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## **ECONOMICS 303Y1**

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

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#### **Lecture Topic No. 12:**

- III. GREAT BRITAIN AS THE UNCHALLENGED INDUSTRIAL POWER, 1815 - 1873**
  - A. Trends and Business Cycles in the British Economy, 1815 - 1873**
  - B. Banking, Finance, and Commercial Organization**

### III. GREAT BRITAIN AS THE UNCHALLENGED INDUSTRIAL POWER, 1815 - 1873

#### A. Trends and Business Cycles in the British Economy, 1815 - 1873

1. **This is not a lecture topic:** and it is for independent reading only.

a) **However, I am posting on my Home Page, under Eco 303Y1 lectures, the printed version of a former lecture,** as Topic no. 11 (and so the next topic, on Banking, is Lecture no. 12).

b) **For this and the subsequent topic on banking,** you might read Peter Mathias, *The First Industrial Nation* (2nd edn. London, 1983), chapters 7, 8, and 13.

c) **Please note, however, that I have some disagreements with him on British banking:** to be discussed below on the topic of banking (on central banking).<sup>1</sup>

d) **The logic of the lecture sequences:**

i) **with the previous lecture on the Industrial Revolution in cotton textiles,** we thus completed our historical and economic analyses of the Industrial Revolution period itself, arbitrarily defined as the period from about 1760 to the end of the Napoleonic Wars, in 1815.

ii) **You did see, however, that some fundamentally important innovations** in both the metallurgical and textile industries took place in the following decades: up to the 1840s

iii) **We are now going to focus on the major economic changes in the British economy from the 1820s, generally up to World War I:**

- in banking and finance,
- in transportation (the 2<sup>nd</sup> transportation revolution),
- in foreign trade — for the era of Free trade
- and, after our return in January, in Agriculture
- and finally the Steel Revolution, from the 1860s

iv) **We will, however, return to aspects of change in the British economy after 1870,**

(1) after we have examined the nature of the continental industrial revolutions: in France, Germany, and Russia, from 1815 to 1914

(2) Only after doing so, can we properly analyse how the British reacted to this new foreign competition, not only from continental Europe, but also from the U.S.

2. **Refer to hand-out for a schematic listing of the major economic trends and business cycles:** in the British economy, 1815 - 1914, along with the graph on price trends.

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<sup>1</sup> See below p. 15; and note 2.

3. **Please refer as well to the document on the Quantity Theory of Money: from Fisher to Friedman** (complete with tables, etc.), which has also been posted on my Home Page (under 'Aids in Studying European Economic History), with this URL (in pdf format):

<http://www.economics.utoronto.ca/munro5/QUANTHR2.pdf>

## **B. Banking, Finance, and Commercial Organization**

### **1. The Historical and Economic Significance of this Topic:**

- a) **first, we examine the very major changes in British banking and financial institutions:**
- i) from the end of the Napoleonic Wars (1815) to the outbreak of World War I (1914).
  - ii) but some aspects of post-1870 banking will have to wait: until we have examined the radically different financial structures on the continent, at the end of this course
- b) **second, we will see how the Bank of England became a genuine central bank:** and both its strengths and serious weaknesses in serving this new role (without any precedents to draw on).
- c) **third, concerning this new ‘central bank’, we will examine the interventionist role of the government, in a supposedly laissez-faire free-market economy:** in particular how government economic policies were fashioned by faulty economic theory.
- d) **fourth: we will examine the true foundations, formation, and functions of the modern business corporation:** the limited liability joint stock companies
- e) **We need to understand all these issues involving financial institutions and the government:** in order to understand properly all the succeeding topics on the British economy between the Napoleonic War and First World War; i.e., in the full century, 1815 - 1914.

### **2. Weaknesses in English Banking Structure during Industrial Revolution and the Napoleonic Wars (i.e., from ca. 1760 to 1815)**

- a) **First Fault: Small size and inadequate capitalization of English banks:** no joint-stock financing permitted
- i) **because, as we saw previously,**
    - (1) **the Bank of England held a monopoly on joint-stock banking** within England, dating from its Parliamentary foundation, in 1694;
    - (2) **Furthermore, the Bubble Act of 1720:** also made it virtually impossible – apart from the Bank of England’s monopoly – to organize any joint stock companies, in banking, or elsewhere in the economy.
  - ii) **In general, English Common Law limited bank structures and capitalization, in these respects:**
    - (1) to just six-member partnerships, or family firms
    - (2) so that most English banks were too small and undercapitalized.
  - iii) **Unlike Scotland, England did not have any well developed system of branch banking,**
    - (1) very few English (or Welsh) banks had any branches;

(2) the Bank of England itself, as noted earlier, had only the one branch, in London: ‘The Old Lady of Threadneedle Street’, in the heart of the City.

iii) **Country Banks in England: i.e., banks outside of London**

(1) This problem of small bank size, without supporting branches,

- was especially true of those banks outside of London called country banks,
- almost all of which were created during the Industrial Revolution, to serve its needs
- in terms of both supplying the lubricant (paper money) and fuel (working capital) for the now expanding economic machinery of Industrial Revolution era England;

(2) the London banks (most of which had been the ‘goldsmith’ banks) were, in contrast, quite different: for they had grown slowly during the previous 150 years

(3) But these new country banks had no time to build up their capital bases, during the Industrial Revolution;

(4) around 1810 their capitalization was, on average, only a third of that enjoyed by the typical London bank (£10,000 vs. £30,000).

iv) **Thus, a proliferation of many small banks:** in 1825, England had 715 banks

v) **The question of bank reserves:**

(1) For a small bank to be reasonably secure, to protect itself against sudden withdrawals from deposits or sudden demands to exchange the bank’s own banknotes for legal tender money (coin or B of E notes), it was supposed to maintain a cash reserve ratio of about one-third.<sup>2</sup>

(2) Reserves were rarely in gold or silver coin, but instead in

- Bank of England notes
- or else in the form of liquid assets, such as Consols (traded on the Stock Exchange)
- i.e., government stock, in the form of non-redeemable annuities, that could be easily sold at rediscount.

(3) To safeguard reserves, banks also preferred to make short-term or callable loans;

(4) and therefore they were very reluctant to issue long-term loans that could not be called or liquidated, when they needed to build up cash reserves.

(5) Essential problem was of course that too many banks were not prudent in managing their reserves;

(6) but even a good and prudent bank could be quickly ruined by a general financial panic.

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<sup>2</sup> The Canadian government, or the Bank of Canada, abolished reserve requirements for Canadian chartered banks in 1991; and before that, they had already been very low – about 5%.

vi) **Thus, to repeat: constant dangers of chronic bank failures, a form of ‘Gresham's Law’:**<sup>3</sup>

(1) i.e., the danger that just one small and insolvent bank, which had lent too much to a few creditors or which had discounted too many bad notes, could cause a general panic.<sup>4</sup>

(2) and thus bring down all the good banks in the same districts: i.e., cause a ‘run on the banks’, so that (in the words of one student), ‘they fell like dominoes’.

(3) thereby draining them of all their cash reserves (which were always, of course, far less than total deposits).

(4) That disaster had in fact happened, as we saw before, in Lancashire in the 1770s, wiping out banks there for a generation, just when this region was undergoing the Industrial Revolution in cotton textiles.

vii) **Scotland, in contrast (as we have seen), had a far superior banking system:**

(1) Scotland admittedly had a few, but still relatively very few bank failures,

(2) and only one really serious bank failure: the Ayr Bank in 1772, which had no branches.

(3) With five large joint-stock banks (three with limited liability), and no restrictions on the number of partners or bank size, Scotland consequently enjoyed a well-capitalized banking structure;

(4) and its particular advantage was a well developed system of branch banking, especially with the joint-stock banks. [i.e., fewer but much larger and more heavily capitalized banks.]

b) **Second fault: lack of any central control over note issue and credit:**

i) **Whether or not this was really a problem, the British felt that it was:**

(1) particularly during the Napoleonic Wars, when the government permitted an experiment in a purely ‘paper pound’:

(2) i.e., a purely fiduciary or fiat note issue, with no gold coverage, from the Bank Restriction Act of 1797 to 1821.

(3) In 1821, after a Parliamentary Royal Commission (the ‘Bullion Report’), the Bank of England was required to resume full gold convertibility: i.e., the obligation to convert paper bank notes on demand into specifically defined, fixed quantities of gold (usually gold sovereigns).

ii) **The consequences of having had a purely fiduciary paper currency, during the so-called Bank Restriction era of 1797-1821:**

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<sup>3</sup> Remember that Gresham's Law states that: ‘cheap money drives out dear’, or bad coins (counterfeit, underweight, inferior alloy, etc) drives out good, full-weight silver coins, if both have the same nominal face value, exchange value.

<sup>4</sup> As in the old saying: ‘if you owe the bank £1000 you are in trouble; but if you owe the bank £1,000,00, the bank is in trouble’.

(1) there had been a flood of paper bank notes and drastic inflation : lasting at least until 1815, to the end of the Napoleonic Wars;

(2) and that inflation was blamed on the uncontrolled issue of paper banknotes and of bank credit. [see the accompanying graph]

**c) Attempts to solve both of these problems -- those involving bank size and note issue -- were the object of government legislation in two Bank Acts:**

**i) We will look separately at the bank acts of 1826 (amended 1833) and 1844.**

**ii) At the same time**, we are also considering the ancillary topic of the role of the state in the British economy.

**iii) As indicated earlier, this lecture topic may demonstrate as well the harmful consequences of state or government economic policies**, those based upon ill-advised economic theories.

### **3. The Bank Act of 1826: Joint Stock Banking**

**a) The origin was a drastic commercial and financial crisis culminating in 1824-25:**

**i) That financial-economic crisis had begun with a crisis in commercial relations with Latin America, the former Spanish colonies there:**

(1) that commercial crisis, in turn, was the consequence of revolutions in Latin (Central and South) America against Spain:

- in the aftermath of the Napoleonic Wars and European continental chaos, to achieve independence, with their own post-colonial governments
- and with the establishment of very unstable governments, most were faced with internal rebellions.

(2) The commercial crisis soon became a general financial crisis in England that led to the collapse of 93 English and Welsh banks -- 13% of the total (of 715 banks).

(3) thus gravely aggravating (making worse) the existing financial and economic crisis.

**ii) Since no Scottish banks failed during this crisis**, there was obviously increased pressure within Parliament to change the law to allow English banks to follow the Scottish system.

**iii) While previous Parliamentary petitions had gone unheeded**, the government was now forced to pay much closer attention to recurrent petitions in Parliament on this very issue.

