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Veröffentlichungsversion / Published Version

Zeitschriftenartikel / journal article

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Empfohlene Zitierung / Suggested Citation:

Faria, V. d., & Diebolt, C. (2000). Trends in public employment and wages: the case of France in the nineteenth and twentieth centuries. *Historical Social Research*, 25(1), 3-24. <https://doi.org/10.12759/hsr.25.2000.1.3-24>

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Trends in Public Employment and Wages The Case of France in the Nineteenth and Twentieth Centuries

*Vivien de Faria & Claude Diebolt **

Abstract: The conjunctural swing in the early 1970s resulted in new Research on long waves of the 'Kondratieff type. Previous theories seemed to have lost their explanatory power when confronted with the atypical fluctuations of certain variables (prices, production, etc.). It became necessary to formulate and verify new hypotheses to explain the original features of the structural crisis that was assuming shape. The present paper in part responds to this need. It postulates a relation between expenditure on human development (wages, education, health care, etc.) and on material growth. We assume that there was a qualitative development of the labour force until 1945 during long phases of economic difficulties; subsequently, this development tended to worsen during prosperous periods. This phenomenon is explained by the hypothesis that until the eve of World War II, the development of the socio-economic system was based on an alternation between the quantitative development of material accumulation and employment on the one hand, and the qualitative development of labour force and capital through technological innovation on the other hand. This qualitative development of the labour force during the long depression phase may account for the strong increase in expenditure on human development. Newly created conditions made it possible to take into account the necessary development of the labour force – especially the development of its qualitative aspect; this structural change could render the productive forces more efficient, thus opening the way for a new accumulation cycle. The reversal of the cycle after

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World War II, with strong growth during the prosperity phase and slower growth since 1973, raises the question if the regulation process has possibly been reversed. This change may show that, after all, human development does not have the edge over the development of material accumulation as the major determinant of economic growth. The study on the development of wages over a long period of time should provide an answer to these issues.

»During the last half century, governments nearly everywhere have become more powerful influences in economic life. As yet, however, little is known in quantitative terms about the size governments have attained, the rapidity of their growth, what functions they have assumed, how large these functions loom, and what differences can be observed among countries. [...] to the more general question of the role of government in economic life, we should recognize that the relation of the state to the economy has two aspects. First of all, governments act as economic agent. That is to say, they participate directly in the activities of the economy. They buy goods, hire Labor and other productive factors, and organize them for the output of goods and services. Some of this output is sold, some given away, and much of it applied to public purposes of a more diffuse or intangible sort. [...] The second aspect of government in its relation to economic life is its more obvious influence as a regulator, that is, as a political agent.«¹

Introduction

Since the beginning of the twentieth century, the development of the theory of marginal productivity provides arguments for those trying to establish the so-called impossibility of a general raise of wages². Contrary to such statements, the works of the national accountants³ and especially of the theorists of economic cycles⁴ show that, for the period preceding World War II,

¹ Abramovitz, M., Eliasberg, V.F.: *The Growth of Public Employment in Great Britain*, N.B.E.R., Princeton, 1957, pp. 3-4.

² Cf. Mossé, R.: *Les salaires*, Librairie Marcel Rivière & Cie, Paris, 1952.

³ Cf. notably Bry, G., assisted by C. Boschan: *Wages in Germany 1871-1945*, N.B.E.R., Princeton, 1960.

⁴ Cf. particularly Dupriez, L.H.: *Des mouvements économiques généraux*, 2 Vols, Nauwelaerts, Louvain, 1947, and Simiand, F.: *Le salaire, l'évolution sociale et la monnaie. Essai de théorie expérimentale du salaire*, 3 Vols, F. Alcan, Paris, 1932.

wages evolve like prices and production and, though less clearly, real wage development reveals a reversed cycle.

From a macro-economical point of view, this hypothesis is important and should be tested especially to check the dynamic relations between salaries and economic growth. However, in the last sixty years, despite numerous interesting theoretical works⁵, empirical knowledge about the long-term evolution of French salaries has hardly made any progress⁶. Indeed, testing this hypothesis implies developing new statistical means. In order to do so, methods of quantitative history are useful. They sum up economic operations by counting, with flows and Stocks, the diverse complex relations between economic aggregates to calculate the national product. Within this system, salaries play an important role because they are a remuneration of the production factor, a means of redistribution and a component of global demand. In this sense, salaries have a fundamental share in achieving economic equilibrium. As an essential component of a household's income, it determines final demand and savings; as a decisive element of a firm's production costs, its evolution influences the firm's behaviour in such areas as price fixing, employment and investment. Through multiple action in physical flows as well as in monetary ones, salaries and their ways of determination play a central part in the short-term regulation and long-term growth of capitalist economies. The present paper deals with the following issues.

