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downward trend in the rate of profit
since XIX century**

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2014

Online at <http://mpra.ub.uni-muenchen.de/55894/>

MPRA Paper No. 55894, posted 11. May 2014 13:03 UTC

The historical transience of capital

The downward trend in the rate of profit since XIX century

Esteban Ezequiel Maito¹

ABSTRACT

This paper presents estimates of the rate of profit on fourteen countries in the long run. The performance shows a clear downward trend, although there are periods of partial recovery in both core and peripheral countries. The behavior of the profit rate confirms the predictions made by Marx, about the historical trend of the mode of production. Finally, an estimate of the global rate of profit for the last six decades is done, also highlighting the particular role of China in systemic profitability.

Keywords: rate of profit - Marx - mode of production – core/periphery.

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Introduction

There is, in the origins of classical political economy, a concern about the downward trend in the rate of profit. Adam Smith and David Ricardo, among others, have argued in their own way the existence of this trend². The systemic tendency to crisis and insufficient profit generation has also been reflected by other exponents of different economic schools, expressing, on one hand, the eminently real character of the trend, and on the other, the theoretical particularities of these economic schools³.

Marx established, as the most important law of political economy, the law of the falling tendency of the rate of profit. Ricardo sustained this trend on the increase of labor costs due to decreasing agricultural productivity, recognizing the necessity to expand production on badlands. However, the Ricardian assumption of a diminishing marginal productivity in agriculture (that neoclassicals extrapolated to all productive activity) has proved unreal. The rate of profit shows a downward trend, not because productivity decreases, but precisely because it increases in historical terms.

The capitalist production process is a valorization process (M - M') through the exploitation of the labor force (M - C ... P ... - C' - M'). The capital advanced in the form of money (M) is exchanged for commodities (C) - means of production, inputs (constant capital, CC) and labor (variable capital, VC) - . The labor force, unlike the means of production and inputs, has the power to generate an additional value that required to its own reproduction. Thus, the production process itself (P) in which the labor force, using the means of production, transforms inputs is realized, resulting in a mass of commodities of a greater value than the prior (M'). In the final product appears transferred this constant capital employee, plus an additional amount generated by labor force, equal to variable capital (reproduction value of labor force) exchanged with the capitalist, and a surplus-value. The capital is thus transmuting from money-capital to commodity-capital, then productive-capital, to finally

² Ricardo, David, *Principios de economía política y tributación*, FCE, México, 1959.

Smith, Adam, *Investigación y causa de la riqueza de las naciones*, Aguilar, Madrid, 1956.

³ "The neoclassical orthodoxy extrapolated this theory (Ricardian theory of diminishing returns in agriculture, EEM) to industry and postulated the existence of a "diminishing yield" of capital, resulting from capital shortages. Keynes placed the cause of the contraction on the financial benefit and speculation and Schumpeter on the discouragement of innovation generated by the bureaucratization of contemporary societies". Katz, Claudio, *Una interpretación contemporánea de la ley de la tendencia decreciente de la tasa de ganancia*, Revista Laberinto N°8, Málaga, 2002.

return to the form of commodity-capital and money-capital of a greater value. This last step is the one that involves the sale on the market (C'-M'), the realization of the profit and the completion of the valorization process.

The necessity each capital has to sell at a lower price than competitors, and cover a larger market share, implies a constantly increasing expenditure on fixed capital, equipment and infrastructure, which allows to increase productivity and to reduce the individual value of commodities, including the labor force. The relative growth of constant capital is given at the expense of variable capital for the reproduction of the labor force, the latter being the only source of profit. The capital thus finds its own internal limit. As such, its sole purpose is to increase the surplus value extracted from the labor force, but its only mean is by the relative increasing of constant capital to variable capital.

In Marx's terms, this trend decline in the rate of profit would occur regardless of a decline or stagnation in wages relative to profits, i.e., a rate of surplus value (profits/variable capital) constant or increasing: *“This mode of production produces a progressive relative decrease of the variable capital as compared to the constant capital, and consequently a continuously rising organic composition of the total capital. The immediate result of this is that the rate of surplus-value, at the same, or even a rising, degree of labour exploitation, is represented by a continually falling general rate of profit. The progressive tendency of the general rate of profit to fall is, therefore, just an expression peculiar to the capitalist mode of production of the progressive development of the social productivity of labour”*⁴.

The downward trend in the rate of profit is not necessarily imposed in a steady pace, or is exempt from recovery periods. There are factors counteracting this trend, some of which have been identified by Marx and Grossmann: cheapening of constant capital, payment of the labor force below its value, increasing turnover speed of capital, capital export, foreign trade to expand markets, among others.

These counteracting factors are characteristic of the system as its tendency to collapse. In his analysis of the trend, Marx neglects some of these elements to focus on the central and essential long-term determinants. These counteracting factors may alleviate only in a relative way the decrease in the rate of profit in the long run. Their own characteristics, which initially tend to increase profitability, then get diluted or reversed in the opposite

⁴ Marx, Karl, *El Capital. Tomo III*, FCE, México, 1968, pp.214-215.

direction. For example, if the cheapening of the elements of constant capital, reduce its relative value to variable capital, raising profitability, then will promote increased spending on constant capital, in the context of capitalist competition. Grossmann concludes that, without these countertendencies, the collapse of the system would be much more abrupt: *"The operation of these countertendencies transforms the breakdown into a temporary crisis, so that the accumulation process is not something continuous but takes the form of periodic cycles (...) as these countertendencies are gradually enmasculated , the antagonisms of world capitalism become progressively sharper and the tendency towards breakdown increasingly approaches its final form of an absolute collapse"*⁶.

If the system tends to lower returns, gradually exhausts its own sustenance. But is there empirical evidence of this trend? This paper attempts to settle the debate about this immanent tendency of the capitalist mode of production to liquidate its own bases.

The rate of profit

In Marxian terms, the rate of profit is calculated from the ratio of profits and, on the other side, capital advanced in machinery, infrastructure (fixed constant capital, FCC), inputs (circulating constant capital, CCC) and wages (variable capital, VC). Fixed constant capital transfers its value to the product for several years. The constant and variable circulating capital is transferred on the final product after every production process, and gets recovered by the capitalist once the commodities are sold, to be newly released to production and valorized.

Circulating capital consumed on inputs and wages, as shown in the national accounts (Intermediate Consumption -IC- and Wage Bill -W-), must be divided by the annual number of turnovers (N). Faced with increasing turnover speed and organic composition of capital (CC/VC) due to largest expenditure on constant capital, wages increasingly have less of a reason for a lack of profitability, as a cost to capitalists.

$$\text{RoP} = \frac{P}{\frac{\text{FCC} + \frac{\text{IC}}{N} + \frac{\text{W}}{N}}{N}} = \frac{P}{\text{FCC} + \text{CCC} + \text{VC}} .$$

⁵ Grossmann, Henryk, *The law of accumulation and breakdown of the capitalist system*, available on www.marxists.org, 2005, p.74.

However, given the difficulty of calculating the constant and variable circulating capital, the rate of return on fixed capital is sufficient to analyze the evolution of the profitability in a country. So that, in this paper we will use as an expression of the rate of profit:

$$\text{RoP} = \frac{P}{\text{FCC}}$$

The rate of profit on fixed capital tends, however, to converge with the Marxian rate of profit in the long run. The reason for this is simple. The growth in turnover speed of circulating capital steadily reduces the participation of that circulating capital in the total capital advanced, ie, related to fixed capital.

