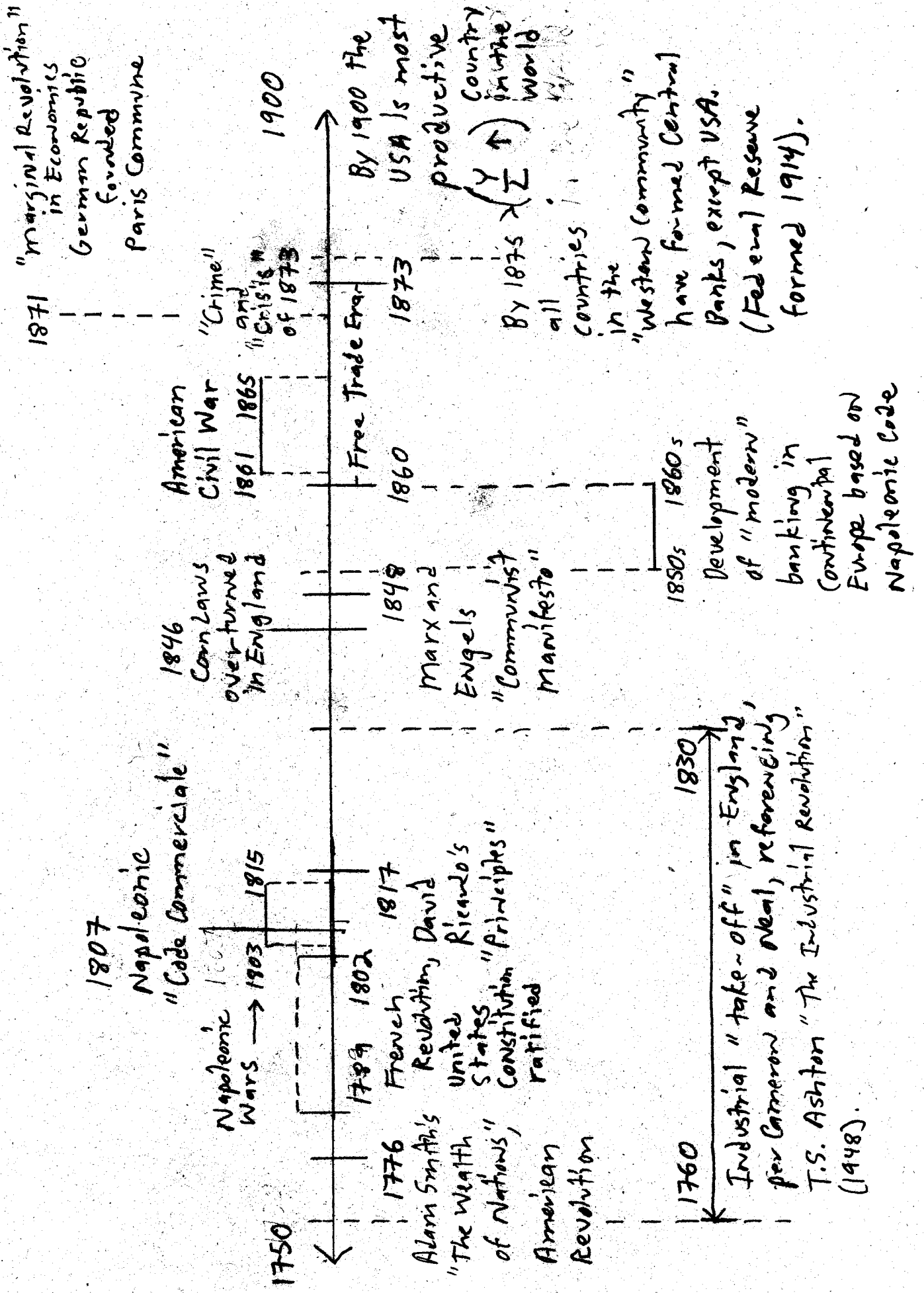


Lecture Notes for Economic History

Industrialization and the "Commercial Revolution"



The Industrial Revolution

The Industrial Revolution (actually a period of industrial 'take-off') is defined by C.N. for England as 1760-1830 based on the ground-breaking work of economic history by T.S. Ashton (1948). It is generally understood that England was the first country to industrialize.