**iv) The End of the ‘Bubble Restriction’: Repeal of the Bubble Act in 1825**

(1) **In 1825, Parliament first responded by repealing the Bubble Act**, thus permitting the legal formation of joint-stock companies in general: with the right to have shares traded on the London Stock Exchange (LSE)

(2) **But, because of the Bank of England's long-standing monopoly on joint-stock banking (dating from its legislated foundation, in 1694),**

- banks, therefore, were initially excluded:
- thus requiring a separate act the following year.

b) **The Bank Act of 1826:** its chief provisions

i) **ended the Bank of England's monopoly on joint-stock banking: thereby permitting the establishment of joint-stock banks anywhere in England (outside London)**

(1) with an unlimited number of shareholders, as had always been case in Scotland.

(2) but London-based banks were initially excluded [see below: Bank Act of 1833]

ii) **Bank of England was ordered to establish branches for the first time outside of London**, in other English cities.

iii) **The note issue was restricted to just notes of £5 [= \$25.00 U.S. dollars of the day] and above in denomination:** i.e., £1 notes, which were considered inflationary, were banned (except in Scotland).

c) **Two Exclusions from the 1826 Bank Act:**

i) **Exclusion of London banks:**

(1) The London banks were originally excluded, as just noted;

(2) but in the 1833 revision of this Bank Act, London banks were similarly allowed to organize as joint-stock companies, provided that they did not issue any banknotes.

ii) **Exclusion of limited liability privileges:**

(1) While the 1826 Bank Act did permit the formation of new joint-stock banks, nevertheless it still required that these banks operate under the legal provisions of partnership:

- i.e., that all the shareholders were still held accountable under law for all the debts of the firm (i.e., as though they were partners in the banks).

- Banks would not be allowed limited liability corporate status in fact until the later 1850s

(2) Again, the major change, with the General Limited Liability Law of 1856, excluded banks, which were granted this status only the following year, 1857;

(3) full limited liability for note issue was granted only in 1862.

d) **The Results: see chart and table on the screen**

## **BANKING STRUCTURES IN ENGLAND & WALES AND THE UNITED KINGDOM**

**EW:** England and Wales

**UK:** United Kingdom (England, Wales, Scotland, and Ireland)

**PB:** private partnership banks

**JSB:** joint-stock banks

Year	EW: Private Banks	EW: PB Offices/ Branches	EW: Joint-Stock Banks	EW: JSB Offices/ Branches	UK: Total Banks	UK: Total Offices/ Branches	UK: Average No. of Branches
1850	327	518	99	576	<b>459</b>	1685	3.67
1875	236	595	122	1364	<b>381</b>	3320	8.71
1900	81	358	83	4212	<b>184</b>	6269	34.07
1913	29	147	41	6426	<b>88</b>	8610	97.84

**Sources:** Mae Baker and Michael Collins, 'English Industrial Distress Before 1914 and the Response of the Banks', *European Review of Economic History*, 3:1 (April 1999): 1-24; Mae Baker and Michael Collins, 'Financial Crises and Structural Change in English Commercial Bank Assets, 1860 - 1913', *Explorations in Economic History*, 36:4 (October 1999), 428-44.

i) **Over the next 25 years, 99 joint-stock banks were formed in England,**

- (1) although many of the old London partnership banks retained this status,
- (2) for they did not wish to lose control to other investors, with joint-stock financing.

ii) **By 1875,** that number had grown to 122 joint-stock banks

iii) **The larger joint-stock banks soon established branches,** along the Scottish model, in the major English cities.

iv) **The smaller joint-stock banks soon dwindled in number,** through business amalgamation:

- (1) so that, by 1913 (on the eve of WWI), there were just 41 banks;
- (2) of these, about a dozen were important;
- (3) they have been now reduced to about five major banking corporations,
  - of which HSBC: Shanghai and Hong Kong Banking Corporation (of British origin) is one of the most important
  - having absorbed one the largest of the older banking corporations, with many branches. the Midland

Bank.<sup>5</sup>

v) **As you can see from the table,**

(1) the decline in the number of the major banks was also accompanied by a significant growth in branch banking,

(2) so that the average number of branches per bank in the UK rose from 3.7 in 1850 to 97.8 in 1913.

vi) **The five biggest were obviously London-based:** with their branch-banking systems, they controlled about two-thirds of national banking assets, in 1913-14.

vii) **As a result the efficiency and competitive of English banking greatly improved:**

(1) there was indeed a sharp drop in bank failures in England,

(2) though certainly some bank failures, even of joint-stock banks, did occur later in the 19th century.

viii) **Even so,** there still remained another 29 independent private-partnership banks.

ix) **most of these would disappear in the course of the 20th century:**

e) **Their 19th-Century Banking Functions: Short Term Financing**

i) **despite the very large growth in average size and capitalization,** despite much greater security:

(1) British banks by and large (including the Scottish) continued to restrict their activities chiefly to discounting and short-term lending ( 90-day notes),

(2) There are, to be sure, several examples of longer-term lending by British banks;

(3) but that is the exception to the general rule of short-term lending

<sup>5</sup> From Answers.com, concerning the Hong Kong and Shanghai Banking Corporation: 'Known locally by the affectionate term 'Hankers and Shankers', or equally its old trademark HongkongBank, the bank was founded by the Scot Thomas Sutherland to finance trade in the Far East in 1865. It is the largest bank in Hong Kong, with branches in major cities in mainland China. In March 1865 the Hongkong and Shanghai Banking Corporation Limited was established in Hong Kong to finance the growing trade between China and Europe, with an office opened in Shanghai during April of that year. The bank was incorporated in Hong Kong by special dispensation from the British Treasury in 1866, and under the Hongkong and Shanghai Bank Ordinance 1866, a new branch in Japan was also established. The bank handled the first public loan in China in 1874, thereafter issuing most public loans.....

In anticipation of the Japanese invasion of Hong Kong in 1941, the bank's head office moved to London. In 1980, the bank, now under the chairmanship of Michael Sandberg acquired a 51 per cent stake in Marine Midland Bank, of the United States of America, and continued its expansion with the establishment of The Hongkong Bank of Australia Limited in 1986. 1987, under the Chairmanship of Willie Purves, saw the bank's ownership of Marine Midland Bank increased to 100% and the acquisition of a 14.9% share in Midland Bank in the United Kingdom. In 1991 HSBC Holdings plc was established to act as a parent company to the group; shares are currently traded on the London and Hong Kong stock exchanges. Under the HSBC brand, the bank maintains a network of around 220 branches throughout the Hong Kong SAR, from which it offers a wide range of financial products and services. For some time in the late 1980s and early 1990s, the bank was known by the name HongkongBank in its native city, although its stock now trades as HSBC.

iii) **As we shall see, this was in sharp contrast to so much continental banking that developed in the 19th century:** which we call ‘investment banking’.

(1) it focused instead much more directly on long-term lending and financing fixed-capital formation.

(2) But such banking was also combined with normal commercial banking.

iv) **the ‘Real Bills’ Doctrine:** refer to the earlier lecture on 18th-century English banking [repeated in an appendix to this lecture].

v) **Tradition is not the only reason, however, to explain the peculiarity of British banking:**

(1) the real reason probably lay in the prior development of alternative institutions for financing fixed capital formation, especially joint-stock financing (after 1825).

(2) so far, however, economic historians have been unable to demonstrate the role that such institutions as mortgage companies, insurance companies, and building societies played in industrial financing during the 19th century.

vi) **British joint-stock and investment banking after 1870:**

(1) We shall return to this question of banks and industrial financing in the final section of the course, on the British economy from 1870 to 1914: to examine the British response to continental industrialization and to continental investment banking.

(2) We will then find more examples of long-term industrial financing by banks,

(3) but chiefly by what are called ‘merchant banks’ -- many of them German/Dutch and American in ownership or origin -- rather than by British-based joint-stock banks;

(4) and even these merchant-banks (such as the Baring Brothers) did not engage in that much industrial financing before the 20th century [to be seen next term]

f) **The Growth of Bill Brokers and the London Discount Market:**

i) **During the Napoleonic Wars, a new financial institution emerged:** bill brokers, evolving into what are called ‘discount houses.’

(1) They began as financial intermediaries, as agents or brokers for various country banks,

- bringing together those who wished to buy and those who wished to sell commercial paper:

- i.e., they took surplus funds from various country banks to buy commercial paper at discount;

(2) more often they bought paper at rediscount, thus providing ready cash for those banks who sold such bills, and a source of income for those buying or discounting bills.

ii) **Other country banks, not wishing to deal with these new bill brokers,** had simply deposited their surplus funds with London banks, to earn interest on these deposits;

iii) **but after the 1825 financial crisis,** many London banks ceased paying interest on these deposits.

iv) **In response, the London bill-brokers then agreed to accept such deposits from country banks:**

- (1) as 'call loans' (paying interest, callable on demand);
- (2) and then used those funds to invest in the discount market (i.e., to buy commercial paper).

v) **In 1830, the Bank of England:**

- (1) permitted the London bill brokers or 'discount houses' to rediscount commercial paper at the offices of the Bank of England;
- (2) Consequently, by and large, the commercial banks then bypassed the Bank of England by rediscounting directly with the London discount houses: with a significant reduction in their transaction costs.

vi) **Thus the discount houses became intermediaries between the regular commercial banks and the Bank of England.**

- (1) Not just country banks but also London banks and the new joint-stock banks also deposited their surplus funds as 'call loans' with the London discount houses;
- (2) They effectively dominated this business until the financial crisis of the 1890s.

#### **4. The Bank Charter Act of 1844**

a) **This bank act, part of the decennial revision of the Bank of England act,** followed upon the very serious economic crisis of 1836-1842.

b) **It is the most significant piece of monetary legislation in 19th century Britain, establishing the legal powers of the Bank of England to World War I (to 1914):**

i) **The act marked the beginning of some central-banking functions of the Bank of England:** in trying to regulate the domestic money supply.

ii) **In some respects it also marks the formal beginning of Gold Standard in Great Britain:** i.e.,

- (1) in making the currency and gold freely convertible into each other at a fixed exchange rate;
- (2) and similarly freely convertible into other gold-backed currencies.

iii) **But the provisions of this act, and of the Gold Standard principles,**

- (1) also impeded the full development of central banking in Britain
- (2) by the naive belief that the money market would be self-regulating if only left alone, by the principles of 'laissez-faire'.

iv) **Nevertheless, even in a basically laissez-faire economy like that of 19th century Britain,** the state still played an important role, as the history of this act demonstrates.

v) **Even more important is the role played by economic theorists,** and by contemporary fashions in economic theory.

c) **The Bank Charter Act:**

i) **was based on the views of a group of contemporary monetary theorists known as the Currency School**, which had won currency so to speak within the British government and the Bank of England (prevailing over the Banking School).

ii) **A strict and crude quantity theory of money was foundation of their beliefs:**

(1) The modern version is known as the Equation of Exchange or the Fisher Identity:  $M.V \equiv P.T$ : i.e., the stock of money (M) times the rate of its flow (V for Velocity) must equal the value of the total volume of transactions times the price level or consumer price index (P).

