Long Term Growth of the Western European countries and the United States, 1830–2000: Facts and Issues. [1]

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1. Introduction

There has been a dramatic improvement in the knowledge of Western European historical national accounts over the past few decades. Almost all the research effort has been allocated to national – i.e. state-defined – entities. Very few efforts, comparatively speaking, have gone into regional estimates. The pioneering effort was made by Paul Bairoch, some thirty years ago on Europe as a whole for 1830-1975 (Bairoch, 1976). There is a simple reason for this lack: it becomes much more difficult to build macro-economic aggregates as their geographical, political and institutional scopes become more diverse.

Luckily enough, the community of researchers in Western European historical national accounting has been very active during this last generation. In many conferences, workshops, research projects and related publications, the academic standards of Western European historical national accounts have been cross-checked many times.

In this paper we will present a new long-term Western European estimates for the main macro-economic variables that serve for quick analytical use in historical national accounting: GDP, population, GDP per capita, investment, investment rate, foreign trade, openness to foreign trade, and prices. There are many more that could be of great interest, but all of these are essentially of the same kind and they are built out of quite comparable sets of national data. In the appendix to our paper we provide detailed reference to the sources, to the aggregation methods and to the criteria used. To limit the length of this paper, we will provide only a cursory, preliminary reading and interpretation of the newly available information. We rely heavily in Mitchell and Maddison previous work in compiling data, but we upgrade it with the latest developments in historical national accounting.

Because of the appearance of the new landmark in historical statistics –the Historical Statistics of the United States (HSUS)- and also because it makes a lot of sense to do it, we compare our Western European estimates with the United States. In

so doing, we aim at taking as much advantage as possible of the comparative venues made possible by the HSUS.

In what follows we will start by presenting the new data and we will turn to GDP, GDP growth rates, population, GDP per capita, Gross Fixed Capital Formation, Investment rate, Foreign trade, Openness, price level and price fluctuations. For each of them we will present and discuss first the West Europe series, and we will introduce in a second round the contrast with the United States series.

2. The new data

Sixteen Western European countries and the United States are surveyed. The chronological coverage is quite diverse. The following table sketches the main features of our data set.

Table 1. Chronological coverage.

Country	GDP	Capital Formation	Foreign Trade	Prices
Austria	1870-	1924-37; 1948-	1924-37; 1950-	1874-1913; 1914-
Belgium	1846-	1948-	1850-1913; 1921-39; 1947-	1840-1913; 1914-1940; 1946-
Denmark	1830-	1844-1914; 1921-	1850-1914; 1921-	1840-
Finland	1860-	1861-	1861-	1870-
France	1830-	1830-1913; 1922-38; 1949-	1850-1913; 1920-38; 1949-	1840-
Germany	1850-	1850-1913; 1925-38; 1950-	1880-1913; 1925-38; 1950-	1840-
Greece	1833-	1947-	1929-39; 1946-	1914-1941; 1945-
Ireland	1921-	1947-	1947-	1922-
Italy	1861-	1861-	1861-1942; 1947-	1861-
Netherlands	1830-	1830-1913; 1921-39; 1948-	1830-1939; 1948-	1870-
Norway	1830-	1865-1939; 1946-	1865-1939; 1946-	1870-
Portugal	1865-	1910-	1870-	1865-
Spain	1850-	1850-	1850-	1840-
Sweden	1830-	1861-	1861-	1860-
Switzerland	1850-	1950-	1929-	1914-
United Kingdom	1830-	1830-	1850-	1840-
United States	1830-	1834-1859; 1871-	1850-	1840-

Sources: See appendix.
Notes: Population is always available since 1830, except for Ireland, that starts in 1921, with independence. The borders are the current ones.

As will be obvious, there are some major shortcomings in terms of coverage. For the first two decades, from 1830 to 1850, GDP data is only available for seven countries: Denmark, France, Greece (from 1833), the Netherlands, Norway, Sweden and the United Kingdom[2]. We decided to proceed with these seven countries as France, the Netherlands and the United Kingdom represent a substantive share of all the variables, and the others help in providing enough diversity. By 1850, four more countries enter into the sample: Belgium (since 1846), Germany, Spain and Switzerland. These eleven cases provide a consistent array of countries: from the North Western European Norway to the South Eastern European Greece; including the three largest European economies and a number of medium size. By 1860 and 1861, Finland and Italy join the previous eleven to enhance the basic features of the 1850 sample. Portugal is added from 1865 on, and Austria is included from 1870 on. Ireland is only since her independence in 1921. All in all, the coverage for GDP data is quite satisfactory.

It is not so much the case for Capital Formation and Foreign Trade. The former is missing for Austria, Belgium and Portugal before First World War (circa), and for Greece, Ireland and Switzerland before Second World War. The latter is missing for Germany before 1880, for Austria, Greece and Switzerland before the 1920s and for Ireland before Second World War.

The world wars are the other cause for major weaknesses of the series. Currently, GDP is available for all years for most of the countries, but that is not the case for GFCF and for foreign trade for a number of countries, including Belgium, France, Germany and the Netherlands. Substantial damage during the world wars also introduced underreporting for several countries. Prices, on the other hand, are always more readily available.

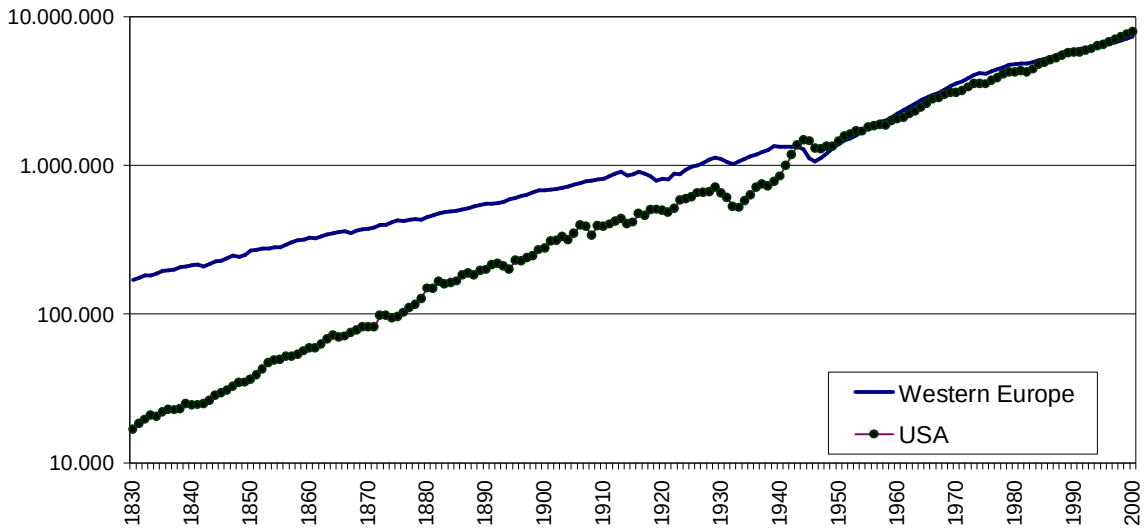
3. A first picture: GDP, population and GDP per capita

No major discoveries were made from our first series. Western European GDP is highly dependent on the four major economies – United Kingdom, Germany, France and Italy

[2] There is annual GDP data available since 1815 for France, 1812 for the Netherlands and 1800 for Sweden.

– and the estimates for the individual countries are quite stable, academically speaking. There have only been significant changes in the French series. The research innovations of the last few years have mainly come from middle-sized countries like the Netherlands and Spain, and even more so from small countries like Greece, Norway, Portugal and Switzerland. The addition of more individual, nation-based, series has largely stabilised the overall profile. The individual series happen to be quite similar. The European profile resulting from the aggregation of national profiles is interesting as it is consistent with the current state of academic knowledge.

Graph 1. WEST EUROPEAN AND UNITED STATES GDP, 1830-2000 (in mill. 1990 G-K $)

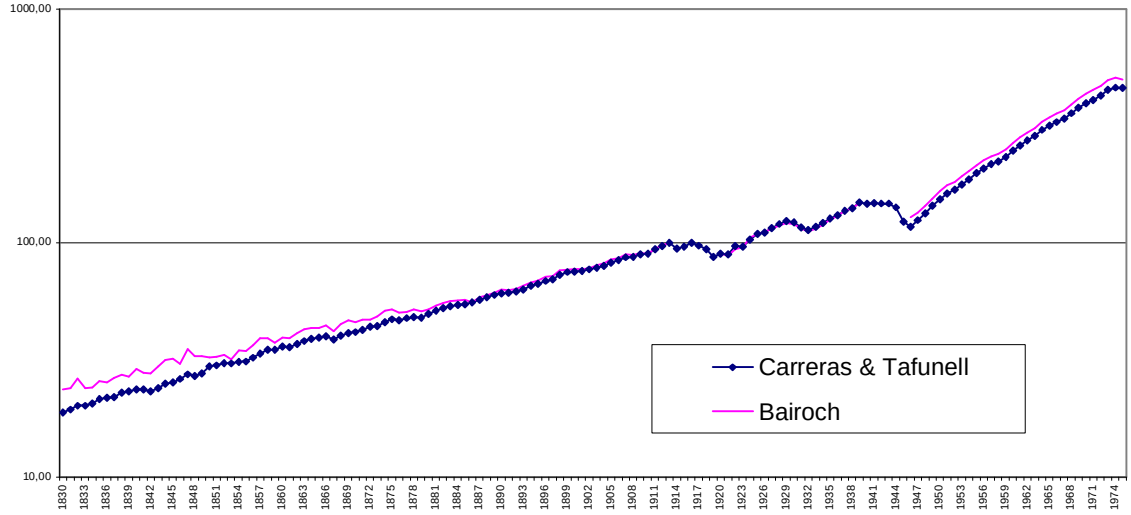


Source: See Appendix and HSUS.