C.N. place the industrialization of other countries within a theoretical framework of a "productivity" gradient based upon the "starting point" of a level of a country's agricultural productivity. Then, the degree to which a country industrialized depends up how conducive that country's finance system was (how rational was the financial system) and what role the state played in industrialization. In general the more laissez-faire the country's policies where the more quickly they developed. Furthermore, how sustainable a country's industrialization was depended on the country's level of education and thusly on that nation's educational policies.

The "British model" of industrialization is held up as the model which other countries adopted for their own industrialization. The productivity gradient meant the following historical progression of "early" industrializers: England, the United States, Belgium, France and Germany.

Industrialization (cont.)

The "British model" of industrialization

The change in technologies were most predominantly,

- The invention of the steam engine which lead to widespread use of railroads
- Shipping moved from sail-power to steam-power
Shipping (and other) construction moved from wood to iron construction and then to steel.
- The use of coal as energy source overcame the use of charcoal.

The dissolution of serfdom lead to capital accumulation and the widespread recognition of property rights and a common law for trade based upon the English language.

It is for this reason, plus widespread war on the Continent, that it is seen for the later industrialization of the continental European countries, who did not have a common system of civil and commercial law until the Napoleonic Codes of 1804 and 1807.

Because it is an island nation England is an outward, open and in general country open to free trade. During the period of industrialization English ships carried 1/4 - 1/3 of the world's trade.

The British model of Industrialization (cont.)

The early gains in agricultural productivity, and subsequent growth of English cities lead more directly to factory wage-labor and trusts to move output per worker (labor productivity $\frac{Y}{N}$), both in the agricultural and manufacturing sectors.

This productivity in turn lead to greater capital accumulation and British Foreign Direct Investment (FDI) abroad, again increasing the extent of the market, specialization of labor and gains through trade.

Later, Britain was passed by the United States in productivity due to the inadequacies of the British educational system which encourage a culture of "classes" which in turn discouraged an entrepreneurial culture, created a problem in the passing of businesses from one generation to the next, and prevented British businesses from quickly adopting new innovations and technologies developed elsewhere.

The Industrial Revolution (cont.)

Some economic historians make the case that common law, derived mostly in English-speaking countries has been better for economic development than laws developed centrally through legislative or authoritative dictate. This same case is made for the later industrialization of continental Europe relative to England and the USA.

The Napoleonic Wars lasted from 1801 until 1815, and in the interim Napoleon created the Code Civile in 1804 and the Code de Commerce in 1807, these laws then provided the necessary rule-of-law for further economic development and industrialization. It should be noted that although the codes provided a common body of law, individual country policy affected and influenced actual further industrialization.

The Industrial Revolution (cont.)

The Napoleonic Codes (cont.)

The Code Civile of 1804 did the following,

- Created a system of property rights
- Granted the freedom to contract and made these contracts enforceable by law
- Authorized Bills of Exchange and loans with interest

The Code de Commerce of 1807 authorized three forms of business enterprise,

- 1) Simple partnership, where all partners were responsible for all debt incurred by the partnership.
- 2) Limited partnership, where active partners were liable for all debts but limited partners liable only up to paid-in capital
- 3) Sociétés Anonyme (S.A.), or corporation, where all owners only liable to paid-in capital (a limited liability corporation).

Industrial Revolution (cont.)

Unlike the U.S. and England (T.S. Ashton's 'revolution' of 1760-1830) the continental Europe did not have a rational rule of law nor sound financial system until the Napoleonic wars were established. This was especially true in the banking sector, where the lack of limited liability form of business entity for banks, and in France, a monopoly granted to the Rothschild family for banking with the monarch, was finally broken by Napoleon III who established a partnership (itself of course a GSE) with the Pereire Bros. to break the Rothschild monopoly.

