

**Prof. John H. Munro**  
**Department of Economics**  
**University of Toronto**

[munro5@chass.utoronto.ca](mailto:munro5@chass.utoronto.ca)  
[john.munro@utoronto.ca](mailto:john.munro@utoronto.ca)  
<http://www.economics.utoronto.ca/munro5/>

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## **ECONOMICS 303Y1**

### **The Economic History of Modern Europe to 1914**

**Prof. John Munro**

#### **Lecture Topic No. 17:**

- IV. THE SPREAD OF MODERN INDUSTRIALIZATION IN THE 19TH CENTURY: THE 'SLOW INDUSTRIALIZATION' OF FRANCE, 1789 - 1914**
  - A. Barriers to Economic Development in France**
  - B. The Economic Consequences of the French Revolution**
  - C. Transportation in the 19th-Century French Economy**

**IV. THE SPREAD OF MODERN INDUSTRIALIZATION IN THE 19TH CENTURY:  
THE 'SLOW INDUSTRIALIZATION' OF FRANCE, 1789 - 1914**

**A. Barriers to Economic Development in France**

1. **Barriers to Economic Development in the 18th and 19th Centuries:** for independent reading only.<sup>1</sup>

2. **The Debate About the Performance of the French Economy in 19th Century**

a) **There are two major errors in discussing the 19<sup>th</sup>-century French economy:**

i) **the first error: to pretend that France was a homogenous economic entity**, rather than a country with several very different regional economies, north and south.

ii) **the second error: to discuss the 19th century as though it were one continuous and consistent period of stagnation**, rather than a century with many different phases.

b) **Phases of Economic Growth:**

i) **the 19th century was certainly not a period of continuous economic stagnation, for France:**

(1) but a century that witnessed several phases of quite rapid growth

(2) alternating with phases of slower growth, as in many other countries

ii) **the following are the main periods or phases of economic change in 19<sup>th</sup> century France:**

<b>1815 - 1840</b>	irregular, usually slow growth
<b>1840 - 1860</b>	very rapid economic growth
<b>1860 - 1880</b>	less rapid, irregular growth [when the Franco-Prussian war intervened, in 1870-71]
<b>1880 - 1895</b>	stagnation and recession [period of the international 'Great Depression, 1873 - 1896', with general deflation]
<b>1895 - 1914</b>	recovery and rapid economic growth [with international inflation; pre-war build up]

c) **the traditional negative views: about the performance of the French economy, 1815-1914**

i) **For a long time**, our views about the performance of the French economy in the 19th century were

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<sup>1</sup> See the ECO 303Y A List Topic (7, or 12 on the Master List): Topic no. 7 [12]: *Impediments to Industrialization on the Continent: France in the 18th and 19th Centuries*. In particular, see Colin Heywood, *The Development of the French Economy, 1750 - 1914*, Studies in Economic and Social History series (Basingstoke: Macmillan, 1992). Excellent summary of the major issues and debates.

dominated by the writings of Sir John Clapham, who stated, in his famous book *The Economic Development of France and Germany, 1815 - 1914* (written in 1921), that France ‘never went through an industrial revolution’.

ii) **Those views have been echoed by many subsequent historians: such as Rondo Cameron**, David Landes, and later also by Clive Trebilcock (and to a modified extent by Nicholas Crafts).

d) **more recent views: with a more positive case**

i) **More recently there has developed a revisionist school**, which has painted a far more optimistic and favourable picture of French industrialization in the 19th century and of French economic growth in general:

(1) the French historians: François Crouzet, Claude Fohlen, Emmanuel Levy-Leboyer;

(2) the British historians: Patrick O'Brien (and Keyder), Roger Price, and Robert Aldrich, Colin Heywood (to a modified extent).