(2) which is now better expressed as  $M.V \equiv P.y$ : in which y = real NNI, which can be readily measured, with national income statistics, while T (volume of transactions) cannot be.

(3) Better yet is the Cambridge Cash Balances equation:  $M = k.P.y$ , in which the variable 'k' represents that proportion of the Net National Income (P.y) that the public collectively chooses to hold in real cash balances:

(4) The reasons for holding cash balances are explained by the Keynesian concept of Liquidity Preference (i.e., factors determining demand for money).

- transactions motives: need for cash for day to day purchases
- precautionary motives: emergency reserve fund
- speculative and investment motives: to take advantage of new investment opportunities.

(5) Note that there is an opportunity cost in holding such cash balances:

- the cost is foregoing the income (interest, dividends, rent) to be earned by investing those funds rather than holding cash balances
- the market rate of interest will therefore influence how much or how little the public will hold in cash balances: i.e., holding less when interest rates are high

(6) Note the similarities in the two equations:<sup>6</sup>

- both equations are pure tautologies: total spending = total spending
- both are linked by the fact that the variables are reciprocals of each other:

$$k = 1/V; V = 1/k$$

[see table at end of lecture]

(7) In accordance with the even cruder version fashionable amongst nineteenth-century Classical Economists, this group believed that the quantity of money solely, directly, and automatically determined the level of prices, interest rates, and foreign exchange rates:

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<sup>6</sup> Again see: <http://www.economics.utoronto.ca/munro5/QUANTHR2.pdf>

(8) For the determination of the price level, most economists then wrongly assumed that:

- an increase in the money supply of, say 10%, would automatically lead to a proportional and thus 10% increase in the price level;
- and conversely that a 10% reduction in the money supply would lead to a 10% decline in the price level.

(9) For foreign trade that also meant that:

- a 10% rise in prices would lead to a corresponding fall in exports and rise in imports
- conversely a 10% fall in prices would lead to a corresponding rise in exports and fall in imports
- correspondingly also such a rise in prices would also lead to an outflow of gold and a trade deficit, while a fall in prices would lead to an influx of gold and a trade surplus

(10) For some, that determination was general and eventual, rather than automatic and immediate.

iii) **They assumed perfect convertibility between paper money and gold:** and argued that all paper banknotes were or should be substitutes for gold.

iv) **They therefore advocated the establishment of a pure gold currency to prevent all future economic crises:** i.e., a system in which all bank notes would be backed 100% by gold bullion in the vaults of the Bank of England.

v) **They argued that the following would result, according to the classic Price-Specie Flow Mechanism,** first enunciated by David Hume (1711 - 1776) and accepted as an axiom in economic theory by the 19th-century Classical School: [see the lecture on Trade: Mercantilism, topic no. 4]

(1) A trade deficit would lead to an outflow of bullion, as just explained;

(2) and that bullion outflow in turn would contract the money supply, as merchants used their paper bank notes to buy bullion to be sent abroad to finance the trade deficit.

(3) The Bank of England in selling gold would neutralize or destroy the paper money received from the merchants.

(4) As the money supply contracted with the bullion outflow, the resulting deflation (automatic and proportional, according to this theorem) would lower prices,

(5) thus making exports cheaper, and so causing exports to expand;

(6) Conversely, imports would become relatively more expensive and so imports would contract;

(7) and thus with expanding exports and contracting imports, trade would again be restored to equilibrium, halting the bullion outflow.

v) **The central thesis of the Currency School was that the quantity of paper bank notes in circulation must always equal the bullion supply, i.e., the gold bullion reserves of the Bank of England.**

(1) Any increase or decrease in the paper money supply had to be, and necessarily only be, the automatic consequence of a corresponding increase or decrease in the Bank of England's gold reserves.

(2) No other bank notes could be issued (or withdrawn).

(3) Thus the Bank would issue bank notes in buying bullion from merchants;

(4) and would withdraw bank notes received from merchants who bought bullion from the Bank.

d) **Provisions of the Bank Charter Act of 1844:** now better known as Peel's Act, after the Prime Minister who introduced it (Robert Peel): important both

- for explaining the subsequent history of the Bank of England, until World War I (1914)
- but also for illustrating how bad economic theory can influence the development of institutions and of economic history itself, with harmful results

i) **The Bank of England was to be split into two autonomous departments:**

(1) **The Issue Department:** to be solely concerned with the money supply.

- to be kept completely separate from the rest of the Bank of England
- in order to ensure the automatic regulation of the bank note issue.

(2) **The Banking Department:**

- to be solely concerned with normal commercial banking functions,
- especially lending and discounting.

ii) **The note issue of the Bank of England:**

(1) was to be limited to the amount of its gold bullion reserves plus the bank's current capital stock of £14 million.

(2) This was a slight deviation from the principles of the Currency School, in permitting some fiduciary currency, though backed by real assets, if not gold bullion.

iii) **Any subsequent note issues had to be fully, 100% backed by gold bullion:**

(1) i.e., notes could be issued only in exchange for bullion.

(2) And conversely, if the bank sold bullion, it had to destroy the banknotes received for that bullion.

iv) **The banknote issues of the private commercial banks in England:** were to be gradually taken over by the Bank of England.

(1) Existing banks were limited to the average of the previous year's circulation of banknotes: i.e., they could never issue more than that previous year's issue.

(2) existing bank note issues were to be taken over gradually by the Bank of England.

- If any private bank for any reason discontinued issuing notes, the Bank of England would replace them with its own notes up to 2/3 of the discontinued issue

- while the other third was viewed as part of reserves.

(3) No new banks were allowed to issue bank notes in Great Britain.

(4) Existing Scottish banks were permitted to operate their note issues independently of the Bank Charter Act (and some still issue notes today: e.g., the Royal Bank of Scotland).

v) **Scotland and the Bank Charter Act**

(1) By the following year's Bank Act of 1845, most of these provisions, *other than those on banknotes*, were extended to Scotland;

(2) that effectively amalgamated the English and Scottish banking systems (though not the money supply).

e) **The British Money Supply: Theoretical Faults of Peel's Act:**

i) **Faults of the Currency School's monetary thesis:** in being based on what is clearly a very crude and unrealistic (totally unhistorical) Quantity Theory of Money:

(1) the Currency School overlooked the effect of changes in these variables: in affecting the price level and foreign exchanges, i.e.,

- Velocity (**V**) – the income velocity of money; or Cash Balances (**k**)
- and Transactions (**T**), or better, independent changes in real national product (**y**)
- the assumption that these variables V (or K) and T (or y) are fixed in the short run is false.
- See the table on Canadian money supplies, GDP, interest rates, and price levels, in appendix

(2) its proponents overlooked the fact that paper credit in the form of bank cheques (current-account deposits), bills of exchange, promissory notes, etc. all functioned as money;

(3) indeed they were already becoming more important than coin and banknotes in determining composition and volume of the money supply.

(4) This obvious fact was continually pointed out by the opponents of the Currency School, known as the Banking School.

(5) As we shall see later from statistical evidence, there was in fact no linear relationship between gold stocks and the supply of credit and thus of money stocks broadly defined.

ii) **The Monetary Approach to the Balance of Payments: an alternative modern monetary theory, developed in the 1970s by Harry Johnson**, which contradicts or is opposed to the classic Price-Specie Flow mechanism. Its basic tenets are as follows:<sup>7</sup>

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<sup>7</sup> See the following publications: and note that Harry Johnson (1923 - 1977) graduated from the University of Toronto in 1943 and subsequently taught here (in what was then the Department of Political Economy), before going to Manchester, London, and then Chicago (in 1959).

(1) Jacob A. Frenkel and Harry G. Johnson, eds., *The Monetary Approach to the Balance of Payments*

(1) **World gold stocks determine a world price level:** under a gold standard, with currencies freely convertible into gold.

(2) **By the international ‘law of one price’**, world prices and price changes anywhere are quickly transmitted to all countries via commodity and capital markets -- indeed by arbitrage traders -- **and without necessarily requiring any corresponding gold flows.**

(3) **On the assumption that domestic money supplies are essentially endogenous**, the combination of the changed national price level and domestic **real** incomes and **real** balances will then determine the requisite money supply to meet these needs in equilibrium.

(4) **By this theory, therefore, while world gold stocks determine the world price level**, world prices determine national prices which in turn (with real incomes) determine domestic money stocks.

(5) **So crudely stated, this theory also assumes an unhistorical stability in both V and y:**

- i.e., it neglects to consider autonomous changes in **Velocity (V)**,
- i.e., changes in the demand for real balances ( $k = 1/V$ ), changes in credit institutions, in productivity, real incomes, etc. and other factors constituting **y**.

f) **The Actual Consequences of the Bank Charter Act:**

i) **Had the Currency School and the legislators been correct in their monetary theory in framing this act,**

(1) we would expect, as the first consequence, that the domestic banknote supply would have become far too inelastic for a rapidly expanding industrial state:

(2) i.e., as inelastic as the gold bullion supply.

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(Toronto: University of Toronto Press, 1976):

a) Jacob Frenkel and Harry Johnson, ‘The Monetary Approach to the Balance of Payments: Essential Concepts and Historical Origins’, pp. 21-45.

b) Harry Johnson, ‘Towards a General Theory of the Balance of Payments’, pp. 46-63.

c) Harry Johnson, ‘The Monetary Approach to Balance-of-Payments Theory’, pp. 147-67.

d) Harry Johnson, ‘The Monetary Theory of Balance-of-Payments Policies’, pp. 262-86.

e) Donald N. McCloskey and J. Richard Zecher, ‘How the Gold Standard Worked, 1880-1913’, pp. 357-85.

(2) John E. Floyd, *World Monetary Equilibrium: International Monetary Theory in an Historical-Institutional Context* (University of Pennsylvania Press, 1985), especially chapters 4 and 5.

ii) **Fortunately for Britain and the expanding world economy this did not happen for three very important reasons:**

(1) Peel's Act unintentionally encouraged a significant expansion in other forms of money,

- i.e., credit instruments, especially bank cheques,
- which became far more important than coins and notes (and which also displaced the old traditional inland bills).
- The credit supply, now divorced from real money, was largely independent of the Bank of England's gold reserves.
- That therefore meant that the Bank Act was of really very limited importance in influencing the money supply.