To make a long history short, we recognize a long period of quite stable growth, reaching as far back as 1830 and continuing until 1913. This much has been clear at least since Paul Bairoch's 1976 European GDP estimate were made known, but more generally speaking European economic historians were fully aware of the progressiveness, generality and smoothness of the aggregate growth experienced in the nineteenth century. Any doubts that still remain can, in our opinion, be laid to rest. Furthermore, the comparison with 1976 Bairoch's estimate force us to be extremely modest on the value that we can add. Graph 2 shows how close is his 30 years old estimate of Western Europe 1830-1975, to ours. The two series are almost identical since 1880 onwards. We only add estimates for the war years and a small change in

level for 1946. Even for pre 1880, the two series are pretty similar, mainly since 1860. The only major difference, on top of the reduced volatility of ours for the first decades, is our higher growth rate for 1830 to 1886: 1,95 versus 1,54.

Graph 2. WEST EUROPEAN GDP, BAIROCH vs. CARRERAS & TAFUNELL, 1830-1975 (1913=100)

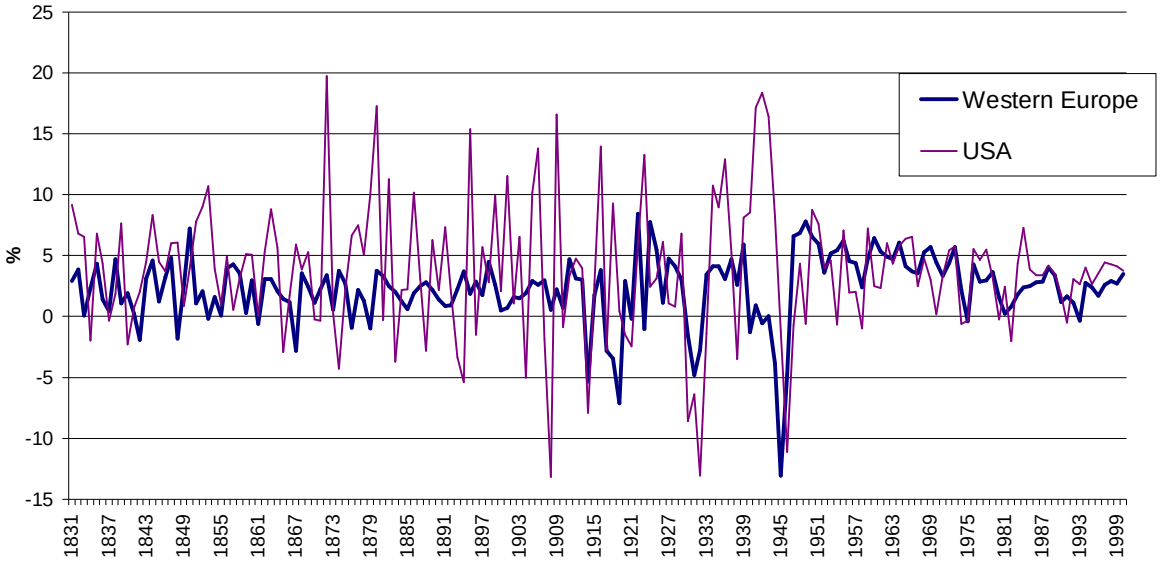


Source: see Graph 1 and Bairoch (1976).

There is still a lot of data for the pre-1830 period missing, but the data available from U.K., France, the Netherlands and Sweden tend to confirm that the trend started before 1830, in fact around the end of the Napoleonic wars. The early nineteenth century is still a period inviting further research as the evidence gathered until now is focused on the more economically advanced countries, and there could be some growth bias if we attempt to build a European-wide estimate out of the available data. To be fair, this even could have been the case for the 1830–1850 data, which is why it is worthwhile to emphasise the continuity in growth rates from the 1830s and 1840s to the 1850s and 1860s.

GDP trends have been very positive in both WE and US. But US growth rate has been much higher from 1830 to the Second World War. Seen from the perspective of Graph 1, it is amazing how similar the post-war growth trends have been at both sides of the Atlantic.

Graph 3. EUROPEAN AND AMERICAN GDP GROWTH RATE, 1831-2000



Source: See Appendix and HSUS.

The average yearly growth rate from 1830 to 1880 still suffers from a lot of volatility. Western Europe may attain growth rates as high as 7.2 per cent, but they also may fall as low as -2.58 per cent. The 'bad' years – those with negative growth rates – numbered as many as seven during the first half a century (1830 to 1880). Something fundamental changes around 1880. The GDP series becomes smoother in its growth trend, i.e. the growth rate reduces its variability. The 'highs' are less frequent but, much more important, the 'lows' disappear. It is not a matter of disappearance of the business cycle, of course. It is, rather, its smoothing. Fluctuations change in their very nature. Before 1880 they were as irregular as harvests. After 1880 they seem much more like business cycles. There is less variability while cycle-like movements appear. It is an outstanding change. It can be explained by a wide variety of reasons, which can be reduced to two: a) the diffusion of industrialization makes economies less dependent on agricultural output, and b) Western European economies have become increasingly integrated, allowing for the smoothing of economic fluctuations – as Craig and Fisher (1997) have shown. There is some evidence of an accelerating trend from the mid-1890s on.

National GDP performances can be better assessed within this European wide framework. Early starters and latecomers are easy to distinguish. The countries with quick growth early in the century typically switch to a slow growth path after two or three generations of high growth rates. In contrast, countries showing low growth rates

at the beginning of the series are those that, by the turn of the century, are growing quicker: i.e. Germany, Italy, and Sweden. Of course, there are also countries that fail to achieve significant growth before 1913. Some of the Southern Europe 'failures' can now be better assessed against the Western European norm.

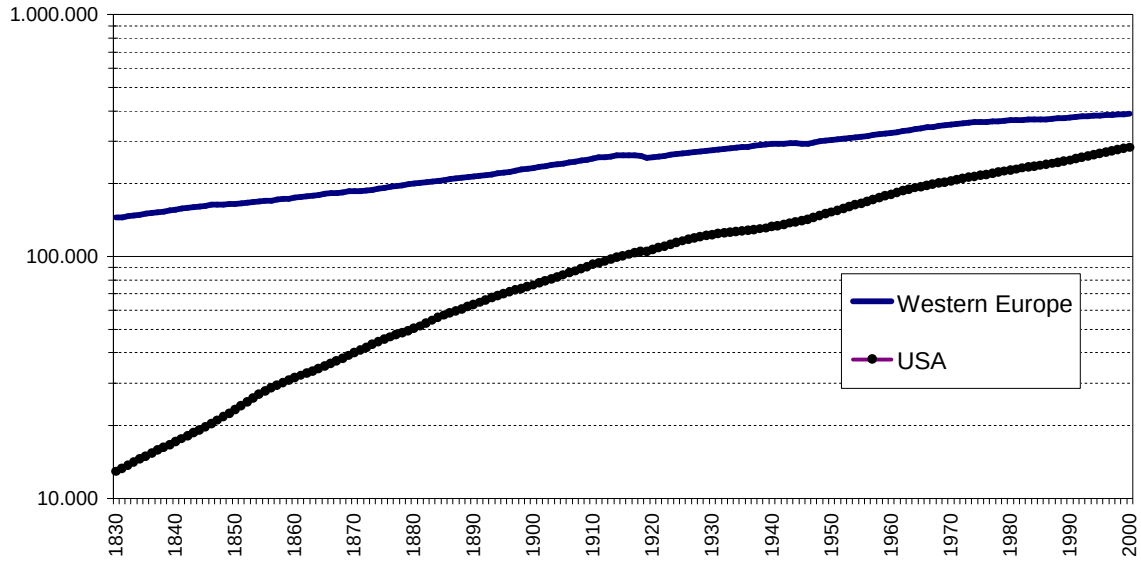
Obviously, the whole picture changes after 1913. Everybody can conclude that we are looking at a European GDP estimate because of the three cuts in the growth path during the first part of the twentieth century: the two world wars and the depression of the early 1930s. Many Western European countries suffered the three shocks. Some of them were luckier and suffered only one or two. There is no one country, however, that escaped facing any of these shocks during the century. Neutral countries also suffered, albeit much more slightly, during the world wars. The Great Depression had an impact – big or small – on all of them.

Recovery efforts after the First World War and the Great Depression were important but they failed to create a path back to the long-term growth trend. Only the third attempt – post-Second World War reconstruction – was successful. For the period 1913 to 1945 the amplitude of the fluctuations increases a lot. The First World War assisted at tough falls of GDP. The recovery efforts produced extraordinary achievements – up to 8.4 per cent growth in 1922 – but they did not last. The Great Depression hit the EU countries even harder than the First World War, but for a shorter period. The Second World War was even worse than the Great Depression. Fortunately the recovery was also more exceptional. Graph 3 is crystal clear in showing how exceptional the post-war boom was. Growth rates were high and sustained for a bit more than a quarter of a century, i.e. 1946 to 1973. It is also clear that the years of high growth display an overall declining trend that came to an end by the late1970s. The 1974 oil crisis brought growth rates to a sudden halt, but the declining trend continued on until much later. The 1980s and 1990s appear, in the light of long historical experience, to be more similar to the period 1880–1913 than to any other period in the last century and a half.

Matching WE and US GDP growth rates underlines the high volatility of pre-1913 economies, both in Western Europe and in the United States. Nevertheless, it is clear from graph 3 that the latter was much bigger than the former. The standard deviation was almost the double (5,38 vs. 2,78) for the whole period, and this was more so (5,40 vs 1,67) for 1830-1913. Not only US GDP was more variable than the Western European, but they seemed to be initially very uncorrelated. The correlation

between the two series for the whole period 1831-2000 is as low as 0,19, although this does not make justice to the pre First World War era. Then the correlation coefficient goes as down as 0,05. The Interwar years, with all its turmoil, increased dramatically the correlation between the two series up to 0,43. From 1945 onwards it has been even larger (0,49), and a bit more for 1970 onwards (0,51).