(3) the American Richard Roehl especially;

(4) and, revising his former negative views, the American economist, the late Rondo Cameron.

ii) **Patrick O'Brien, however, has published an important article on this topic:** some 15 years ago:

(1) ‘Path Dependency, or Why Britain Became an Industrialised and Urbanized Economy Long Before France’, *The Economic History Review*, 49:2 (May 1996):

(2) I will comment on that article in the subsequent section on agriculture, and again at the end of this series of lectures on French industrialization.

iii) **But clearly France did in fact enjoy an economic growth during the 19th century that is very substantial,**

(1) especially when compared with either France in previous centuries or with other countries outside western Europe.

(2) As both Donald [now Deirdre] McCloskey and Nicholas Crafts have reminded us:

- it is rather silly, in a way, to debate the rather small differences in growth rates between western European countries in the 19th century, when you consider how much more rapidly they were all growing, compared both to past centuries,

- but more especially compared to other countries or regions in the 19th century -- in Asia, Africa, and in much of Latin America (Argentina and Chile excepted).

iv) **While citing these contrary views does provide, I believe and hope**, an important introduction to this topic on the French economy and comparative economic development: to make you aware of the key objectives.

(1) nevertheless: now is not the proper time to continue this debate, which must obviously wait until we have

examined all sectors of the 19th-century French economy;

(2) then we can return to this debate as a review and overview of the French economy from 1789 to 1914, from the French Revolution to the eve of World War I.

e) **Where should we begin our examination of the French economy?**

i) **If we began in the early 18th century**, and plotted the course of the French economy during much of this century we would be struck by a rate and extent of both commercial and industrial expansion that seems to match the English performance, at least until the 1770s.

ii) **But France did not undergo any comparable industrial revolution from the 1770s;**

(1) instead it underwent a far more drastic political revolution in the next decade, one that brought France into a generation of destructive warfare and internal chaos;

(2) that provided serious economic setbacks, while also preparing some grounds for a more modern economy in the next century.

iii) **So we will start in earnest with the French Revolution**, and I will try to do so with some positive observations.

## **B. The Economic Consequences of the French Revolution, 1789 - c.1795**

1. **The Political and Economic Unification of France:** as the most positive result.

a) **The French Revolution of 1789:**

i) **marks obviously a crucial watershed or turning point in all aspects of French history**, in economic history as well as in political and social history.

ii) **For both, perhaps**, the greatest achievement of the French Revolution was political and economic unification, which had been only partly achieved by the end of the *ancien régime* [a term which actually means ‘the former regime’, and not the ‘old regime’], i.e., before 1789.

iii) **On the eve of the French Revolution, France was the most populous country in Europe,**

(1) with some 25 million inhabitants, almost three times larger than Great Britain (with about 8 million for England and Wales, and a million for Scotland)

(2) and thus France had potentially the largest domestic market in Europe.

iv) **but that market was instead several divided markets**, reflecting the heritage of France's feudal past.

b) **The heritage of medieval Feudalism in France's political structure:**<sup>2</sup>

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<sup>2</sup> See Lecture no. 5, in ECO 301Y (online): on medieval feudalism

**i) At one time, medieval France had been a mosaic of virtually independent feudal principalities,**

(1) in the form of counties, duchies, and some bishoprics:

- each of which was a virtually independent, feudal-ruled political entity
- e.g., the counties of Flanders, Anjou, Maine, Champagne, etc.
- the duchies of Normandy, Brittany, Burgundy, Gascony, etc.

(2) the duchy of Gascony-Guienne, a particularly important case:

- this vast area had long been ruled by English kings, by feudal inheritance, up to the end of Hundred Years' War: 1338-1453:
- its end marked the final, permanent transfer of this duchy to France.

(3) also: the bishoprics of Cambrai and Tournai, for example (in northern France)

(4) The earlier kings of France, up to Philip II Augustus (1180-1223), had directly ruled only a small area around Paris: the area of Notre Dame Cathedral (in the Seine River: known as the Isle de France).

(5) Philip Augustus began the process of royal centralization, which took place over many centuries

(6) Centralization becomes the chief theme of French history, indeed after the Revolution as well.