Ricardian theories rooted on profit squeeze, supported by "heterodox" and many Marxists, wrongly identified the labor cost faced by capitalists with the annual wage bill. By not considering turnovers of circulating capital, they changed the setting axis of the determination, overestimating labor costs. In countries like the U.S., Japan and the Netherlands, compared to wage bills exceeding 50 % of GDP, the turnover speed is such that the true labor cost to the capitalists, the annual variable capital, is about 5%. Minimizing the advanced variable capital relative to constant capital, increased capital composition (CC/VC) that fails to be offset by increases in the rate of surplus value (P/VC), is the pillar on which the trend of capital to breakdown or collapse is sustained. Today, in the core countries, the CC/VC ratio is near to 40-1⁶. In this context profit squeeze theories, very popular in the sixties and seventies, lost their strength, regardless of any influence of wage behavior in the short term.

Among studies of the rate of profit on fixed capital in particular countries, profit/wage shares has not been the main determinant of the rate of profit's performance. It has been the output-capital ratio, the reduction of value added related to fixed capital⁷.

The rate of profit on fixed capital has been, by far, the most commonly used measure in studies on capital profitability. In a previous study⁸, we performed a comparison for four

⁶ Maito, Esteban, *Distribución del ingreso, rotación del capital y niveles de rentabilidad*, Revista Economía:Teoría y Práctica, Universidad Autónoma Metropolitana (on evaluation), México.

⁷ Freeman, Alan, *What makes the US profit rate fall?* MPRA Paper N°14147, <http://mpra.ub.uni-muenchen.de/14147/>, 2009.

Maito, Esteban, *La Argentina y la tendencia descendente de la tasa de ganancia 1910-2011*, Revista Realidad Económica N°275, pp.127-152, Buenos Aires, 2013

Marquetti, Adalmir et al, *The rate of profit in Brazil 1953-2003*, Review of Radical Political Economics Vol.42 N°4, pp.485-504, SAGE, New York, 2010.

countries on the Marxian rate of profit but, otherwise this case, all studies that address an international comparison, due to data availability, focus on the rate of return on fixed capital. Chan-Lee and Sutch, in one of the first comparative analyses, studied the profit rates of OECD countries for the period 1960-1980, clearly reflecting the decline due to the profitability crisis in the seventies. Li et al conducted a study that considers the long-term profitability for the UK, U.S., Japan and the Euro zone (from the 60s) in the context of a historical analysis of the global hegemony of successive states in the world system. Duménil & Lévy also compared the profit rates levels for these countries, although in a more limited temporal range. Zachariah makes a similar exercise, adding too China and India. However, he does not estimate the return on reproductive fixed capital, but additionally includes dwellings, which are not part of the fixed capital and the process of capitalist production itself⁹.

Estimates for fourteen countries are presented in this article, in some cases covering more than a century of history, and representing more than half of world production in the last seventy years¹⁰. In relation to the work of Li et al, are incorporated on the longer term (series of more than a century of extension) estimates for Germany, Argentina, Sweden and the Netherlands. The inclusion of Argentina in the early twentieth century, as well as Korea and China in recent decades, allows us a better interpretation of the most dynamic peripheral areas of accumulation, during some particular periods, in their relation to the general trend of profitability.

In all cases, the rate of profit arises as the ratio of net profits and fixed constant capital (net reproductive capital stock) of the whole economy, valued at current prices. The exception is the U.S., whose estimate is based only on the private corporate sector. Finally, statistical and methodological appendixes for each country are included, specifying the estimate's sources.

⁸ Maito, op.cit.

⁹ Chan-Lee, James & Helen Sutch, *Profits and rates of return in OECD countries*, OECD Economic and Statistics Department Working Paper N°20, 1985.

Li, Minqi, Feng Xiao & Andong Zhu, *Long waves, institutional changes and historical trends: a study of the long term movement of the profit rate in the capitalist world-economy*, Journal of World-System Research, Vol.13 N°1. 2007.

Duménil, Gerard & Dominique Levy, *From prosperity to neoliberalism. Europe before and after the structural crisis of the 1970's*, disponible en <http://www.jourdan.ens.fr/levy/>, 2005

Zachariah, Dave, *Determinants of the average profit rate and the trajectory of capitalist economies*, Bulletin of Political Economy Vol.3 N°1, 2009.

¹⁰ In 2010, they represented 62% of world GDP.

Movement of capital and rate of profit

In Volume III of *Capital*, Marx develops the general process of capitalist production on the existence of different individual capitals. Yield spreads between different areas (between industries or national spaces) foster an influx of capital to the most profitable branches or countries. This influx intensifies competition by investing in fixed capital, resulting in a general decline of profitability in that industry or national space. The own action of individual capitals to increase their own productivity is what ultimately ends up eroding general profit rates. These constant movements involve a tendency to equalization and fall of the rates of profit¹¹.

In parallel, a conclusion that emerges from this work is that, in historical terms, profitability in core countries is actually lower, due to higher relative levels of fixed capital accumulation. So that in these countries, the production processes required to develop a higher minimum capital. However, the peripheral countries have a greater relative decline in recent decades compared to the core countries, which is usually expressed in higher rates of accumulation and growth for the recent period.

The historical development of capital will promote the entry of peripheral countries in the world market, with particular dominance of certain agricultural and mining branches, driven by cheap and mass production of means of production -including transport - in the core countries and the favorable international relative prices of agriculture products and raw materials. The late years of XIX century are crossed by the great 1871-1873 general crisis, which would imply a steady decline in the rate of profit for the period in core countries and a major boost to capital in peripheral countries. The full consolidation of imperialism in the last decades of the century has a strong relationship with the counteracting elements of the tendency to collapse (export of capital cheapening of constant capital inputs produced more easily in the periphery, etc.). Given the sharp decline in the rate of profit during the

¹¹ There are, however, performance differences related to technical characteristics of production in certain branches. For example, the production and distribution of electricity and other services requires significant amounts of fixed capital relative to variable capital. Thus, in general the branches of this type have had historically lower rates than the rest. The trend towards the equalization of the rate of profit between such branches and others is slower than between manufacturing branches. However, this tendency to equalization would be developed in the long term, rather than by a sustained increase in branches with high fixed capital requirements in infrastructure, by the relative decline in the rate of profit in the other branches, as Duménil & Lévy have found in the American case. Duménil, Gerard & Dominique Lévy, *The profit rate. Where and how much did it fall. USA 1948-2000*, available on <http://www.jourdan.ens.fr/levy/>, 2002.

seventies, a growing mass of capital was overaccumulated. The export of capital to the periphery allowed a significant portion of that mass to be valorized, usually at higher profitability levels, based on the production of commodities bearing ground rent and related activities (infrastructure, etc.). In the first two decades of the twentieth century, the downward trend will show a more stable path, less pronounced in relation to the years marked by the consequences of the general crisis of 1871-1873.

During the postwar period, the entry into world market for certain peripheral national spaces, the most dynamics of the period, was not based on bearing land rent goods production, but through the production of industrial goods, firstly related to the textile industry but subsequently increased in volume and complexity, to achieve a high industrial development, as in the Korean case.

Regardless of the specific role in particular capitalist developments, the movement of capital in search of higher returns is not only international, but also national, ie, capital previously increased in such national space by exploiting its labor force, which accumulates and is reinvested there. This seems to be an important aspect in the postwar capitalist development in East Asia although, strictly speaking, is a general process of historical development of capital. Faced with previous and contemporary processes, especially Latin American ones, the capital contribution in the form of foreign direct investment may have been relatively minor.

