THE REGULATION SCHOOL IN LIGHT OF ONE CENTURY OF THE U.S. ECONOMY

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RÉSUMÉ

L'ÉCOLE DE LA RÉGULATION
A LA LUMIÈRE D'UN SIÈCLE D'HISTOIRE DES ÉTATS-UNIS

Cet article confronte les thèses principales de la théorie de la Régulation concernant l'origine de la crise de 1929 et du fordisme, à l'évolution réelle des variables macroéconomiques (aux U.S.A. de 1869 à 1985). On montre que la répartition ne fut pas biaisée à l'avantage des profits dans les années vingt, et que la consommation ne fut pas insuffisante. Le fordisme ne peut pas être interprété comme la correction de cette distorsion dans la répartition. La référence traditionnelle aux lois tendancielles et, en particulier, à la loi de la baisse tendancielle du taux de profit de Marx, est présentée comme une caractérisation adéquate de l'évolution à très long terme de la répartition aux U.S.A., à ceci près qu'une soudaine et exceptionnelle restauration de ce taux se produisit pendant la seconde guerre mondiale.

ABSTRACT

THE REGULATION SCHOOL
IN LIGHT OF ONE CENTURY OF THE U.S. ECONOMY

This article compares the main theses of the Regulation School concerning the origin of the Great Depression and Fordism with the actual evolution of macroeconomic variables in the U.S. from 1869 to 1985. We contend that distribution was not biased during the 1920s to the advantage of profits, and that consumption was not deficient. Fordism, thus, cannot be interpreted as the correction of this lopsided distribution. The traditional reference to historical tendencies and, in particular, to Marx's tendency for the rate of profit to fall, is presented as an appropriate characterization of the very-long-term evolution of distribution in the U.S., with the *proviso* that a sudden and exceptional recovery occurred during World War II.

MOTS CLEFS : École de la Régulation, Fordisme, Taux de Profit, Lois Tendancielles.

KEYWORDS : Regulation School, Fordism, Profit Rate, Tendencies.

J.E.L. Nomenclature : 010,040.

Introduction

Although the economists who compose the "Regulation School" (see, in particular, AGLIETTA M. 1979, BOYER R., MISTRAL J. 1978, LIPIETZ A. 1979) differ in several respects in their analyses, it is still possible to outline a common set of factual observations — stylized facts — which lie at the basis of their historical interpretation of capitalism. At the heart of their analysis is the contrast between four periods: prior to World War I, between the two wars, after World War II (until the late 1960s), and post 1960s.

The main purpose of this study is to evaluate the historical accuracy of the foundations of the Regulation School concerning the U.S. economy over one century, focusing on the specificity of the interwar period and the situation of distribution. *Other aspects of the theory of Regulation are not presently considered.* The analysis is further restricted to basic macroeconomic variables[1]. We conclude that the interpretation of the economic history of capitalism developed by the Regulation School is contrary to historical facts. The development of capitalism was not jeopardized by excessive profitability during the 1920s, as contended by the Regulationists, and there was no divergence between labor productivity and wages.

The trend of most economic series, observed over a period of more than a century, has been steady and fits well with the classical notion of *historical tendencies*. However, a sudden break can be observed in most series, and in particular the profit rate, during World War II.

A refutation of the interpretation developed by the Regulation School further requires the consideration of its theoretical grounding. Such a discussion can be found in our earlier work (*cf.* DUMÉNIL G., LÉVY D. 1988, Part II or, in French, DUMÉNIL G., LÉVY D. 1993(b).)

The study divides into three parts. The first part presents the basic features of each of the periods described by the Regulationists: extensive accumulation, intensive accumulation without mass consumption, Fordism, and the crisis of Fordism. The second part presents the profiles of the main series, and questions the factual relevance of the account that lies at the base of the Regulation theory — in particular their view of the differences between the interwar years (rising productivity *without* mass consumption) and the 25 years following World War II (rising productivity *with* mass consumption). In the third part, we elaborate on the observations made in the second part, and present a more traditional classical, or specifically Marxist, approach to the same material.

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1. This study borrows considerably from our earlier contribution (DUMÉNIL G., LÉVY D. 1988) to the International Conference on the Theory of Regulation, held in June 1988 in Barcelona, but is based on new estimates of the series. During the conference, several other criticisms of the School were presented, in particular, see CARTELIER J., de VROEY M. 1989 and BRENNER R., GLICK M. 1989. The focus of the De Vroey and Cartelier paper was the ability of the theory of Regulation to provide an alternative framework of analysis, a new "paradigm", in the sense of the Marxist, Keynesian, or neoclassical frameworks of analysis. Brenner and Glick's emphasis was on the interpretation of the so-called "crisis of Fordism".

1 - The four subperiods

The basic features of four subperiods are clearly defined in several works by the Regulation School. Below we extract representative samples of these studies.

Lipietz's analysis of the history of capitalism refers to Marx's reproduction schemes as in Volume II of *Capital* (MARX K. 1885), in which two productive sections are distinguished. One of these sections produces investment goods and the other consumption goods. Central to Lipietz's interpretation is the notion of a *balance* between these two sections. On this basis he defines three "regimes of accumulation" :

> From this stage, several regimes of accumulation appear : extensive accumulation (the mere homothetical growth of the two sections mutually validating one another), intensive accumulation without mass production (in which only the bloating of constant capital in the first section validates the growth of section I), intensive accumulation with increasing mass consumption, [...][2].

These regimes basically correspond to the three subperiods delimited by the two World Wars, until the late 1960s. The second regime of "intensive accumulation without mass production", clearly describes the interwar period, and the third regime of "intensive accumulation with increasing mass consumption", describes the period after World War II — the golden age of Fordism, until its crisis. Concerning the first period, before World War I, it can be characterized by the regime of extensive accumulation.

