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# Reassessment of German Aggregate Wage Earnings in the Long Run

*Claude Diebolt\**

**Abstract:** This article produces a new estimate of aggregate wage earnings in Germany from 1810 to 1989.

Wages play a fundamental role in the determination of economic equilibria. They form an essential component of household incomes and have a direct effect in the setting of final demand and savings. Determinants in company production costs, their movements affecting the behaviour of businesses in price setting, employment and investment. Their multiple effects on physical flows and on monetary magnitudes mean that wages and the way in which they are set are central to the short-term regulation and long-term evolution of developed capitalist economies.

However, in Germany for example, although the statistics on wages and the occupations of workers are plentiful and varied, their heterogeneity and the gaps in them mean that it is not possible to obtain a rapid and accurate appraisal of the mass of wages distributed over a long period<sup>1</sup>. The difficulties increase further when breakdowns that display a degree of aggregation are required for specific subgroups: occupational sectors, professional categories, regions, etc.

Taking up this point, this article has one main purpose. It aims at developing a reassessment of the long-term movements of wages and wage-earners and thus to obtain an original estimate of aggregate wage earnings in Germany from 1810 to 1989.

The points are addressed in three parts. The first defines the concept of wages. The second presents the spatial field covered. The third describes the methodological constraints and shows our cliometric results.

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<sup>1</sup> Homogeneous information on wages in Germany only appeared in December 1935. „Von einer nennenswerten und brauchbaren amtlichen Lohnstatistik kann in Deutschland erst seit Dezember 1935 gesprochen werden.“ Hohls, R.: *Arbeit und Verdienst. Entwicklung und Struktur der Arbeitseinkommen im Deutschen Reich und in der Bundesrepublik*, Doctoral Thesis in History, Free University of Berlin, 11 February 1992, p. 10.

## 1. Wages

Study of the evolution of wages, wage-earners and wage earnings in Germany in the nineteenth and twentieth centuries requires the assembly of new sets of statistics<sup>2</sup>. As in our previous work<sup>3</sup>, we used a procedure inspired by cliometrics (cf. [www.cliometrie.org](http://www.cliometrie.org)).

The wages concept gave rise to complex problems throughout the nineteenth century. Very general definitions hide fundamental differences. The main uses of the term in everyday life, in political controversies or in scientific writing do not reflect an even approximate single reality. Two major viewpoints make wages either a purchasing power index that is fairly closely defined in relation to well specified material goods or, more broadly, a purely subjective index of well-being.

In the first notion, wages are the sum of the income of a person during a certain period of time. The second notion is much broader and covers monetary and non-monetary income. Thus a wage that has been defined is complemented by a whole series of services whose inclusion is not automatic in the first notion. This definition of wage refers to the notion of standard of living. In a broad sense it is seen as the counterpart of well-being. It is very interesting but, unfortunately, has a major disadvantage when it is applied as there is a two-fold difficulty. Firstly, that of the limit of the list of items to be included in the practical measurement of well-being and secondly the question of how to evaluate these items. A choice between the two concepts of wages must therefore be made.

For reasons of effectiveness, reference is made in this article to the traditional notion of wages as in the first concept, that is to say income drawn directly from a production-related occupation. However, we are aware that there is no single concept that can be used to match all the points of view. Indeed, the statistical definitions of the notion of wages are different in the various concepts. Moving on from there, we define the average wage of a population en-

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<sup>2</sup> See especially the article by K.H. Kaufhold on the state of knowledge (since 1930) in historical research on wages in Germany. Kaufhold, K.H.: „Forschungen zur deutschen Preis- und Lohngeschichte (seit 1930)“, in: Kellenbenz, H.; Pohl, H. (eds.): *Historia Socialis et Oeconomica. Festschrift für Wolfgang Zorn zum 65. Geburtstag*, Special issue of the journal *Vierteljahrschrift für Sozial- und Wirtschaftsgeschichte*, 84, 1987, pp. 81-101. Interested readers can also see Schulz, G.: Résultats, débats et nouveaux champs de travail: Nouvelles recherches sur l'histoire économique du XIXème et XXème siècles en Allemagne, in: *Revue historique*, 118 (1), 1994, pp. 191-206.