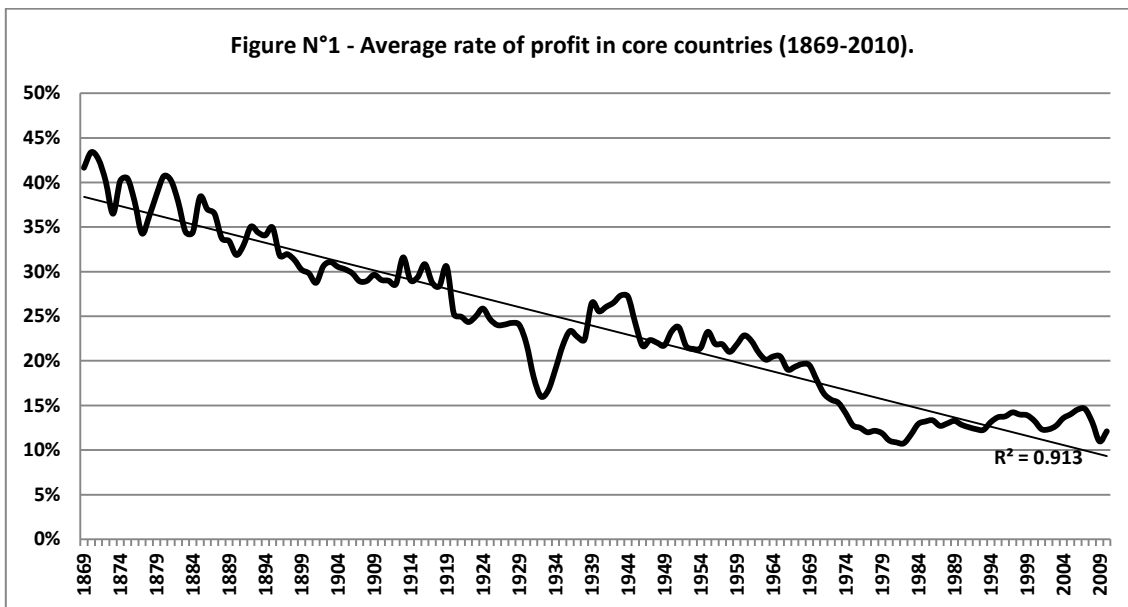
However, the growth of accumulation and declining profitability remains whether controls or restrictions on international capital mobility, and although the highest levels of performance are capitalized by own country's capitals, the economic fundamentals described by Marx continue operating. Regarding the downward trend in the rate of profit, accumulation laws remain valid regardless of the nationality of the more developed capital prevailing in a particular nation or specific characteristics of their national bourgeoisies. Indeed, Japan and Korea have probably experienced the largest decreases in profitability during the war, certainly since well above average levels.

The rate of profit from the mid-nineteenth century

The rate of profit in the long run shows a clear downward trend, shared by both the core and oldest capitalist development as the peripheral ones¹².

a) The core countries

For the core countries, our series start in the second half of the XIX century, marked by the general crisis of 1871-1873 that, as noted earlier, would imply a sharp fall in profitability, to show some stability in the early decades of the twentieth century. The presence of the three national spaces that successively became the core of the development of the mode of production for several centuries (Netherlands, United Kingdom and United States) , together with the two countries which otherwise posed strong economic competition to American hegemony throughout the twentieth century (Germany and Japan) , gives their series a particular relevance reflecting the systemic trend.



The rate shows a sharp decline in the general crisis of 1930 and a subsequent recovery whose highest point is given by the Second World War. Anyway, after the war, the rate drops so that finally re-locates in the previous trend line. That is, capital could not escape the trend development even through the wildest barbarism in the history of mankind.

¹² Germany, USA, Netherlands, Japan, United Kingdom and Sweden are considered core countries. While Argentina, Australia, Brazil, Chile, China, Korea, Spain and Mexico are considered peripheral.

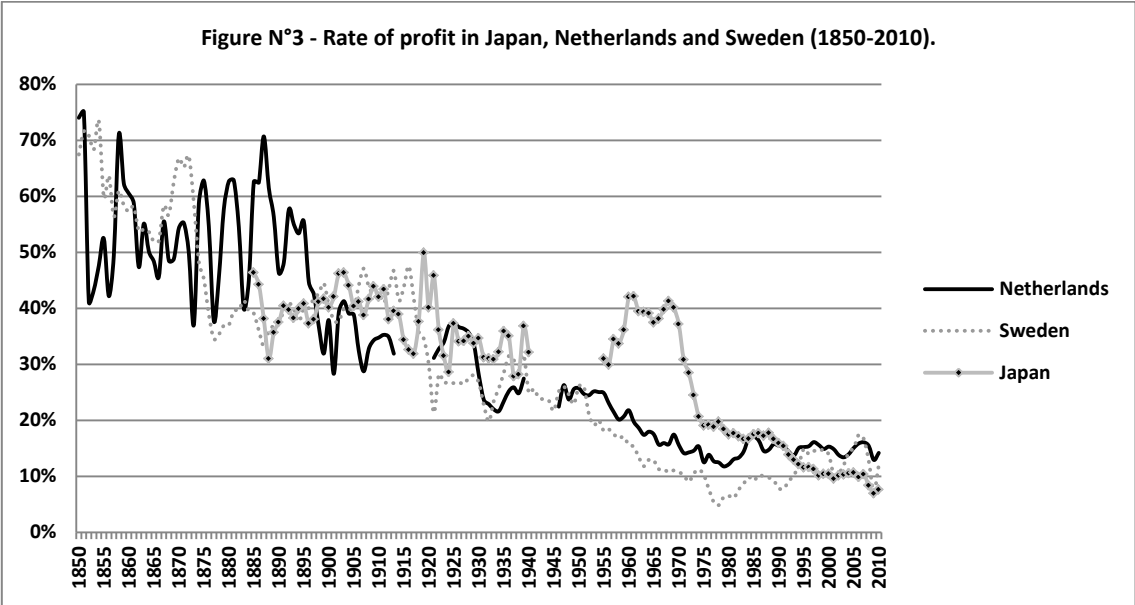
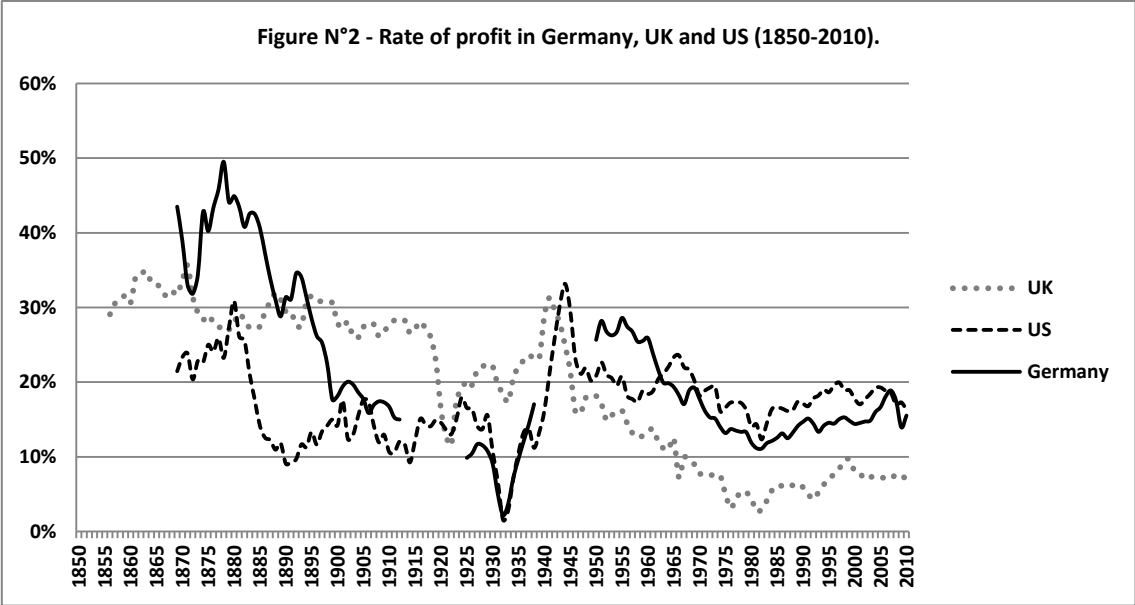
Certainly, this barbarism allowed to temporarily expand the projection of the collapse (ie, in the thirties, the trend line were obviously much more pronounced in its fall).