**ii) This feudal political structure was in sharp contrast to medieval England's political structure, from the time of the Norman Conquest, in 1066:**

(1) William the Conqueror (as King of England, 1066-1087): whether by accident or design, he rewarded his feudal vassals by giving them, not quasi-independent feudal counties and duchies, but rather fiefs, in the form of hundreds of manors, scattered across the extent of England

(2) Their descendants later acquired fiefs in Wales, Scotland, and Ireland, as well

(3) Hence, there were, in medieval England, no feudal principalities to hinder the expansion and centralization of royal rule.

(4) The reign of King Henry II (1154-1189), following the civil wars under King Stephen (1135-1154):

- marks the real beginning of royal centralization and national unification in England
- especially with the establishment of Common Law throughout England
- with royal appointments of Justices of the Peace and sheriffs

(5) This early, precocious centralization of royal power and national unification is one of the most important reasons why England became the homeland of the modern Industrial Revolution – though obviously not the only reason!

(6) In France, this goal of national unification was not achieved until the French Revolution, of 1789

**ii) In France, by the 16th century, the situation had, however changed:**

(1) most of these ancient feudal principalities were no longer ruled by feudal princes;

(2) **as each dynastic line of feudal princes died out**, and was not replaced, these feudal provinces reverted to the control of the French monarchy, which reorganized them as *gouvernements*.

iii) **But that change did not result in a centralized royal rule over France:**

(1) because most of these provinces were allowed to retain their local customs and laws, weights and measures, and sometimes their own legislatures, as well;

(2) and the crown was forced to select the provincial governors from the local feudal aristocracy.

iv) **Most of these provinces had long levied their own customs and excise duties not just on goods imported from foreign countries**, but also from neighbouring French provinces.

v) **Furthermore, as just indicated, 11 of these provinces kept their own legislative assemblies**,

(1) these 11 provinces were known as the *pays d'état*: see appended map

(2) vs. the other provinces, known as *pays d'élection*, which sent elected deputies only to the national assembly, the *Etats Généraux* (which did not meet after 1614).

c) **The Problem of Internal Trade:** Before the French Revolution there was a major attempt to impose internal free trade, but that was only partially successful:

i) **In 1664, Jean Colbert, the famous chief minister for Louis XIV,**<sup>3</sup> coerced 12 provinces centred about

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<sup>3</sup> Jean Baptiste Colbert: The French statesman Jean Baptiste Colbert (1619-1683) was one of the greatest ministers of Louis XIV and is generally regarded as the creator of the economic system of prerevolutionary France. Jean Baptiste Colbert was born at Reims on Aug. 29, 1619, of a family of prosperous businessmen and officials. He entered the service of the French monarchy under Michel le Tellier, the father of the Marquis de Louvois. In 1651 he became the agent of Cardinal Mazarin, whom he served so well that the cardinal bequeathed him to King Louis XIV in 1661. Almost immediately Colbert became the most important minister in France. He was made intendant of finances in 1661 and in the next few years assumed responsibility for public buildings, commerce, and the administration of the royal household, the navy, and the merchant marine. His only serious rival was the war minister, Louvois. The two men intrigued against each other for royal favor, with Louvois, especially after 1679, gradually winning the upper hand. Colbert, however, remained immensely powerful until his death. Colbert's most successful years were from 1661 to 1672. The neglect and corruption of the Mazarin period were replaced by a time of prosperity with expanding industry and mounting employment. The tax system was made slightly fairer and much more efficient, thereby greatly increasing Louis XIV's revenues. In a mercantilist age Colbert was the supreme mercantilist. His program was to build up the economic strength of France by creating and protecting French industries, encouraging exports, and restricting imports (especially of luxury goods). By endless regulation and supervision, he tried to make French industry, particularly in luxury items, first in Europe; he was partially successful, for the French tradition of high quality in certain fields (for example, tapestry and porcelain) dates from his time. Colbert was not an innovator. His ideas came from other men, particularly Cardinal Richelieu, and his interpretation of them was often mistaken. But for 22 years he controlled the economic fortunes of France, and he did so with an all-embracing scope and an incredible capacity for work. Some of his projects, however, were unsuccessful. He was unable to unify the diverse systems of weights and measures in France or to secure free trade within the country. His regulation of industry by constant inspection was largely ineffective, as his orders were often disregarded. Colbert died on Sept. 6, 1683, to the