<sup>3</sup> See in particular Diebolt, C.: *L'évolution de longue période du système éducatif allemand: 19ème et 20ème siècles*, special issue of the journal *Economies et Sociétés, Cahiers de l'ISMEA, Série AF*, 23, 1997. We suggest that interested readers should also visit the website <http://www.histat.gesis.org>. This database (Online-Datenbank Historische Statistik) displays the main statistics produced by Claude Diebolt for Germany in the nineteenth and twentieth centuries.

semble made up of several categories (e.g. occupational categories: managers, office workers, labourers, etc.) as being the sum of the average wages of each category weighted by the numbers in each category. Then movement of the average wage of the population depends not only on the movements of the average wage in each category but also on the changes in the proportion of managers, office workers, labourers, etc. The latter feature is referred to as the structure effect and depends in turn on the choice of categories, that is to say the way in which the population is assembled. The quality of historical reconstruction depends in turn on the availability of homogeneous, reliable statistics. However, this is far from being certain for the long period<sup>4</sup>.

## 2. Reference territory

For the pre-1945 period, our work is based on the states that formed the German Empire as proclaimed in Versailles on 18 January 1871 and whose territorial cover dates back to the Congress of Vienna, and more precisely to the setting up of the German Confederation, whose Final Act was signed on 8 June 1815. Particular attention is paid to the state of Prussia that first played a guiding role in the economic development of Germany and then turned German unity to its benefit.

For the period running from after World War 2 until the fall of the Berlin Wall on 9 November 1989, marking the end of the study, attention is paid solely to the Federal Republic of Germany (FRG), founded on 8 May 1949. This takes into consideration the structural phenomena reflecting territorial and institutional changes, evolution of behaviour and economic changes. It therefore has fragile components that make the extension of the old trends delicate. However, given the importance of the changes that have affected the German socioeconomic system since 1945, understanding the contemporary system requires information about its post-war developments.

## 3. Calculation of wages series

Quantitative study of the movements of wages over a long period concerns wage-earners only. Numerous factors cause changes in this population: total population, the proportion of workers and the proportion of wage-earners.

In fact, the switch from working population to wage-earning population was not immediate as employment structures differed in the various German states

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<sup>4</sup> See in particular Scholliers, P.; Zamagni, V. (eds.): *Real Wages in the Nineteenth and Twentieth Centuries*, 11th International Economic History Congress, Università Bocconi, Milan, 1994.

throughout the nineteenth century<sup>5</sup>. Furthermore, the proportions of agriculture, industry and services varied according to the reference area<sup>6</sup>. This being so, reliable estimates of the evolution of the wage-earning population and hence the employment earnings<sup>7</sup>, only really started with the founding of the German Empire<sup>8</sup>.

The nominal wages series is completely original. As far as we know, it is the longest series drawn up to date on the annual movements of wages in Germany:

- 1810 to 1870: it is constructed using statistical information available for Prussia and is based on the preliminary estimates made by Gömmel<sup>9</sup>, Hoffmann<sup>10</sup> and Kuczynski<sup>11</sup>;
- 1871 to 1945: data from German Empire records and from our work on the invalidity and old age system<sup>12</sup>; this discusses and deepens the publications of Bry<sup>13</sup>, Desai<sup>14</sup> and Hohls<sup>15</sup>;

<sup>5</sup> See Hohls, R.; Kaelble, H.: *Die regionale Erwerbsstruktur im Deutschen Reich und in der Bundesrepublik 1895-1970*, Scripta Mercaturae Verlag, St. Katharinen, 1989.

<sup>6</sup> See Grumbach, F.; König, H.: „Beschäftigung und Löhne der deutschen Industriegewirtschaft 1888-1954“, in: *Weltwirtschaftliches Archiv*, vol. 79, No. 1, 1957, pp. 125-155.