From XIX century to the seventies of the XX there was, except for the period 1930-1944, a very regular trend (marked by the proximity of the points to the line) which would be again interrupted by a sharp decline during the period 1970 - 1982. The subsequent partial recovery has been very limited. While in the former case the recovery passed from an average rate of 16% in 1932 to 27.3 % in 1943, in this one passed from 10.8% in 1982 to 14.6 % in 2007, the higher level since 1973. The capital inability to restore its profitability is given not only by the slight rise but the extended period of time involved to reach the peak of their recovery, especially considering that in recent decades it was promoted unsuccessfully fuller capacity to act for many of the counteracting factors (trade, financial and investment liberalization, worsening labor conditions). The last decades clearly appear as those with lower levels of profitability, almost repeating in 2009 the historic trough of 1982, and thus reversing the cycle of very limited recovery started in the eighties.

In the U.S. case, successor of the Netherlands and the UK in the global hegemony, the profit rate is significantly lower than the rest from the late nineteenth century until the Second World War. Whether our measurement is bounded to the private sector, it also expressed the great development of the productive forces in the United States, and its consolidation as a major exporter of capital and foreign investors since the early twentieth century. After the Crisis of 1930, there will be a sustained recovery in the rate of profit, mainly from its entry into the Second World War in 1941, and reaching its historical peak in 1944. This rise will reduce the differentials between American and European profitability. The postwar period was characterized by a higher rate of profit in European countries (and a greater economic expansion), which nevertheless present a greater rate of decline in relation to the United States.

Within the European context, there were highest rates in Germany, Netherlands and Sweden during the nineteenth century in relation to the United Kingdom. Since the early twentieth century these differentials would be virtually discounted. Due to high capital accumulation rates in Germany and the lower profit rate since then, just as in the case of the United States, that country will become one of the major capital exporters, with an increasing amount of foreign investment by German companies. The end of British hegemony, although it had been previously brewing, coincides with its sharp decline in the rate of profit after the First World War. The picture in Germany and the United States

during the twenties shows a greater profitability in the North American country compared to previous years to war, while in Germany the return on capital was even lower. The general crisis of 30 virtually leveled the profit rate in these two countries, both in regard to the 1932 record low as the subsequent recovery.

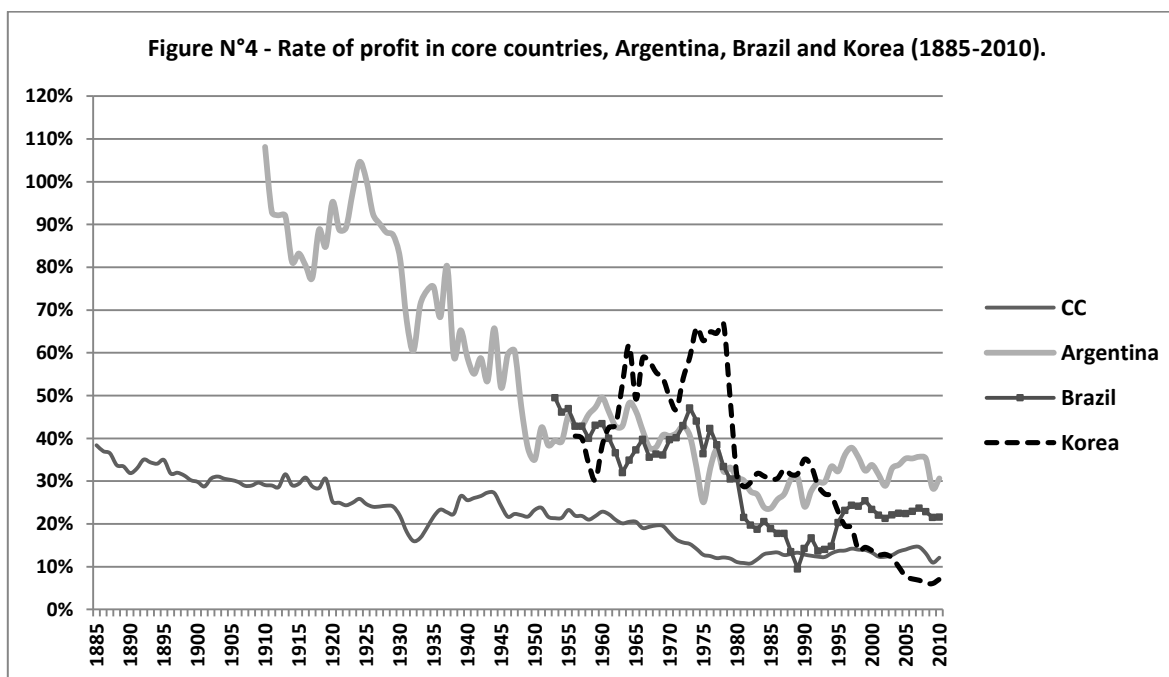


Japan experienced a tremendous economic dynamism during the postwar, which allowed it to become a main capitalist power, gaining positions in the world market on productive branches or phases where countries like the U.S., UK and Germany lost competitiveness (from textiles to electronics). However, this potential, the clear profitability spread relative

to the rest, derived precisely in such a capital accumulation that finally collapsed the rate of profit, immersing Japanese economy into a chronic crisis during the last decades¹³.

b) The peripheral countries

The most dynamic periods of peripheral countries in terms of production and trade show significant profitability spreads relative to the core countries. The specific levels tend, in addition to decrease, to converge, but generally remains differentials. Reached a certain point, profitability in peripheral countries falls more markedly from much higher levels, and tends to adjust to the general trend, expressed by the central countries. Probably the most eloquent cases are Argentina and Korea, countries that, at different historical moments, were among the most dynamics in the periphery.