Graph 4. WESTERN EUROPE AND UNITED STATES POPULATION, 1830-2000 (thousands)

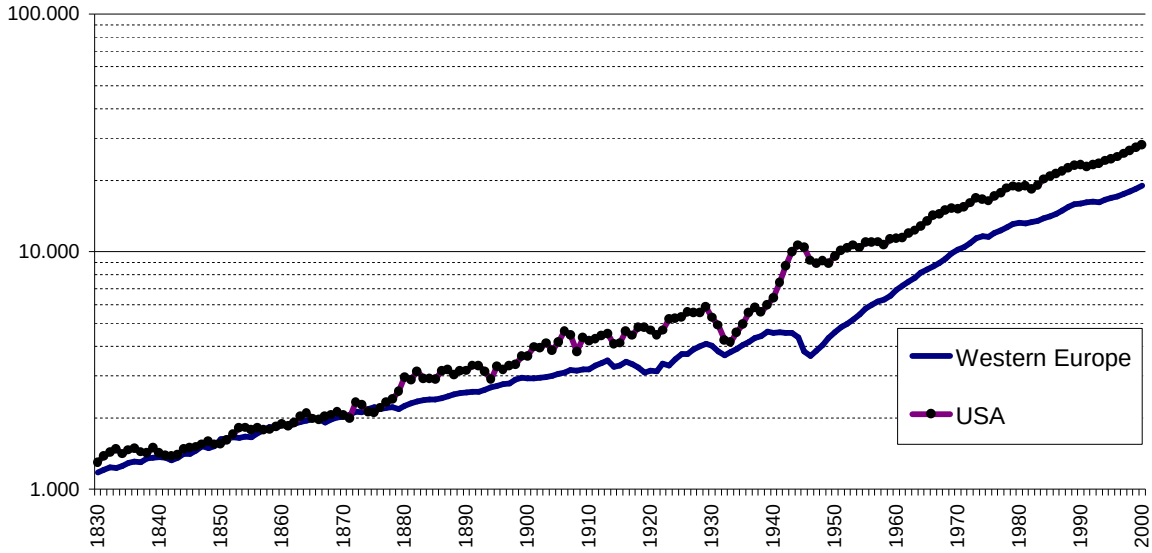


Source: See appendix and HSUS.

The uneven growth of population in WE and the US is presented in Graph 4. No wonder to see a quite regular, but modest, population growth in WE and a very strong, but decelerating growth in the US.

Of the graphs on population and GDP per capita, the latter is very similar in its trends and fluctuations to GDP. Nevertheless, it is worth emphasising that the slight evidence of an accelerating WE GDP trend in the pre-1913 period disappears when looking at the per capita GDP. Indeed, the similarity in GDP figures between the last quarter of a century and the pre-1913 period is nowhere to be found in the per capita GDP. The deceleration of European population growth since the 1970s has produced a better per capita GDP performance than for the period 1890–1913 (see Graph 4).

Graph 5. WESTERN EUROPE AND UNITED STATES GDP PER CAPITA, 1830-2000 (in 1990 G-K $)



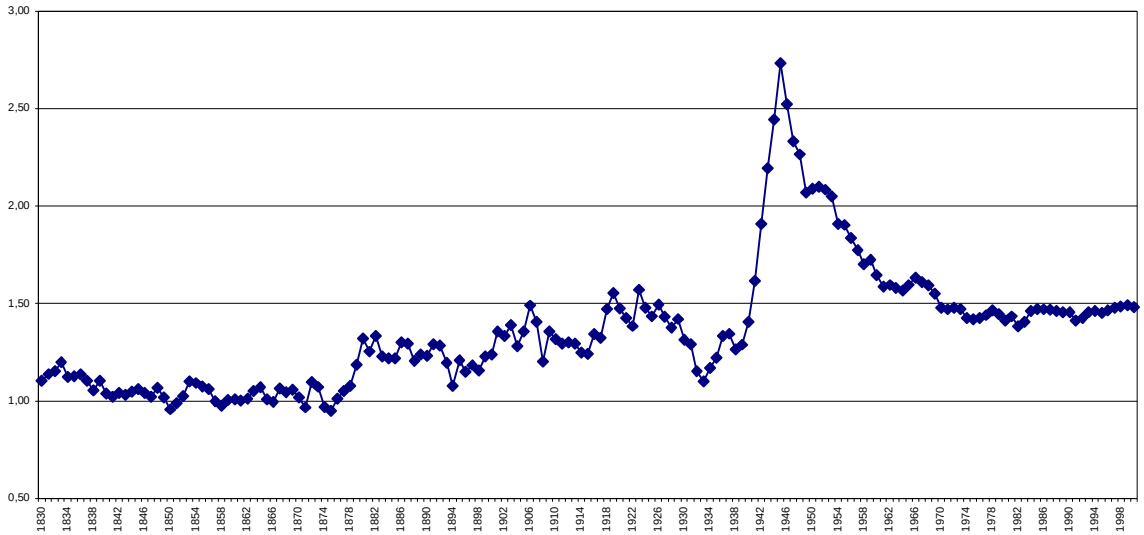
Source: See appendix and HSUS.

All of this is quite well known. Our exercise does not pretend to add anything special to knowledge on this matter but, rather, is meant to confirm, on the Western European dimension, what has emerged from previous exercises in national accounting and in regional aggregation, as for example those performed by Angus Maddison on a number of occasions[3].

The data gathered here makes a case for the similarity of Western Europe and the United States from 1830 to mid 1870s, but not further. By 1880 –to be precise, between 1878 and 1880- a very important gap appeared in favour of the United States. The gap increased during and immediately after First World War. It was reduced –but not cancelled- during the Great Depression, and rose to unprecedented and never repeated levels during Second World War. After, during what we use to know as the Golden Age, the gap was reduced, without going below what was the distance of the 1920s.

[3] We rely on Maddison (2003) that differs from his previous data in choosing current borders and not constant borders.

Graph 6. RELATIVE GDP PER CAPITA, UNITED STATES/WESTERN EUROPE, 1830-2000



Sources: see graph 5.

Graph 6 provides a more straightforward assessment of theses divergences. We can see that before 1876 there was a slightly declining trend, with the US growing less than Western Europe. The jump from 1878 to 1880 is epochal, and deserves closer attention because being so much concentrated in time. It suggests a change in regime. Looking back at the preceding graph, the responsibility seems to lie on the United States side. Graph 6 also allows to provide a very positive assessment of US relative growth rate from 1898 to 1906, another jump in comparison to Western Europe. Nothing is comparable to the steep divergent trend of the Second World War, and to the subsequent catching up. Graph 6 suggests that the catching up was slow and not rapid as we use to think of it. A first stage happened from 1946 to 1949, but the years of the Korean War were a four years interruption of the Western Europe catching up. From 1953 to 1961 catching up regained momentum, but it flattened out subsequently, and eventually, finished without completing the catching up.

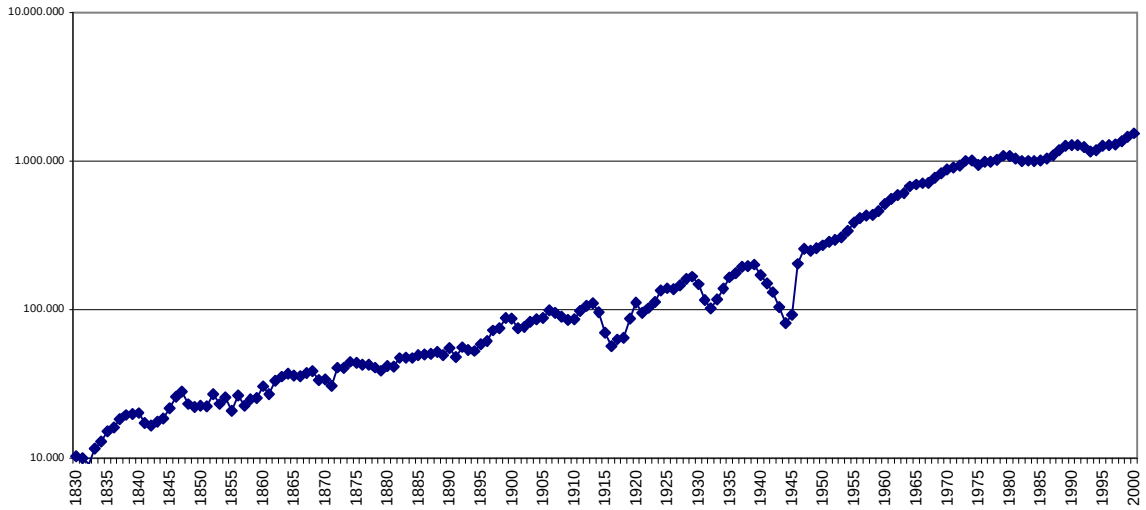
The Second World War is the major divergence between Western Europe and the United States. But, second to this episode, there is another one that has been very much overlooked: the years 1878-1880. There are other episodes of similar intensity in US comparative success: 1915-1919 and 1933-1937, but both are transitory phenomena, partly recoveries and partly peak years followed by tough crisis. No other period shares being such a clear step up. But the years around 1880 do not trigger any clear cut explanation. Nothing special happens then. The US GDP series show some

acceleration by then, but nothing special. The Western European GDP series does not suffer any major crisis. No major shocks can explain the divergence. This is why the divergence is so interesting. When looking at the major components of gross national expenditure we do not find anything special happening. Even gross capital formation – the most volatile component in expenditure- does not seem to provide an explanation. The output figures do not display extraordinary performances. The closest impression of over performance comes from the agrarian sector: corn production and exports behave really well. Manufacturing keeps growing quite smoothly. On the European side, overall performance is also pretty stable, although some stagnation is evident during the second half of the eighteen seventies. As far as a cursory consideration of the series allows us to do, the most likely candidate to explain what was going on was agrarian success in the US and agrarian depression in Western Europe. But it is difficult to swallow the idea that the foundation of the US "take off" is agrarian!