- The constitution of a statistical aggregate always depends on a theoretical system. The one underlying this study has already been the subject of extended research. Therefore, in the first part of this paper, our principal theoretical hypothesis will be re-outlined only briefly.
- Even while today's economists can rely on statistical series to serve their current interest, this might not be the case for historical economics. This type of economic research can dispose of many, sometimes very rich, statistical data, which had been generally conceived for other purposes. This issue will be addressed in the second part.
- In the third part, there is an attempt to estimate the evolution of wages and employment in France's civil service in the 19th and 20th centuries. This can serve as a starting point for establishing a national index of the French evolution of wages. By relating this to already available series, we should be able to validate or invalidate the general nature of the evolution already observed.

⁵ Cf. notably Boyer, R.: »Les salaires en longue période«, in : *Economie et Statistiques*, No. 103, 1978, pp. 27-57, and Fontvieille, L.: »The Labor Force in Long-Term Fluctuations«, in: *Review*, Vol. 10, No. 3, 1987, pp. 535-585.

⁶ Cf. Diebolt, C.: »Contribution to the Analysis of Kondratieff Cycles. The Quantitative History of Wages in France and Germany in the Nineteenth and Twentieth Centuries«, *European Association of Labour Economists*, 7th Conference, Lyon, 7th-10th September, 1995, 20 pages.

1. Hypothesis

Since the discovery of long cycles in prices and production at the beginning of the twentieth century, the determination and interpretation of economic movements have involved numerous statistical and theoretical demonstrations. All contributions can be conventionally divided into two categories depending on whether the authors propose exogenous or endogenous causes. The long cycle theories involving exogenous causes can be divided into monetarist explanations, explanations in which wars play a fundamental role and explanations based on agricultural prices. Exogenous explanations were initially more numerous, but have been decreasingly proposed as the fundamental cause of long cycles.

By developing a theory of investment cycles, N.D. Kondratieff⁷ was the first to put forward the idea that long cycles originated in the very functioning of the economic system. An increase in saving increases the possibility for investing available capital and causes the long upward period. Reduction in saving reduces investment and causes the downward swing.

J.A. Schumpeter⁸ enriched the Field of interpretation of long cycles by introducing the role of innovations. Grouped in time and concentrated in a few branches of industry, innovations govern regular cycles. They first tend to attract capital; then, the diffusion of the innovations to the whole of the economy modifies the economic balance and increases the risk of failure for the next innovations. The economy must go through a recession process to assimilate the progress of the upward phase before the system approaches equilibrium again and allows for new innovations.

From 1945 to 1970, in spite of notable work by G. Imbert⁹ and U. Weinstock¹⁰, less attention was paid to research on long movements of the economy because of the continuous growth observed in the economies of developed countries and due to the domination of Keynesian thinking. With the changing situation in the early 1970s and renewed research on long cycles, the theories resulting from the work of J.A. Schumpeter started circulating more

⁷ Cf. Kondratieff, N.D.: »Die langen Wellen der Konjunktur«, in: *Archiv für Sozialwissenschaft und Sozialpolitik*, Vol. 56, No. 3, 1926, pp. 573-609.

⁸ Schumpeter, J.A.: *Business Cycles. A Theoretical, Historical and Statistical Analysis of the Capitalist Process*, 2 Vols, McGraw-Hill Book Co., London, 1939.

⁹ Cf. Imbert, G.: *Les mouvements de longue durée Kondratieff*, La Pensée Universitaire, Aix-en-Provence, 1959.

¹⁰ Cf. Weinstock, U.: *Das Problem der Kondratieff-Zyklen. Ein Beitrag zur Entwicklung einer Theorie der »langen Wellen« und ihrer Bedeutung*. Duncker & Humblot, Berlin, 1964.

widely. Major work on the subject stressed the role of the rhythm of investment and innovation¹¹. The underlying concept of Neo-Schumpeterian logic is that the appearance of new products or processes during the long depression phase causes a flow of investment because of the renewal of equipment and results in stimulation of economic activity. When the renewal is completed, the investment flow decreases again and causes a new period of depression. Although a Neo-Schumpeterian analysis allows for a preliminary approach to reality, it is not sufficient to account for the whole complexity of the cyclical phenomenon. In particular, it skirts the problem of human development during the phase of economic difficulties.