(2) Secondly, the obvious related factor: a rise in the income velocity of money (or in Cambridge 'cash balances' k) could compensate for any rigidities in the money supply.

(3) Thirdly, from this very era, in the 1850s, there occurred two major gold mining booms: in both California and Australia, greatly augmenting the world's gold supply (much of which flowed to Great Britain): see the graphs.

g) **The Evolution of Central Banking:** Further Negative Consequences of the Bank Charter Act:

i) **While there is still some disagreement on this issue**, the majority of financial historians now argue that the Bank Charter Act (Peel's Act) seriously impeded the development of modern Central Banking in Britain.<sup>8</sup>

ii) **Bank of England's Role as a central banker or 'Lender of Last Resort':**

(1) Prior to the Bank Charter Act, and certainly from the 1797 crisis, the Bank of England had been developing these rudimentary central-banking functions in managing the supply of currency and credit, especially through the rediscount rate.

(2) There had been general acceptance of the view that the Bank's fundamental role was to act as a 'Lender of Last Resort'.

iii) **The framers of Peel's Act, however, fully believed that the newly established Banking Department should:**

(1) be relieved of any such role and

(2) should instead restrict itself to the operations of a normal commercial bank: operating in competition with

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<sup>8</sup> Peter Mathias, *The First Industrial Nation* (2nd edn. 1983), chapters 7, 8, and 13. I had voiced some of my disagreements with some of his views, in his presence, at an international conference on European banking held in Siena, Italy, in 1989; and found more support for my views than for his. See also Rondo Cameron, ed., *Banking in the Early Stages of Industrialization: A Study in Comparative Economic History* (New York, 1967).

the other private banks in the London money market,

(3) Thus the Bank was supposed to follow market discount or interest rates, rather than trying to control or set them.

iv) **Peel's government and many directors of the Bank believed that,**

(1) so long as the bank and the economy were allowed to function unfettered according to the hallowed principles of Classical Economics, financial and economic crises would be impossible:

(2) that a fully gold-backed currency would ensure a stable and automatic equilibrium of the economy.

v) **They really believed that any changes in the balance of trade, and hence in Britain's gold bullion supply, i.e., in the Bank of England's gold reserves, would therefore automatically adjust the level of prices, interest rates, and the balance of trade.**

vi) **Indeed the Banking department then did plunge into the London money market in the mid 1840s:**

(1) to attract business, it cut its discount rate at times below the market rate, to as low as 2.5%.

(2) Many people now blame the Bank's activities for causing a speculative credit boom that burst in a severe financial crisis in 1847 (which also had other causes).

vii) **Subsequent financial crises indeed proved the folly of this policy.**

g) **The Financial and Economic Crisis of 1847**

i) **What happened in the first great crisis of 1847 was this, initially:**

(1) A catastrophic harvest failure (to be investigated in two more topics) in northern Europe, combined with the disastrous Potato Famine in Ireland, required very substantial imports of grains and other foodstuffs to deal with this crisis.

(2) Those grain imports led to a short-run trade deficit (Current Account): which had to be financed by a large outflow of gold.

(3) By the provisions of the 1844 Bank Charter Act purchases of gold from the Bank of England reserves necessitated a destruction of the currency used to purchase the gold.

(4) Therefore, bank reserves in the private sector contracted as clients used B of E notes from the reserves to have their financial agents buy gold to pay for grain imports

(5) That in turn led to a contraction of the aggregate money supply

ii) **expected consequences by the framers of the Bank Charter Act:** those adhering to the crude Quantity Theory of Money and contemporary Classical Economics

(1) the contraction of the money supply should have resulted in an immediate fall in prices

(2) thus export prices should have fallen – to stimulate exports

(3) imports should have been curbed: because imports would have become *relatively* more expensive

(4) therefore, as exports rose and imports fell, the bullion outflow should have been reversed or counterbalanced by a bullion influx

(5) The supposed influx of bullion should result in an increase in the money supply, and thus a rise or restoration of the price level: back to equilibrium

**iii) what actually happened threatened economic disaster:**

(1) prices did not in fact fall,

- for there were too many cost and price rigidities: most factor costs could not adjust in the short run
- therefore, exports did not rise nor were imports curbed:
- more gold continued to flow out of the country

(2) Thus, if prices do not adjust with monetary contraction, then the economy must adjust by other forms of very dangerous contraction: with a liquidity crisis

(3) the monetary contraction led to a severe contraction of bank reserves, thus limiting the ability of banks and other financial institutions to lend money, to provide credit

(4) thus the liquidity crisis: and without easy access to credit, at previously prevailing low interest rates, many businesses were threatened with bankruptcies

**iv) the responses of the British government and the Bank of England:**

(1) fortunately, the Chancellor of the Exchequer (the finance minister) and his financial officials soon realized the nature of the impending economic disaster

(2) Privately they instructed the Bank of England to ignore the provisions of the Bank Charter Act and to do the exact opposite of what the regulations stated were to be followed.

- and thus to rediscount freely,
- in order to supply the discount houses and banks with sufficient credit and banknotes for their own reserves.
- in fact the Bank was told to resume its former role of Lender of Last Resort

(3) The clear lesson was this: when commercial and trade crises lead to a liquidity crisis, the only feasible and immediate response must be to restore liquidity: by lending freely and by reflation of the money supply.

(4) We shall come back to this economic crisis in the last lecture for this term (1 December), when we discuss the introduction of Free Trade, by Peel's government, indeed chiefly because of this economic crisis.

**b) The subsequent financial crises of 1856-57, 1866, and 1873:**

**i) The same consequences and reactions can be seen in three following crises: 1856-57, 1866, 1873);**

(1) Each time, the British government had to instruct the Bank of England to suspend the requisite provisions of the Bank Charter Act

(3) Thus there ensued considerable dissension within the Bank about its proper role.

(4) Certainly many in the Bank were still unwilling to establish clearly any role as Lender of Last Resort, i.e., freely lending or rediscounting in times of crisis.

(5) Many within the Bank felt that its first obligation lay with its stockholders;

(6) and thus that it should maximize profits in the London money market.

ii) **The verdicts of two hostile economic historians:** you can judge for yourself whether or not they are fully justified in the following harsh criticisms.

(1) Jacob Viner: 'The available evidence warrants the verdict that during the period from about 1800 to about 1860 the Bank of England almost continuously displayed an inexcusable degree of incompetence or unwillingness to fulfill the requirements which could reasonably be expected of a central bank'.<sup>9</sup>

(2) Rondo Cameron: 'At almost every point at which banking and monetary policy might have been used constructively to promote economic growth, the authorities either made the wrong decision or took no action at all'.<sup>10</sup>

iii) **After the 1873 crisis, a very major international crisis,** the Bank's philosophy changed, as the following notes explain.

## **5. The Bank of England's Subsequent Evolution as a Central Bank**

a) **Those financial crises:** intensified by the Bank's failure to act until it was almost much too late, obviously undermined any remaining faith in the currency principles of the Bank Charter Act:

b) **certainly by the financial crisis of 1873,** an international financial crisis of large proportions, there developed an implicit agreement to change policies.

i) **In that same year, the economist Walter Bagehot published his most influential book, *Lombard Street*,** arguing that the fundamental duty of the Bank of England was to act as Lender of Last Resort;<sup>11</sup>

ii) **he recommended that the Bank should always offer freely to rediscount,** buying any and all good commercial paper, i.e., promissory notes, and other credit instruments, presented to it (and reselling some if necessary).

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<sup>9</sup> Jacob Viner, *Studies in the Theory of International Trade* (New York, 1937).

<sup>10</sup> Rondo Cameron, ed., *Banking in the Early Stages of Industrialization: A Study in Comparative Economic History* (New York, 1967).

<sup>11</sup> Walter Bagehot (1826-1877), *Lombard Street; a description of the money market* [London, 1873] *With a new introduction*, by Frank C. Genovese (Homewood, Ill., R.D. Irwin, 1962).

c) **During the 1870s the Bank directors evidently came to accept that principle**, though still unwilling to initiate any formal amendment of the Bank Charter Act, which remained in force until 1914.

d) **But in 1878, the Bank did announce that it would rediscount paper at market rates only for a few select customers**; and for all others, rediscounting would be at Bank Rates that would normally be set above the current market rates.

e) **Did the Bank of England then become a Central Bank?**

i) **Certainly the Bank of England had firmly cemented its role as Lender of Last Resort**, and so restored confidence.

ii) **Some historians go further:**

(1) to argue that the Bank of England withdrew slowly from active participation in the London money market,  
 (2) and that the Bank of England used its Bank Rate to influence the money market and thereby the overall economy.

iii) **But in fact the Bank still operated as a private bank and still invested heavily in various commercial assets (and did so until 1945: when nationalized by the new Labour government):**

iv) **and thus really continued with older policy:** of necessarily following the market rather than directing it.

v) **Nor is there any evidence that the Bank of England followed any aggressive policy of trying to manage the national money supply and credit by autonomous use of Bank Rate:** i.e., to force adjustments in the market rate of interest.

(1) Nor did it engage in any important Open Market operations to expand or contract the money supply: i.e.,

- by purchasing government bonds from the public: exchanging bonds (acquired by the bank) for money, thus expanding the effective money supply.
- by selling government bonds to the public: and thus acquiring in return cash, which could be neutralized, thus contracting the effective money supply.

(2) But given the relatively small size of the national debt and especially that held in bonds, there was not much room to manoeuvre in terms of such open market operations

(3) Much of the national debt was still held in the form of Consols [Consolidated Stock of the Nation] as perpetual annuities, from Pelham's Conversion of 1749-53.

- which the government was loath to redeem
- as noted earlier, the government did not do so until 1888: when it replaced the original 3.0% Consols with new, lower-interest rate annuities return: at 2.75%, which became 2.5% Consols in 1903: the same rate applying to this very day)

- and which the government would and could not readily augment with new issues
- v) **Nor, finally, does it appear that the Bank of England successfully managed the next two financial crises:** of 1890 (crisis involving the Baring Brothers bank) and 1907.
- vi) **We really have to wait until the 20th century,** after World War I, and perhaps to the 1930s, to witness the real evolution of Central Banking.
- f) **Conclusion:**
  - i) **Whatever the remaining faults of the British banking structure, the fact remained that British banks,** along with the Bank of England, dominated the world's financial markets from the 1860s to World War I;
  - ii) **and in so doing,** the Bank of England constituted one of the chief and most profitable pillars of the British economy in this era (when the British economy was supposedly declining).