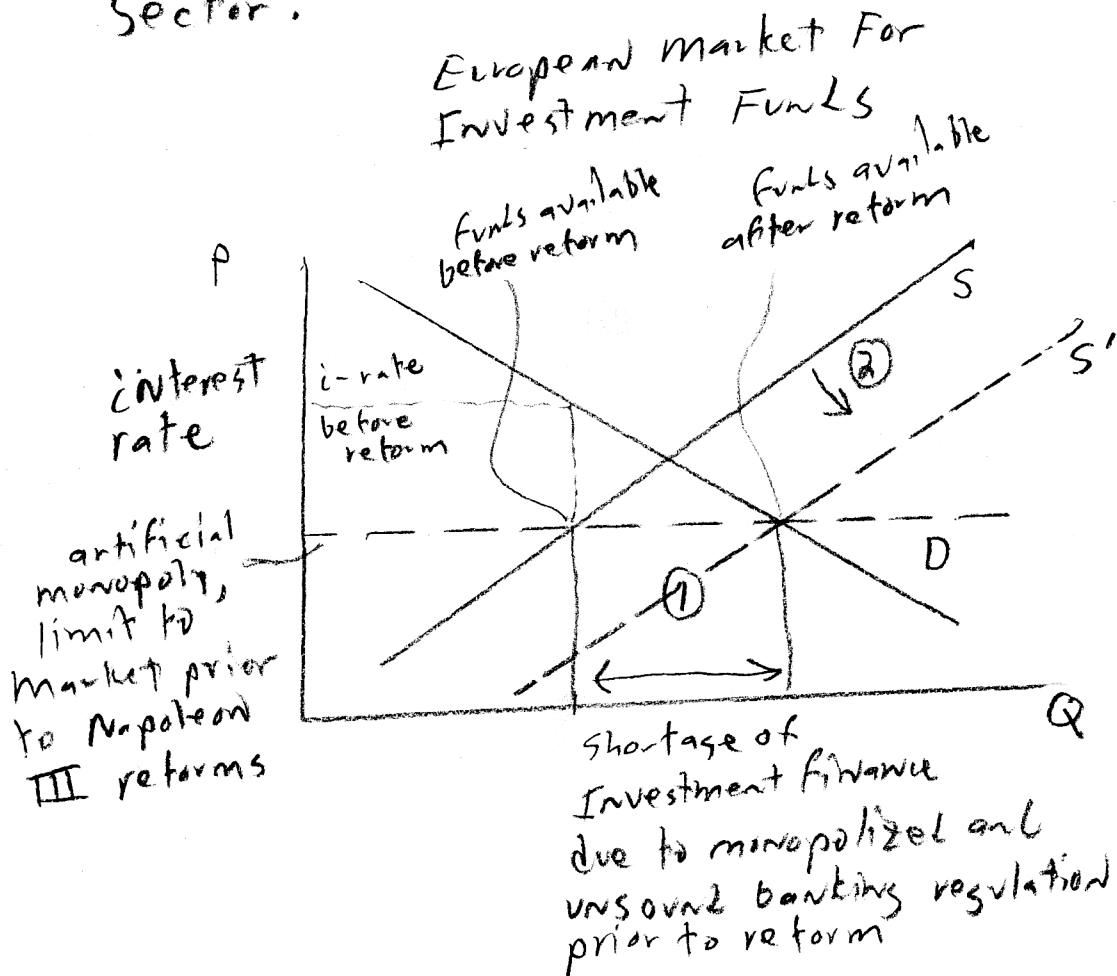
In 1825 during the French 2nd Empire the Société Générale de Crédit Mobilier was established to funnel investment into the railroads and housing finance, as well as other French industrial sectors.

There were additional revolutions (in this case the aristocracy and the working class against the landed class rentiers) in the late 1840s (see Hobsbawm 1962), so it was not until the 1850s that continental European finance was seen as a positive contribution towards industrialization on the continent.

Industrial Revolution (cont.)

French Banking (cont.)

The banking established in France, Belgium, Germany and elsewhere is seen as the beginning of "modern banking", in that banks could handle both commercial banking (deposits and loans) as well as investment banking (underwriting the issuance of stocks). Until this time Europe was seen as "under-banked". The demands of the market for investment funds was not being met by the financial institutions so industrialization was being held back by the financial sector.