The theory of systemic regulation of the economic system developed at Montpellier I University extends the analysis by introducing the link between expenditure on human development (education, wages, health care etc.) and material growth¹².

We put forward the idea that there was a qualitative development of the labour force during the downward phases of Kondratieff cycles until about 1945, which tended to deteriorate during the phases of prosperity. This phenomenon is explained by the hypothesis that until the eve of World War II, the development of the economic system was based on an alternation between the quantitative development of material accumulation and employment on the one hand, and qualitative development of the labour force and capital through the process of technological innovation on the other hand. In fact, this qualitative development of the labour force during the long depression phase could account for the strong growth of expenditure on human development (education, wages, pensions, etc.). By setting up new conditions, making it possible to take into account the development of men and women, the structural transformation appears to confer greater efficiency upon the productive forces, thus paving the way for a new accumulation cycle.

After 1945, the strong increase in expenditure on human development during the phase of prosperity from 1945 to 1973 and that of slowed growth after 1973 leads to supposing that human development is tending to become dissociated from the economy and becoming one of the driving forces of growth, and possibly the driving force. Consequently, the changes that took place at the turning point formed by World War II would be such that the initial hypotheses no longer explain the evolution of the system. Insofar as they define the mode of regulation of the socio-economic system, the regulation mode itself may

¹¹ Cf. Mensch, G.: *Das technologische Patt. Innovationen überwinden die Depression*, Fischer Taschenbuch Verlag, Frankfurt am Main, 1977.

¹² Cf. Diebolt, C.: *Développement des Hommes et croissance économique*, Habilitation Diss. in Economics, Université Montpellier I, October 1998, 302 pages.

have changed from one period to another. Studies on wages over a long period of time can shed light on the subject¹³ It should not be forgotten that the dominant feature of the growth of the economic system since the beginning of the nineteenth century is the development of wage-earners. It is therefore difficult to try to understand growth and the structural changes involved without an in-depth study of the wage-earning population, the way in which it is sustained and in which it developed. Indeed, wages play a basic role in the determination of economic balances. They are an essential component of household incomes and have a direct effect on the levels of demand and saving. They are a determining component in company production costs and their movements affect company behaviour regarding price fixing, employment and investment. The many-faceted effects of wages and the way in which they are determined on physical flows and on monetary scales are central to short-term regulation and the Long-term evolution of developed capitalist economies.

II. The Long Period Evolution of Wages A Poorly Mastered Question

Wages are one of the key variables in the economy. Paradoxically, they are also a poorly known variable, especially in the Long term. There is currently no pertinent macro-economic appraisal of wages and payroll costs in France. Historians have not subjected the issue to synthetic work, and of all the economists before World War II who centred their work on long cycles of the economy, F. Simiand¹⁴ is the only one to have approached the study of wages over a long period. He revealed that the long-term development of wages moved in the same direction as the price trend and, with less certitude, put forward the hypothesis of an inverse real wages cycle. This hypothesis is extremely significant and all efforts should have been made to settle possible doubts. However, in the past sixty years research has made little progress. The purpose here is to fill the gap by proposing new statistics to shed quantitative light on the successive stages in long changes of wages and payroll costs in France.

Indeed, better exploitation of available sources should make it possible to obtain the following results:

- evaluation of wages and payroll costs at national level with classification according to major sectors: industry, agriculture, administration and services;

¹³ Cf. De Faria, V.; Diebolt, C.: »Histoire quantitative et cycles économiques. Enquête sur les salaires de la fonction publique en France aux 19ème et 20ème siècles«, in: Archambault, E.; Boeda, M. (eds.): *Comptabilité nationale. Nouvelles frontières*, Economica, Paris, pp. 101-116.

¹⁴ Cf. Simiand, F.: *Le salaire, l'évolution sociale et la monnaie...*, 1932.

- fuller information on individual wages: wage rates and actual wages, nominal and real wages, wage rankings, forms of remuneration, etc.;
- data for international comparisons thanks to their incorporation into the European network for the study of wages.

The production of new, organised information should make it possible to both verify hypotheses concerning the links between human development and economic growth and make progress in the ongoing conceptualisation in this field. In addition, the included appraisal of the labour force would contribute to the determination of national income, which is still lacking today. However, before presenting the actual research, it is pertinent to recall that the concept of wages raises thorny problems. Indeed, definitions generalised to a high degree hide fundamental differences. The main uses of the term 'wage' in everyday life, in political controversies and scientific writings are far from reflecting only one version of reality.