Later in the same article, Lipietz explicitly introduces the specific features of the interwar period :

> As early as between the wars, the development of Taylorism and the embryonic forms of Fordism provoke the first large wave of intensive accumulation. Productivity increases at a 6 percent rate (triple the tendency in the 19th century)[3], but purchasing power remains in line with its mediocre impetus. This scissor, highly favorable to the rate of profit — by way of the rise in the rate of exploitation, which is not compensated by the slow growth of the organic composition of capital — provokes an unprecedented crisis of overproduction : the 1930s crisis[4].

The main difference between the interwar period and the postwar years (the golden age of Fordism) lies in the movement of wages. Lipietz describes a new "*thrust of intensive accumulation*" :

> ...which, this time, will last twenty years, during which again productivity will increase considerably, as well as *per capita* fixed capital. But, this time, the rise in the purchasing power of salaried workers (productive and unproductive) will

2. LIPIETZ A. 1984, p. 700.

3. Lipietz comparison of the two rates is quite questionable. It is not possible to contrast in this manner a *historical trend* and a movement observed in the *upswing of a business cycle*. A comparison of rates obtained for the U.S. economy, during similar periods, show that the records of the 1920s are not exceptional. One obtains : 2.72 percent for 1869-1879, 3.23 percent for 1894-1901, and 2.86 percent for 1920-1929. For the late 19th century, from 1869-1900, the figure is 1.01 percent. As for France, the country considered by Lipietz, the growth rate of labor productivity for the 1920s is about the triple of that obtained for the 19th century. This does not prove anything, however, concerning the specificity of the 1920s.

4. LIPIETZ A. 1984, p. 703.

> nearly exactly parallel the rise of productivity. Since this productivity rise occurred, approximately in the same proportions, in the two sections, the organic composition of capital remained about constant, as well as the rate of exploitation[5].

This evolution ensures the constancy of the rate of profit :

> ...the rate of profit remains stable, and accumulation can pursue its steady rate path[6].

The rate of growth is exceptionally high (larger in countries of "Young Fordism", than in the U.S.) :

> The various O.E.C.D. countries were, thus, allowed to enjoy, for fifteen years, an exceptionally strong, exceptionally long, exceptionally steady growth[7].

Boyer's approach is more strongly influenced by Keynes, and does not refer to Marx's reproduction schemes. However, his view of the history of capitalism is similar to that of Lipietz. The role of wages is once again central :

> Basically, transformations of the wage relation have appeared to be one of the chief determinants of long-term changes in the mode of development[8].

The Great Depression of the 1930s is explained by the deficient increase of wages :

> ...the boom of the 1920s benefited employment and real wages very little, so that the Great Depression represented a "forced" redistribution of productivity gains to wage earners [...]. This is similar to the analyses that regard the inadequacy of the wage relation *vis-à-vis* the unprecedented growth of Taylorism as one of the key factors behind the crisis of 1929 [...][9].

The explanation that is set forward in order to account for the miracle of the years following World War II is the exact inverted image of that proposed for the Great Depression :

> From this perspective, the "Thirty Glorious Years" are interpreted as the first example of the almost synchronized simultaneous evolution of the norms of production and consumption[10].

The same type of interpretation of the 1920s could already be located in Aglietta's book (AGLIETTA M. 1979) :

> The global imbalance resulting from the unequal development of the two productive sections was already underlying, since the mid-1920s, the economic movement that lead to the Great Depression. The evolution of the overall distribution of income to the disadvantage of wage earners quickly developed all along the 1920s. Thus, from 1920 to 1929, income cashed as profits of enterprises, interests, and rents, increased by 45 percent ; salaried income by 13 percent[11].

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5. LIPIETZ A. 1984, p. 704.
6. LIPIETZ A. 1984, p. 704.
7. LIPIETZ A. 1984, p. 706.
8. BOYER R. 1989, p. 73.
9. BOYER R. 1989, p. 53.
10. BOYER R. 1989, p. 73.
11. AGLIETTA M. 1979, translated from the French Edition, p. 303.

Lipietz, Boyer, and Aglietta do not differ significantly on the essential aspects of the periodization of the history of capitalism. Instead the following observations are common to each writer :

1. Concerning the 1920s, in contrast to the pre-World-War-I period, the emphasis is placed on the acceleration of the growth of labor productivity compared to the slower growth of real wages. Following this description, the share and rate of profit are claimed to have been high and increasing during the decade, resulting in a diminished (and diminishing) share of consumption.

2. The first 20 or 30 years following World War II are described as a "golden age" by the Regulation School. The growth of labor productivity is equal to that of the 1920s or, even, higher. But now the rate of growth of the real wage keeps pace with labor productivity. The share and rate of profit are no longer climbing as in the 1920s. Similarly, a higher than usual share of consumption in national income is expected. One can also surmise a high rate of growth of output.

The specificity of Fordism is not limited to the pegging of wages to labor productivity. One should also mention the stickiness of the wage rate (in comparison to the movements of the general level of activity), on which Aglietta places much emphasis.

2 - Facts

Section 2.1 is devoted to the series used in this study and their sources. Section 2.2 deals with the origins of the Great Depression as described by the Regulation School. Section 2.3, in which the profile of the productivity of labor is considered, contrasts the two regimes of extensive and intensive accumulation that were characteristic of the development of capitalism until World War I, and after World War II. Section 2.4 discusses the relationship between the productivity of labor and the real wage rate. Section 2.5 summarizes the major findings.

2.1 The data

Some reservations accompany economic data for the 19th century and early 20th century. Obviously, this trek into the past is problematic, and the various sources are not always consistent in their image of how the economy evolved. It is only by comparing the various sources that a coherent picture may be obtained.

Historical data for the U.S. economy are, however, much more reliable than for any other country. There is a long tradition of American scholarship using quantitative analysis in the study of their economy. As a result a large number of studies exist, even prior to 1929. The Department of Commerce and the National Bureau of Economic Research are the sources for many such studies. National accounts (NIPA) data are available since 1929.

To develop the series presented below, we drew on several different sources. It was often necessary to splice together various series, in order to cover the complete period.