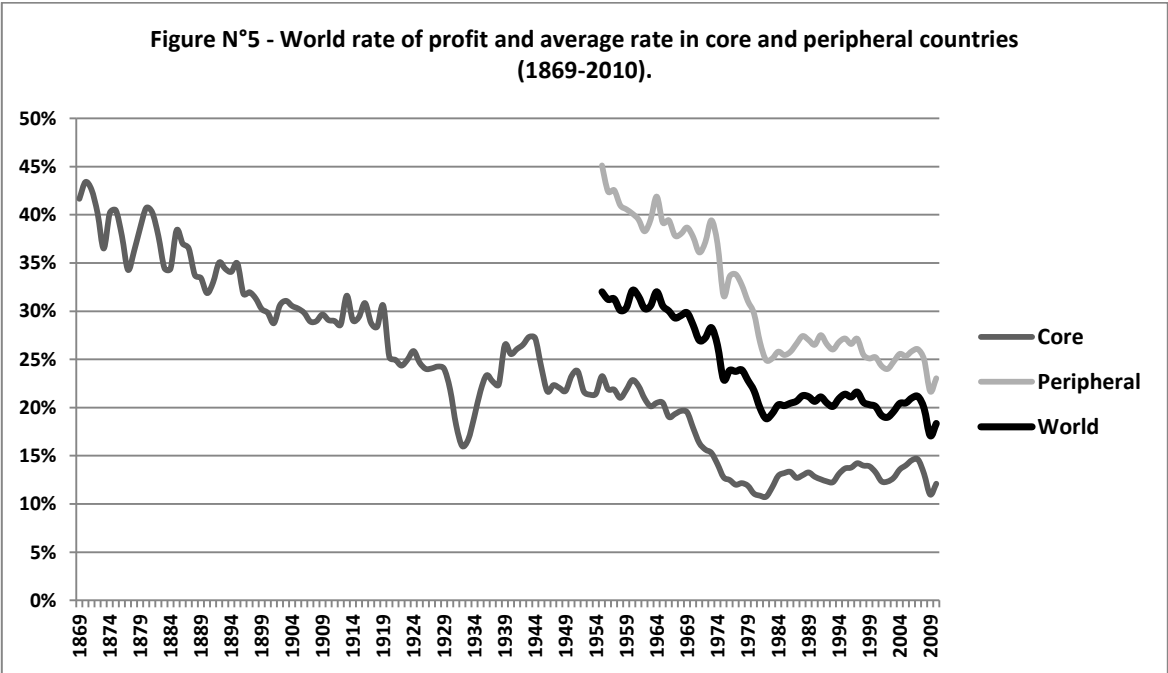
For what reason the core countries express further the general trend of systemic profitability? They show higher development of productive forces and relative contribution to the world production, due to a wider accumulation of capital. In this sense, the yield differentials in many peripheral countries, at least in many lapses, being crossed during cycles by strong devalorization processes and devaluation crisis, reduce their potential of

¹³ For a Japanese case analysis, Maito, Esteban, *Auge y estancamiento de Japón (1955-2008). Una explicación marxista*, Revista Realidad Económica N°280 (on edition), Buenos Aires.

counteracting to the general trend, by descending, despite their higher profitability after the devaluation, their share in the world aggregate output. Thus, their higher levels of profitability are formed in a context of reducing their own contribution to the systemic mass of profits. This applies, for example, to the growth in profitability in Chile during the seventies and eighties, in Argentina for several periods after crises and devaluations, or the UK in the interwar period. Opposite cases like Korean are also presented during the postwar. Its biggest impact on global production, from a remarkable development of the productive forces, is performed in conjunction with an exacerbated decline in profitability, exemplifying again Marx's assertion that the downward trend in the rate of profit expresses the development of the productive forces in the mode of production. In recent decades, however, the contribution of the core countries to the world economy has fell, increasing further their contribution peripheral Asian countries like China and Korea itself.

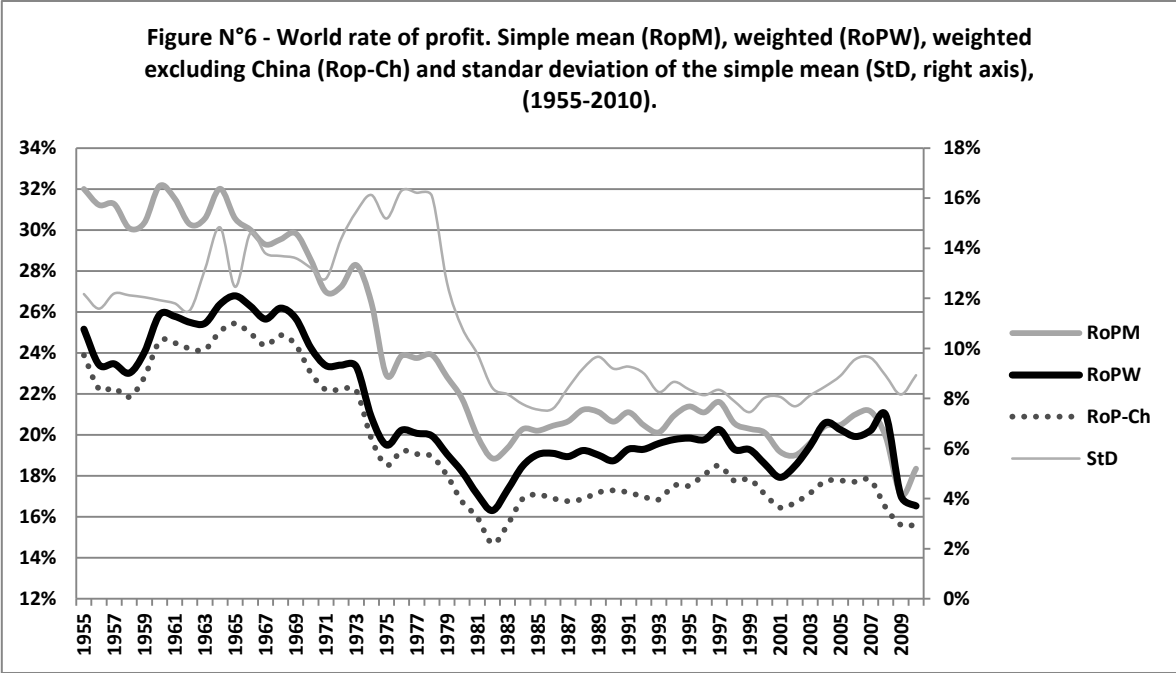
c) The world rate of profit and the role of China

Figure No. 5 shows the average rate of profit in the fourteen countries and in core and peripheral ones. As noted above, profitability in peripheral countries falls even more sharply, being mainly in the central countries where the rate experienced a higher recovery , although very slight, since 1982.