Two broad concepts of wages present 'wage' either as a purchasing power index that is quite narrowly defined in relation to clearly specified material resources or, more broadly, as a purely subjective index of well-being. In the first concept, wages are the income in money and in kind received by a person over a certain period of time. The second concept is much broader and covers monetary and non-monetary income. The wages defined above are therefore complemented by a whole series of services not necessarily included in the first concept. The second definition of wages refers to the notion of living standard and, in its broadest definition, embodies the counterpart state of well-being. Although it is an interesting concept, its application has major disadvantages. There are two difficulties: first, the limit of the features to be included in the practical measurement of well-being; and, second, how to appraise these factors. A choice must therefore be made between the two concepts of wages. For reasons of efficiency, in the purely statistical part of this research reference is made to the traditional notion of wages, i.e. that of income drawn directly from a production-related occupation and redistribution transfers. Income from property is therefore excluded a priori from the original definition of national accounting. Nevertheless, in the theoretical discussion reference is made to a broader definition of wages, thus moving closer towards the second concept.

III. Methodology

Checking theoretical hypotheses requires new statistical sets, in order to describe the form and content of wages in France in the 19th and 20th centuries. The methods of quantitative history launched in the 1960s by S. Kuznets and F. Perroux are essential for reaching this aim. They consist of assembling historical facts in homogenous, comparable time units in order to measure changes in intervals of time (generally annually). The advantage

of this method is that the moment of operation of the observer's choice is shifted. Instead of acting while observing the reality to be described, he operates during the construction of the reference system serving in the recording of facts rendered conceptually homogeneous. This methodology should allow for an empirical verification or the rejection of initial hypotheses hinged on the pattern of theoretical interpretation.

1. Quantitative history

Empirical verification of the hypotheses concerning the role of wages in cyclical movements of the Kondratieff type is based on quantitative history methods applied on an extensive long-term basis.

However, a map is not the area it plots, and care must be taken not to confuse reality and its description. The approach is not applicable to isolated historical events. It is used to describe the history of the masses, but is not sensitive to the history of the heroes. It is only an image of reality and does not draw all of reality's contours. Quantitative history does not aim at replacing traditional descriptive history. On the contrary, the two forms of historical investigation are strictly complementary and hence indispensable for a better knowledge of the past. The application of quantitative methods to wages can nevertheless profoundly renew the terms that have progressively become legitimate. The great merit of statistical formalism is that it allows for the examination of the logical and quantitative consequences of historical proposals, which could not be obtained by a discussion based on literary documents and the like.

The proposed study on wages has two advantages. Firstly, it is of immediate practical interest as it is an original, completely new reconstruction of wages in France. It is also of theoretical interest as it provides better knowledge of the mechanisms governing the long development of wages and payroll costs. We are nevertheless aware that the statistical work provides only the quantitative aspect of changes in structure. Although it is important, it is not sufficient to provide the complete picture of the sequence of facts.

The decisive role of deductive theories in empirical research must therefore be stressed. Starting with a general idea, they attempt at identifying symptoms in reality by means of a chronological series of statistics. Like the Frankfurter Gesellschaft für Konjunkturforschung (founded in 1926 by E. Altschul), we recommend an economic semiology that would implement the results of statistical research and deductive reasoning of the theory.

There is no conflict or compartmentalisation between empirical research and deductive theory; on the contrary, these disciplines are only truly valuable individually if they draw on each other's results. The validity of the theoretical hypotheses thus depends both on their external coherence, i.e. on their conformity with real facts, and their internal coherence, i.e. their ability to provide one or more solutions to the raised questions. The theory

of general equilibrium is extremely significant in this respect. It has given rise to much work concerning the validity of its bases and of the teachings drawn from it. In contrast, research on the existence of a solution has been carried out by only a handful of specialists. Here, it is still possible to discuss the coherence of a theoretical hypothesis, but it is more important to submit it to empirical verification.

1.1. The scope of quantitative history

Quantitative history aims at drawing up a general macroscopic synthesis by constructing models integrated at the national level with the prospect of possible links between several national models. This requires a succession of research operations, the most important of which is the creation of chronological data series covering the whole of the period under consideration.

The initial work consists of sorting dozens or even hundreds of volumes of old statistics. The figures are transcribed and reclassified using a pre-established model (e.g. using national budget items). This meticulous research is a question of doing rather than learning and is carried out in the silence of archives and libraries. The classifications used in statistical documents change according to the year and the recording administration. It is necessary at all times to exert some judgement to decide on the matching of the original item and the item under which the figure is to be transcribed.