Since 1929, data were derived from the Bureau of Economic Analysis. Prior to this date we relied primarily on GOLDSMITH R.W. 1952, GORDON R.J. 1986, KENDRICK J.W. 1961, and LEBERGOTT S. 1964. The detailed description of series and sources is available in DUMÉNIL G., LÉVY D. 1994.

The definition of the series is traditional. However, profits are defined in a very broad sense as the excess of private Net National Product over the remuneration of labor, employees and self-employed persons. The nominal remuneration of labor is determined by dividing total compensation of employees by the number of employees. This rate is then multiplied by the total number of employees and self-employed (*i.e.*, a wage-equivalent for self-employed is considered). Including the wage equivalent for the self-employed persons is important because their number diminished greatly over time. In the early years, the wage-equivalent accounts for a considerable portion of the remuneration of labor. This measure of profit includes all taxes, interests, and rents, but is net of depreciation. The unit of analysis is the *private U.S. economy* and the period covered 1869-1985.

2.2 The origins of the great depression

For the Regulationists, the Great Depression was a result of excess profitability. High profits cut on final demand that, in turn, caused the collapse. In the first subsection we test the empirical foundations of this analysis using the series described above. In the second subsection, we refer to other sources.

2.2.1 Profits and consumption

The profit rate is displayed in figure 1. The share of profit in the private NNP appears in figure 2.[12] Whereas the image suggested by the profile of the profit rate is that of two segments with downward trends (prior to and after World War II), two plateaus can be identified in the profile of the share of profits (prior to and after World War I).

The fluctuations in the two series are similar excepting the recovery in the profit rate which occurred during World War II. A wide oscillation can be observed at the end of the 19th century in both series, which corresponds to the boom in 1880 and the ensuing years of stagnation. The interpretation of other fluctuations is rather straightforward. One can easily identify the effects of the two world wars, as well as that of recessions and of the Great Depression.

It is evident from figures 1 and 2 that large profits are, by no means, a feature of the 1920s. Quite the contrary, the average profit rate during this period is lower than before World War I and, also, inferior to the levels reached after World War II. Concerning the profit share, the ratio obtained for the 1920s is lower than that observed before World War I and in line with that which prevailed after World War II. The opposite results to that claimed by the Regulation School are obtained in two respects : 1) The share of profits is not exceptionally high during the 1920s, 2) It is not increasing during this period.[13]

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12. Lipietz refers to the rate of surplus value τ in price terms, instead of the share of profits π. By definition $\tau = \pi/(1-\pi)$, and the observations in figure 2 can be easily converted to apply to the refutation of his analysis.

13. Aglietta, in his book AGLIETTA M. 1979, refers to an article of Fortune Magazine, from which he borrows the two figures in the quotation in part 1 (45 percent growth of profits in the 1920s, and 13 percent for wages). These figures radically contradict our own findings. *Fortune*'s inspiration

Figure 1 The Rate of Profit *(Profits/Net capital)*, 1869-1985.

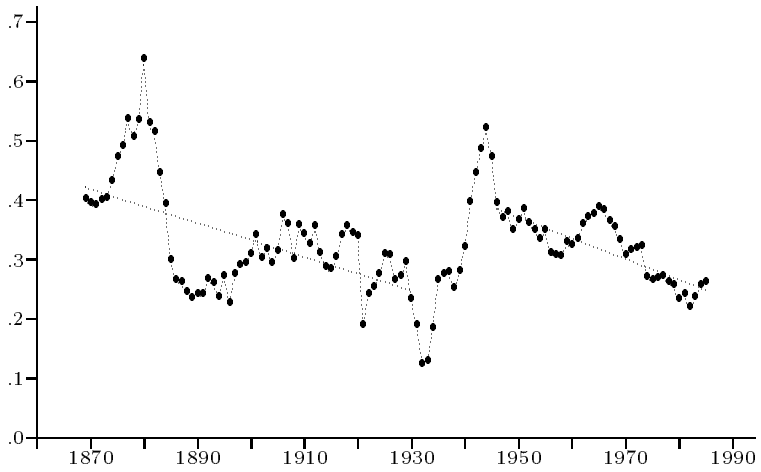
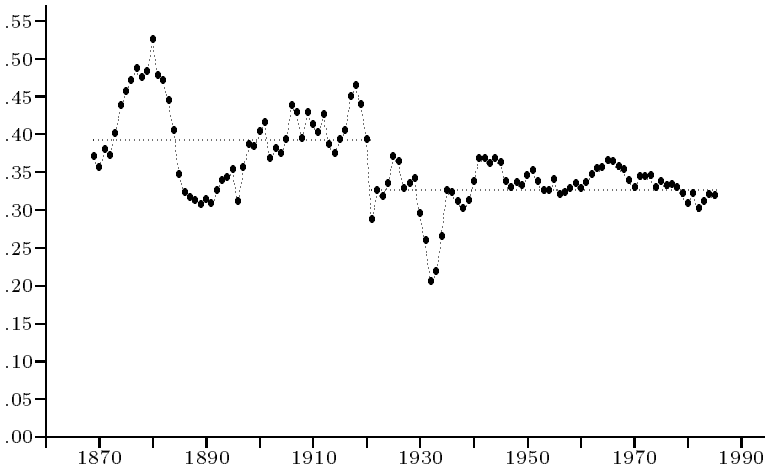
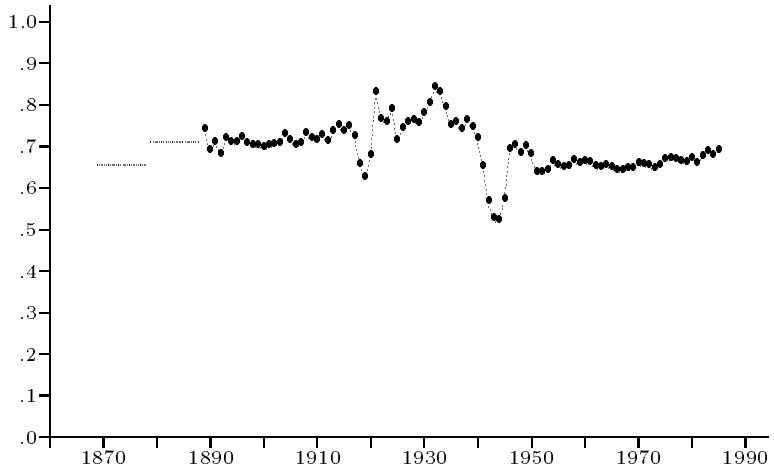


Figure 2 The Share of Profits in NNP *(Profits/Private NNP)*, 1869-1985.



and data can be traced to the work of The Brookings Institution in the 1930s (see, for example,

Figure 3 Ratio of Private Consumption to Private GNP, 1869-1985 (*decennial averages for 1869-1878 and 1879-1888*).