② the removal of restrictions on commercial and investment banking lead in the 1850's to modern banking and industrialization in the continental European countries beginning with Belgium and France

Industrialization (cont.)

Country-by-country case studies on Continental Europe

Belgium

1795 Broke from Hapsburgs

Bruges and Antwerp open to trade and ideas from England, thus were first to adopt "British model" of industrialization. Commercial institutions inherited from Italians in medieval period.

Walloons - part Dutch, part French, with entrepreneurial culture.

Coal, ironworks, zinc and other mineral deposits

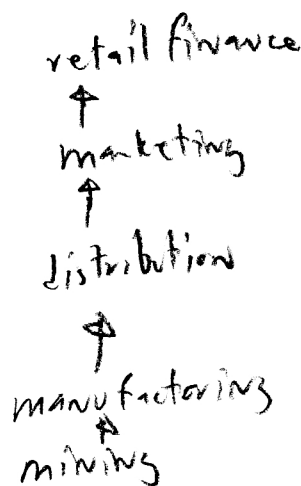
[Ruhr Valley]

Relatively free trade with Dutch meant Dutch FDI (foreign direct investment).

Cockerill family industrial establishment (see p. 230 C+V) was largest vertically-integrated business in Continental Europe



as opposed to horizontal integration



Industrialization (cont.)France

Banking liberalization under Napoleon III

Hydro power → turbines + electricity + French leadership
lead to in energy sector, including nuclear power through today.

Steel, aluminium, aviation, chemicals, glass

Less urban culturally than Netherlands, Belgium, England
(less than 50% of French live in cities, unique
amongst industrialized ("developed") countries.

Tariff war with Italy 1887-1898

From 1850s until WWI, "La Belle Epoque",
modernism in Art and MusicGermany1800-1833 Prussian common trade zone, combination of
legal institutions from England, Belgium and France1833-1870 copied technologies via FDI from earlier
industrializers, railroads helped unify disparate
states economically.1870-1913 Steel output increased 6% annually.
(3% growth was average throughout period)1871 Free Incorporation law created + German Republic
created
207 new GmbHs in 1871
479 in 1872Coal, iron, steel, engineering machines, chemicals,
organic chemistry (Bayer aspirin) [Siemens, Daimler,
Benz]
World's best university system established
(sustainability gradient)

Industrialization (cont.)

"Late-comers and no-shows"

The one thing these countries have in common is the lack of coal resources. This can be seen in Fig. 10-1 (cont) pg. 245. It was not until the late 1880s - 1900 that coal consumption per capita increased to the point that industrialization was possible.

Switzerland

Is an isolated mountainous country with little or no natural resources, except hydro-electric power which then provided a cheap source of electricity and thus the development of electric railroads linking the various multi-lingual decentralized regions of Switzerland.

Like England Switzerland developed a strong financial and banking sector, and, as isolated, depends on foreign trade.

A good education system meant that Switzerland's comparative advantage was "high-value" (high labor to output $\frac{L}{Y}$) technologies such as specialized machinery, clocks, watches and sophisticated cheeses and chocolates, textiles - hand-loomed specialized silks and cottons. Nestles is an example of the high-value food and beverages developed in Switzerland.

In 1898 the Swiss Government took over (nationalized) the bankrupt local railways and electrified the railway system as well as created a cohesive national network.

Industrialization, "Late-comers and No-shows" (cont.)

Netherlands, Denmark, Norway and Sweden.

Highest literacy rates in the world but lacked coal, and were late in abolishing serfdom, although well-governed afterward

Regional specializations included fish, timber, and seaports

Small countries, like England (and Switzerland) thus depended on trade sector ($\frac{x-m}{y}$ relatively high)

Are examples of "upstream industrialization" where began by exporting raw materials but then began processing the materials themselves, yet, no heavy industrialization occurred.

Austria-Hungarian Empire

Austria, Hungary, Slovakia, Czech Republic, parts of Poland

Were part of Habsburg sovereignty until WWI ended (1918),

with the Czech region providing greater than 50% of the Empire's output.

In 1780's Habsburgs allowed serfs to market crops (surplus) and leave manors, yet serfdom not declared illegal until 1848 (e.g. taxes were paid to state instead of to landed class).