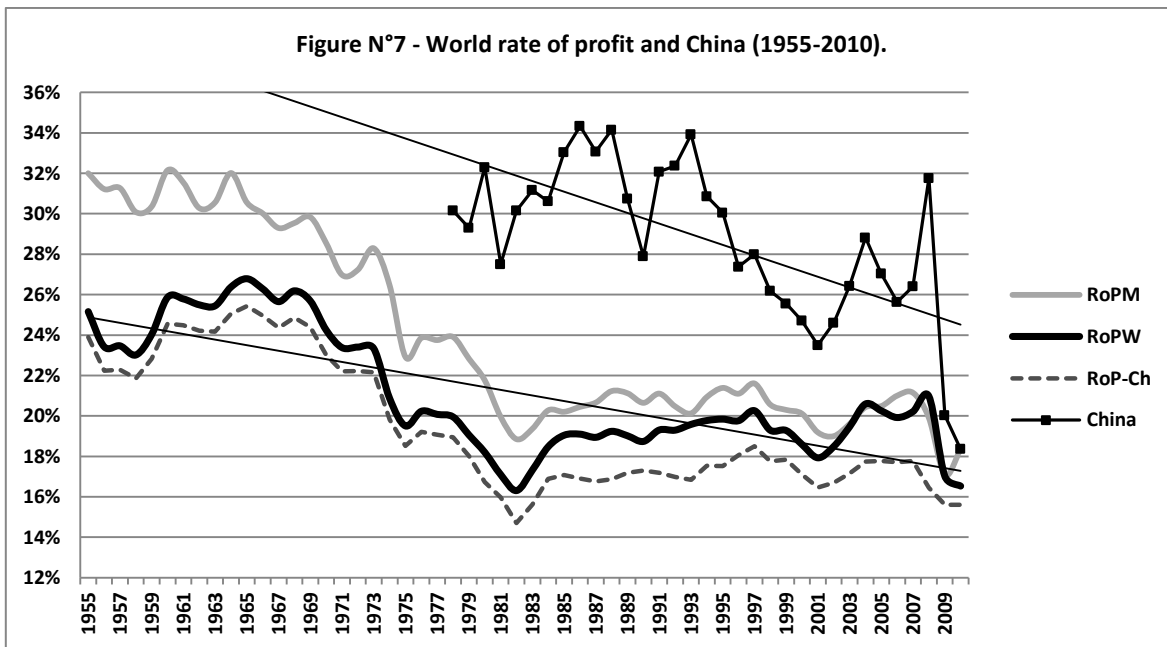


The global rate of profit arising from the series presented here may be a result from simple average or from weighted average of the different national rates. The weighted rate of profit, which is further related to the Marxian in the sense that expresses the return on total social capital (here reduced to fourteen countries in the period from 1955 to 2010 accounted for 57.3 % of the world economy), because individual rates are weighted by the share of each country in the fourteen countries aggregate production as a whole, understanding that, from a systemic perspective, the influence on the overall profitability of the variation in national rates is related to the size of the individual economies.

The average rate has a stronger tendency to decline than the weighted one, largely due to a fall in national profitability spreads. Expressions of this are the remarkable fall of the average rate and the standard deviation, during the seventies and early eighties, as well as the inability to recover their previous levels. The higher relative capital expansion during postwar in countries like Japan, Korea, México and Argentina, which had higher profit rates, has been eroding, by its own action in these national spaces, those differentials. Thus, the increasing competition between national spaces, including peripherals, to present more favorable conditions to capital under global competition, lowers profit rate's spreads, presenting in the last two decades very similar trajectories both the average rate and weighted rate without China.



The growth cycle of the world economy during the first decade of the century had, as its main dynamic element, the increase of capital hegemony in China, as seen in the highest growth between 2001 and 2008 of the weighted rate including this country, in relation with the weighted without this country. The behavior of the rate of profit in China has a growing influence in the systemic accumulation. Behind its emergence as one of the major capitalist economies of the world are concentrated, from the perspective of accumulation as a global phenomenon, many counteracting factors - payment of the labor force below its value, cheapening of constant capital elements, capital export, foreign trade – of the falling tendency of the rate of profit. But a further reading arises about the historical significance of this advent of China. The series shows a peak, in 1997, of the recovery from the 1982's trough. The period 1998-2001 is the first, since 1982, in which rates show a steady decrease¹⁴. The deepening of the capitalist transformation of China since 2001, has been a focal point for capital in the attempt to break this new phase of fall, of which China itself was not free.



The widening gap between the two weighted rates (with and without China) for 2002-2008 sets the tone of the growing contribution of China to the global rise in profitability. In 2008 the weighted rate (20.9%), the closest measure to the actually existing rate, exceeds the

¹⁴ Usually, explanations of the crisis in the peripheral countries during this period (South East Asia, Russia, Brazil, Argentina) have not even suggested a relationship with a cycle of declining profitability but have been forwarded to characterize it as a crisis caused for purely financial or economic policy issues. The same reading is the one that has prevailed on the current global crisis.

average rate (19.8%) and the weighted without China (16.4%)¹⁵. In that year, China rises 4.5 percentage points the global weighted rate (in 2001, rises just 1.4%) which indeed exceeds, unlike the other two measures, its 1997 peak. The growth of China's rate since the cyclic trough of 2001 reach a peak in 2008 and then collapsed in 2009, from 31.8% to 20 %. The current crisis places the rate, both in China and globally, more or less near the trend marked in the 1998-2001 period. The recovery cycle of 2002-2008 seems finally ended. The same can be said about the long cycle of recovery since 1982. The crisis of profitability and China's rising tensions, are thus an expression of the general crisis and the depletion of capital ability to counteract the action of the global trend in the current historical context.

Concluding remarks

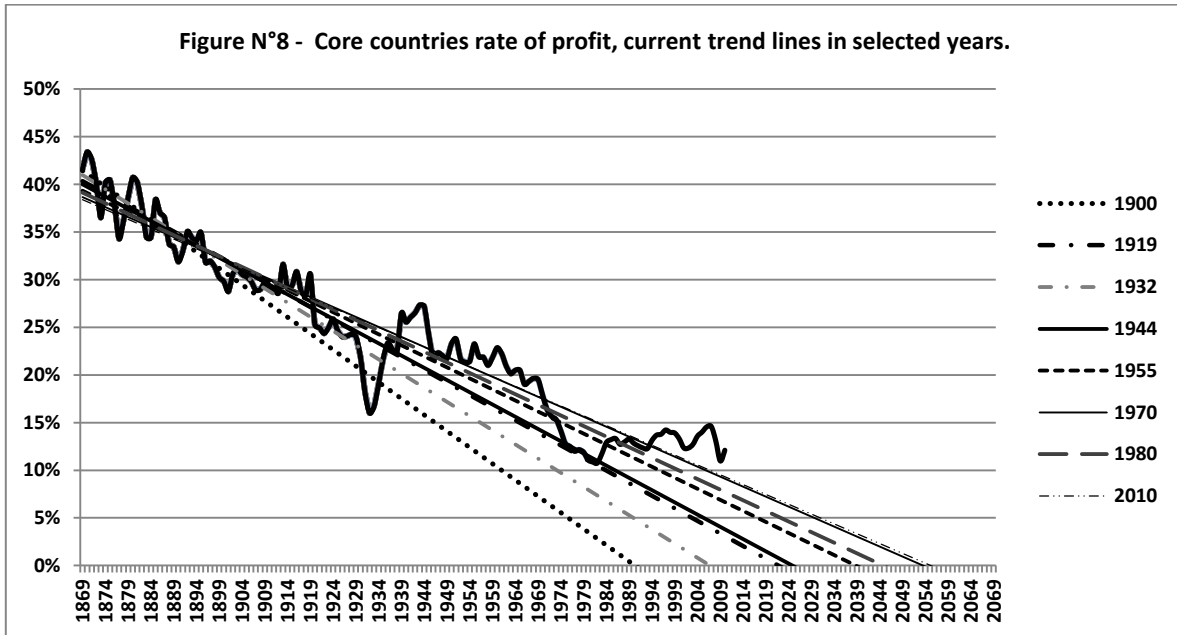
The downward trend of the rate of profit, its empirical confirmation, highlights the historically limited nature of capitalist production. If the rate of profit marks the vitality of the system, the logical conclusion is that it approaches further to an endpoint.

Many considerations were made on the ability of capital to overcome the crisis and regenerate constantly. Periodic crises are specific to this mode of production, and allow, ultimately, a partial recovery of profitability. This regeneration capacity is a characteristic aspect of capital and the cyclical nature of the capitalist economy. But the periodic nature of these crises has not stopped the downward trend of the rate of profit on the long term. So that, compared to those claims on the inexhaustible capacity of capital to restore the rate of profit and its own vitality, and therefore consider the mode of production as a natural and a-historical phenomenon, it's necessary to assert its inevitable historical transience, in the light of empirical evidence.