Paris into abolishing their customs duties in order to form a free-trade zone known as the Cinq Grosses Fermes (the Five Great Tax Farms), as a customs union.<sup>4</sup>

ii) **But the other 28 provinces refused to join this customs union;**

iii) **consequently, trade between the Cinq Grosses Fermes and the other provinces,** and with each other, was subject to internal tariffs: i.e., imports from these provinces were taxed the same as imports from foreign countries,

iv) **After 1665, the internal trade structure involved:** two sets of provinces for customs duties, outside the Cinq Grosses Fermes.

(1) **Provinces réputées étrangères:** existing provinces outside Five Great Farms.

(2) **Provinces d'étranger effectif:** territories acquired by Louis XIV after 1664, and which were regarded for tax purposes as still being foreign lands.

d) **The Achievement of the French Revolution:** was to sweep away all of these feudal divisions to create a truly united France under the firm centralized rule of Paris.

i) **all the feudal provinces (i.e., the *gouvernements*) were eliminated:**

(1) they were replaced by 83 new administrative units called *départements*, each run by Paris-appointed prefects, who reported directly to Paris.

(2) The boundaries of these new *départements* bore no relation to the old provinces,

(3) deliberately so, in order to extinguish local customs.

ii) **Thus all internal taxes and tolls on trade were eliminated:**

(1) they were replaced by a single, common tariff applied to the external national frontiers.

(2) Thus for the first time France enjoyed a unified domestic market, the largest such market in Europe, with over 25 million people, as noted above, and continuing to grow.

e) **Weights and Measures: the Metric System:**

i) **In July 1793, the Revolutionary national assembly (the Convention) also swept away all the ancient feudal and local systems of weights and measures,** which had been a major trade barrier;

ii) **By 1795, it replaced them all with a new common system of measurement, a scientific system:** namely, the metric system, which French force of arms imposed on the rest of continental Europe (but which the

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great relief of the general public, with whom he was (for the most part undeservedly) very unpopular. The immense concentration of responsibilities in one minister was never repeated under the monarchy.

<sup>4</sup> A tax farm is the annual sale of the right to collect a tax: the state receives a fixed capital sum in selling the farm, and the purchaser of the tax farm hopes to make a profit by collecting more in taxes than he paid in buying the tax farm, each year. Tax farms were usually sold by annual auctions.

British – and also the Americans – stoutly resisted).

## 2. Fiscal and Tax Reforms: Positive and Negative Aspects

a) **The tax reforms imposed by the Revolutionary regime initially appeared to be very beneficial:**

i) **by eliminating a highly oppressive and very regressive tax structure**, which had developed under the *ancien régime*, i.e., of the former monarchy.

ii) **one that had largely exempted the nobility and the Church**, while very heavily taxing the peasantry and the bourgeoisie.

b) **The New Republican Tax Structure:**

i) **But the seeming improvements of the new republican tax structure**, in making it much more equitable and progressive, did not mean that it was popularly respected.

ii) **For hatred of the old tax system had become so strong**, so entrenched,

(1) that the populace retained a deeply ingrained custom of tax evasion and distrust of the government.

(2) and that was not altered by the Revolution, or by nineteenth-century governments.

iii) **As the government found that its current tax structure produced insufficient revenues**, especially because of still widespread tax evasion, it raised its taxes more and more -- i.e., the burden on those who could not so easily evade taxes.

iv) **For those in business, commerce, industry, etc., who could not escape**, the tax burden became perhaps the highest in nineteenth-century Europe, with seriously distorting effects on investment, production, the market.

c) **The French government also steeply raised its national tariffs on the import trade:** partly to produce more revenue, partly to protect French agriculture and industry against foreign competition.

i) **Again, such tariffs remained generally high** (if not higher than those of other continental countries), until they were dramatically moderated by the previously mentioned Cobden-Chevalier Treaty in 1860 (a brief free trade era, lasting only until the late 1870s).<sup>5</sup>

ii) **Such tariff barriers promoted both industrial and agricultural inefficiency:** i.e., they misallocated resources.