Low levels of education and literacy until modern period.

By the 1870s with the development of the railroad Budapest became the largest milling center in Europe.

Industrialization, "Lato-comes and No-shows" (cont.)

Southern and Eastern Europe

All shared low literacy rates and no "agrarian reform" (abolishment of serfdom), thus were late in primitive accumulation of capital, instead of market reforms the general tendency was for collectivization and subsidy. Therefore there was low productivity of labor in agriculture.

Governments were in general autocratic, authoritarian, corrupt and inefficient

Spain and Portugal

After mercantilism period and Napoleonic Wars experienced continuous civil wars and bad public finance.

Lost American empires, meaning trade and gold revenues decreased in early 1800s.

Attempted land (agrarian) reform by confiscating lands of church, municipalities and aristocrats who opposed the civil wars. Wanted to sell the lands to peasants, who could not afford the lands, so therefore had to accept payment in government bonds from mostly same people whose lands were confiscated in first place.

Both countries had high population and low economic growth, meaning $\frac{Y}{N} \downarrow$.

Industrialization, "Late-comers and No-shows" (cont.)

Italy

Italy was in fact not a "nation-state" after mercantilist state-craft period, and was left various city-states warring amongst themselves, both literally and through high tariffs.

There were unsuccessful unification attempts in 1820s, 1830s and 1848-49.

The Austria Habsburgs annexed Venice but in 1850 Count di Cavour (an entrepreneur who owned railroads, a newspaper and a bank) successfully defeated the Austrians and created a constitutional monarchy in the "Kingdom of Italy" in 1861. Created national fiscal and monetary policy, negotiated trade treaties, accepted FDI (Foreign direct investment) and exports doubled in 5 years. Count di Cavour sold public debt to France, but died leaving no successor. This led to a 10 year war with France (1870-1871) and an increase in trade barriers.

There was large-scale immigration to the United States in the 1890s.

Industrialization (cont.)

The United States of America

The history of the U.S. is often seen as one of 'exceptionalism' because the U.S. did not transform from a feudal society. In addition, unlike Europe land was plentiful and population was scarce. Abundant natural resources and an entrepreneurial, individualistic national culture aided industrialization and the commercial revolution.

Scarce population meant that capital investment was directed specifically towards "labor-saving" technology leading to high output per person and thusly to high income per person, the highest in the world by 1900 ($\frac{4}{10}$).

As England's colony the US directly imitated both English rule-of-law (common law) and the British model of industrialization, including technologies.

In 1790 the population was 4m, in 1870, 40m people. This period also coincided with the westward movement of the country aided by specific government "frontier" policies.

The first wage-labor factory was in Rhode Island in 1789.

In 1793 Eli Whitney invented the cotton gin, cotton was the US's largest export, timber being second.

After the Civil War (1861-1865) the US began rapid industrialization based on steel and railroads, based on the capital accumulated during the "free-banking" period of the early-mid 1800s.

Industrialization, "Late-comers and No-shows" (cont.)

Russian Empire

Was a great empire in terms of land mass and gross output (Y) but per person productivity was low ($\frac{Y}{N}$), as it is today excepting natural resources,

Did not receive serfdom until 1861, resulting in low agriculture productivity and low levels of capital accumulation

Imported French capital and technology, through GSEs (government supported enterprises) beginning in the 1880s and in 1890s industrial productivity began increasing 8% per year.

The trans-siberian Railroad was built in 1891

The French convinced the Tsar to guarantee the bonds issued to build the railroads and other means-of-production leading to industrialization but then the Russo-Japanese war of 1904-1905 showed the unsustainability of the GSE investment model, leading to an unsuccessful revolution in 1905-1906.

The October Revolution of 1917 was more successful and led to creation of the Soviet Union, again based on central planning, which ultimately collapsed in 1989.