Obviously, there is no specific date on which to place this point that, moreover, must be understood rather as a particular historical period that poses significant political challenges for the working class. However, we have made projections of the linear trend of the average rate of profit in the core countries, according to its trajectory until relevant years. Although the 0% profit rate should not be regarded as the real limit of capital, but higher

¹⁵ Since China series starts in 1978, and considering its marginality in global capitalism during the previous years, has been applied to the weighted rate which includes China, for the period 1955-1977, the variation of weighted one without China.

levels, the years which the trend line reaches 0 % were considered. For the year 1900, the trend would have reached 0% in 1990. For 1919, in 2024. For 1932, in 2007. For 1944, in 2025. For 1955, in 2040. For 1970, in 2055. For 1980, in 2046. For 2010, in 2056. For the peripheral countries, this exercise marked, for the year 1970, 0% rate projected in the year 2072. For the year 1980, in 2050, and for 2010, in 2064.



Two points can be highlighted from these projection exercises. As noted earlier, the trend does not develop in a steady way but changes its slope according to the historical moment and the counteracting factors. So, by 2010, the projected limit in 1900 had moved 66 years, from 1990 to 2056. However, and secondly, the progress of this trend continues, increasingly reducing the number of years with respect to the projected limit, which tends, on the other hand, to remain fixed in the middle of this century. The inability of capital, and the counteracting factors, to revert its tendency in recent decades is reflected then like being unable to move forward this hypothetical limit. Well worth repeating at this point Grossmann's quote: "...as these countertendencies are gradually enmasculated, the antagonisms of world capitalism become progressively sharper and the tendency towards breakdown increasingly approaches its final form of an absolute collapse."

Statistical Annex

World Rate of Profit, simple mean (RoPM), weighted (RoPW), and weighted without China (RoP-CH) (1955-2010).

Year	RoPM	RoPW	RoP-CH	Year	RoPM	RoPW	RoP-CH
1955	32,0%	25,2%	23,9%	1983	19,4%	17,3%	15,6%
1956	31,2%	23,4%	22,2%	1984	20,3%	18,5%	16,9%
1957	31,3%	23,5%	22,3%	1985	20,2%	19,0%	17,1%
1958	30,1%	23,0%	21,9%	1986	20,4%	19,1%	16,9%
1959	30,4%	24,0%	22,8%	1987	20,7%	18,9%	16,8%
1960	32,1%	25,9%	24,6%	1988	21,2%	19,2%	16,9%
1961	31,5%	25,8%	24,5%	1989	21,1%	19,0%	17,2%
1962	30,3%	25,5%	24,2%	1990	20,6%	18,7%	17,3%
1963	30,6%	25,4%	24,2%	1991	21,1%	19,3%	17,2%
1964	32,0%	26,4%	25,0%	1992	20,5%	19,3%	17,0%
1965	30,6%	26,8%	25,4%	1993	20,1%	19,6%	16,8%
1966	30,0%	26,3%	25,0%	1994	20,9%	19,8%	17,5%
1967	29,3%	25,7%	24,4%	1995	21,4%	19,8%	17,5%
1968	29,5%	26,2%	24,9%	1996	21,1%	19,8%	18,1%
1969	29,8%	25,7%	24,4%	1997	21,6%	20,3%	18,5%
1970	28,5%	24,2%	23,0%	1998	20,6%	19,3%	17,8%
1971	27,0%	23,4%	22,2%	1999	20,3%	19,3%	17,8%
1972	27,2%	23,4%	22,2%	2000	20,1%	18,6%	17,1%
1973	28,3%	23,3%	22,2%	2001	19,2%	17,9%	16,5%
1974	26,5%	20,9%	19,8%	2002	19,0%	18,5%	16,7%
1975	22,9%	19,5%	18,5%	2003	19,6%	19,5%	17,2%
1976	23,9%	20,2%	19,2%	2004	20,4%	20,6%	17,7%
1977	23,8%	20,1%	19,1%	2005	20,5%	20,3%	17,8%
1978	23,9%	20,0%	18,9%	2006	21,0%	19,9%	17,7%
1979	22,8%	19,1%	18,0%	2007	21,1%	20,2%	17,8%
1980	21,8%	18,2%	16,7%	2008	19,9%	21,0%	16,4%
1981	20,0%	17,1%	16,0%	2009	17,1%	17,0%	15,6%
1982	18,9%	16,3%	14,7%	2010	18,4%	16,5%	15,6%

Rate of profit in core countries and Argentina, five years average (1850-2010)

Years	Core Countries	Germany	U.S.	Netherl.	Japan	U.K.	Sweden	Argentina
1850-54				56,2%			70,4%	
1855-59	50,4%			55,5%		30,6%	59,9%	
1860-64	47,8%			54,4%		33,5%	55,4%	
1865-69	44,8%	43,5%	21,5%	49,4%		32,2%	56,3%	
1870-74	40,6%	36,2%	22,6%	51,0%		31,7%	61,3%	
1875-79	37,5%	44,6%	25,1%	51,7%		27,8%	38,2%	

1880-84	37,5%	42,8%	24,3%	53,0%		28,1%	39,4%	
1885-89	35,8%	34,3%	12,3%	62,7%	39,1%	30,1%	36,3%	
1890-94	33,7%	32,5%	10,2%	52,1%	39,2%	29,0%	39,1%	
1895-99	32,1%	24,0%	13,5%	42,3%	39,8%	30,9%	41,8%	
1900-04	30,2%	19,2%	14,5%	37,2%	43,8%	27,1%	39,2%	
1905-09	29,5%	17,0%	14,8%	33,4%	41,2%	27,2%	43,5%	
1910-14	29,5%	15,6%	10,8%	34,2%	40,4%	27,8%	43,1%	93,3%
1915-19	29,6%		14,1%		37,3%	26,3%	40,7%	83,0%
1920-24	25,1%		14,8%	33,7%	36,5%	15,5%	26,6%	95,1%
1925-29	24,2%	10,9%	15,3%	35,9%	34,9%	21,2%	27,1%	91,8%
1930-34	18,4%	5,4%	5,8%	23,7%	32,0%	19,6%	23,7%	71,2%
1935-39	23,3%	13,3%	12,4%	25,4%	32,8%	23,0%	30,4%	69,7%
1940-44	26,5%		25,4%		32,1%	28,5%	24,4%	58,4%
1945-49	22,4%		23,2%	24,5%		17,9%	24,1%	51,4%
1950-54	22,3%	26,7%	20,9%	25,0%		16,3%	22,5%	39,0%
1955-59	22,0%	26,8%	18,6%	22,1%	33,0%	13,9%	17,6%	44,8%
1960-64	21,3%	22,2%	20,2%	19,1%	40,4%	12,2%	13,8%	45,9%
1965-69	19,6%	18,6%	22,2%	16,5%	39,4%	9,6%	11,4%	41,0%
1970-74	15,9%	15,7%	18,4%	14,8%	28,3%	7,6%	10,4%	39,7%
1975-79	12,3%	13,4%	16,9%	12,7%	19,0%	4,6%	6,9%	32,1%
1980-84	11,5%	11,6%	14,3%	14,0%	17,1%	3,9%	7,8%	27,9%
1985-89	13,1%	13,1%	16,6%	15,7%	17,4%	6,1%	9,7%	27,6%
1990-94	12,6%	14,3%	17,8%	14,8%	14,1%	5,3%	9,4%	28,9%
1995-99	13,9%	14,8%	19,2%	15,4%	11,0%	8,5%	14,5%	34,9%
2000-04	12,9%	14,9%	18,0%	14,3%	10,2%	7,5%	12,2%	32,2%
2005-09	13,4%	17,0%	18,2%	15,1%	9,2%	7,3%	13,8%	34,0%

Rate of profit in peripheral countries, five year averages (1950-2010)