4. Gross Fixed Capital Formation (GFCF) and the Investment rate

In this section we aggregate the available information on the historical series for gross fixed capital formation of the Western European countries to arrive at a new – Western European wide – estimate of GFCF. It is statistically less robust than the GDP as it is poorly documented for some countries and for the war periods (see the appendix on "Sources and methods"). Even so, we think that there is so much to learn.

Graph 7. GROSS FIXED CAPITAL FORMATION, WESTERN EUROPE, 1830-2000 (in G-K 1990 $)

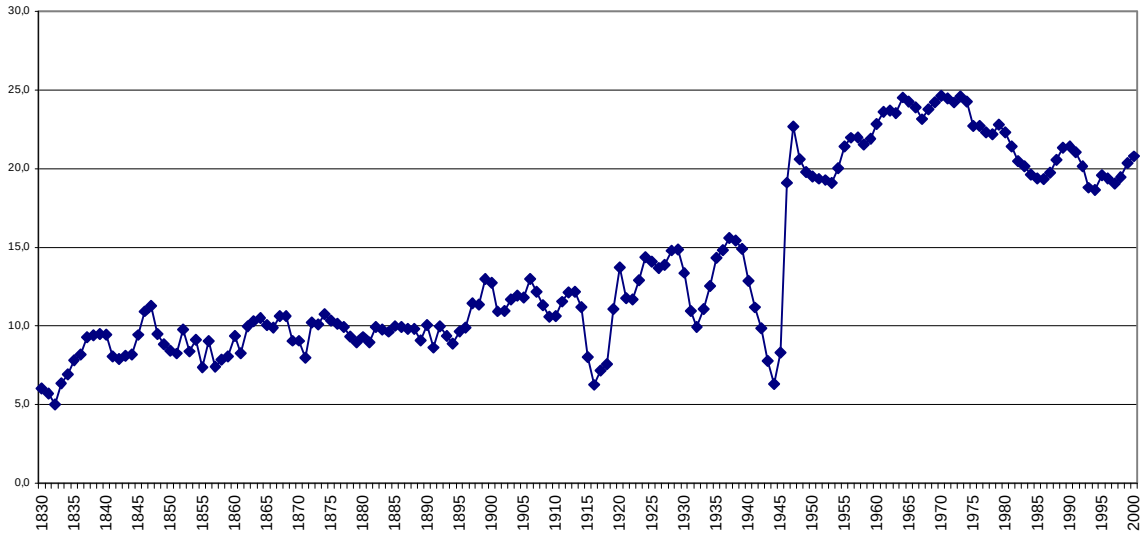


Source: See appendix.

Graph 7 provides the GFCF estimate in international Geary-Khamis 1990 dollars for the period 1830–2000. Prima facie, there are not so many differences compared to the GDP or the per capita GDP series. Major breaks are the same, as are the major continuities. So, the Western Europe series for GFCF seems really reasonable. The long nineteenth century provided steady growth. The 'trans-war' years show strong fluctuations. The Golden Age registered GFCF growth at rates higher than before World War I. The 1974 oil crisis meant a turn in investment trends, and so on. It is nice to see particular details, like the jump in investment in the1830s, probably related to the first British railway boom, the investment cycle centred on the 1847 peak, or the 1894–1901 cycle, and many others episodes, all easy to distinguish and running through to the even recent years.

The major news comes from Graph 8. It displays the Western Europe investment rate, i.e. the GFCF series divided by GDP. In our reading of the graph, the major break is the change in levels of investment effort after World War II. There are two clear-cut periods, before and after WWII.

Graph 8. INVESTMENT RATE (GFCF/GDP), WESTERN EUROPE, 1830-2000 (%)



Source: See appendix.

Looking at the first century, many things appear to happen. In the first place, the European investment rate started, by 1830, at roughly 5 per cent. It should be remembered that this was the level indicated by Rostow (1961) as the critical investment effort for a 'take-off' to occur. In very few years, from the early 1830s to the 1846 and 1847 peak values, the European investment rate jumps to the 10 per cent level. For some fifty years it was to remain dramatically higher than the 1830 level, fluctuating between 7.4 and 10.7 per cent. As far as we know, the jump is to be explained by the huge railway investment effort all across current European Union countries. Investment rising up to a 9–10 per cent range was a major success for European economies as it allowed them to build extensive railway networks and also many factories, carry out public works and land improvements, as well as construct private buildings. The chronology is very much the one advocated by early scholars of nineteenth century industrialisation, and by all the classic works of the period. From the early 1830s to the mid-1840s, an investment revolution took place in Europe that has left its footprints all over the economic map and much of economic history. It is good to see that all our historical national accounting efforts fully capture good old economic history. It is also satisfying to perceive the smooth increasing trend in investment rate from the late 1830s to the mid-1890s. Within this long, sixty-year period the central part, i.e. from 1862 to 1877, is clearly visible, and fits nicely with the well-known efforts to diffuse the railways across Western Europe.

Another major break in the series can be seen for the end of the nineteenth century. From 1894 to 1899 the investment rate increases from 8.9 to 13.0. Interestingly enough, this investment boom remains. Investment levels continued in the range of 10.6 to 13.0 per cent until the outbreak of WWI. This new increase can be easily related to the second technological revolution: electrification, mainly, but also to new urban development, the start of motorisation, the launching of new industries, and so on. The 'Belle Époque' years or the 'Edwardian era' was a distinctive period in European history by many reasons, among them because investment efforts were clearly higher than before. In this context a number of countries 'took off'. The increase in the investment rate is visible in many national figures. It can also be related to a time of historically low interest rates and to exceptionally high rates of profit. Of course, the gold standard, working to the complete satisfaction for everybody, was instrumental in this sustained economic success.

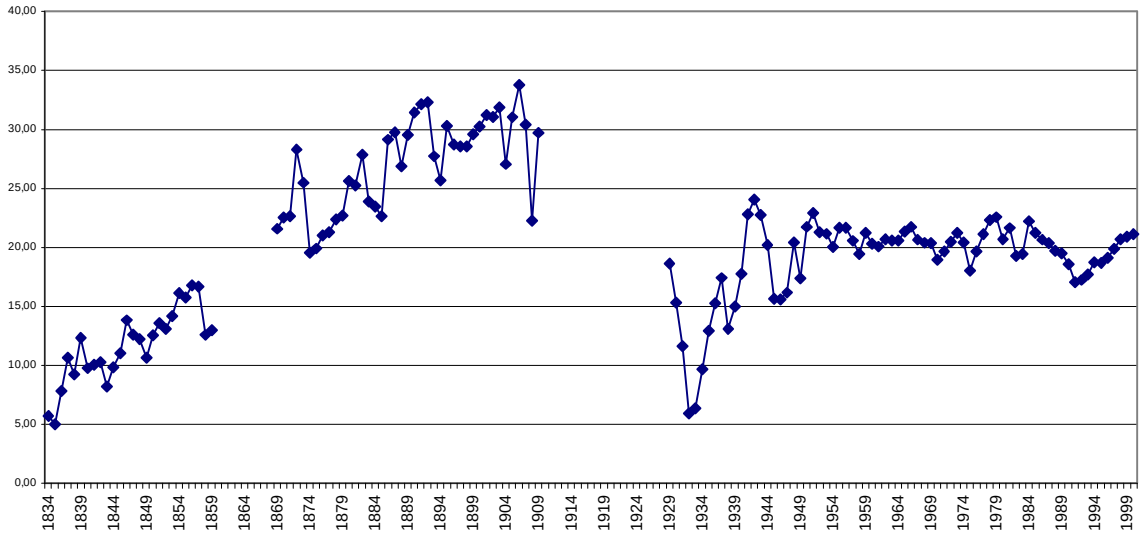
As can be expected, WWI put an end to this evolution. Investment rate fell as low as 6.3 per cent (as in 1833, more than eighty years before); this might well be a maximum, as the countries suffering the most during the war do not have data on this item. WWII brought a similar experience, with investment rate reaching the same depths as for WWI and for a similar length of time. The interwar years were ones of strong, but delayed recovery. The heights of 1899 and 1906 (13.0 per cent) were surpassed in 1920 and from 1924 until 1930, reaching a high of 14.9 by 1929. Nevertheless, the Great Depression, for all the harm it brought, was not as destructive as the world wars. The investment rate felt a lot, but only to 9.9 per cent, and recovery pushed it up again to 15.6 by 1937. Looking at Graph 7, there appears to be an increasing trend at work from the late nineteenth century to the late nineteen thirties. But had this trend really existed, it would have produced our current investment rates, not the post-war rates.

Investment efforts after WWII were by all means extraordinary. By 1947 the investment rate had reached 22.7 per cent. The equivalent, earlier experience was in 1920, with a high of 13.7. The investment reaction was quicker after WWII than after WWI, and it was much stronger. Investment efforts by 1947 were more than 50 per cent higher than the highest pre-war rates. In 1920 they were almost the same (five per cent higher). The exceptional 1947 experience did not last longer than that of 1920. They fell the following year, but did not decline back to normal levels. The investment rate from 1948 to 1953 remained at an astonishingly high 19 per cent or more. To everybody's

surprise what came next was not an investment crisis but a further investment boom. The 19.1 per cent rate of 1953 increased to 24.5 per cent in 1964, and it remained around the height of 24 per cent until 1974! The European economic miracle did very much exist, and it was founded on allocating resources to gross fixed capital formation. After 1974, investment rates went down quite quickly. By 1986 they were at the same early 1950s level: 19 per cent. A lower level was reached in 1994, at 18.7, the lowest level since WWII. Compared to the interwar years, these are still very high rates. They only seem low when compared to the achievements of the Golden Age.