1.2. The quantitative history method

The quantitative history method applies when a large number of causes and their complexity and intermingling make the use of experimental methods impossible. The moment at which the observer's choice intervenes is shifted. Instead of being set during observation of the reality to be described, it applies during the elaboration of the system of reference used to count facts thus rendered conceptually homogeneous. The definition just given essentially consists of three main phases:

- collection of documents;
- analysis of the data collected;
- interpretation of the results.

The first phase is mainly descriptive in order to prepare the real work of the researcher by co-ordinating the collected information. It is a preliminary task required for a serious analysis. All the documents related to the field of study are assembled. The data from archived documents must not be merely recorded, but have to be subjected to intelligent, perspicacious criticism. Some are discarded when considered unreliable; others must be corrected when their interpretation reveals sources of error. Finally, estimates may be required to fill gaps. The final results are assembled in a statistical table.

Having arrived at this mass of numerical information, the researcher must then put the figures in a logical order and classify them according to a previously established nomenclature. The data are reduced, substituted by a small number of representative series drawn by calculation from the ordered mass of numerical data.

The third and final interpretation phase consists of drawing conclusions from the analysis. It is a decisive stage as here an attempt is made to explain the observations. There is a vast scope of interpretative possibilities, ranging from merely checking hypotheses to forecasting future developments.

One has to be aware that the conclusions drawn from the analysis of the statistical sets contain a degree of uncertainty. Also the degree of the validity of the general observations has to be considered. Quantitative history is a long, slow process that is never free from difficulties. There are hesitations to overcome and problems to solve at every stage, as each new research operation is a new beginning and there are decisions that can only be taken alone.

2. The case of France

One of the most serious problems in quantitative history is that of drawing up pertinent, clearly classified and exhaustive accounts. 'Exhaustive' does not mean that everything in the reference documents should be reported. The analysis must be selective within the target area. The accounts must be well classified without serious gaps. It would of course be easier to identify extreme positions in each dimension, but this would stress only the clearest situations and hide any nuances in the analysis. For the French case, the project proposed can be divided into five research sources.

1) Public accounts, including the Budgets submitted to the parliamentary assemblies, the general account (*Compte Général de l'Administration des Finances*) drawn up by the financial administration and ministerial reports, form one of the main national sources of information of wages that has hardly been exploited. Budgets, ministerial reports and even the general account give details of salaries and wages paid by departments and according to staff category and specify the corresponding numbers of personnel. The *Compte Général* plots annual movements of all state financial services. It consists of two categories of documents: 'general accounts' and 'special accounts'.

2) The statistics administration called 'Statistique Générale de la France' (S.G.F.) is also a significant source of pre-1945 information. In 1911 it published a work entitled *Salaires et coût de l'existence à diverses époques* (wages and cost of living during various periods). It contains in particular a nominal wages index for the whole of France with base 100 in 1900 and set out at regular intervals (every ten years from 1810 to 1850 and then every five years from 1850 to 1910). After 1945, essential statistical documents include those of the

Institut National de la Statistique et des Etudes Economiques (I.N.S.E.E.) and the *Centre d'Etude des Revenus et des Coûts* (C.E.R.C.).

3) As an extension of the *Enquête Charbon* (Coal Survey) performed at Montpellier I University, it is also possible to use one of the main French sources on wages data, the 'Statistique de l'Industrie Minerale' (S.I.M.) (Mining Industry Statistics), starting on April 23rd, 1833. The S.I.M. gives employment figures, the number of working days and the wages paid in each department possessing coal mines from the middle of the nineteenth century until the present day. The main advantage of this statistical source lies in the three following characteristics: the length of the period covered, the processing of information at the department level and the number of sets of statistics assembled. The richness of S.I.M. data has not escaped the attention of certain researchers and university workers. F. Simiand's doctoral thesis published in 1904 (*Les salaires des ouvriers des mines en France*) is based solely on data drawn from the S.I.M. Later, in *L'industrie française de 1789 à 1964*, T.J. Markovitch used the S.I.M. for work by the *Groupe de Recherche en Histoire Quantitative de l'Economie Française*. During the same period, J. Bouvier, F. Furet and M. Gillet used the S.I.M. to complete their sorting of records for their work on *Le mouvement du profit en France au 19ème siècle*. I.N.S.E.E. has also used S.I.M. data, especially in its 1951, 1961 and 1966 retrospective yearbooks. These references are by no means exhaustive and are only intended to show the importance of the *Statistique de l'Industrie Minerale* as a source of research in quantitative history.

4) In addition, the mining engineers' reports drawn up to fix mine dues provide information on concessions running back to 1810. These annual reports on each mine generally provide more detailed and richer information than the S.I.M..