## **6. Joint Stock Company Organization and Corporate Status**

- a) **Repeal of the Bubble Act in 1825:** the first major change
  - i) **The 1720 Bubble Act, as we have seen,** had prohibited all new joint-stock companies
    - (1) unless they were specifically authorized and incorporated by Parliament: by private Acts of Parliament,
    - (2) which were very rarely granted, and extremely costly to obtain.
    - (3) The only major and indeed necessary exceptions were, as noted several times previously, the canal companies in the 1790s:
      - for reasons noted earlier: including the salient fact that canal companies were established only by private Acts of Parliament, which granted them monopoly rights
      - so that adding an incorporation clauses was not a major extra cost.
  - ii) **Otherwise all business ventures were limited by law to the status of six-member partnerships.**
  - iii) **That restriction was obviously not so great as to prevent the Industrial Revolution:** we saw that much of the fixed capital requirements, which were then generally modest, were financed by profit reinvestment by the firms themselves.
  - iv) **But by the early 19th century, the restrictions of the Bubble Act were beginning to become more of a burden:**
    - (1) partnerships and other forms of business organization were proving to be inadequate in raising the much larger amounts of fixed capital required with a more advanced industrial technology and increased scale of production.
    - (2) So pressure mounted for repeal of the Bubble Act.
- v) **The commercial-financial crisis of 1824-25 provided the catalyst,** as we have seen, in having Parliament

repeal the Bubble Act in 1825.

b) **Defects of the Repeal Legislation:** to explain why so few joint-stock companies were formed in years after repeal:

i) **all new joint-stock companies were still required to function under partnership law**, not corporate law, unless they could obtain a charter of incorporation through an act of Parliament.

ii) **that meant all shareholders were simply partners under law subject to unlimited liability:** (1) that each and every shareholder could be held liable for all the debts of the company, (2) and thus could also be sued and stripped of their assets.

iii) **Similarly shareholders could be involved in any law suit affecting the company.**

iv) **Thus the future development of joint-stock financing for large scale industrial companies depended upon extending the privileges of corporate status and limited liability to shareholders:** who otherwise would be too risk-averse to buy stocks in such companies.

c) **The current status of corporate law and limited liability:** in the 1820s

i) **neither of these was by any means new;** and many of the very large, well established joint-stock companies had such status: e.g., the Bank of England, Bank of Scotland, East India Company, Hudson's Bay Company

ii) **But corporate status had been very difficult to obtain,** at high cost.

(1) That charter of incorporation had to be enacted by Parliament;

(2) parliamentary costs and fees had to be paid for the private acts.

(3) The directors had to put up security, a deposit equal to 75% of the invested capital placed with the Bank of England, before Parliament would even consider the legislation.

(4) The directors then had to convince a parliamentary committee that the proposed corporation would be economically viable, sound, beneficial.

(5) Special request for limited liability clause then had to be made, at further cost: i.e., the limitation of liability of investors, of shareholders, to the amount invested, value of the shares purchased.

(6) A corporation under law was a separate legal entity: which could be sued, and which itself could sue, separately from the shareholders.

iii) **Thus corporate status with limited liability for all shareholders almost an impossibility:**

(1) the average manufacturing company had almost no hope of obtaining such a charter.

(2) In general, only the canal companies and later the railroads, insurance companies, and the aforementioned overseas commercial companies (East India Co, Hudson's Bay Co.,) etc. enjoyed this privilege.

iv) **Why therefore was Parliament so restrictive: why did it provide so many costly obstacles to**

**obtaining corporate status? Mixed views of businessmen in Parliament:**

(1) Chief argument, based upon the trauma created by the South Sea Bubble scandal in 1720, was that corporate status and limited liability were reckless and dangerous:

- that they would encourage a climate of speculation and fraud,
- especially if shareholders could escape the dire consequences of bad decisions (or of fraud).

(2) hence the salutary ‘dread of loss’ -- the veritable ‘Sword of Damocles’,<sup>12</sup>

- with the threat of complete unlimited liability for a company’s debts, for each individual shareholder, was deemed absolutely necessary to prevent such dangers:
- i.e., to ensure prudent investment and management; and above all to guarantee the reputations of British businesses; to safeguard the stability of British financial markets.

(3) Belief that unless lenders, creditors were fully protected, by being able to levy claims against stockholders as owners, then British business reputations and financial credit would suffer.

(4) **This is essentially a ‘Moral Hazard’ Problem:**<sup>13</sup>

- i.e., that those operating joint-stock corporations, so protected by limited liability, would undertake undue or excessive risks, or engage in speculative activities, that they would not consider, had they been liable for the adverse consequences
- that problem therefore involves a related problem:

(4) **‘Adverse selection’ theory:**

- belief that limited liability legislation would produce ‘external effects of adverse selection on the cost of capital for all firms’:
- i.e., by increasing the risk premium that creditors would now demand, in higher interest rates, with a greater risk of default by limited liability firms.<sup>14</sup>

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<sup>12</sup> Answers.com: ‘Sword of Damocles: Also, Damocles' sword. Impending disaster, as in: “The likelihood of lay-offs has been a sword of Damocles over the department for months.” This expression alludes to the legend of Damocles, a servile courtier to King Dionysius I of Syracuse. The king, weary of Damocles' obsequious flattery, invited him to a banquet and seated him under a sword hung by a single hair, so as to point out to him the precariousness of his position. The idiom was first recorded in 1747. The same story gave rise to the expression “hang by a thread”.’

<sup>13</sup> Free Dictionary (Financial Dictionary): definition of Moral Hazard: ‘the risk that the existence of a contract will change the behavior of one or both parties to the contract, e.g. an insured firm will take fewer fire precautions.’ See also the next note (note 12).

<sup>14</sup> *Adverse selection*: ‘When a negotiation between two people with different amounts of information, that is, asymmetric information, restricts the quality of the good traded. This typically happens because the person with more information is able to negotiate a favourable exchange. This is frequently

- in other words, if the liability of shareholders, holders of equity was limited, somebody else would have to bear a disproportionate burden of the actual liability: namely the debt-holders, or creditors, who owned bonds, debentures, or mortgages
- if so, such debt-holders, would presumably respond to an increased risk, or perception of risk, by adjusting the terms of lending: namely by raising interest rates.

(5) Firms holding such views, and resisting incorporation, also preferred to raise capital internally: i.e., through retained profits and private investments of firm members, rather than pay increased interest costs for capital financing.

(6) Selfish desire of existing large-scale firms to restrict entry and thus curb competition (and protect their 'rents'):

- i.e., because they knew that limited liability would lower capital costs and thus lower the barriers to entry in their industry (or commerce).
- Theory of economic historians belonging to the 'transaction cost' school.

(7) Prevalence of family firms who thus feared loss of family control and family identity through incorporation with the much wider base of equity investment (share holding) that limited liability would promote.

v) **Thus the view of many at the time, and of current-day economists/economic historians**, that limited liability, in shifting the risk from equity investors (whose liability would be limited to the amount invested) to creditors -- those who lent the firm money -- would **not** lead to a reduction in a firm's capital cost nor to an increase in investment.

vi) **The validity of this view may be reflected in the very slow pace by which firms did adopt limited liability status decades after the law permitted them to do so:**

- (1) Approximately two-thirds of existing British firms chose to remain unincorporated,
- (2) and thus they retained the status of unlimited liability after the 1856 legislation.

vii) **Question about risks and capital markets:**

- (1) who were the more 'risk adverse' in the mid to later 19th century: equity investors or lender - creditors?

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referred to as the "market for lemons". A related term: *Moral Hazard*: Moral hazard occurs when a person changes behaviour to the detriment of another person, after an agreement has been reached. This is an important information problem with insurance. The problem is that the harmed party does not have information concerning the change in behaviour'. See also *Asymmetric Information*: 'The economics of information search tells us that everyone falls short of having perfect information. It suggests that everyone will have different information about different things'. The Nobel Prize in Economics in 2001 was awarded to three economists for their contributions to the economics of asymmetric information: George Akerlof, Michael Spence, and Joseph Stiglitz.

(2) It may well be argued that potential equity investors were the more risk averse than standard business creditors (especially banks) because they had inferior information, or access to information to permit them to weigh the risks properly or judiciously.

(3) Hence it may be argued that limited liability legislation did provide a more balanced capital market, by shifting risk to those better informed and better able to shoulder the risks of capital investments.

**d) The Continental Alternative for Business Organization:**

i) **Société en Commandite:** The French, in the later 17<sup>th</sup> century, introduced this new and very sensible type of business organization, which was copied by many other continental countries

(1) In essence it provided limited liability for all investors – silent partners – who had no active role in the company (and so could hardly be responsible for its bad decisions)

(2) The directors and active partners who actually ran and operated the company were, conversely, subjected to unlimited liability

ii) **since this business structure would obviate the ‘moral hazard’ and ‘adverse selection’ problems**, one wonders why the British never sought to adopt it, at least after the repeal of the Bubble Act.

iii) **We will examine this type of business organization in the second term**, when we come to continental banking and business organization.

**7. The Coming of Limited Liability in the 1850s**

a) **What then explained the change in attitudes to permit the general extension of limited liability to British businesses?**

i) **technological change and more complex machinery:** requiring much larger scale forms of production, in turn requiring far higher initial capital investments.

ii) **rapid economic expansion in mid-19th century:** similarly led to larger scale forms of enterprise requiring heavier capital investment.

iii) **increasing scale and larger capital investments meant that joint-stock companies generally had far larger numbers of stockholders than earlier:** and the impossibility of holding so many anonymous non-involved investors liable for company debts was obvious.

iv) **At same time, companies were still having difficulty in obtaining enough shareholders:** in tapping the full potential of the middle class capital markets, without offering risk-averse investors the protection of limited liability.

v) **Foreign competition:** the fact that France and Germany, as just noted, had long provided legally-protected limited liability for at least the non-involved shareholders (imposing full liability only on the active directors).

vi) **So all of these factors together finally forced the hand of Parliament:** to amend the corporation laws.

b) **Parliament and the Limited Liability Laws of the 1850s:**

i) **The Registration Act of 1844:** which facilitated the widespread ownership and exchange of company shares, while maintaining unlimited liability for share owners.

ii) **The Joint-Stock Companies Act of 1856 was the most important change in introducing limited liability:**

(1) it stipulated that any seven or more persons who registered as a joint-stock business association and who promised to produce an annual balance sheet with a list of directors were given the legal right of incorporation,

(2) with limited liability for shareholders, without further requirements, restrictions, or large fees.

iii) **Limited Liability Amendment of 1857:**

(1) limited liability rights were extended to shareholders in banks, who were originally excluded from the 1856 law;

(2) but the law still retained unlimited liability for note issues.

iv) **Amendment of 1862:**

(1) law amended to limit the liability for banknote issues.