The Development of US Banking. r

The evolution of banking and monetary policy in the United States might be seen as a dialectic between the "Hamiltonians" who wanted a strong central (Federal) government role in banking and the "Jeffersonians" who wanted policy left to the individual states. The synthesis of this dialectic then would be the Federal Reserve System (central bank), which was formed in 1913 and began operating in 1914. The U.S. Constitution gave the right to "note issuance" (specifically species-money) to the Federal government so it can be argued that the "Hamiltonians" won the debate initially at the time of formation of the Constitution. However, the Federal government still had the ability to delegate policy to the states. It is for this lack of precision in policy that Cameron and Neal state that US financial policy at the time of industrialization was "mixed", e.g. at times overtly harmful and at other times helpful.

Lecture Notes for Economic History

US Banking (cont.)

Pre-Constitutional Period

most banks "limited liability" corporations who issued notes up to 2 times the amount of paid-in capital.

1789 Constitution Ratified

"Hamiltonian"

1791 Congress Creates 1st Bank of the United States (1st BoUS)

"Hamiltonian". BoUS given 20 year charter and no competition (no more state chartering of banks). Federal government did allow National Banks as long as they lent to the state + fed governments. This monopoly led to a backlash against Federal control.

1811

1811 Brief Period of states' rights and state-chartered banks

"Jeffersonian" War of 1812-1814 lead banks to over-lend and over-issue notes to government. 75% of banks receive permission to cease payment in species until 1817.

1816

2nd Bank of the US

"Hamiltonians" 2nd BoUS serves as bank for US Treasury and acts as 'lender of last resort'. Lack of private note-clearing between banks due to large geographical distances means no market forces to prevent over-issuance of notes. Is a problem of unit banking (regulation preventing bank branches) and lack of competition between states (state-only charters).

1836

US Banking (cont.).

1837 State-chartered banks, "Free-Banking Era" despite federal taxes on state banks

↓

1861

"Jeffersonian." Barriers-to-entry and lack of bankruptcy (lender of last resort) enforcement suspended state-by-state beginning 1837. Period of rapid growth and capital accumulation in U.S.A. due to bank competition. (Jackson elected 1837 and vetoed renewal of 2nd BoUS, returned BoUS funds back to state banks).

1861 Period of Civil War "War Finance"

↓

1865 Legal Tender Act of 1861 makes the fiat "Greenback" official currency of the USA

"Hamiltonian." Tendency for fiat and inflationary money. 1864 National Banking System Act gave 8 National Banks note-issuance monopoly. State chartered banks had to buy government bonds as reserves, this limited fiscal policy flexibility for federal government, + prevented money supply from expanding and contracting to meet commercial requirements, especially for farmers.

1873 "Crime of 1873"

"Hamiltonian." Federal government declares silver no longer acceptable as species-money which contributes to world-wide stockmarket crashes and helps bring end to Free Trade Era as countries retreat to economic nationalism (protectionism). De facto Gold Standard for USA.

US Banking (cont.).