As was recalled in part 1, the Regulationists are concerned with distribution, because of its impact on final demand. A sufficient consumer purchasing power is necessary for balanced growth. A straightforward test of this thesis is, therefore, to examine the profile of the various components of demand and, in particular, the share of consumption in the total product. Following the Regulationists, one should expect a diminishing share of consumption during the 1920s.

The ratio of consumption to GNP (both private) is plotted in figure 3. The ratio reflects a certain specificity of the 1920s, but again *the result is the reverse of that derived from the views of the Regulation School.* Private demand is rather strong during the 1920s (1920-1929 : 0.765) in comparison to both the earlier (1889-1914 : 0.72) and later periods (1945-1985 : 0.70).

2.2.2 Other sources

This refutation of the observations that support the views of the Regulationists are not specific to our series. (For a more detailed discussion, see DUMÉNIL G., GLICK M., RANGEL J. 1987.)

Confirmation of our result can be found in MARTIN R. 1939, for the years 1899-1937. His measure of realized income, to which retained earnings from GOLDSMITH R.W., BRADY D.S., MENDERSHAUSEN H. 1956 have been added, displays a similar profile. One difference between his measure and the above excess of private NNP over the remuneration of labor is that indirect business taxes are excluded. The share of profits in this definition (again deducting from profits a wage equivalent for self-employed) reveals the same reduction after World War I. If the correction for the wage-equivalent of self-employed is not included, the same result is obtained. The same observation concerning the low levels

LEVEN M., MOULTON H.G., WARBURTON C. 1934). The divergence in the estimates seems to result from the restriction of the unit of analysis to the corporate sector in the Brookings estimate, whereas we consider total private economy.

of profitability during the 1920s had already been made in the two well-known historical studies: GILLMAN J. 1958 and MAGE S. 1963 (see figure 13 and table 3 in DUMÉNIL G., GLICK M., RANGEL J. 1987).

The debate over the profile of historical series continues in the U.S. (The discussion concerns the degree of volatility of GNP prior to World War I and after World War II, in relation to the issue of the efficiency of demand policy.) In this context two new estimates of GNP have just become available (BALKE N.S., GORDON R.G. 1989 and ROMER C.D. 1989). To date no estimates of employment and consumption consistent with these new GNP series have been made available. For this reason, it is not possible to utilize these new data for this study.

Romer's new estimates are quite similar to GORDON R.J. 1986, although her series dampens the fluctuations. The main difference between Gordon and Balke's new and their former measures, is that GNP has been reduced to a considerable extent (more than 10 percent) between the turn of the century and World War I. If one computes the share of profits in NNP, using Gordon and Balke's new figures (thus, disregarding the lack of consistency of the data), the profile is significantly modified: The share of profits in the 1920s is in line with its pre-World-War-I records, but it is neither *higher* or *increasing*, as would be necessary to support the view of the Regulation school.

There is no doubt that these historical estimates will, again, be modified in the future as research develops, but *no* series exists that can support the Regulation School's historical interpretation of capitalism. All the existing series converge to belie the factual foundations of the Regulation School concerning an alleged divorce between profits and wages in the 1920s.

2.3 Intensive and extensive accumulation

In their analysis of the Great Depression and Fordism, the Regulationists refer to a break in the trend of labor productivity. This transformation corresponds, in their formulation, to a switch from a regime of *extensive* accumulation to a regime of *intensive* accumulation. As was recalled in part 1, the depression originated from a switch to an intensive accumulation between the two wars, without mass consumption. In this section, we briefly examine this thesis concerning the speed of technical change.

The productivity of labor is plotted in figure 4 (using a log scale). An important change in the growth rate of labor productivity can be located in the middle of the period considered. The growth rates of labor productivity for the entire century, up until the recent slowdown, *i.e.*, from 1869 to 1968, was 1.76 percent. For 1869-1914 this rate is only 1.28 percent, whereas a rate of 2.71 percent was obtained after World War II, between 1947 and 1968. The exact timing of the transformation is not evident, however. The break could be located either during World War I or World War II. The 1920s appear as a period of transition, and it is not easy to distinguish between fluctuations due to the business cycle and breaks in the trend.

In sum, these observations fit with the views developed by the Regulation School, as far as the pre-World-War-I years and the post-World-War-II years are concerned. The existence of a sharp modification of the trend after World War I is dubious.

Figure 4 Labor Productivity *(Private NNP in constant dollars/Number of hours worked)*, 1869-1985.

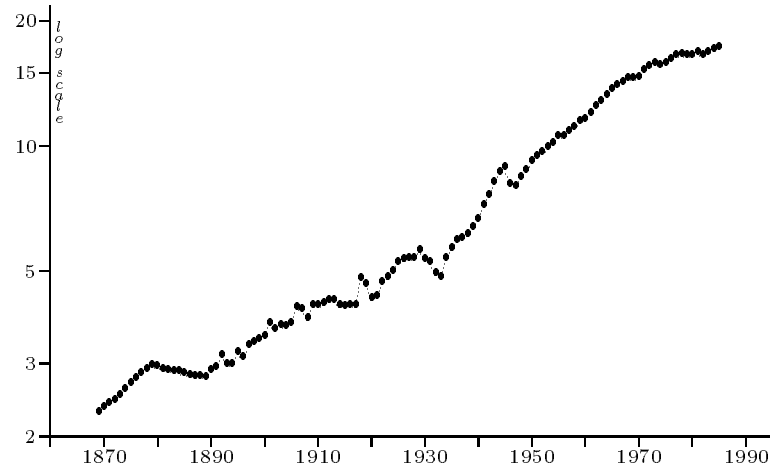


Figure 5 Real Wage Rate *(Nominal wage rate/Consumer price index)*, 1869-1985.