## 3. The Economic Consequences of Warfare: 1792 to 1815

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<sup>5</sup> That view, and still the standard view about the differential between French and British tariffs in the nineteenth century is disputed in: John Vincent Nye, 'The Myth of Free-Trade Britain and Fortress France', *Journal of Economic History*, 51 (March 1991), 23 - 46.

a) **The warfare engendered by the French Revolution and the successor regime of Napoleon was arguably the most harmful consequence of that Revolution:** if only for the very crucial reason that France ultimately lost the war, after suffering enormous destruction of men, land, and materials.

b) **That warfare was especially harmful to France's foreign trade,**

i) **for such foreign trade,** and overseas trade in particular, had been expanding rapidly and successfully during the eighteenth century.

ii) **The wars cost France some of her overseas colonies and many of her trade routes,** and trade advantages, lost principally to the British victor.

iii) **The losses were especially harmful:** to French ports and export industries.

c) **War was also a burden, of course, in the taxes imposed:**

i) **but an important article by Peter Mathias and Patrick O'Brien:**

(1) contends that, in the 18<sup>th</sup> and early 19<sup>th</sup> century, the tax burden became heavier in England -- and also in the Netherlands --

(2) during not just the 18<sup>th</sup> century wars in general, but especially during the French Revolutionary and Napoleonic Wars.<sup>6</sup>

ii) **Since then (1976), however, there have been no follow-up studies:** to demonstrate whether or not the structure of taxation was more an impediment to growth in England or in France.

d) **Far more serious, of course, were the physical consequences of warfare:**

i) **the destruction of French agricultural land,** resources, and manpower;

ii) **and the magnitude of these losses was far,** far greater than those borne by Great Britain during the Napoleonic Wars.

e) **The fact that Britain won the wars,** without having to fight any of the wars on her own soil, while France lost, gave the British a crucial advantage over the French, and indeed over most of continental Europe: i.e., a several decades lead in industrialization.

#### 4. **French Revolutionary Land Reforms:**

a) **These were the Revolutionary Land Reforms designed to abolish all remaining elements of Feudalism, Manorialism, and Serfdom:** to give the peasantry full title and control over their lands.

b) **Perhaps paradoxically those Revolutionary Land Reforms can be seen as yet another negative**

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<sup>6</sup> See in particular Peter Mathias and Patrick K O'Brien, 'Taxation in Britain and France, 1715-1810: A Comparison of the Social and Economic Incidence of Taxes Collected for the Central Governments', *Journal of European Economic History*, 5 (1976), 601-50.

**consequence of the Revolutionary era;**

- i) but to see why and how those reforms were in some respects a barrier to industrialization, we shall have to wait until the next lecture,
- ii) when we come to our first major topic on French economic development: French agriculture in the 18th, 19th, and early 20th centuries.
- c) **But first, I want to continue and complete the theme of national unification,** as the chief consequence of the French revolution, by looking at the physical means of unification: the French railways, a very short topic.