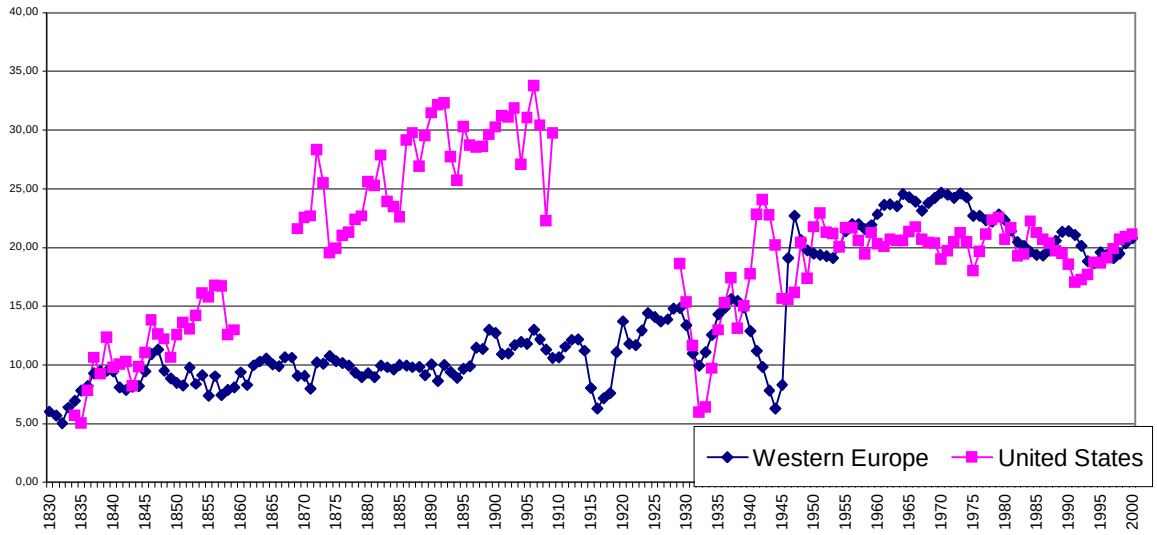
We have attempted to compare US investment rate with Western Europe's. It has not proved to be easy at all. US data, so rich in many respects, triggers some hesitation. We have attempted to repeat the same approach that we used for Western Europe, i.e., current Gross Domestic Capital Formation on current GDP. This is only possible and straightforward since 1929 onwards, and the outcome is a quite stable relationship but for the years of the Great Depression (see Graph 9) and the subsequent recovery. There is no way to repeat the exercise before 1929. If we rely on the Gallman constant 1860 dollars estimate, available from 1834 to 1859 and from 1869 to 1909 what we get is an ever increasing growth trend, as it is displayed in the left hand side of Graph 9. Investment rate started at five per cent of GDP and reached more than 30 per cent early in the twentieth century.. If we display the resulting US series and the Western European, as we do in Graph 10, what we get is a very plausible picture from 1929 onwards, when estimation methods are basically the same, and a huge discrepancy before 1909. It is hard to believe that the investment rates were so different at both sides of the Atlantic, but it is even more difficult to accept that there was a step reduction in the US from 1909 to 1929. We might be comparing two different things.

Graph 9. INVESTMENT RATE, UNITED STATES, 1834-2000 (in %)



Sources and notes: HSUS. Investment rate is Capital Formation on Gross National Product. Constant 1860 prices until 1909 and current prices since 1929.

Graph 10. INVESTMENT RATE, UNITED STATES AND WESTERN EUROPE, 1830-2000 (in %)

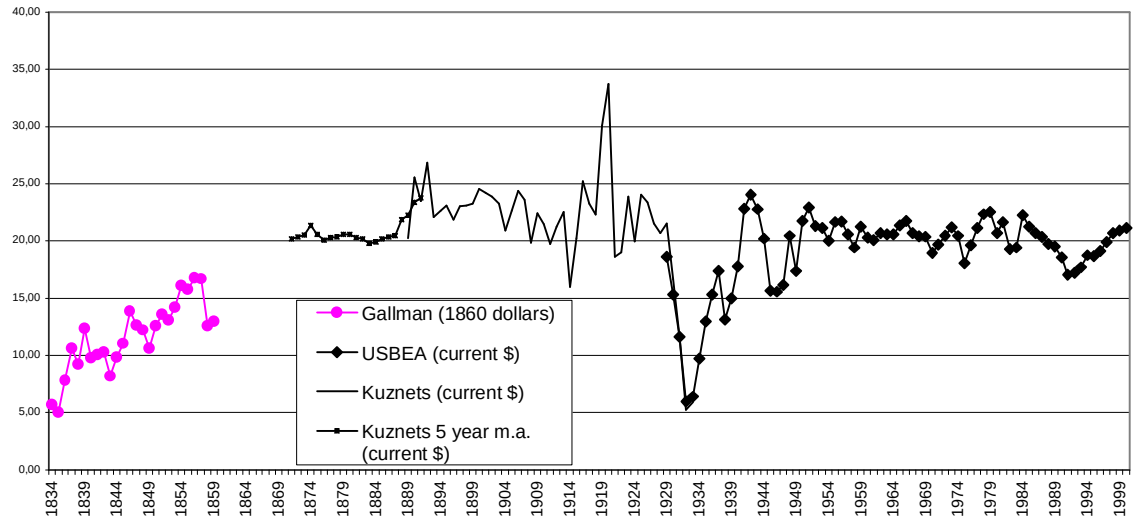


Sources: see graph 8 and graph 9

We have attempted another approach, looking for current prices estimates of capital formation. We have found them at Simon Kuznets' 1961 *Capital Formation*. He provides annual series from 1919 to 1933, from 1889 to 1918, and five year centred moving averages from 1871 to 1929. The linkage between 1918 and 1919 is not obvious. The use of moving averages raises some problems. Graph 11 presents our

exercise for 1834 to 1929 (and beyond, with the official data). We see that Kuznets approach seems much more reasonable.

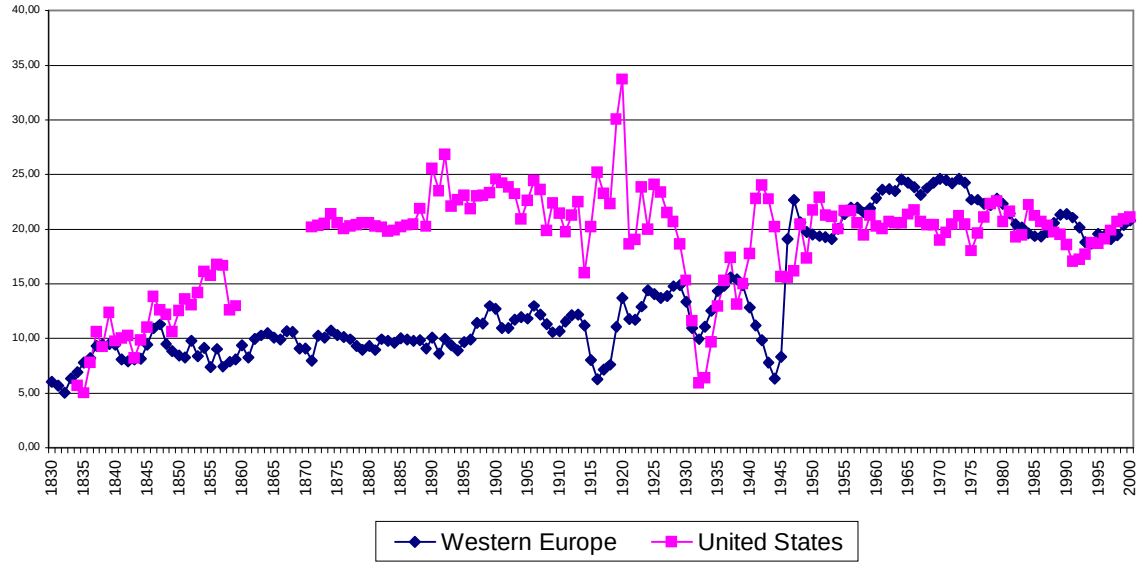
Graph 11. INVESTMENT RATE, UNITED STATES, 1834-2000, various estimates (%)



Source: HSUS and Kuznets (1961).

We take its annual series, expanding the current dollars based estimates from 1871 onwards. Graph 12 shows this new combination, with the addition of the constant dollars based series up to 1859. The 1871-2000 series seems very much reasonable. Is the 1834-1859 consistent with it? It seems so, but there is no reason to consider that a constant dollar series would be intrinsically better for those years than for the last third of the century. The 1860 weighting scheme was likely to produce an exaggeration of the investment estimates after 1860, and it was likely to underestimate investment before 1860. Even so, the comparison with the Western Europe investment rate is quite illuminating (see Graph 12).