5) Students' papers and theses and economists' and historians' research programmes form another important source of information for work on wages and wage earners over long periods of time, although it naturally does not provide the homogeneity of the preceding sources. To the best of our knowledge, researchers have never drawn up a synthesis of wages, but their work often contains sets of figures or, more simply, original statistical information. Such data, produced within the framework of very diverse work and not primarily aimed at examining wages, may concern a wage-earning category, a company, a region or a town, wage levels or payroll costs, and they cover different time spans. The great dispersion of these data sets, the difficult access and their heterogeneity mean that they have been little used. However, assembling, classifying and entering them into the Computer should be an interesting tool for analysing long periods of wage development. It is unlikely that the Sets can be used to establish a national index of trends in nominal or real wages or even on index of payroll costs. However, when related to state or coal industry statistics, they should make it possible to confirm or call into question the general

form of the trends observed at both geographical levels and that of wage rankings.

In this paper, the study on the salaries of French civil servants in the 19th and 20th centuries will throw some light on this aspect. It should enable us to close a statistical gap in the cyclical evolution of French wages in the 19th and 20th centuries. Our main national sources are *Le Compte Général de l'Administration des Finances* and the *Comptes définitifs rendus par les Ministres*. It is strange that these documents have hardly been exploited so far. According to A. Vivien, the reason is political rather than technical since the documents display an inventory of the spending on wages as well as the number of staff. As a matter of example, "the article 22 of the budget of 1849 required from the government the publication of the full report of all its personnel spending. The government never complied because, it said, the publication would be too costly".¹⁵ Consequently, there has been almost no research on the long-term growth of public wages in France so far. They started only in the second half of the 20th century, but remain incomplete. The aim of this paper is to partly fill this gap. To our knowledge, despite all the papers dedicated, through half of the century, to studies on the growth of the French civil service, there is no in-depth and quantitative research on the origin of this phenomenon. Most papers simply acknowledge this development and consider its explanation as obvious. We do not agree with such a superficial explanation. Rather, the growth of the civil service and especially the evolution of wages require new empirical and theoretical validation.

Concerning the 19th century, the wages series compile the ordinary spending of the ministers of Justice, Foreign Affairs, Home Office and Religious Affairs, Colonies, Trade and Agriculture, Education and Culture, Public Work and Finances¹⁶. For the years 1918 to 1969, we used the series calculated by L. Fontvieille¹⁷. From 1970 onward, we calculated the salaries with the help of the index of gross and net public wages completed by D. Quarré series¹⁸.

The series concerning the salaries of the civil service were calculated from the *Comptes définitifs rendus par les Ministres* for the period before 1914 and with the help of A. Tiano¹⁹, P. Flora²⁰ and D. Quarré²¹. The retail price figures

¹⁵ Cf. Vivien, A.: *Etudes administratives*, 2 Vols, Librairie Guillaumin & Cie, Paris, 1852, p. 178.

¹⁶ Cf. De Faria, V.: *Les salaires de l'Etat en France aux 19ème et 20ème siècles*, PhD Diss. in Economics, Université Montpellier I, forthcoming.

¹⁷ Cf. Fontvieille, L.: »Evolution et croissance de l'Etat français: 1815-1969«, in: *Economies et Sociétés*, Serie AF, No. 13, 1976, pp. 1655-2149.

¹⁸ Cf. Quarré, D.: »Annales statistiques de la fonction publique: 1945-1969-1990«, in: *INSEE Resultats*, No. 169-170, 1992.

¹⁹ Cf. Tiano, A.: *Le traitement des fonctionnaires et leur détermination (1930-1957)*, Génon, Paris, 1957.

²⁰ Cf. Flora, P.; Kraus, F., Pfenning, W.: *State, Economy, and Society in the Western Europe 1815-1975. A Data Handbook in Two Volumes, Vol. II: The Growth of Industrial Societies and Capitalist Economies*, Campus Verlag, Frankfurt, 1987.

were calculated from J. Singer-Kérel's²² estimation and the data from INSEE²³. Annual total population figures are the official ones as established by the census²⁴. The gross national product (GNP) was calculated by J.C. Toutain²⁵. The results should allow for a general view on the evolution of French civil service staff wages in the 19th and 20th centuries.

IV. Empirical Results

In this paper, emphasis will only be placed on the main breaks, already recognisable through the observation of the raw series. Beyond revealing the long-term growth of central civil service staff and average wages (see Figures 1, 2, and 3), the biggest achievement of this study is the detection of a long, Kondratieff-like wave.