**C. Transportation in the 19th-Century French Economy**

**1. The Development of French Railways: State Direction**

- a) **So, now to continue with that theme:** of state-influenced integration of the French economy during the 19<sup>th</sup> century.
- b) **Railways were obviously and clearly important for French economic development and industrialization:** as elsewhere, but less so than in Germany, or Russia (or even Britain), because of the following relative factors: positive and negative.
  - i) **positive:** France had a much better developed road and canal systems before the railway era.
  - ii) **negative:** The state directed pattern of French railway construction in the railway era itself, which unfortunately for France made railways rather less effective a mechanism for economic development than elsewhere.
- c) **The Role of the Government:** from 1833
  - i) **In 1833,** the French parliament (dominated by the lower house: Chambre des Députés):
    - (1) First, it gave itself the exclusive rights to grant all railway concessions;
    - (2) but then parliamentary feuds prevented any concrete railway construction for almost a decade.
  - ii) **Railway Law of 1842:** finally began the true railway era, with a definitive partnership of state and private enterprise to establish a national railway system with nine major lines radiating from Paris.
- d) **Provisions of State Control and Direction of the Railways:**
  - i) **The State put up part of the capital,**
    - (1) about the equivalent of £10,000 sterling per mile,
    - (2) and private companies furnished the rest of the fixed capital requirements:
  - ii) **The State guaranteed interest on railway bonds issued by the private companies:** in order to give

them cheaper capital by reducing the risk factor.

iii) **The State provided most of the physical requirements, except the railway tracks and rolling stock:**

i.e., the state furnished the land, built road-beds, bridges, stations, etc.

iv) **Private companies thus laid railway tracks,** provided the rolling stock, and operated the railway lines.

v) **The French parliament regulated the entire system:** determined where lines would be built, determined the railway schedules to co-ordinate traffic, and set the fares for cargoes and passengers, schedules, etc.

## 2. French Railway Construction in the Mid 19th Century

a) **The first railway boom of the 1840s was interrupted by the Revolution of 1848:** during this boom, about two-thirds of the capital provided by British investors.

b) **The second railway boom in the 1850s:** promoted by new government of Emperor Napoleon III, with lavish state subsidies.

c) **Under Emperor Napoleon III (1848-70),<sup>7</sup> the state engineered the reorganization of 36 French railway companies into six:** and with a much more unified national structure than in Britain or Germany.

d) **Major Fault of French railway construction:** was state-directed policy of having all major railway lines radiate out of Paris, as the hub of a national system.

i) **The result:** was that originally there was little connection between the major rail lines, leaving many regions economically isolated.

ii) **This situation meant that transport between regions had to go through Paris,** changing trains there with very high transshipping costs.

## 3. French Railway Expansion, 1870 - 1914

a) **Franco-Prussian War of 1870-71:**

i) **France suffered a humiliating defeat in the Franco-Prussian war:**

(1) a war which the German Kingdom of Prussia (under Kaiser Wilhelm I and Chancellor Bismarck) engineered (as to be seen when we commence our lectures on 19<sup>th</sup> century Germany)

(2) and, one in which Prussia and its other German allies made much better use of their railways in transporting troops and supplies than did the French.

(3) As we will note later, this Franco-Prussian war led to German political unification: the creation of the

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<sup>7</sup> Louis Napoleon, President of the Second Republic, 1848-1852; Emperor Napoleon III, 1852-1870, when the Franco-Prussian war broke out. The consequence was the abolition of the Empire, and the creation of the Third Republic, from 1871 (without Napoleon).

German Reich or Empire.

ii) **That disastrous defeat finally made the French aware of basic weaknesses of system:** both the military and the economic costs of a Paris-centred system.

iii) **the French defeat cost also them the economically more advanced north-eastern départements,** those that we commonly call Alsace-Lorraine (old provincial names), with some of France's best railways, which were all ceded to the new German Empire.