Graph 12. INVESTMENT RATE, UNITED STATES AND WESTERN EUROPE, 1830-2000 (%)



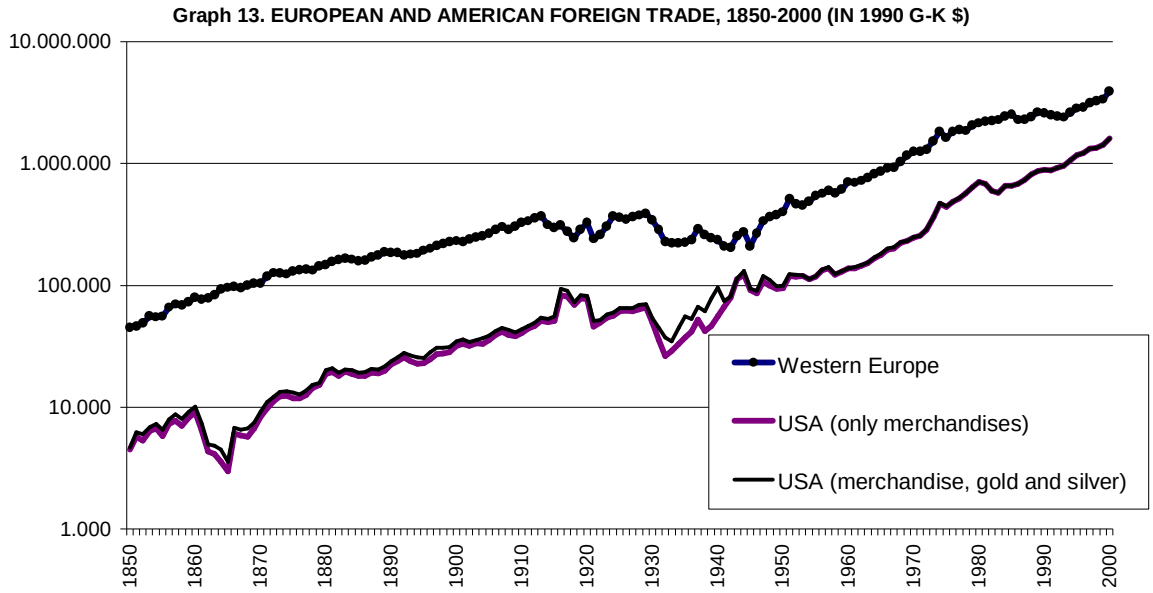
Source: graphs 8 and 12

If the early Gallman series (1834-1859) is considered acceptable to be linked with the Kuznets series, what we get is a common departing point in the US and in Western Europe. By the late 1840s, the US mange to increase significantly their investment rate. By 1871, after more than one decade without any attendable data for the US, its investment rate was roughly the double than the West European. The distance was not reduced until First World War. It was even larger during the war. Indeed, from 1914 to 1945 both regions registered inverse movements in their investment rates. After Second World War Western Europe achieved the United States traditional levels, and even surpassed them for some twenty years. This picture makes sense, although the high divergence from as early as the 1850s is less obvious.

5. Foreign trade and openness

To obtain the volume of US foreign trade is much easier. Graph 13 presents two alternative series, one of merchandise, gold and silver, and the other of only merchandise. The latter is much closer to the standard Western European definitions. The US series display the tough impact of the Civil War and of the Great Depression, and the good behaviour of the two world wars.

Graph 13. Foreign trade, United States (two alternative estimates) and Western Europe, 1850-2000 .



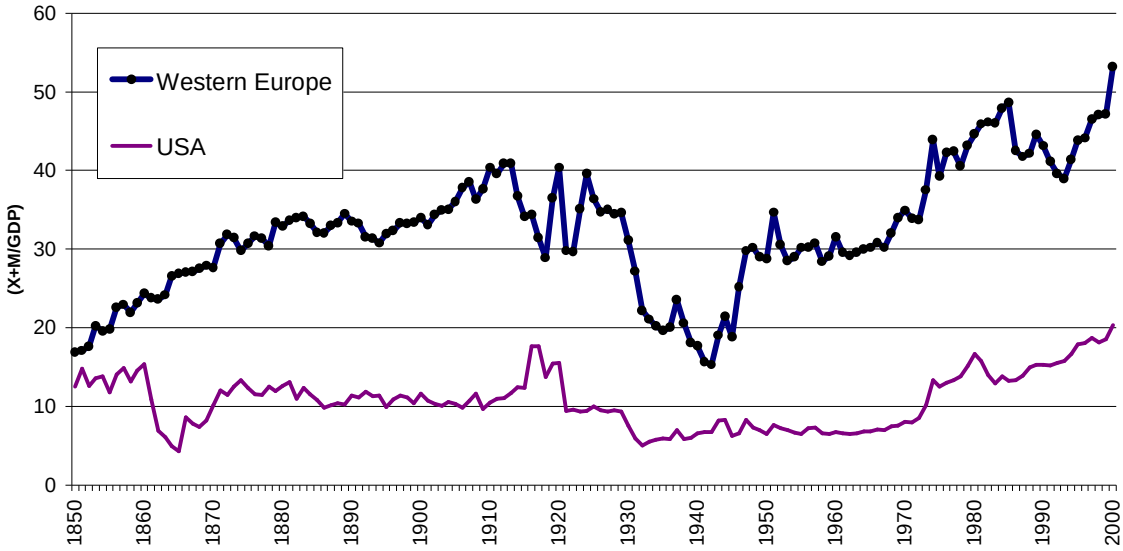
Sources: HSUS

We have been unable to gather sufficient foreign trade data (value of imports plus value of exports in 1990 Geary-Khamis dollars) for Western Europe before 1850. But the Western European foreign trade series is quite robust even at the very beginning. What we can see in Graph 13 is substantive enough. The 1850–1913 period gave sustained growth with three different sub-periods: from 1850 to the mid-1870s, high growth; from mid-1870s to early 1890s, slow growth; and from then to 1913, growth acceleration, without reaching the rates of the third quarter of the nineteenth century. The 'trans-war' period is definitely a period of foreign trade reduction. This happened during the wars, but also during the Great Depression. The years of WWI reconstruction and Great Depression recovery are disappointing at providing more foreign trade. By 1945 foreign trade was more than forty percent below its 1913 value. From 1945 onwards, foreign trade grew almost without deceleration until the late 1970s. The 1980s and early 1990s were years of deceleration, stagnation and, eventually, crisis. Growth resumed after 1993. All in all, the pre-1913 period was one of foreign trade expansion; the period 1913–1945 was one of foreign trade contraction; and afterwards the dominant trend was expansive again.

On the long term, the US foreign trade has been growing faster than the West European, but the divergence in rates is fully centred in the war and interwar years (but the Great Depression).

This account of foreign trade growth does not fully show how intense the commitment of Western European countries was to foreign trade. This is better presented in Graph 14, on Western European openness [(X+M)/GDP]. The three major periods identified in Graph 13 are still there, but really amplified. The series start with an openness degree of 16.9 per cent in 1850. This ratio doubled to 34 per cent during the next three decades – 1850 to 1882. It was the era of diffusion of free-trade policies and of commercial treaties. The level reached by 1882 stagnated – or even slightly declined – for twenty years. By the turn of the century openness increased again, rising to a high of 40.9 per cent in 1913. This ratio was only surpassed in 1974, more than sixty years later! For the thirty years following 1913 the trend was deeply downwards, to the trough of 15.3 per cent in 1942. There were some reverses in downward path: in 1920 – but a protectionist reaction and an economic depression made 1920 truly exceptional; in 1924, when Western Europe seemed, for a while, to return back to normal; and once again in 1937, for a very short-lived economic boom. For 1941 and 1942 Western European openness was even smaller than in 1850.

Graph 14. EUROPEAN AND AMERICAN OPENNESS, 1850-2000 (IN %)



Source: See appendix and HSUS.

Recovery after WWII was important, but nothing compared to what happened with investment ratios. The 1945 starting point – 18.8 per cent, i.e. in the range of the early 1850s – was to be easily surpassed and within a few years – by 1951 – the rate jumped up to 34.7 per cent. That level was unsustainable, only lasting one year. From 1952 to 1967 the values ranged between 28 and 32 per cent. So, the Golden Age, when investment ratios were astonishingly high, occurred in a Western Europe where average openness was at relatively low levels – the same as in the late 1860s or the worst moments of the 1920s. We feel that this contrast is highly relevant as it reveals the asymmetry between two major explanatory factors of the Western European Golden Age.

The increase in openness of Western Europe made important advances only from the late 1960s to the mid-1980s, jumping to 48.6 per cent from 30.2. The reasons for this are quite varied. The early steps should be related to the completion of the elimination of internal tariffs within the European Economic Community, in association with the impact of the GATT Kennedy rounds and EFTA trade liberalization. The shocks of the oil crises also had an effect on this trend. It seems that openness was increasing during the 1970s, but a part of this increase was only due to oil price movements, just as it happened, inversely, in 1986. So, if we cancel out the effect of the oil crises, what we get is an increase in openness lasting until late 1980s. It is difficult to

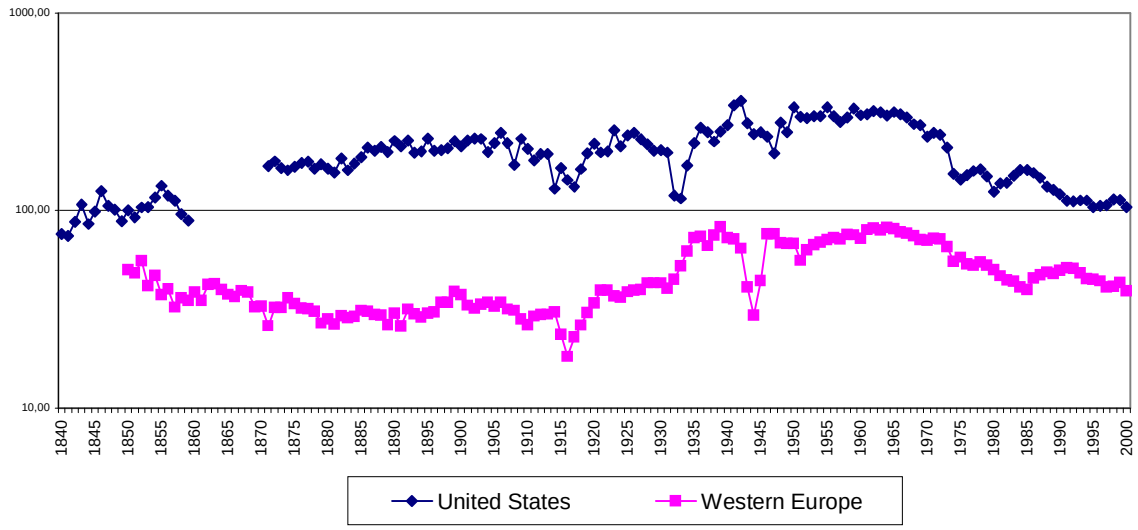
identify – although it did happen – the impact of the progressive merger of the EFTA and EEC in 1973, with the U.K. and Denmark entering into the EEC. Greece and Ireland should have had a small impact in overall figures. More noticeable should have been the entrance of Spain and Portugal in 1986, as well as the European Union enlargement to include Austria, Finland and Sweden in 1995. Meanwhile, the early 1990s crises, related to German unification, the fall of East European socialist regimes and the dissolution of the Soviet Union, but also to the Gulf war, brought a reversal to the increase in openness. Once this turmoil was over, openness grew again, increasing from 39 per cent in 1993 to 53 per cent in 2000. The overall post-WWII trend is one of increasing openness, but the chronology is much less straightforward than to be expected.