<sup>7</sup> Wage earnings (at constant prices) are calculated using the following formula:

$$WE = NWE \times (AAW/P), \text{ in which:}$$

- WE = wage earnings;
- NWE = number of wage earners;
- AAW = average annual wage;
- P = price index.

<sup>8</sup> See Kaiserlich Statistisches Amt, Abteilung für Arbeiterstatistik (ed.): „Deutsches Reich“, in: *Beiträge zur Arbeiterstatistik Nr. 1. Die Fortschritte der amtlichen Arbeitsstatistik in den wichtigsten Staaten. Erster Teil: Vereinigte Staaten von Amerika, Großbritannien und Irland, Frankreich, Belgien, Österreich, Deutsches Reich*, C. Heymanns Verlag, Berlin, 1904, p. 176.

<sup>9</sup> See Gömmel, R.: *Realeinkommen in Deutschland. Ein internationaler Vergleich*, Aku-Fotodruck GmbH, Nürnberg, 1979.

<sup>10</sup> See Hoffmann, W.G.; Müller, J.H. unter Mitarbeit von H. König; K. Döring; J. Dohmen; R. Goldschmidt; F. Grumbach; A. Hölling; A. Hülden: *Das Deutsche Volkseinkommen 1851-1957*, J.C.B. Mohr, Tübingen, 1959. Hoffmann, W.G. et al.: *Das Wachstum der deutschen Wirtschaft seit der Mitte des 19. Jahrhunderts*, Springer-Verlag, Berlin, 1965.

<sup>11</sup> See Kuczynski, J.: *Die Geschichte der Lage der Arbeiter unter dem Kapitalismus*, 38 Vol., Part 1: *Die Geschichte der Lage der Arbeiter in Deutschland von 1789 bis zur Gegenwart*, 21 Vol., Akademie-Verlag, Berlin, 1961-1972.

<sup>12</sup> See Diebolt, C.: „Le système d’invalidité et de vieillesse en Allemagne avant la Première Guerre mondiale“, in: *Economies et Sociétés*, Série AF, 26, 2000, pp. 135-155.

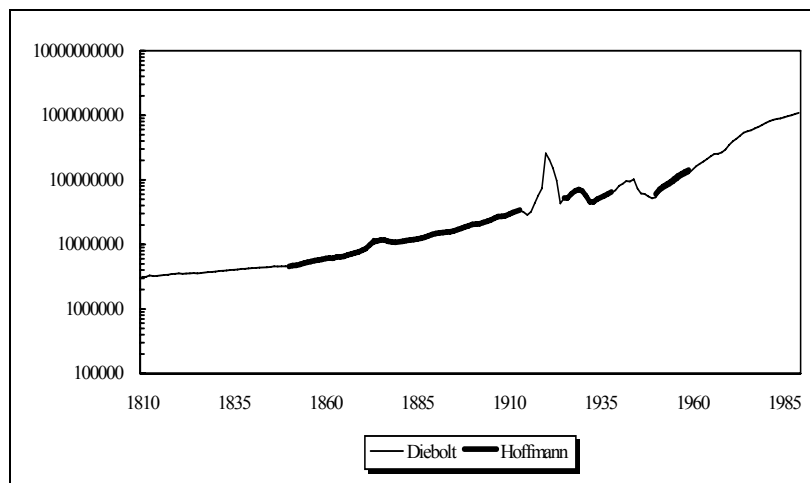
<sup>13</sup> See Bry, G. assisted by C. Boschan: *Wages in Germany 1871-1945*, N.B.E.R., Princeton, 1960.