(2) But consider also that most banks had ceased or were ceasing to issue bank notes, giving the Bank of England almost sole control over the money supply, by this era.

v) **With 10 years,** some 5,000 British companies had organized or reorganized themselves as limited liability corporations.

c) **Nevertheless corporate organization was relatively slow to spread in Britain:**

i) **as noted, that number cited,** of 5,000 incorporations, was only about one-third of the total number of British business firms.

ii) **Quite a few of these incorporations, those that were new companies, failed:**

(1) and many failed for the reasons argued by critics of limited liability legislation:

(2) i.e., that they were too easily allowed to enter their field of business.

iii) **There remained the strongly held view amongst older companies that such organization was neither necessary nor desirable:**

(1) that corporate status with limited liability would hurt a company's reputation and injure credit: for the reasons just enunciate, in terms of both 'moral hazard' and 'adverse selection'.

(2) i.e., make it more difficult to borrow money.

iv) **Many businesses were family firms**

(1) thus they did not wish to surrender family control:

(2) or more importantly, to injure inheritance rights, by creating a separate legal entity (i.e., the corporation) that might end up being controlled by outsiders.

v) **The real growth of British corporations, perhaps slower than on the continent (Germany especially), came only in the late 19th and early 20<sup>th</sup> century:**

(1) When foreign competition was growing so much more strongly, especially from Germany and the U.S., and thus when Britain was losing her industrial hegemony in many fields.

(2) When the 'Second Industrial Revolution' in power and related fields of technology demanded even larger scale and heavier investments.

## BRITISH BUSINESS CYCLES AND PRICE TRENDS, 1815 - 1914

### 1. Secular Trend of 1815-1842:

- Completion of the Industrial Revolution.
- A mild and mixed Phase B, with two depressions and two booms. *Deflationary*.
  - a) **1815 - 1821:** Post-Napoleonic War depression, with very painful reconversion to a peace-time economy and sudden monetary contraction
  - b) **1821 -1825:** Recovery and powerful boom, based especially on Latin American trade and investments; a speculative boom period
  - c) **1825 - 1826:** commercial crisis, financial panic, sharp recession
  - d) **1826 - 1836:** recovery and then very rapid boom, based especially on large railway investments, but also in cotton and iron & the U.S.
  - e) **1836 - 1842:** Financial crisis generated in the U.S., with a credit collapse that spread to Britain and produced severest depression of the 19<sup>th</sup> century. Also internal causes; especially in the metallurgical and railroad engineering industries. Nadir in 1841-42.

### 2. Secular Trend of 1843 - 1873:

- A very strong Phase A.
- A Secular upswing expansion, and boom known as ‘Growth by Leaps and Bounds.’
- Marked the period of greatest expansion for the British economy in the 19<sup>th</sup> century and decisive hegemony of the British economy. *Inflationary*.
  - a) **1842 - 1845:** Recovery and renewed investment boom, especially in railways (Second Railway Boom); but also in foreign trade and loans.
  - b) **1845 - 1847:** financial crises & disastrous harvests. Bank failures.
  - c) **1847 - 1857:** recovery, strong industrial expansion and investment boom. The so-called ‘Golden Age’ of Britain. Especially marked by the Californian and Australian gold-mining booms; and very rapid growth of British foreign trade and foreign investments and British railway building at home and abroad. Beginnings of steam-shipping.
  - d) **1857 - 1858:** financial panic, briefly interrupting the boom, again originating in the United States; but only a mild depression.
  - e) **1859 - 1866:** renewal of the boom, and continuation of the upswing, marking the start of the ‘steel revolution:’ and also: the fourth and major railway construction boom; shipbuilding boom; export boom.
  - f) **1866 - 1868:** domestic banking and financial crisis; stock market crash. Produced severe contraction and unemployment, but only briefly.
  - g) **1869 - 1873:** sharp recovery and major boom, especially in shipbuilding.
  - h) **1873:** Financial panic in Vienna, spreading to Germany, France, U.S. and Britain. Though less severe in London, did mark the end of the great secular upswing, and beginning of a 23-year secular downswing.

3. **1873 - 1896:** The ‘Great Depression.’ Phase B: very *deflationary*.

4. **1896 - 1914:** Pre-War Boom and Secular Upswing. Generally, Phase A: *inflationary*.

## THE BANK CHARTER ACT AND THE CURRENCY SCHOOL

**Symbols:** for the Fisher Identity and the Price-Specie Flow Mechanism (David Hume: 1711-76)

**M** = stock of money

**V** = transactions or income Velocity of money (average measure of stock-turnover)

**P** = price index; a measure of the average price level

**T** = total volume of transactions in a given period (year)

**y** = net national product and income [deflated  $Y = C + I + G + (X-M)$ ]

**M.V**  $\equiv$  **P.T** (Transactions approach): Fisher Identity

**M.V**  $\equiv$  **P.y** (national income approach)

**X** = exports, in aggregate value

**M** or **IM** = imports, in aggregate value (IM, in order to avoid confusion with M as money)

> greater than < less than

### A. EXPECTED CONSEQUENCES OF A TRADE DEFICIT

A trade deficit: so that the aggregate value of imports (of goods and services) exceeds the aggregate value of exports (of goods and services, i.e., including 'invisibles')

**IM > X**  $\rightarrow$  **gold outflow**

merchants purchase gold with bank notes (whose supply therefore contracts) to finance the trade deficit: i.e., they pay for the surplus of imports with gold, which flows out of the country. At the same time, the aggregate money supply contracts, thus forcing down prices:

**M**  $\downarrow$  . **V** = **P**  $\downarrow$  . **y** (or **T**): assume that V and y are constants

As prices fall, imports (now relatively more expensive) also fall while exports (now relatively cheaper than rival goods abroad) rise:

$\therefore$  **IM**  $\downarrow$  and **X**  $\uparrow$ , so that **X > IM**  $\rightarrow$  **gold inflow**  $\rightarrow$  **P**  $\uparrow$

as exports rise to exceed imports, gold flows into the country, is exchanged for bank notes, whose increased circulation forces up prices proportionately (assuming again that V and y are constant)

$\therefore$  **IM** = **X** and equilibrium has been restored (with equilibrium prices and interest rates)

### B. EXPECTED CONSEQUENCES OF A TRADE SURPLUS

**X > M**  $\rightarrow$  **gold inflow**; **M**  $\uparrow$  and **P**  $\uparrow$   $\rightarrow$  **IM**  $\uparrow$  and **X**  $\downarrow$  until equilibrium is restored

## **The Bank Charter Act of 1844, the Quantity Theory of Money, and the Price-Specie Flow Mechanism (of David Hume)**

**The 1844 Bank Charter Act:** was based on the views of a group of contemporary monetary theorists known as the **Currency School**, whose views were based on a crude Quantity Theory of Money. In essence they believed that the quantity of money by itself determined the level of prices and the balance of trade. An increase in the quantity of money must lead to a proportional rise in prices (inflation), and thus to a rise in imports, a fall in exports, and consequently to an outflow of gold (which will then contract the money supply and thus the level of prices, to the former equilibrium).

They argued that the supply of Bank of England notes must always equal the value of gold bullion deposits in the vaults of the Bank of England (i.e., a 100% gold backed currency). Any increase or decrease in the paper money supply must be, and must only be, the automatic consequence of a corresponding increase or decrease in the Bank of England's gold reserves. No other bank notes could be issued (or withdrawn). Note that gold and Bank of England notes were freely convertible into each other.

### **A. The Quantity Theory of Money and The Fisher Identity:**

The more modern version of the Quantity Theory is found in the so-called Fisher Identity, as follows:

$$M.V \equiv P.T$$

**M** = the aggregate stock of money, in gold coin and bank notes

**V** = the transactions velocity of money; i.e., the average number of times that the stock of money (£ sterling) circulates in the course of a year to effect all of the economy's transactions in that year

**P** = some measure of the price level (e.g. Consumer Price Index)

**T** = the aggregate quantity of transactions for all goods and services effected by the use of money in the course of the year.

This is simply a tautology stating that Total Spending, when measured as  $M \times V$  (money stock times flows), must always equal Total Spending, when measured as  $P \times T$  (total volume of transactions multiplied by the current price index).

Today, most economists would prefer the 'income' version of the Fisher Identity, replacing 'T' (which cannot be measured) with  $y$  = Net Real National Product or Income (i.e., measured in constant prices), as the sum of:  $C + I + G + (X-M)$ , in Keynesian national income accounting. Thus:  $M.V \equiv P.y$

### **B. Hume's Price-Specie Flow Mechanism (based on the Quantity Theory):**

In the following equations, **IM** stands for the total value of imports, **X** stands for the total value of exports (goods and services), and arrows indicate the direction of gold flows:  $\rightarrow$  indicates a gold outflow to finance a Current Account deficit (aka 'unfavourable balance'); and  $\leftarrow$  indicates a gold inflow that results from a surplus on Current Account (aka as 'favourable balance')

#### **(1) A Trade Deficit: Money, Prices, and Gold Flows**

$$IM > X \rightarrow \text{gold outflow}$$

To finance or pay for this trade deficit (surplus of imports over exports) merchants must supply Bank of England notes to purchase gold from their bankers (who purchase the gold from the Bank of England); when

the Bank of England receives these notes, it destroys them, thus contracting the supply of money. As a consequence:  $M \downarrow$  and thus  $P \downarrow$  (proportionally); and as a consequence of the deflation, imports fall (because they are relatively more expensive than domestic goods) and exports rise (because they are relatively cheaper than foreign goods):

$IM \downarrow$  and  $X \uparrow$  to produce a Current Account surplus and a gold inflow, as in the next model

## (2) A Trade Surplus: Money, Prices, and Gold Flows

$X > IM \leftarrow$  gold inflow, so that  $M \uparrow$  and  $P \uparrow$  (proportionally); and subsequently  $X \downarrow$  and  $IM \uparrow$ , until  $X = IM$ .

A trade surplus produces an inflow of gold, since foreign buyers must make up the difference between the two in gold (i.e., exports exceed imports in value). The gold so acquired by exporting merchants is sold to their bankers, who supply them with Bank of England notes in return, thus increasing the money supply. As a consequence, prices rise to their former level, imports (now relatively cheaper) rise to their former level, exports (now relatively more expensive) fall back to their former level, and equilibrium in both prices and trade is restored.

## C. Faults in the Currency School's Monetary Analysis:

### 1. Definition of Money:

a) Their definition of money was much too narrow, in overlooking the role of negotiable and transferable credit instruments as money, in particular bank cheques. Indeed, in so restricting the supply and circulation of bank notes, the 1844 Bank Charter Act stimulated a disproportionate increase in chequing – a relative increase in commercial transactions effected by cheque and other credit instruments.

b) Consequently changes in the bullion reserves of the Bank of England did not produce proportional changes in the effective money supply (nor, for reasons given below, in the price level).

c) Note: from the late 1840s, gold mining booms in both California and Australia substantially increased world gold stocks and Britain's gold reserves independently of trade flows.