1900 Gold Standard
for US
Declared

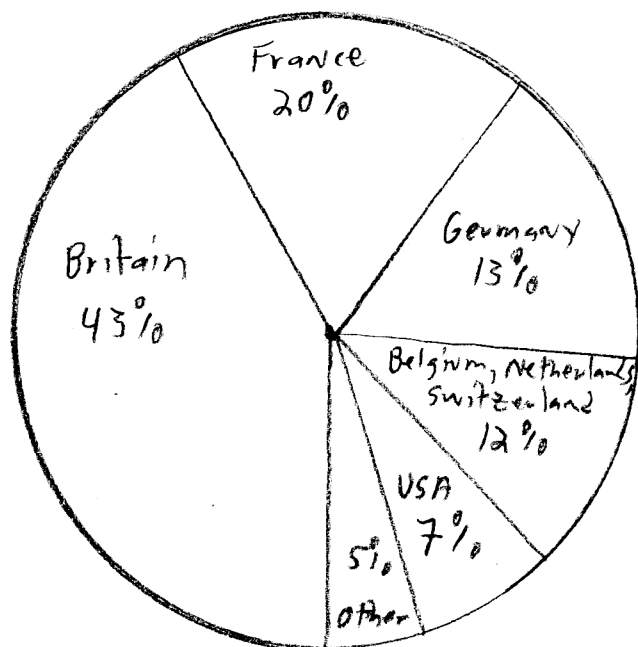
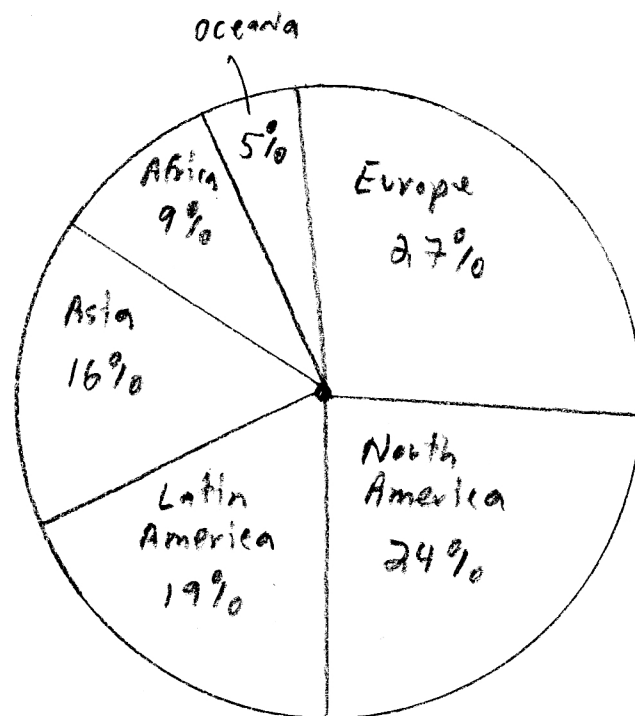
ushers in official period of
International Gold Standard,
until World War I period of
War Finance.

1913 Federal
Reserve
Act

Federal Reserve system created
to prevent "panics" + monopolize
note issuance. Allowed banks to
engage in international finance.

Industrialization (cont.)

In summary, industrialization led to the world we know today. There was vast capital accumulation and wealth created. During early industrialization wages increased steadily, leading to a rapid growth of wages in the modern economy (see attached wage chart from the "Historical Statistics of the United States"). Both trade and investment became increasingly internationalized, with the "early and late" industrializers creating Foreign Direct Investment in all regions of the world on the eve of World War I (1914).

Sources of FDIUses of FDI

FDI
Distribution in 1914,
from C+N, 12.4,
pg. 304.

college graduates) and earnings inequality. See, for example, Table Ba4426–4430.

During the second half of the nineteenth century, the collection of wage data became more routine as federal agencies expanded their operations and as states established their own bureaus of labor and industrial statistics.⁹ These state agencies conducted numerous surveys of both individual workers and firms, sometimes publishing the original data in their annual reports, usually without any analysis. Carroll Wright, the first Commissioner of Labor Statistics in Massachusetts, and later chief of the U.S. Census Bureau, was a pioneer in such surveys. One such survey, published in 1885, provides wage evidence similar to that of the Aldrich and Weeks reports, and it is used in the construction of series Ba4218.

The U.S. Bureau of Labor Statistics (BLS), established in the late nineteenth century, is charged with the regular collection of wage and related labor market information. Prior to the 1930s, this was accomplished through the use of periodic surveys and special studies; see, for example, Tables Ba4253–4267, Ba4280–4282, and Ba4320–4334. Beginning in 1932, the Bureau surveyed firms on a monthly basis as to their employment and payroll; in March 1993, there were approximately 390,000 reporting units in the survey. These data are a fundamental source of wage information for the twentieth-century United States, and they are used in the construction of Tables Ba4361–4380. The BLS also produces Area Wage Surveys, which provide evidence on average wages in detailed occupations for various metropolitan areas.

In conjunction with the construction of the national income and product accounts (NIPA), the U.S. Bureau of Economic Analysis (BEA) publishes annual estimates of the average yearly wage and salary income of full-time employees by industry, beginning in 1929; see Tables Ba4397–4418 and Ba4490–4511. These have been extended backward in time; see Tables Ba4280–4282 and Ba4335–4360. Wage and salary income, of course, is not the only form of labor income: total compensation includes payments by firms into social insurance programs (for example, Social Security), employer-provided group health insurance, and so forth. Estimates of these average annual “supplements,” in total for all industries, and by type of supplement, are provided in Tables Ba4419–4421 and Ba4484–4489. In addition to the BLS and BEA, there is an enormous number of specialty surveys that provide information on wages for specific groups.