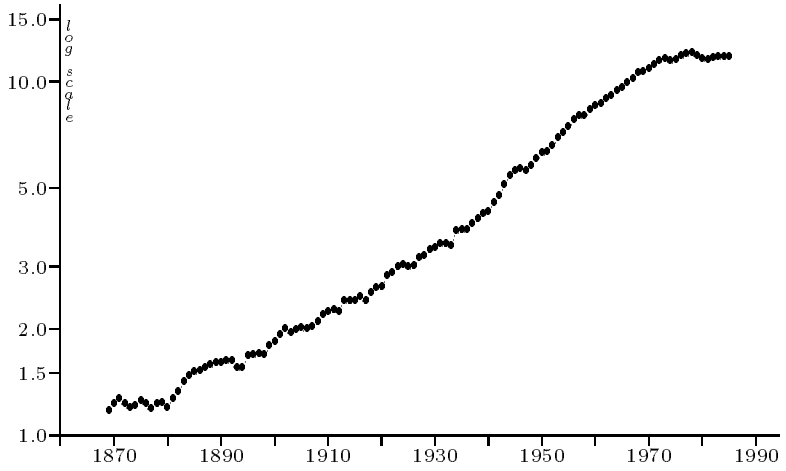
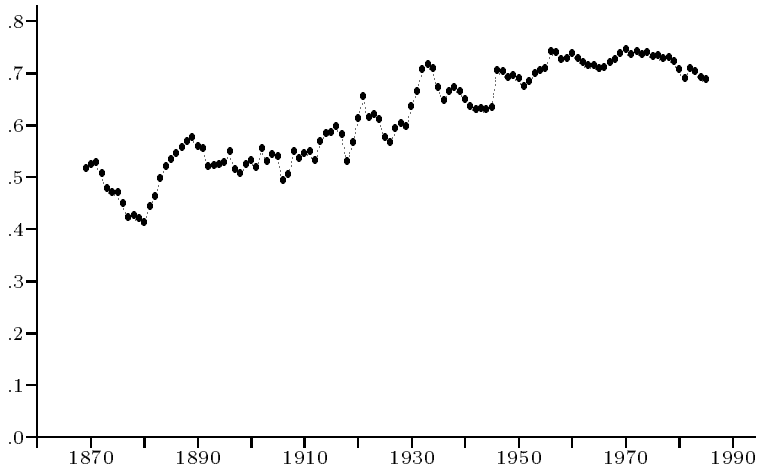


Figure 6 Ratio of the Real Wage Rate to Labor Productivity, 1869-1985.



2.4 The pegging of wages to labor productivity

According to the Regulation School, a *scissor* between the acceleration of the progress of labor productivity and the relative stagnation of the purchasing power of wage earners, *i.e.*, a decrease of the ratio *real wage/labor productivity*, caused the Great Depression. Following the same analysis, after World War II the rate of wages was pegged to labor productivity and no such divergence was observed.

In the first subsection, we consider the trend of the real wage rate and the evolution of the ratio between the real wage rate and labor productivity. The second subsection is devoted to the differences between the real rate of wages and the labor cost.

2.4.1 Real wage and labor productivity

The profile of the rate of real wages is displayed in figure 5 (using a log scale). This profile is very similar to that of labor productivity. An acceleration occurs somewhere in the intermediary years. The transformation of the rate of growth is progressive and difficult to date precisely. The rates of growth for the three periods already considered for labor productivity are : 2.12 percent for 1869-1968, 1.63 percent for 1869-1914, and 2.71 percent for 1947-1968.

A closer examination appears necessary. To this end, the ratio of the two series has been plotted in figure 6. An upward trend is evident in the ratio of real wages to labor productivity, revealing that real wages increased slightly faster than labor productivity. An anomaly during the 1920s is not evident. The reason why no break can be observed is that the two series have similar profiles. The fluctuations are created mainly by the movement of labor productivity, and they correspond to variations in the general level of activity and move countercyclically.

Nothing such as Fordism can be inferred from these data. The main finding is that the *wage-productivity* relation has been rather stable historically. Thus, *no significant periodization of the development of capitalism is related to the pattern of the ratio of*

wages to labor productivity. Neither the Great Depressions of the 1930s nor the specificity of the period following World War II can be explained on this basis.

2.4.2 Real wage and labor cost

The focus of the Regulationists is demand, and the main determinant considered is the real wage rate. The alternative focus of profitability we adopted in our studies, suggests instead the consideration of the labor cost. To obtain labor cost the nominal wage rate is divided by the deflator of output instead of the consumer price index.

The ratio of the labor cost to the productivity of labor is nothing else that the share of wages in total output, *i.e.*, the complement to 1 of the share of profits presented in figure 2 :

$$Labor\ cost = \frac{Unit\ nominal\ wage}{NNP\ deflator} \qquad Labor\ productivity = \frac{Real\ NNP}{Total\ labor\ time}$$

$$\frac{Labor\ cost}{Labor\ productivity} = \frac{Unit\ nominal\ wage}{NNP\ deflator} \times \frac{Total\ labor\ time}{Real\ NNP} = \frac{Total\ wages}{NNP\ in\ current\ \$}$$

The two series, *real wage rate* and *labor cost*, are significantly different. Their ratio is 0.81 for 1869 in the 1982 basis, *i.e.*, with a value of 1 for this year. The ratio *real wage rate/labor productivity*, as in figure 6 has a clear upward trend, whereas the share of wages displays a smaller trend or, rather, a leap upward after World War I. (See figure 2 that presents the share of profits, *i.e.*, the complement to 1 of the share of wages.) This evolution mirrors the divergence between the consumer price index and the deflator of the output. It also explains why the share of profits and the profit rate significantly diminish after World War I, as the rise of the labor cost is more pronounced than that of the real wage rate.