### 2. Crudeness of their Quantity Theory:

a) They were unaware of and thus ignored the two other variables in this Quantity Theory identity: Velocity and Transactions; and as noted above, it is preferable to replace  $T$  with  $y$ . Changes in  $M$  may be produce related changes in  $V$  and  $y$ , or be accompanied by autonomous changes in these two variables.

b) Thus, an increase or decrease in  $M$  almost never produces a directly proportional change in  $P$ , because changes in  $M$  may produce partially or wholly offsetting changes in both  $V$  and  $y$  (so long as the economy has not reached a stage of 'full employment', with all inputs, and not just labour, fully employed). An increase in the money supply may produce inflation, but not in direct proportion; and an increase in the money supply may result in **no** inflation, if that increase reduces the need to economize on money, so that  $V$  falls, and if that increase stimulates a growth of investment, production, and net output, so that  $y$  rises. If there is an autonomous rise in  $y$  (net national product) the money supply ( $M$ ) indeed should grow correspondingly to accommodate that growth in the real economy.

#### D. The Monetary Approach to the Balance of Payments

The Canadian economist Harry Johnson first proposed this theoretical model, which contradicts or is opposed to the classic Price-Specie Flow mechanism. Its basic tenets are as follows:

1. World gold stocks determine a world price level (under a gold standard, with currencies freely convertible into gold).
2. By the international 'law of one price', world prices and price changes anywhere are quickly transmitted to all countries via commodity and capital markets -- indeed by arbitrage traders -- without necessarily requiring any corresponding gold flows.
3. On the assumption that domestic money supplies are essentially endogenous, the combination of the changed national price level and domestic **real** incomes and **real** balances will then determine the requisite money supply to meet these needs in equilibrium.
4. By this theory, therefore, while world gold stocks determine the world price level, world prices determine national prices which in turn (with real incomes) determine domestic money stocks.
5. So crudely stated, this theory also assumes stability in both **V** and **y**: i.e., it neglects to consider autonomous changes in **Velocity** ( $V$ ), i.e., changes in the demand for real balances ( $k = 1/V$ ), changes in credit institutions, in productivity, real incomes, etc. and other factors constituting **y**.

## APPENDIX ON BRITISH BANKING IN THE 18<sup>TH</sup> AND 19<sup>TH</sup> CENTURIES:

### SHORT-TERM LENDING AND THE REAL BILLS DOCTRINE

(1) **Short-term lending, and chiefly by discounting commercial bills, is the most striking feature of British banking -- both English and Scottish -- during the Industrial Revolution era and on into the 19<sup>th</sup> century:** short-term loans, short-term credit, for essentially working-capital needs, as opposed to longer term loans for financing fixed capital formation (in plant and machinery).

(2) **This is in quite striking contrast to subsequent developments in continental and even American banking:** which came to engage in what we call investment banking to provide such long-term capital financing -- for financing fixed capital formation, especially in underwriting stock and bond issues.

(3) **We will subsequently explore many and various reasons for this persistent contrast:** as well as some limited ventures by London banks in investment banking in the very late 19<sup>th</sup> century.

(4) **But for now it is important to understand the philosophical importance** of the so-called **Real Bills Doctrine** that underlay British economic thought and banking practice in the 18<sup>th</sup> and 19<sup>th</sup> centuries.

(a) **Real Bills:** that banks must not inflate the issues of credit and money but must restrict themselves only to issuing credit -- and that in bank notes -- that is fully backed by real goods.

(b) **More concretely:** that bank lending must be restricted to discounting commercial bills which in turn represent the production of actual goods in the very near future, so that those goods or inventories of goods will provide the real backing for the credit so issued.

(c) **In our example of discounting,** we saw that the whole purpose was to secure bank credit in order to finance the working capital needs of the firm in producing, within the next 90 days or so, the goods that it had promised to sell and supply: in this case, so many yards of cotton yarn.

**Table 1.**

**BANKING STRUCTURES IN ENGLAND & WALES AND THE UNITED KINGDOM**

**EW:** England and Wales

**UK:** United Kingdom (England, Wales, Scotland, and Ireland)

**PB:** private partnership banks

**JSB:** joint-stock banks

<b>Year</b>	<b>EW: Private Banks</b>	<b>EW: PB Offices/ Branches</b>	<b>EW: Joint-Stock Banks</b>	<b>EW: JSB Offices/ Branches</b>	<b>UK: Total Banks</b>	<b>UK: Total Offices/ Branches</b>	<b>UK: Average No. of Branches</b>
<b>1850</b>	327	518	99	576	<b>459</b>	1685	3.67
<b>1875</b>	236	595	122	1364	<b>381</b>	3320	8.71
<b>1900</b>	81	358	83	4212	<b>184</b>	6269	34.07
<b>1913</b>	29	147	41	6426	<b>88</b>	8610	97.84

Michael Collins, *Banks and Industrial Finance in Britain, 1800 - 1939*, Studies in Economic and Social History (London: Macmillan, 1991).

Table 2.

## Stock of Money, Means of Payment, and National Income in England and Wales

1750 - 1913, in millions £ sterling

Money	1750	1775	1801	1811	1821	1831	1844	1855	1865	1875	1885	1913
<b>Specie</b>	15.0	16.0	20.0	15.0	18.0	30.0	36.0	50	70	105	109	145
<b>Banknotes</b>	5.0	10.0	25.0	45.0	32.0	29.0	28.5	26.7	27.0	32.2	27.7	44.7
<b>Deposits*</b>			5.0	15.0	25.0	40.0	80.5	145.0	270.0	409.0	458.0	1,074.5
<b>Total M1</b>	<b>20</b>	<b>26</b>	<b>50</b>	<b>75</b>	<b>75</b>	<b>99</b>	<b>145</b>	<b>221.7</b>	<b>367</b>	<b>546.2</b>	<b>594.7</b>	<b>1264.2</b>
<b>Other*</b>	20.0	37.0	115.0	140.0	76.0	67.0	75.0	153.0		32.4		
<b>Total M2</b>	40.0	63.0	165.0	215.0	151.0	166.0	220.0	374.7		578.6		
<b>Components of Money Stock in percentages</b>												
<b>Specie</b>	75.0	61.5	40.0	20.0	24.0	30.3	25.0	22.6	19.1	19.2	18.3	11.5
<b>Banknotes</b>	25	38.5	50.0	60.0	42.7	29.3	20.0	12.0	7.4	5.9	4.7	3.5
<b>Deposits*</b>			10.0	20.0	33.3	40.4	55.0	65.4	73.5	74.9	77.0	85.0
<b>Total M1</b>	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
<b>Components of Means of Payment in percentages</b>												
<b>Specie</b>	37.5	25.4	12.1	7.0	11.9	18.1	16.4	13.3		18.1		
<b>Banknotes</b>	12.5	15.9	15.2	20.9	21.2	17.4	12.9	7.1		5.6		
<b>Deposits*</b>			3.0	7.0	16.6	24.1	36.6	38.7		70.7		
<b>Other*</b>	50.0	58.7	69.7	65.1	50.3	40.4	34.1	40.9		5.6		
<b>Total M2</b>	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0		100.0		
<b>National Income</b>	100.0	135.0	196.7	255.9	247.4	290.7	403.8	474.5	640.7	896.9	928.2	2,265.0
<b>Per Capita Income</b> in £ sterling	16.3	18.2	21.7	24.8	20.5	20.8	24.4	25.2	30.3	37.3	34.1	49.6

Rondo Cameron, ed., *Banking in the Early Stages of Industrialization* (London, 1967), Introduction and chapter 2: 'England, 1750-1844'

\* bank deposits (chequing accounts) are included in 'Other Means of Payment' until 1801.

**Table 3**

**World Gold Mining Outputs in the 19th Century**  
**Average annual outputs in metric tonnes**

<b>Decade</b>	<b>Australia</b>	<b>New Zealand</b>	<b>Russia</b>	<b>South Africa</b>	<b>Rhodesia</b>	<b>Mexico</b>	<b>Canada</b>	<b>United States</b>	<b>World Total</b>	<b>Total in kg.</b>
<b>1850-59</b>	76.8	0.3	25.4					83.4	<b>185.9</b>	<b>185,900</b>
<b>1860-69</b>	61.9	14.1	25.1					70.6	<b>171.7</b>	<b>171,700</b>
<b>1870-79</b>	46.0	12.0	37.1			1.6		61.5	<b>158.2</b>	<b>158,200</b>
<b>1880-89</b>	35.8	6.7	34.8	4.5		1.6	2.0	49.6	<b>135.0</b>	<b>135,000</b>
<b>1890-99</b>	59.7	8.4	38.4	62.0	1.2	8.0	7.7	70.2	<b>255.6</b>	<b>255,600</b>
<b>1900-14</b>	94.6	13.4	39.9	171.2	14.6	25.1	22.8	132.3	<b>513.9</b>	<b>513,900</b>
<b>Totals</b>	<b>374.8</b>	<b>54.9</b>	<b>200.7</b>	<b>237.7</b>	<b>15.8</b>	<b>36.3</b>	<b>32.5</b>	<b>467.6</b>	<b>1,420.3</b>	<b>1,420,300</b>
<b>Percent</b>	<b>26.4%</b>	<b>3.9%</b>	<b>14.1%</b>	<b>16.7%</b>	<b>1.1%</b>	<b>2.6%</b>	<b>2.3%</b>	<b>32.9%</b>	<b>100.0%</b>	

**Sources:**

C.J. Schmitz, *World Non-Ferrous Metal Production and Prices, 1700-1976* (London, 1979); Barry Eichengreen and Ian McLean, 'The Supply of Gold under the Pre-1914 Gold Standard', *Economic History Review*, 2nd ser. 47:2 (May 1994).