However, the long and reverse fluctuation of the wages as proposed in the first part can not be seen (see Figure 4). Its evolution seems to be independent of the economic situation. It can not be concluded that there is a cyclical movement. We can nevertheless find some interesting elements concerning the structural transformations of salaries and their conditions of reproduction. The weak increase in the average wage between 1820 and 1914 is a startling phenomenon, all the more so as before 1945, this relative stability sharply contrasts with the steady increase in civil servants on the one hand and with the cyclical evolution of the national product on the other hand.

After 1945, the introduction of a generalised wage scale makes the hierarchy of salaries homogenous. Since then, the increase of the average wage is a function of the relative evolution of the rated point of each grade and of the population of each grade. This process maintains the hierarchy of salaries, even though the lowest wages increase faster than the highest. Thus, the strong increase of wage bills since World War II is essentially the consequence of the rising staff number and of the remuneration of the graded point. From this point of view, the non-perception of the wage wave does not mean that it does not exist. In practice, we could solve the problem by looking through two "statistical windows". The first would cover the 19th century, the second the whole 20th century. However, such a solution could not avoid some errors of perspective.

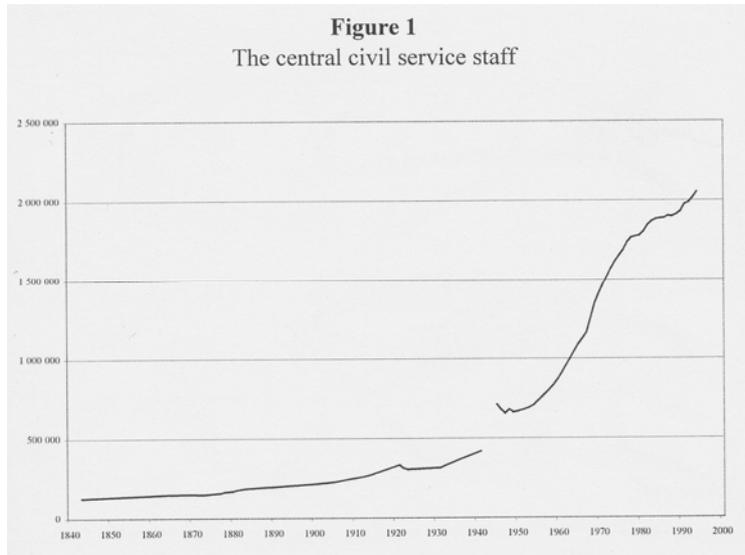
²¹ Cf. Quarre, D.: »Annales statistiques de la fonction publique: 1945-1969-1990«..., 1992.

²² Cf. Singer-Kérel, J.: *Le coût de la vie à Paris de 1840 à 1954*, A. Colin, Paris, 1961.

²³ Cf. *Annuaire Statistique de la France*, Imprimerie Nationale, Paris. Cf. particularly the retrospective yearbooks 1951, 1966, and 1948-1988.

²⁴ Cf. Diebolt, C.: »L'évolution de longue période du système éducatif en France: XIX^{ème} et XX^{ème} siècles«, *Research Papers*, No. 8, Comparative Education Centre, Humboldt University, Berlin, 1999, 121 pages.

²⁵ Cf. Toutain, J.-C.: »Le produit intérieur brut de la France: 1789-1982«, in: *Economies et Sociétés*, Serie AF, No. 15, 1987, pp. 1-237.



The part of public wages in France's GNP is clearly evolving against the long wave of price and production before 1945 with the exception of the 1820-1850 period (see Figure 5)²⁶. After the Second World War, the part of public wages in the French GNP increases at a high rate until 1977. How can we explain this change since 1945?

First, given the qualities of our statistics, the results can not be coincidental. Before 1945, reality is somewhat opposed to what would be expected by common sense. It would seem only logical that the part of public wages in the GNP would rise in expansion. Our study shows the opposite. Therefore, we believe that before 1945 wage development was the consequence of economic growth. After 1945, in contrast, wages as well as education²⁷ became one of the most essential components of economic growth.

How can we explain then the turn of the early 1970s and the decrease of the public wages part in the GNP since 1977? There is probably no single answer. We believe that it is linked to the crisis of the welfare state.

²⁶ This period has until today remained open to scientific debate, whose standpoints differ to a great degree: whereas some regard it as a period of economic expansion, others see it as a phase characterised by enormous economic difficulties.

²⁷ Cf. Diebolt, C.: »Towards a Theory of Systemic Regulation? The Case of France and Germany in the Nineteenth and Twentieth Centimes«, in: Schriewer, J. (Ed.): *Discourse Formation in Comparative Education*, P. Lang, Frankfurt am Main, 2000.

