Technology on the Continent (Belgium and France) (August 2002)
- GD-56\* van Ark, Bart, Johanna Melka, Nanno Mulder, Marcel Timmer and Gerard Ypma, ICT Investments and Growth Accounts for the European Union 1980-2000 (September 2002)
- GD-57\* Sleifer, Jaap, A Benchmark Comparison of East and West German Industrial Labour Productivity in 1954 (October 2002)
- GD-58\* van Dijk, Michiel, South African Manufacturing Performance in International Perspective, 1970-1999 (November 2002)
- GD-59\* Szirmai, A., M. Prins and W. Schulte, Tanzanian Manufacturing Performance in Comparative Perspective (November 2002)

- GD-60\* van Ark, Bart, Robert Inklaar and Robert McGuckin, “Changing Gear” Productivity, ICT and Services: Europe and the United States (December 2002)
- GD-61\* Los, Bart and Timmer, Marcel, The ‘Appropriate Technology’ Explanation of Productivity Growth Differentials: An Empirical Approach (April 2003)
- GD-62\* Hill, Robert J., Constructing Price Indexes Across Space and Time: The Case of the European Union (May 2003)
- GD-63\* Stuivenwold, Edwin and Marcel P. Timmer, Manufacturing Performance in Indonesia, South Korea and Taiwan before and after the Crisis; An International Perspective, 1980-2000 (July 2003)
- GD-64\* Inklaar, Robert, Harry Wu and Bart van Ark, “Losing Ground”, Japanese Labour Productivity and Unit Labour Cost in Manufacturing in Comparison to the U.S. (July 2003)
- GD-65\* van Mulligen, Peter-Hein, Alternative Price Indices for Computers in the Netherlands using Scanner Data (July 2003)
- GD-66\* van Ark, Bart, The Productivity Problem of the Dutch Economy: Implications for Economic and Social Policies and Business Strategy (September 2003)
- GD-67\* Timmer, Marcel, Gerard Ypma and Bart van Ark, IT in the European Union, Driving Productivity Divergence?
- GD-68\* Inklaar, Robert, Mary O’Mahony and Marcel P. Timmer, ICT and Europe’s Productivity Performance, Industry-level Growth Accounts Comparisons with the United States (December 2003)
- GD-69\* van Ark, Bart and Marcin Piatkowski, Productivity, Innovation and ICT in Old and New Europe (March 2004)
- GD-70\* Dietzenbacher, Erik, Alex Hoen, Bart Los and Jan Meist, International Convergence and Divergence of Material Input Structures: An Industry-level Perspective (April 2004)
- GD-71\* van Ark, Bart, Ewout Frankema and Hedwig Duteweerd, Productivity and Employment Growth: An Empirical Review of Long and Medium Run Evidence (May 2004)
- GD-72\* Edquist, Harald, The Swedish ICT Miracle: Myth or Reality? (May 2004)
- GD-73\* Hill, Robert and Marcel Timmer, Standard Errors as Weights in Multilateral Price Indices (November 2004)
- GD-74\* Inklaar, Robert, Cyclical productivity in Europe and the United States, Evaluating the evidence on returns to scale and input utilization (April 2005)
- GD-75\* van Ark, Bart, Does the European Union Need to Revive Productivity Growth? (April 2005)
- GD-76\* Timmer, Marcel and Robert Inklaar, Productivity Differentials in the US and EU Distributive Trade Sector: Statistical Myth or Reality? (April 2005)

### **Groningen Growth and Development Centre Research Monographs:**

Monographs marked \* are also available in pdf-format on the internet: <http://www.ggdc.net/>

- No. 1\* van Ark, Bart, International Comparisons of Output and Productivity: Manufacturing Productivity Performance of Ten Countries from 1950 to 1990 (1993) (<http://www.eco.rug.nl/GGDC/ThesisArk.html>)
- No. 2 Pilat, Dirk, The Economics of Catch-Up: The Experience of Japan and Korea (1993)
- No. 3 Hofman, André, Latin American Economic Development. A Causal Analysis in Historical Perspective (1998)
- No. 4 Mulder, Nanno, The Economic Performance of the Service Sector in Brazil, Mexico and the United States (1999)
- No. 5\* Smits, Jan-Pieter, Edwin Horlings and Jan Luiten van Zanden, Dutch GNP and Its Components, 1800-1913 (2000) (<http://www.eco.rug.nl/GGDC/PUB/dutchgnp.pdf>)