Years	Periph. Countr.	Australia	Brazil	Chile	China	Korea	Spain	Mexico
1950-54							45,4%	46,7%
1955-59	42,3%		43,1%			36,2%	45,2%	40,5%
1960-64	39,9%	31,3%	37,4%	35,7%		47,7%	40,2%	40,7%
1965-69	38,6%	26,5%	37,0%	36,1%		55,1%	34,6%	40,1%
1970-74	37,5%	23,6%	42,8%	29,7%		55,0%	32,9%	38,6%
1975-79	32,6%	17,9%	36,2%	23,4%	29,7%	61,5%	25,1%	32,4%
1980-84	26,5%	17,6%	22,3%	26,8%	30,3%	30,5%	24,9%	31,5%
1985-89	26,5%	18,4%	15,5%	28,3%	33,1%	31,4%	31,2%	26,2%
1990-94	26,7%	20,1%	14,7%	31,9%	31,4%	30,2%	26,5%	29,5%
1995-99	26,3%	21,7%	23,5%	29,2%	27,4%	18,0%	28,1%	27,6%
2000-04	24,8%	23,4%	22,3%	24,7%	25,6%	12,3%	29,1%	28,6%
2005-09	24,8%	24,0%	22,7%	30,3%	26,2%	6,8%	26,0%	28,4%

Methodological Annex

Germany: Tables DE1 (1950-2010) and DE1C (1850-1950) from Piketty & Zucman database on Germany. Available at <http://piketty.pse.ens.fr/files/capitalisback/Germany.xls>

¹⁶

Argentina: Rate of profit series from Maito.¹⁷

Australia: Australian Bureau of Statistics (ABS), tables 34 (Income) and 56 (Capital Stock) for 1960-2011. Available at www.abs.gov.au.

Brazil: Series of fixed reproductive capital and net profits from chart C2 (p.466) in Grinberg (1953-2005), and operating surplus and fixed reproductive capital nominal variations from IPEADATA – www.ipeadata.gov.br – for the last years¹⁸.

Chile: Official capital stock series from Banco Central de Chile (1985-2010) – www.bcentral.cl -. For previous years, capital stock from Souza & Feu, investment prices from Braun et al, and reproductive construction participation from Aguilar & Collinao. The resulting series were linked with the official. Net profits available on CEPALSTAT¹⁹.

China: Rate of profit over fixed reproductive capital from Bai et al (1978-2005), linked with series from Hongbin et al for the last years²⁰.

Korea: Series of fixed reproductive capital and net profits from chart C15 (p.471) in Grinberg (1956-2005), and operating surplus and fixed reproductive capital nominal variations from KOSTAT – www.kostat.go.kr/eng - for the last years²¹.

Spain: Rate of profit over fixed reproductive capital from Camara Izquierdo (1954-2002) and operating surplus and fixed reproductive capital nominal variations from Instituto Nacional de Estadística (INE) – www.ine.es – for the last years²².

United States: Rate of profit from Duménil & Lévy database (1869-2010), en www.jourdan.ens.fr/levy/uslt4x.txt.

Netherlands: Income and fixed reproductive capital series from Smits et al (1850-1913). Profit series from Centraal Bureau voor de Statistiek (CBS) – www.cbs.nl – and fixed

¹⁶ Piketty, Thomas & Gabriel Zucman (2013) *Capital is back. Wealth-income ratios in rich countries 1700-2010*, en <http://piketty.pse.ens.fr/files/PikettyZucman2013WP.pdf>.

¹⁷ Maito, Esteban, *La Argentina y la tendencia descendente de la tasa de ganancia 1910-2011*, Revista Realidad Económica N°275, pp.127-152, Buenos Aires, 2013

¹⁸ Grinberg, Nicolás, *Transformations in the Korean and Brazilian processes of capitalist development between the mid-1950s and the mid-2000s: the political economy of late industrialisation*. Tesis de doctorado, The London School of Economics and Political Science, Londres, 2011.

¹⁹ Souza, Marcos & Aumara Feu, *Capital stock in Latin America: 1950-2000*, E&E N°50, Brasil, 2005.

Braun, Juan, et al, *Economía chilena 1810-1995. Estadísticas históricas*, DT N°187 del Instituto de Economía, Universidad Católica de Chile, Santiago, 2000.

Aguilar, Ximena & Collinao, María Paz, *Cálculo del stock de capital para Chile 1985-2000*, DT N°133, Banco Central de Chile, Santiago, 2001.

²⁰ Bai, Chong-En, Chang-Tai Hsieh & Yingyi Qian, *The return to capital in China*, NBER Working Paper N°12.755, 2006.

Hongbin, Qu, Julia Wang & Sun Junwel, *Return on capital: perception vs reality*, HSBC Global Research, Hong Kong, 2013.

²¹ Grinberg, Nicolás, op.cit.

²² Camara Izquierdo, Sergio, *La onda larga capitalista en España (1954-2002)*, Revista Sociedad Brasileña de Economía Política pp.86-111, Río de Janeiro, 2006.

reproductive capital from Groote et al and CBS (1921-2010) using perpetual inventory method²³.

Japan: Series of fixed reproductive capital and net profits (1955-2010) from Statistics Bureau of Japan (SBJ) - www.stat.go.jp/english/ -. For previous years, official series available at Hayashi & Prescott and Moriguchi & Saez²⁴.

Mexico: Rate of profit from Mariña Flores (1950-2004), and operating surplus and fixed reproductive capital nominal variations from Instituto Nacional de Estadística y Geografía (INEGI) - www.inegi.org.mx – for the last years²⁵.

United Kingdom: Fixed reproductive capital from Office for National Statistics (ONS) – www.ons.gov.uk – and net profits from Piketty & Zucman (1855-2010), available at <http://piketty.pse.ens.fr/files/capitalisback/UK.xls> ²⁶.

Sweden: Series of fixed reproductive capital and net profits from Edvinsson (1850-2000), and operating surplus and fixed reproductive capital nominal variations from Statistiska Centralbyrån (SCB) – www.scb.se – for the last years²⁷.

The rates were weighted by GDP from Maddison tables (1955-2008). In 2009-10, series were expanded using UNSTAT real GDP growth rates.

²³ Groote, Peter, Roland Albers & Herman De Jong, *A standardized time series of the stock of fixed capital in the Netherlands, 1900-1995*, GGDC Working Paper N°25, Groningen, 1996.

Smits, Jan Pieter, Edwin Horlings & Jan Luiten van Zanden, *Dutch GNP and its components, 1800-1913*, GGDC Monograph Series N°5, Groningen, 2000.

²⁴ Hayashi, Fumio & Edward Prescott, *The Depressing Effect of Agricultural Institutions on the Prewar Japanese Economy*, Journal of Political Economy Vol.116 N°4, 2008

Moriguchi, Chiaki & Emmanuel Saez, *The evolution of income concentration in Japan 1886-2005: evidence from income tax statistics*, Review of Economics and Statistics Vol.90 N°4, 2008.

²⁵ Mariña Flores, Abelardo, *La crisis mexicana de 2008-2010 en perspectiva histórica y en el contexto de la crisis mundial*, en María Beatriz García Castro (coord.), “Estudios sobre México en la crisis mundial: escenario nacional tras dos décadas de apertura y desregulación”, UAM-A, México, 2012.

²⁶ Piketty, Thomas & Gabriel Zucman, op.cit.

²⁷ Edvinsson, Rodney, *Historical national accounts for Sweden 1800-2000* (en www.historicalstatistics.org), Universidad Stockholm, Stockholm, 2005.