Figure 2
The ratio of central civil service staff to total population

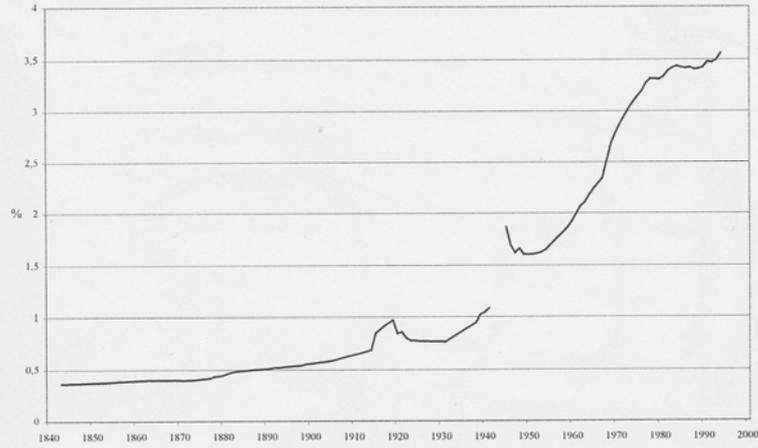


Figure 3
Total wages of the central civil service staff
(in Ln)



Figure 4
The nominal and real average wages of the central civil service staff
(in Ln)

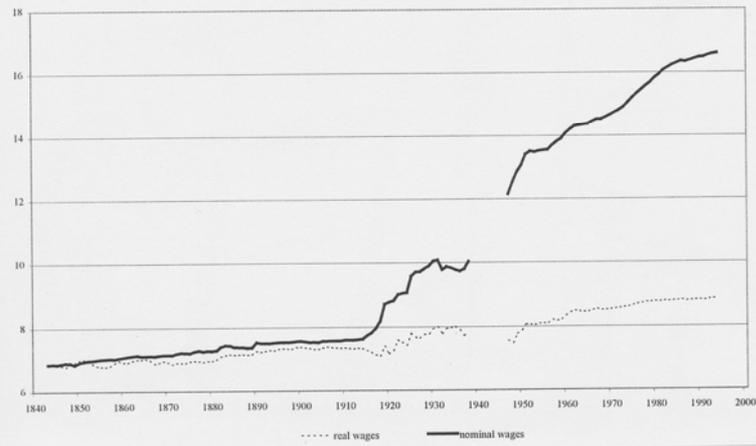


Figure 5
The ratio of central civil service staff wages to GNP



Years	GNP at 1905-1913 million of constant francs	Central civil service staff total wages at 1820 Million of constant francs	Retail price index (100 = 1820)	Central civil service staff	Central civil service staff average wages in constant francs	Total Population in million
1815-1824	10 007	124	96			
1825-1834	11 913	112	104			
1835-1844	14 774	111	105			
1845-1854	16 996	132	103	133 127	995	35 625 224
1855-1864	20 963	144	119	143 530	1 000	36 496 774
1865-1874	23 495	152	127	150 032	1 013	37 442 049
1875-1884	26 113	189	137	170 445	1 104	38 053 055
1885-1894	29 650	267	128	197 138	1 351	38 732 125
1895-1904	35 463	331	123	214 931	1 542	38 713 994
1905-1913	41 133	384	127	246 691	1 559	39 047 574
1920-1924	46 822	522	479	317 786	1 649	39 003 758
1925-1934	60 035	818	745	320 695	2 545	40 801 878
1935-1938	61 320	982	732	375 582	2 621	41 181 350
1949-1954	78 359	2 036	20 579	681 833	2 980	42 129 169
1955-1964	115 174	3 631	29 457	872 200	4 096	45 399 002
1965-1974	194 603	7 002	45 907	1 356 200	5 139	50 459 839
1975-1984	274 772	11 263	114 002	1 778 600	6 323	53 663 512
1985-1994	336 636	13 239	206 621	1 944 780	6 804	56 333 116

Conclusion

To measure economic growth, quantitative history needs many regular data and sufficiently homogenous elements in order to compare in space and time. The construction of long statistical series is part of this process of providing such new data. Long period observation facilitates an understanding of today's economic growth. In this perspective, the present paper raises new questions as to the relationships between theoretical constructions and empirical results. Indeed, although before 1945 the part of public wages in the French GNP evolves clearly against the long wave of price and production, it is yet too early to formulate a hypothesis on a rise of real wages in the depression phase before World War II.

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