Just as we did with Western Europe, we also consider now US openness (graph 14). We display both the US and the WE series. The former is much lower and quite declining in the long run, at least from mid nineteenth century until the end of the Golden Age. Only during the three last decades of the twentieth century there has been a sustained increase in openness. Previous increases, as during First World War, were transitory. The fundamental question, nevertheless, is: does it make sense to compare these two series? The Western European openness does reflect the increase in intra Western European trade. It is not net of the intraregional flows. The existence of frontiers makes a huge difference. During the second half of the nineteenth the United States enjoyed a powerful market integration that is not displayed in the openness series but that was extremely important. So, market integration did exist in the US but it is not visible, while a good deal of Western European market integration, like in the 1850s, 1860s and 1870s, or in the 1850s and 1960s, is fully measured by the openness ratio – even if disappointing! We do realize that there are major shortcomings in comparing the absolute levels, but we do not agree that the exercise could be considered futile. The trends and the main episodes are very telling. What we see is the US economy developing without resourcing to its foreign trade as a growth engine. We also see that from 1930 to 1970, the US was, just as West Europe, experiencing an extraordinary long period of relative closeness.

The sense of trade-off between investment and foreign trade is better assessed in Graph 15. We have divided gross fixed capital formation (GFCF) by foreign trade. Our aim is to compare the relative growth of both variables. As they are competing factors in the explanation of European growth, it is worth to look at their relative behaviour.

During most of the second half of the nineteenth century the trend was declining – i.e. foreign trade was growing quicker than investment. The trend was reversed in the 1890s, but it declined again in the 1900s. By 1913 it was no different to the trend up to 1880. The interwar period contributed to a steep increase in the trend. The ratio, quite stable at the 25–30 per cent level, rose dramatically to 70 per cent. GFCF was growing much quicker than foreign trade – indeed, the latter was declining. The high levels reached by the late 1930s remained as they were until the late 1960s and early 1970s. The Western European system of relatively closed economies started to switch back after its historical high of 1964 to a more open system. From then until the mid-1980s the dominating trend was one of reduction – a halving of the ratio – meaning that foreign trade was a more dynamic force than investment. The declining trend is unclear for the last decade and a half of the series, although it seems that, from a long-term perspective, declining forces are still predominant. Interestingly enough, the ratio by 2000 is quite similar to that of almost a century and a half ago – 1855 or 1860 (or 1899 or the mid-1920s).

Graph 15. INVESTMENT RATE / OPENNESS, UNITED STATES AND WESTERN EUROPE, 1840-2000 (%)



Sources: See graphs 12 and 14.

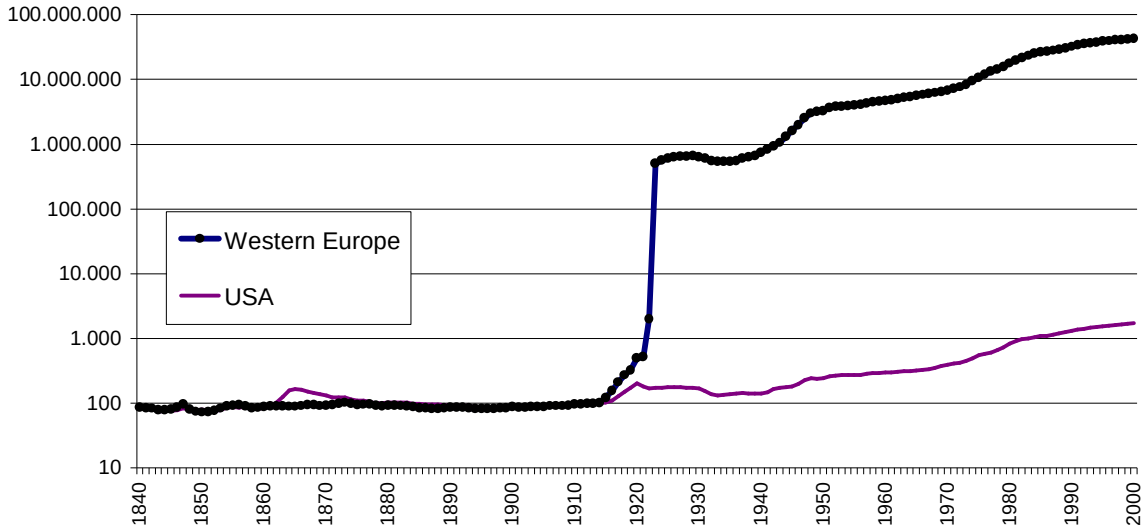
As for West Europe, we look at the trade off between investment rate and openness (see graph 15). The differences in level are spectacular. While the United States uses to be always above one hundred per cent, and will go well beyond three

hundred per cent, Western Europe is always below the parity, and can go as low as twenty per cent. So, Western Europe relies much more in foreign trade than in investment, and the United States are just the contrary. To all these differences, that we have under displayed by using a semilogarithmic graph, we can add the fact that during the nineteenth century, and even during the early twentieth century, the two areas were leading into different directions. It is only from the late 1950s that we see both moving roughly in the same way.

6. Prices and stability

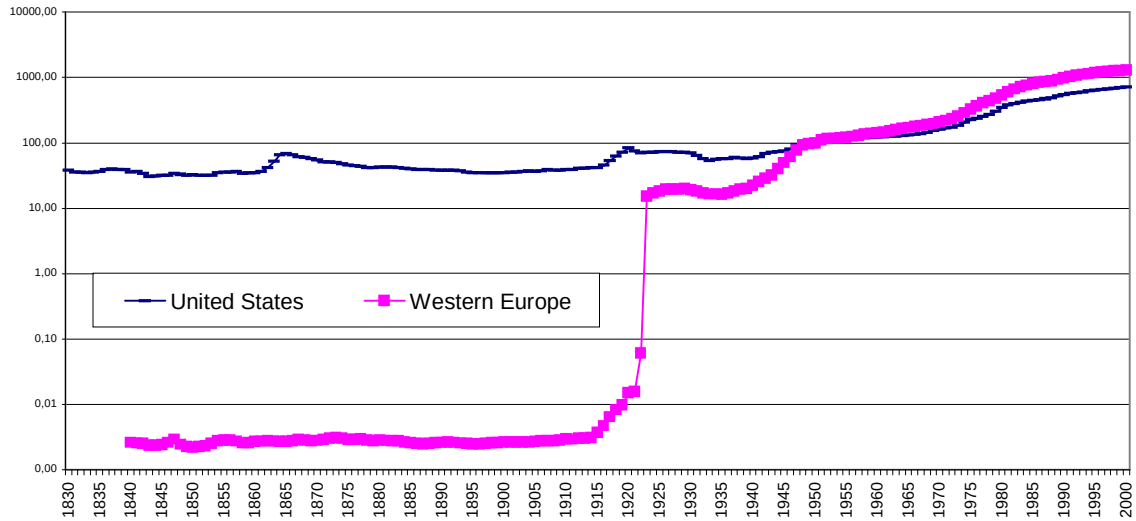
It is difficult to present a Western European price index without experiencing a sense of fear, but we decided that it was, nevertheless, an exercise worth the effort (see Graph 16). One can see the usual long period of price stability for the nineteenth century (with data starting in 1840), the price revolution of WWI and its immediate aftermath, with peak prices being reached in 1923, only to be stabilized in 1924. The rest of the interwar years show quite stable prices, but with a clear cyclical pattern. During WWII prices start to rise again, reaching very high levels in the immediate post-war years, i.e. by 1948. A long period of low price increases start then, which lasts some 25 years. Around the early 1970s, and more clearly during the oil crisis, prices accelerate again. The years of double-digit inflation last a decade or so, after which prices decelerate. The major periods are clearly established and they correspond to well-known stages in European economic policy.

Graph 16. CONSUMER PRICE INDEX, WESTERN EUROPE AND UNITED STATES, 1840-2000 (1913=100)



Source: See appendix and HSUS.