b) **the new Third Republic and Fréycinet (1828-1923):** from 1871<sup>8</sup>

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<sup>8</sup> Charles Louis de Saulces de Freycinet (November 14, 1828 - May 14 1923) was a French statesman and President of the Council during the Third Republic, part of the Opportunist Republicans faction. He was born at Foix and educated at the École Polytechnique. He entered the government service as a mining engineer (see X-Mines). In 1858 he was appointed traffic manager to the Compagnie de chemins de fer du Midi, a post in which he showed a remarkable talent for organization, and in 1862 returned to the engineering service, attaining in 1886 the rank of inspector-general. On the establishment of the Third Republic in September 1870, he offered his services to Léon Gambetta, was appointed prefect of the department of Tarn-et-Garonne, and in October became chief of the military cabinet. It was mainly his powers of organization that enabled Gambetta to raise army after army to oppose the invading Germans. He showed himself a strategist of no mean order; but the policy of dictating operations to the generals in the field was not attended with happy results. He entered the Senate in 1876 as a follower of Gambetta, and in December 1877 became minister of public works in the Dufaure cabinet. He carried a great scheme for the gradual acquisition of the railways by the state and the construction of new lines at a cost of three milliards, and for the development of the canal system at a further cost of one milliard. He retained his post in the ministry of Waddington, whom he succeeded in December 1879 as president of the council and minister for foreign affairs. He passed an amnesty for the communards, but in attempting to steer a middle course on the question of the religious associations, lost Gambetta's support, and resigned in September 1880. In January 1882 he again became president of the council and minister for foreign affairs. His refusal to join England in the bombardment of Alexandria was the death-knell of French influence in Egypt. He returned to office in April 1885 as foreign minister in Henri Brisson's cabinet, and retained that post when, in January 1886, he succeeded to the premiership. He came to power with an ambitious programme of internal reform; but apart from settling the question of the exiled pretenders, his successes were chiefly in the sphere of colonial extension. In spite of his unrivalled skill as a parliamentary tactician, he failed to keep his party together, and was defeated on December 3 1886. In the following year, after two unsuccessful attempts to construct new ministries, he stood for the presidency of the republic; but the radicals, to whom his opportunism was distasteful, turned the scale against him by transferring the votes to Sadi Carnot. In April 1888 he became minister of war in Charles Floquet's cabinet--the first civilian since 1848 to hold that office. His services to France in this capacity were the crowning achievement of his life, and he enjoyed the conspicuous honour of holding his office without a break for five years through as many successive administrations--those of Floquet and Pierre Tirard, his own fourth ministry (March 1890-February 1892), and the Loubet and Ribot ministries. To him were due the introduction of the three-years' service and the establishment of a general staff, a supreme council of war, and the army commands. His premiership was marked by heated debates on the clerical question, and it was a hostile vote on his Bill against the religious associations that caused the fall of his cabinet. He failed to clear himself entirely of complicity in the Panama scandals, and in January 1893 resigned the ministry of war. In November 1898 he once more became minister of war in the Dupuy cabinet, but resigned office on May 6 1899.

- i) **Under Charles de Fréycinet**, one-time Minister of Public Works, Foreign Minister, Minister of War, and then Prime Minister, the French government stepped in to construct feeder lines to link up the major systems,
  - ii) **thus now bypassing Paris**, to provide more direct connections;
  - iii) **the government**: also invested heavily in modernizing French railways.
- c) **New railway boom developed:**
- i) which doubled the amount of railway tracks by the 1890s:
  - ii) Indeed, only from the later 1880s, were French railways sufficiently developed to be a reasonably effective contributor to French economic development.

**Table 1: Railway Tracks Open at Decennial Intervals, 1840 - 1914 in kilometres:  
Britain, Belgium, France, Germany, and Russia\***

<b>Year</b>	<b>Britain**</b>	<b>Belgium</b>	<b>FRANCE</b>	<b>Germany</b>	<b>Russia</b>
<b>1840</b>	2,390	335	<b>498</b>	468	27
<b>1850</b>	9,791	903	<b>2,914</b>	5,856	500
<b>1860</b>	14,594	1,730	<b>9,166</b>	11,088	1,625
<b>1870</b>	21,545	2,897	<b>16,464</b>	18,875	10,731
<b>1880</b>	25,045	4,112	<b>23,233<sup>a</sup></b>	33,836 <sup>b</sup>	22,864
<b>1890</b>	27,810	4,525	<b>33,278</b>	42,868	30,594
<b>1900</b>	30,061	4,591	<b>38,107</b>	51,675	53,231
<b>1910</b>	32,163	4,678	<b>40,483</b>	61,205	66,579
<b>1913</b>	32,613	n.a.	<b>40,768</b>	63,375	70,153

\* 1 km. = 0.6214 miles.