Key Trends

The majority of series provided here pertain to the “nominal” wage. It is possible to construct a “real” wage series – that is, nominal wages adjusted for change in the cost of living – by dividing nominal wages by an appropriate price index. Table Ba4218 displays a nominal wage series for unskilled laborers. A real wage series, shown in Figure Ba-L, can be calculated using a consumer price index (CPI) developed by Paul David and Peter Solar that covers two full centuries.¹⁰

It is immediately evident that over this very long period, real wages have increased substantially; indeed, the average annual rate

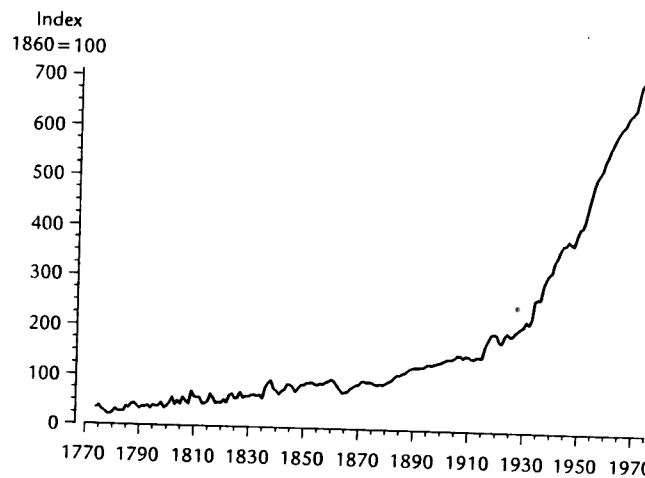


FIGURE Ba-L Index of real wages for unskilled labor: 1774–1974

Sources

Series Ba4218 divided by series Cc2, then multiplied by 100.

of growth of real wages is approximately 1.5 percent per annum.¹¹ A series growing at this rate will double in value every forty-six years, or approximately twice every three human generations. This particular series attempts to measure the price of “raw” (that is, unskilled) labor, and thus does not capture many improvements in labor force “quality” associated with higher wages. It is also evident from the values of both series underlying Figure Ba-L that the price level (the deflator) rose markedly over the two centuries, implying that growth in nominal wages not only kept up with growth in the price level but outpaced it.

Several other features of the graph are worthy of note. First, the growth rate of real wages accelerated: growth was slower during the nineteenth century than in the twentieth.¹² This acceleration in growth is also apparent in real per capita incomes and reflects fundamental shifts in the underlying sources of productivity growth over time. Second, it is apparent that year-to-year (or longer-term) variability in growth rates of real wages – volatility – was very considerable in the nineteenth century but was dampened in the twentieth century. This dampening in volatility is partly an artifact of improvements in the quality of the underlying data series, but it also reflects changes in labor market institutions that, to some extent, insulate wages from various real and nominal “shocks” – for example, wars or recessions.

The David-Solar data end shortly after the beginning of the so-called productivity slowdown, which began about 1973. A consequence of the slowdown in productivity growth was a marked slowdown in the rate of growth of real wages. The slowdown in real wage growth is clearly visible in Figure Ba-M. According to these data, the median annual earnings of men were lower in 1997 than in 1973 when adjusted for changes in the price level. Some of the stagnation may be more apparent than real if the conventional CPI

¹¹ Growth rates are estimated as the coefficient of a linear time trend in a regression of the log of the real wage index. A rate of 1.5 percent per annum is similar to the long-run growth rate of output per worker, and consistent with the view that, in the long run, labor is paid the value of its marginal product, as simple neoclassical models of the labor market predict.

¹² The (estimated) average annual growth rate from 1774 to 1900 is 1.2 percent per annum, compared with 2.5 percent per annum from 1900 to 1974.

⁹ For additional information on various nineteenth-century sources of wage statistics collected by the federal government, see Lebergott (1964).

¹⁰ For additional real wage series covering the antebellum period, see Margo (2000b).