Graph 17. CONSUMER PRICE INDICES, UNITED STATES AND WESTERN EUROPE (1950=100)

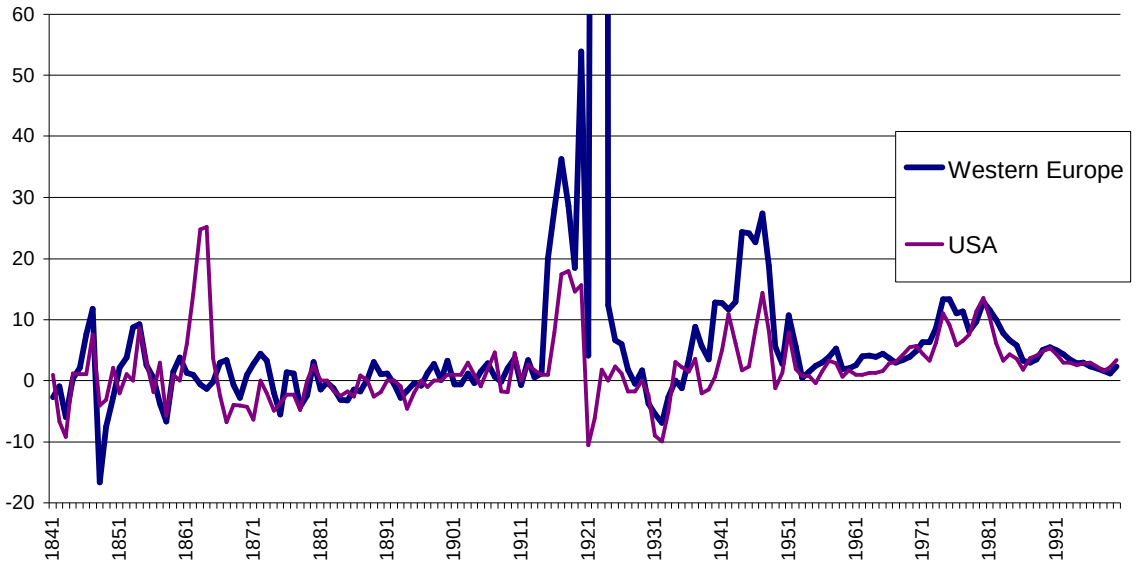


Source: See graph 16.

Introducing the United States price index in graph 17 underlines dramatically the contrast between the unstable –in terms of prices- Western Europe and the very stable United States. Until 1913 the North American experience was of stability, as in Western Europe, with the only exception of the Civil War years. After 1914, US prices

have always been more stable than the West Europeans. Even if we switch our perspective to 1950=100 (see graph 18), the outcome is the same: it makes even stronger what we have said.

Graph 18. WESTERN EUROPE AND UNITED STATES INFLATION RATE, 1841-2000 (%)



Source: See graph 16.

Graph 19 focuses on the inflation rate. It is worth emphasising that the inflation rate, just as for GDP growth rate, became increasingly less volatile as the nineteenth century proceeded. The variance seems to be very much reduced after the mid-1890s. What happened next is the closest picture of a revolution – or, to be more exact, a discontinuity – that we can get in an economic history graph. The price regime changed dramatically, expand violently up to the moment of its final collapse. The whole episode took no more than one decade, from 1914 to 1924. Afterwards we can perceive how tough the efforts were to keep monetary policy under control, causing a clear deflationary trend from 1926 to 1932. After 1932, inflation was quite symmetrical, but the outbreak of WWII changed the system again and a new wave of high inflation started in 1940 that was to last almost another decade – until its end in 1949. This inflation–deflation cycle was less violent than that of 1914–1924, but in itself extraordinary enough. With the exception of the Korean War years, inflation was again under control from 1954 to the late 1960s. The difference was that deflation was carefully avoided. From the mid-1960s onward prices underwent a modest acceleration. The inflationary period that followed the oil crisis – thirteen years long –lasted a bit

longer than the previous price crisis, but it was definitely smoother. Once the highs were over – after 1981 – the trend again tended toward inflation reduction, but avoiding deflation. The creation of the Euro should create price stability in the future.

The US inflation rate provides further thoughts. Looked at it more closely, it does not seem really different to the West European. They are quite similar, but for the hyperinflation experience of 1922-1924. Indeed, the correlation coefficient for the whole 1841-2000 period is -0,00, i.e, no correlation at all. It is difficult to find any other coefficient so close to zero. Of course, it is the extreme diversity of experience around 1923 that makes for all the difference. If we split the series in two subperiods, what we find is very much a resemblance. From 1841 to 1921 the coefficient of correlation is as high as 0,54, and from 1925 to 2000 it jumps to 0,68. Within these two long periods it is not difficult to distinguish the periods with the closest similarity. From 1841 to 1860 correlation is of the order of 0,66. From 1878 to 1914, of 0,53. The First World War years and its immediate aftermath (1914-1921) display a 0,74. Only the American Civil War destroyed cross Atlantic correlation, with a strongly negative -0,81 correlation coefficient from 1861 to 1865. After European hyperinflation, correlation becomes high again. The 0,68 overall correlation jumps to 0,84 for 1947-2000, and even to 0,86 from 1950 to 2000. It only goes down during the 1940s, when the figure is 0,48.

Concluding remarks

In this paper we present new aggregated data for Western Europe and we compare it with the United States. Even with this very simple and straightforward approach we are able to identify some major phases and turning points, and some under researched episodes. We also provide evidence for some widely diffused assumptions, that now have a quantitative foundation.

APPENDIX: SOURCES AND METHODS

For the United States we have fully relied on Carter, Gartner, Haines, Olmstead, Sutch and Wright, eds., *Historical Statistics of the United States. Millennial edition*, Cambridge University Press, 5 vols, 2006, except otherwise stated.

GDP and population

The fundamental source for GDP and population data is Angus Maddison (2003). We have checked his last updates at his webpage: http://www.ggdc.net/maddison/. The GDP is made comparable according to Maddison's criteria: 1990 international (Geary-Khamis) US dollars. This procedure allows for a substantial – although limited – correction of price effects. For 1830–1870 population data, when no annual data was available we interpolated a geometric trend. When more recent GDP estimates do exist or when they start earlier than those of Maddison, we have relied on them. We have used 1913 current values as the base year for switching to a common *numéraire*. Unless otherwise stated we have relied on Mitchell (1992) until 1979, and IMF, *International Financial Statistics*, thereafter.
Exceptions to the sources summarised in the previous paragraph are:
Austria : 1870–1913, Schulze (2000).
Belgium: 1846–1870, Gadisseur (1973).
Finland : 1860–1960, Hjerppe (1996).
France: 1830–1913 , Toutain (1997).
Germany : 1850-1901, Burhop and Wolff (2005); 1913–1949, Ritschl and Spoerer (1997). Population and GDP of the former German Democratic Republic for 1870–1945 have been estimated according to the proportion that it represented in 1936 within nowadays Germany (Maddison, 2003).
Greece: 1833–1939, Kostelenos (2001).
Italy: 1861-1913, Fenoaltea (2005).
Netherlands: 1830–1913, Smits, Horlings and van Zanden (2000).
Norway: Grytten (2004).
Portugal: 1865-1910, Lains (2003) ; 1910-1958, Batista, Martins, Pinheiro & Reis (1997).
Spain: 1850–2000, Prados de la Escosura (2003)
Sweden: Krantz (2001)

We would like to stress that we have adhered to Maddison's 2003 criteria of working with current frontier state units. This introduces some problems in cases of major frontier changes, e.g. in Germany and France and in the United Kingdom and Ireland.

GDP per capita

The series has been calculated by dividing the sum of the GDP for all the European Union countries by their total population.

Gross Fixed Capital Formation (GFCF)

The major shortcoming is the fact that for some long periods the available national series are of *net* capital formation. Another, less important, shortcoming is that some series include inventories. An additional problem concerns prices. We have decided to calculate investment rates based on the current GDP and GFCF values as the deflators of each of them are less reliable than their current values. But there are a few cases for which we have only constant prices. All these particular cases are indicated in the following list. Unless otherwise stated, the source is Mitchell (1992) until 1979, and IMF, *International Financial Statistics*, thereafter. The investment values at 1990 international dollars come out of multiplying the investment rate series by the GDP series. The investment ratio has been calculated by dividing the sum of national GFCF series by their total GDP.

Austria: Inventories included.

Belgium: 1959–1988, calculation made on Gross National Product.

Finland: 1860–1960, Hjerppe (1996).

France: 1830–1938, our own calculation based on Toutain (1997). For 1922–1938, the series were at constant prices.

Germany: 1850–1913, net investment rate, calculated from Net National Product, and including inventories. 1921–1939, Ritschl and Spoerer (1997), including inventories for the sake of continuity with the pre-war series.

Netherlands: 1830–1913, Smits, Horlings and van Zanden (2000). 1921–1939, net investment, including inventories but excluding public investment (a very exceptional case), and compared with Net National Product.

Spain: 1850–2000, Prados de la Escosura (2003).

Foreign Trade

Export (fob) and import (cif) data, as well as GDP, all in current values, come from Mitchell (1992) until 1979, and from IMF, *International Financial Statistics*, for 1980–2000.

The way to estimate a foreign trade aggregate figure for European Union countries has been the same method that we have followed for GFCF. The sum of exports and imports in current values has been divided by GDP in current values to obtain a ratio that we have applied to the GDP 1990 international dollars series. Once they are switched to a common *numéraire*, national foreign trade value series can be added to obtain the total value of EU countries' foreign trade. As with GFCF, a problem can be that GDP series may only exits at constant prices. In these cases we have proceed as follows:

Belgium: We have used the 1913 based wholesale price index as a GDP deflator, thus obtaining nominal GDP for 1850–1913. We did the same for 1914–1948 with 1914-based price indices, linked with the 1929 based series, according to 1948 current values. All the data comes from Mitchell (1992).

Portugal: 1865–1910, GDP data in constant terms from Lains (2003), switched to current values according to the Nunes, Mata and Valério (1989) price index.

Other sources used have been:

Finland: 1860–1960, Hjerppe (1996).

Netherlands: 1830–1913, Smits, Horlings and van Zanden (2000).

Portugal: 1910–1958, Batista, Martins, Pinheiro and Reis (1997).

Spain: 1850–2000, Tena (2005).

Prices:

They are Consumer Price Indices. As a general criteria we have relied on Maddison (1991) for 1870–1979. For 1979–2000, we relied on IMF data. The years 1840–1870 come from Mitchell (1992). The aggregation has been done according to GDP weight. The weighting schemes used have been 1870 (until 1873), 1913 (1873-1918), 1929 (1918-1946) and 1970 (from 1946 onwards). The major problems have been:
Austria and Belgium: Both were excluded from the 1914 calculation as there is a break in the series between 1913 and 1914 (two different price series without any link between them).
Portugal: 1865–1929, Nunes, Mata and Valério (1989).
Spain: Maluquer de Motes (2005).

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