\*\* Great Britain: England, Scotland, and Wales. [United Kingdom = Great Britain + Ireland]

a. Excluding Alsace-Lorraine: ceded to Germany in 1871

b. Including Alsace-Lorraine: acquired from France in 1871

**Sources:**

B.R. Mitchell and Phyllis Deane, *Abstract of British Historical Statistics* (Cambridge, 1962), pp. 225-26; Carlo Cipolla, ed., *Fontana Economic History of Europe*, Vol. IV:2, *The Emergence of Industrial Societies* (London, 1973), pp. 790, 794.

**Table 2. Aggregate and per capita indices of industrial production (United Kingdom in 1900 = 100), and percentage shares of world industrial production, for various countries: in 1860 and 1913**

Country	Total Industrial Output		Per Capita Industrial Output		Percentage Shares of World Industrial Production	
	1860 Index	1913 Index	1860 Index	1913 Index	1860 %	1913 %
<b>With 1913 Frontiers</b>						
<b>United Kingdom*</b>	45	127	64	115	20%	14%
<b>Germany</b>	11	138	15	85	5%	15%
<b>France</b>	18	57	20	59	8%	6%
<b>Russia</b>	16	77	8	20	7%	8%
<b>ALL EUROPE</b>	<b>120</b>	<b>528</b>	<b>17</b>	<b>45</b>	<b>53%</b>	<b>57%</b>
<b>United States</b>	16	298	21	126	7%	32%
<b>Canada</b>	1	9	7	46	--	1%

**Source:** Paul Bairoch, 'International Industrialization Levels from 1760 to 1980', *Journal of European Economic History*, 11 (Fall 1982), 269-333, tables 4 - 13.

\* The United Kingdom of Great Britain and Ireland: the values for its aggregate and per capita industrial outputs for 1900 are taken as the base 100 for all the indices in columns 1 to 4. Note that columns 5 and 6 are percentages of total world industrial output.

**Table 3. Indices of Industrial Output\*: in the United Kingdom, France, Germany, and the United States in quinquennial (5 year) means, 1860-4 to 1910-13**

**Mean of 1870-4 = 100**

<b>Period</b>	<b>United Kingdom**</b>	<b>France</b>	<b>Germany</b>	<b>United States</b>
<b>1860-64</b>	72.6			
<b>1865-69</b>	82.8	95.8	72.6	75.5
<b>1870-74</b>	100.0	100.0	100.0	100.0
<b>1875-79</b>	105.5	109.5	120.8	111.4
<b>1880-84</b>	123.4	126.6	160.6	170.4
<b>1885-89</b>	129.5	130.3	194.9	214.9
<b>1890-94</b>	144.2	151.5	240.6	266.4
<b>1895-99</b>	167.4	167.8	306.4	314.2
<b>1900-04</b>	181.1	176.1	354.3	445.7
<b>1905-09</b>	201.1	206.2	437.4	570.0
<b>1910-13</b>	219.5	250.2	539.5	674.9

\* Excluding construction, but including building materials.

\*\* United Kingdom: Great Britain (England, Wales, Scotland) + Ireland

**Source:** W. Arthur Lewis, *Growth and Fluctuations, 1870 - 1913* (London, 1978), pp. 248-50, 269, 271, 273.

**Table 4.****Per Capita Product in Selected  
European countries, 1850 - 1910:****Measured in Constant 1970 U.S. Dollars**

<b>COUNTRY</b>	<b>1850</b>	<b>1870</b>	<b>1890</b>	<b>1910</b>	<b>Percent- age Total Growth 1850-1910</b>
<b>BRITAIN</b>	660	904	1,130	1,302	197%
<b>FRANCE</b>	432	567	668	883	204%
<b>GERMANY</b>	418	579	729	958	229%
<b>BELGIUM</b>	534	738	932	1,110	208%
<b>NETHER- LANDS</b>	481	591	768	952	198%

**Source:**Nicholas Crafts, 'Gross National Product in Europe, 1870 - 1910: Some New Estimates', *Explorations in Economic History*, 20 (October 1983), 387-401.