2.5 A summary

We agree with the Regulation School, and most economic historians that the late 19th century up until World War I, is in many respects different from the period following World War II, and the interwar years appear as a transition period. We disagree, however, on many specific features of each subperiod :

1. The profitability of capital in the 1920s is low in comparison to the earlier and later periods and does not increase throughout the 1920s.

2. The share of private consumption in GNP is comparatively large and remains large throughout the 1920s.

3. The ratio *real wage rate/labor productivity* does not reveal any extraordinary break after World War I or II.

Thus, the stylized facts that provide the empirical grounding of the interpretation of the history of capitalism in terms of Fordism, by the Regulation School, are simply incorrect.[14]

14. In series of recent papers, Lipietz has boldly extended the explanatory power of the notion of Fordism to include developing Third World countries (Global Fordism). An interesting refutation of this view can be found in AMSDEN A. 1989, with special attention to the case of Korea.

3 - Historical tendencies

Section 3.1 is devoted to the interpretation of figure 1 and explains why we interpret the profile of the profit rate in this figure as a manifestation of the tendency for the rate of profit to fall. In section 3.2, we contend that the break which occurred during World War II interrupted this tendency and mislead Marxist economists and the Regulationists in their interpretation of the development of capitalism. Section 3.3 is devoted to other historical tendencies. It is shown in this section that many such tendencies can be identified in the concrete history of U.S. capitalism. Section 3.4 briefly discusses the role or, rather, the absence of a role, played by historical tendencies within the Regulation School.

3.1 The tendency for the rate of profit to fall

It is not vital to the Marxist interpretation of the history of capitalism that the profit rate actually displays a downward trend, but the examination of the profile of the profit rate is an obvious preliminary to the discussion of the interplay of tendencies and counter-tendencies.

The very-long-term movement of the profit rate for the U.S. economy has already been considered in figure 1. As suggested by the two doted lines, the examination of the profile of the series reveals : (1) A break during World War II ; (2) Two downward trends.

If one abstracts from the oscillation that occurred at the end of the 19th century and the bulge in the 1960s, the two downward trends appear steady and parallel.[15]

We believe that the fluctuations observed before and after World War II, along both trend lines, are of a different nature than the break observed during World War II. Basically, *these fluctuations mirror that of the general level of activity (the capacity utilization rate), whereas the World-War-II break reflects a sudden change in technology.* Only the latter must be seen as a reversal in the manifestation of the tendency.

The examination of figure 1 is not sufficient to provide our interpretation with a full justification. Other series must be considered :

1. Figures 7 and 8 display two variables characteristic of technology, which are basically independent from the fluctuations of the general level of activity or distribution : the technical composition of capital and the ratio of equipment to structures within the net stock of fixed capital. It is clear from these two figures that the transformation of the technology has been very steady, *excepting World War II,*[16] which coincided with a sharp and sudden transformation of technology. The productivity of capital has been plotted in figure 9. Again we obtain here another measure of the World-War-II break. In addition, this figure shows that the World-War-II leap cannot be explained by a change in the situation of distribution.

15. Although the period considered was shorter, and the data for the early years different, a similar interpretation had already been given in DUMÉNIL G., GLICK M., RANGEL J. 1987, where a first step downward in the profit rate had been identified at the end of World War I, a second step in the late sixties, and a puzzling recovery during World War II.
16. Another exception is the fluctuation that can be observed in the ratio of equipment to structures that followed World War II.

Figure 7 The Technical Composition of Capital *(Net capital/Number of hours worked)*, 1869-1985.

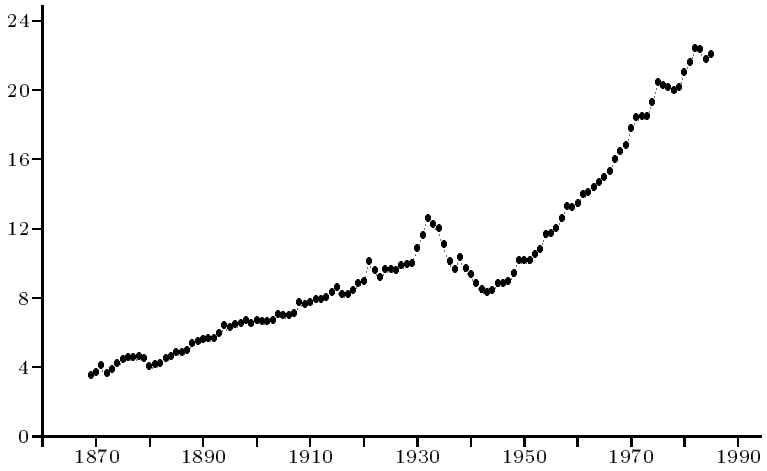


Figure 8 The Ratio of Equipment to Structures *(Net Stocks of Capital)* 1889-1985.

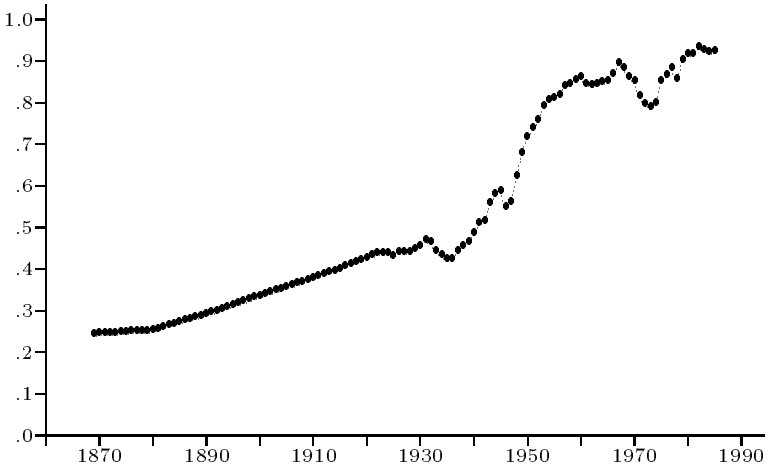


Figure 9 The Productivity of Capital *(Private NNP/Net capital, both in current dollars)*, 1869-1989.