<sup>14</sup> See Desai, A.V.: *Real Wages in Germany 1871-1913*, At the Clarendon Press, Oxford, 1968. A.V. Desai’s statistical series are considered by the international community as being those most representative of the movement of wages in Germany before 1914. „Einzig Desais Lohnreihen aus dem Jahre 1968 [...] wurden aber bisher von der Literatur als am repräsentativsten für das kaiserliche Deutschland angesehen.“ Hohls, R.: *Arbeit und Ver-*

- after 1945: annual data were compiled from Hohls' doctoral thesis<sup>16</sup> and the GFR National Statistics Office yearbooks<sup>17</sup>.

As our estimation of a new series of statistics for wage earnings has a central position in our research in quantitative history, it seemed opportune to compare the series with other series, and especially those compiled by Hoffmann (1959 and above all 1965). It is seen clearly that our evaluation gives much the same results as that of Hoffmann (see figure below) as the shapes of the curves are practically identical.

Aggregate Wage Earnings in Germany, 1810-1989 (in Log.)



*dienst. Entwicklung und Struktur der Arbeitseinkommen im Deutschen Reich und in der Bundesrepublik*, op. cit., p. 87.

<sup>15</sup> See Hohls, R.: *Arbeit und Verdienst. Entwicklung und Struktur der Arbeitseinkommen im Deutschen Reich und in der Bundesrepublik*, op. cit., 683 pp.

<sup>16</sup> See Hohls, R.: *Arbeit und Verdienst. Entwicklung und Struktur der Arbeitseinkommen im Deutschen Reich und in der Bundesrepublik*, op. cit., 683 pp.

<sup>17</sup> See Statistisches Bundesamt (ed.): *Bevölkerung und Wirtschaft. Langfristige Reihen 1871 bis 1957 für das Deutsche Reich und die Bundesrepublik Deutschland*, W. Kohlhammer, Stuttgart, 1958, Statistisches Bundesamt (ed.): *Bevölkerung und Wirtschaft 1872-1972 (Herausgegeben anlässlich des 100jährigen Bestehens der zentralen amtlichen Statistik*, W. Kohlhammer, Stuttgart, Mainz, 1972, Statistisches Bundesamt (ed.): *Statistisches Jahrbuch 1990 für die Bundesrepublik Deutschland*, Metzler-Poeschel, Stuttgart, 1990, Statistisches Bundesamt (ed.): *Volkswirtschaftliche Gesamtrechnungen, Fachserie 18, Reihe 1.1: Konten und Standardtabellen*, éd. 1990: *Erste Ergebnisse der Sozialproduktberechnung*, Metzler-Poeschel, Stuttgart, 1991, and Statistisches Bundesamt (ed.): *Volkswirtschaftliche Gesamtrechnungen, Fachserie 18, Reihe S.7: Lange Reihen 1950 bis 1984*, W. Kohlhammer, Mainz, Stuttgart, 1985.

However, our estimation covers a much longer period, totalling 180 years against the 118 examined by Hoffmann. The log scale used also allows better display of the slight differences between the two chronological series. Hardly any differences in rate can be seen between the two statistical series. This is easily explained by the fact that the sources we use are mainly the same as those available in Hoffmann's time. Nevertheless, it can be seen that Hoffmann's evaluations for the period following World War 2 are doubtless overestimated<sup>18</sup> in comparison with the more recent figures produced by the *Statistisches Bundesamt*.

## Conclusion

For the measurement of economic growth, the raw material of retrospective national accounting is a regular quantity of information and a sufficiently homogeneous sum of items for making comparisons in time and space. The drawing up of statistical series on the long-term evolution of wages, wage-earners and wage earnings in Germany in the nineteenth and twentieth centuries is part of this process of contributing new information. Indeed, a long period is an excellent observation window because it facilitates—in its own way—the understanding of contemporary economic growth.

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<sup>18</sup> Concerning the overestimation question see also Ritschl, A.; Spoerer, M.: „Das Bruttosozialprodukt in Deutschland nach den amtlichen Volkseinkommens- und Sozialproduktsstatistiken 1901-1995“, in: *Jahrbuch für Wirtschaftsgeschichte*, 2, 1997, pp. 27-54.

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