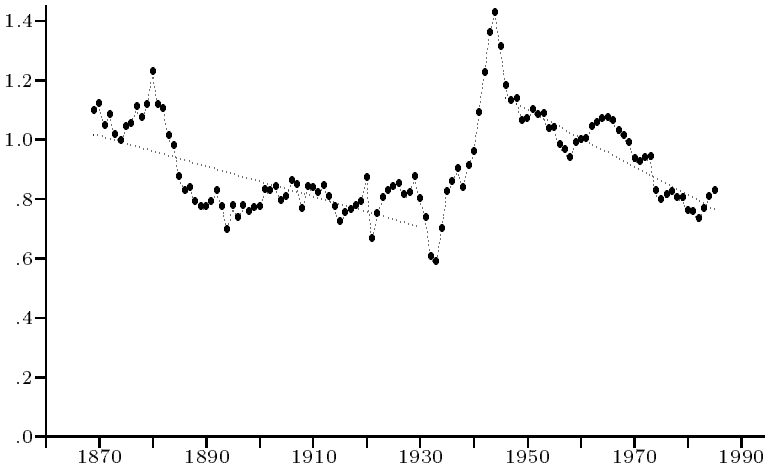


Figure 10 Net National Product in Constant Dollars, 1869-1985.

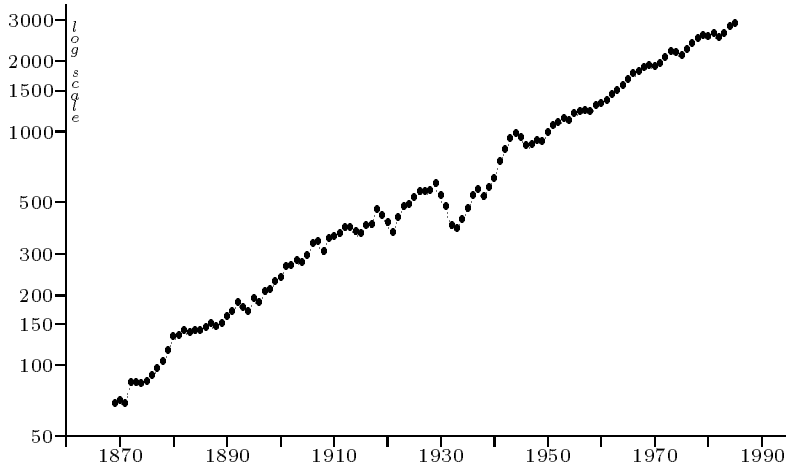
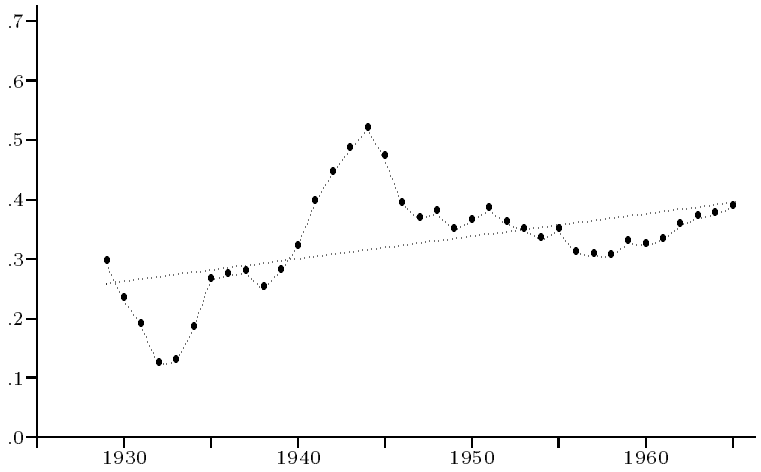


Figure 11 A Segment of the Profit Rate from Figure 1, 1929-1965.



2. The fluctuations around the two trend lines do not correspond to swift metamorphoses of the technology, but basically reflect the changes in the general level of activity. No measure of the capacity utilization rate is available for the very long run, but a view of the general activity can be obtained from figure 10 on which the real NNP is displayed (using a log scale).[17] The tremendous acceleration of the growth of output between 1874 and 1880 (probably overstated in the data[18]) translates into a surge in the productivity of capital and in the rate of profit. The stagnating growth that followed this episode, between 1881 and 1890 or, through two recessions, up to 1898, coincides with a low productivity of capital and a depressed profit rate. After World War II, the most dramatic fluctuation in the profit rate, during the 1960s, also coincides with the acceleration of the rate of growth of output and the high level of activity. This argument could be made for every fluctuation in the activity.

For these reasons, the best characterization of the historical profile of the profit rate in the U.S. economy since the late 19th century is, in our opinion, that of a tendency downward interrupted by a sudden recovery during World War II.

3.2 World War II and Marxist economics

We believe that the theory of Regulation highly derived from the confusion that was created within the traditional Marxist interpretation of the history of capitalism, by the recovery of the profit rate during World War II.

17. Parenthetically, one can notice that the "golden age of Fordism" cannot be characterized by a large rate of growth of output (1946-1968: 3.39 percent, 1869-1914: 3.87 percent).

18. In Gordon and Balke's series in GORDON R.J. 1986 (p. 781), the annual rate of growth of real GNP from 1875 to 1880 is 8.9 percent, with a peak of 14.2 percent in 1880, to be contrasted with 1.7 percent for 1880-1888, or 2.2 percent for 1880-1896. A controversy developed concerning the rate of growth during these years and the alleged "depression" of 1873-1879, which will not be discussed here. As was contended in ROMER C.D. 1986 for industrial production, the amplitude of these oscillations might be partly an artifact due to the small number of goods considered in the construction of the indexes for these early years.

For many Marxist economists writing after World War II and concerned with empirical verification (as was the case in the U.S.), the World-War-II leap forward has always been a puzzle. The period usually covered by their investigation was limited to 1929 (because of the availability of data) to the years in which they were writing. In the 1960s, because of the leap and the 1965 bulge in profitability, it was impossible to defend the thesis of an actual tendency downward in the rate of profit using series starting in 1929. Figure 11 shows the trend observed in most of these studies. Typical of these difficulties was the work of Paul Baran and Paul Sweezy (BARAN P., SWEEZY P. 1966), which substituted for Marx's law its exact opposite. As is well known, they attributed this transformation to that of competition. Still because of the leap, researchers covering longer periods reached ambiguous conclusions (GILLMAN J. 1958, MAGE S. 1963).[19] When the Regulation School developed its new framework of analysis, the reference to the tendency for the rate of profit to fall, deprived of empirical foundations, had become quite artificial.

3.3 Other tendencies

The tendency for the rate of profit to fall must not be seen as a unique case. Already in Marx's *Capital*, a complete system of historical tendencies was considered : diminishing value of commodities (*i.e.*, rising labor productivity), increasing organic composition of capital, increasing rate of exploitation, diminishing profitability, and accelerating accumulation.

The examination of historical series covering more than a century in the U.S. economy, suggests the relevance of this notion of tendencies. Breaks can always occur (as is the case for the World-War-II leap in profitability) and remind the analyst of the risks that can result from an excessively mechanistic or deterministic approach. It is obvious, however, that strong continuities can be observed in the very long run.

Such regularities are manifested in most series displayed in this study :

1. The profit share in figure 2 is rather constant, in spite of a step downward following World War I.

2. The propensity to consume, as in figure 3, has been very stable.

3. Labor productivity in figure 4 and the rate of real wage in figure 5 have both been very steadily rising. One of the most striking regularities concerns the ratio of these two series (*cf.* figure 6).

4. The transformation of technology can be very accurately described by a rising technical composition of capital and increasing ratio of equipment to structures (*cf.* figures 7 and 8).

5. The rate of growth of output, as displayed in figure 10, has been very steady.

These observations raise two complementary types of questions. The first issue is that of the explanation. These tendencies cannot be interpreted independently of one another, but must be seen as part of a *system* of interrelationships. The second issue concerns the *breaks* that interrupted these trends. The rise of profitability during World War II is not the only break to be explained. Many series manifested such transformations, and only a few exceptions can be listed :

19. Okishio's theorem (OKISHIO N. 1961) also opposed to Marx's analysis a very serious objection at the beginning of the 1960s.

1. No break can be identified in the trends of the rate of growth of output, the ratio *real wage rate/labor productivity*, and the propensity to consume.

2. World War II coincides with an inflection in the trend of some series : labor productivity and real wage rate.

3. For other series, World War II corresponds to a change in the general level of the variable : technical composition of capital, ratio *equipment/structures*, and capital productivity.

3.4 The Regulation School and historical tendencies

Historical tendencies do not appear as key elements in the interpretation of the history of capitalism by the Regulation School. History is seen as a succession of periods, called *modes of regulation*, in which wages were pegged to labor productivity adequately or not, consumption was sustained or inadequate, and in which the profit rate either increased or diminished, in a given institutional environment. This is not too surprising in Boyer's works, who adopts a Keynesian point of view. In Lipietz's analysis the tendency for the rate of profit to fall takes center stage only when necessary, *i.e.*, in order to account for the crisis of Fordism. It does not seem, however, to play an important role in the analysis of the interwar period and the first 20 or 30 years following World War II.

For this reason, the various stages of development of capitalism seem, in the theory of Regulation, to be chained together in a random order. No historical necessity can be clearly located in this theory. An episode such as the interwar period, when labor productivity and wages supposedly diverged, could have occurred earlier and could, as well, happen again. The point here is not to contend that "events" such as the World-War-II break could not occur at any stage of development of capitalism. Our objection refers to the lack of an underlying mechanism in the general transformation of the system.

Conclusion

The observations that can be made from over more than one century of economic history of capitalism do not support the periodization established by the Regulation School. The Great Depression did not originate from a biased distribution, in the 1920s, to the advantage of profits, and Fordism was not the solution to this problem that did not exist. Rather, the examination of the available series shows that the relation between the real wage and labor productivity has not been significantly modified in the aftermath of World War I or II. Instead, the data supports the traditional Marxist view of the tendency for the rate of profit to fall, with the important exception of a sudden recovery during World War II. The 1920s must be seen as a new step in the development of the law. Ironically enough, these years can be characterized as a stage of exceptionally low profitability.

At a more general level, the examination of historical series concerning basic macroeconomic variables confirms the explanatory power of the notion of hitorical tendencies. Very strong regularities have been manifested in this respect in the history of the U.S.,

rather than a succession of periods in which these macro relations would have appeared in various configurations.

It goes without saying that the above statement with its reference to hitorical tendencies does not solve every problem in the interpretation of the history of capitalism:

1. Many other phenomena should be considered. For example, we fully abstracted from monetary phenomena, as well as from the transformation of class relations (*cf.* DUMÉNIL G. 1975) or many other crucial aspects of the evolution of capitalism (for example, the international dimension of accumulation).

2. The specific role conferred to the tendency for the rate of profit to fall among other tendencies should be explicated (see DUMÉNIL G., LÉVY D. 1993(a), entitled *Why does profitability matter?*).

3. Both the existence of historical tendencies and breaks should be justified.

The object of the present study is limited to the refutation of the interpretation developed by the Regulation School on the basis of its erroneous representation of the profiles of basic macroeconomic variables, and the defense of the traditional Marxist reading of these series for which the Regulation worked as a substitute. Indeed, the present study does not provide an alternative interpretation of the history of capitalism.

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