Table 4:

## Money Supply, GDP, and Prices in Canada, 1955 - 2007: Annual Means of monthly data

Year	M: MB = Y/M	V = Y/M	k	P	y	GDP = Y Gross Domestic Product in billions current market prices CANSIM	Population Canadian population in millions	Inflation: Percent Change in CPI	Bank Rate in percent	Real GDP per capita in dollars
	Money: Monetary Base in billions	Income Velocity of M: Mon Base	Cambridge cash balances k = 1/V	CPI June 1992= 100.00 CANSIM	Real GDP: in billions of 1992 dollars CANSIM					
1955	2.2588			16.83			15,681,250			
1956	2.3793			17.07			16,070,250	1.39%	3.153	
1957	2.4378			17.60			16,579,500	3.12%	4.023	
1958	2.5973			18.04			17,062,250	2.51%	2.499	
1959	2.7276			18.25			17,467,500	1.15%	5.128	
1960	2.7500			18.48			17,855,250	1.23%	3.539	
1961	2.8565	14.414	0.06938	18.70	220.176	41.1730	18,224,500	1.22%	3.061	12,081.34
1962	3.0239	14.771	0.06770	18.87	236.740	44.6650	18,570,750	0.89%	4.477	12,748.02
1963	3.1361	15.293	0.06539	19.22	249.561	47.9610	18,919,000	1.86%	3.875	13,191.00
1964	3.3160	15.847	0.06310	19.57	268.564	52.5490	19,277,250	1.81%	4.042	13,931.65
1965	3.5971	16.105	0.06209	20.03	289.288	57.9300	19,633,500	2.34%	4.292	14,734.43
1966	3.8743	16.730	0.05977	20.78	311.875	64.8180	19,997,500	3.79%	5.167	15,595.69
1967	4.1888	16.639	0.06010	21.53	323.675	69.6980	20,363,750	3.61%	4.979	15,894.66
1968	4.2691	17.833	0.05608	22.39	339.997	76.1310	20,692,000	3.99%	6.792	16,431.33
1969	4.7133	17.785	0.05623	23.43	357.717	83.8250	20,994,250	4.65%	7.458	17,038.80
1970	4.9789	18.112	0.05521	24.21	372.512	90.1790	21,287,500	3.31%	7.125	17,499.11
1971	5.5635	17.692	0.05652	24.87	395.827	98.4290	21,747,314	2.72%	5.188	18,201.19
1972	6.3914	17.197	0.05815	26.08	421.392	109.9130	22,187,140	4.89%	4.750	18,992.61
1973	7.3540	17.535	0.05703	28.06	459.600	128.9560	22,453,775	7.57%	6.125	20,468.70
1974	8.3454	18.458	0.05418	31.13	494.769	154.0380	22,772,045	10.96%	8.500	21,727.02
1975	9.7236	17.856	0.05600	34.46	503.858	173.6210	23,102,980	10.68%	8.500	21,809.21
1976	10.9117	18.328	0.05456	37.06	539.673	199.9940	23,414,365	7.55%	9.292	23,048.82
1977	12.0083	18.402	0.05434	40.03	552.087	220.9730	23,694,035	8.01%	7.708	23,300.69
1978	13.4578	18.196	0.05496	43.61	561.537	244.8770	23,935,651	8.95%	8.979	23,460.28
1979	14.8698	18.802	0.05319	47.59	587.449	279.5770	24,170,445	9.13%	12.104	24,304.45
1980	16.0130	19.633	0.05093	52.43	599.695	314.3900	24,471,129	10.16%	12.891	24,506.22

**Money Supply, GDP, and Prices in Canada, 1955 - 2007: Annual Means of monthly data**

<b>Year</b>	<b>M: MB</b> <b>Money:</b> <b>Monetary</b> <b>Base in</b> <b>billions</b>	<b>V</b> <b>= Y/M</b> <b>Income</b> <b>Velocity</b> <b>of M:</b> <b>Mon Base</b>	<b>k</b> <b>Cambridge</b> <b>cash</b> <b>balances</b> <b>k = 1/V</b>	<b>P</b> <b>CPI</b> <b>June 1992=</b> <b>100.00</b> <b>CANSIM</b>	<b>y</b> <b>Real GDP:</b> <b>in billions of</b> <b>1992 dollars</b> <b>CANSIM</b>	<b>GDP = Y</b> <b>Gross</b> <b>Domestic</b> <b>Product in</b> <b>billions</b> <b>current</b> <b>market</b> <b>prices</b> <b>CANSIM</b>	<b>Population</b> <b>Canadian</b> <b>population</b> <b>in millions</b>	<b>Inflation:</b> <b>Percent</b> <b>Change</b> <b>in CPI</b>	<b>Bank</b> <b>Rate</b> <b>in percent</b>	<b>Real GDP</b> <b>per</b> <b>capita</b> <b>in dollars</b>
<b>1981</b>	17.1964	20.962	0.04771	58.94	611.572	360.4710	24,785,059	12.43%	17.931	24,675.05
<b>1982</b>	17.4193	21.807	0.04586	65.31	581.639	379.8590	25,083,479	10.80%	13.958	23,188.15
<b>1983</b>	17.7398	23.190	0.04312	69.13	595.062	411.3860	25,336,505	5.86%	9.553	23,486.34
<b>1984</b>	17.9203	25.088	0.03986	72.11	623.481	449.5820	25,577,353	4.30%	11.312	24,376.30
<b>1985</b>	18.7576	25.894	0.03862	74.97	647.907	485.7140	25,813,854	3.96%	9.647	25,099.18
<b>1986</b>	19.9900	25.640	0.03900	78.10	656.262	512.5410	26,068,353	4.18%	9.214	25,174.68
<b>1987</b>	21.0964	26.495	0.03774	81.49	685.897	558.9490	26,399,956	4.34%	8.403	25,981.00
<b>1988</b>	22.2465	27.559	0.03629	84.79	723.059	613.0940	26,754,940	4.05%	9.686	27,025.26
<b>1989</b>	23.5343	27.948	0.03578	89.03	738.813	657.7280	27,219,748	4.99%	12.293	27,142.53
<b>1990</b>	24.4104	27.854	0.03590	93.27	729.008	679.9210	27,638,583	4.76%	13.045	26,376.44
<b>1991</b>	25.3470	27.039	0.03698	98.51	695.745	685.3670	27,987,829	5.62%	9.034	24,858.85
<b>1992</b>	26.7329	26.203	0.03816	99.98	700.655	700.4800	28,319,473	1.49%	6.783	24,741.11
<b>1993</b>	28.2746	25.719	0.03888	101.83	714.092	727.1840	28,648,235	1.86%	5.088	24,926.22
<b>1994</b>	29.2574	26.348	0.03795	102.00	755.758	770.8730	28,958,270	0.16%	5.766	26,098.17
<b>1995</b>	29.5420	27.433	0.03645	104.21	777.698	810.4260	29,262,649	2.17%	7.308	26,576.47
<b>1996</b>	30.1993	27.711	0.03609	105.85	790.613	836.8640	29,570,577	1.58%	4.531	26,736.48
<b>1997</b>	31.7384	27.813	0.03595	107.57	820.638	882.7330	29,868,726	1.62%	3.521	27,474.83
<b>1998</b>	33.5764	27.250	0.03670	108.63	842.258	914.9730	30,125,715	0.99%	5.104	27,958.11
<b>1999</b>	36.5423	26.885	0.03720	110.52	888.953	982.4410	30,369,575	1.73%	4.917	29,271.16
<b>2000</b>	38.1102	28.223	0.03543	113.53	947.357	1,075.5660	30,650,631	2.73%	5.771	30,908.24
<b>2001</b>	39.6666	27.919	0.03582	116.41	951.357	1,107.4590	30,973,522	2.53%	4.313	30,715.17
<b>2002</b>	42.3101	27.280	0.03666	119.03	969.716	1,154.2040	31,322,332	2.25%	2.708	30,959.24
<b>2003</b>	43.9059	27.700	0.03610	122.32	994.297	1,216.1910	31,626,552	2.77%	3.188	31,438.68
<b>2004</b>	45.2319	28.524	0.03506	124.56	1,035.808	1,290.1850	31,932,015	1.83%	2.500	32,437.91
<b>2005</b>	47.3058	28.991	0.03449	127.34	1,076.965	1,371.4250	32,258,138	2.23%	2.917	33,385.84
<b>2006</b>	49.6239	29.145	0.03431	129.90	1,113.400	1,446.3070	32,603,606	2.01%	4.313	34,149.61
<b>2007</b>	52.1695	29.436	0.03397	131.65	1,166.461	1,535.6460	32,881,904	1.35%	4.604	35,474.26
<b>2008</b>	54.4343	29.395	0.03402	135.78	1,178.445	1,600.0810	33,260,314	3.14%	3.208	35,430.97

<b>Money</b>	<b>Source</b>	<b>Definition</b>
Monetary Base	CANSIM	notes and coin in circulation, chartered bank and other Canadian Payments Association members' deposits with the Bank of Canada
M1	IMF	notes, coins, chequeable deposits: narrowly defined
M1B	CANSIM	currency outside banks, chartered bank chequeable deposits, less inter-bank chequeable deposits
M1+ Gross	IMF	M1 broadly defined: notes, coins, chequeable and other deposits; Canada Savings Bond and other liquid assets

CANSIM = Canadian Socio-Economic Information Management System: operated by Statistics Canada.

Table 5:

<b>Money Supply, GDP, and Prices in Canada, 1955 - 2007: Annual Means of monthly data</b>										
	<b>M1</b>	<b>V</b>	<b>k</b>	<b>P</b>	<b>y</b>	<b>GDP = Y</b>	<b>Population</b>	<b>Inflation:</b>		
		<b>= Y/M</b>				<b>Gross Domestic</b>				
<b>Year</b>	<b>Money: M1</b>	<b>Income</b>	<b>Cambridge</b>	<b>CPI</b>	<b>Real GDP:</b>	<b>Product in</b>	<b>Canadian</b>	<b>Percent</b>	<b>Bank</b>	<b>Real GDP</b>
	<b>narrow</b>	<b>Velocity</b>	<b>cash</b>	<b>June 1992=</b>	<b>in billions of</b>	<b>billions</b>	<b>population</b>	<b>Change</b>	<b>Rate</b>	<b>per</b>
	<b>in billions</b>	<b>of M:</b>	<b>balances</b>	<b>100.00</b>	<b>1992 dollars</b>	<b>current</b>	<b>in millions</b>	<b>in CPI</b>	<b>in percent</b>	<b>capita</b>
	<b>IMF data*</b>	<b>M1 (MIF)</b>	<b>k = 1/V</b>	<b>CANSIM</b>	<b>CANSIM</b>	<b>market</b>				<b>in dollars</b>
						<b>prices</b>				
						<b>CANSIM</b>				
<b>1955</b>	4.7720			16.83			15,681,250			1.896
<b>1956</b>	4.7610			17.07			16,070,250	1.39%		3.153
<b>1957</b>	4.7880			17.60			16,579,500	3.12%		4.023
<b>1958</b>	5.4200			18.04			17,062,250	2.51%		2.499
<b>1959</b>	5.2330			18.25			17,467,500	1.15%		5.128
<b>1960</b>	5.4990			18.48			17,855,250	1.23%		3.539
<b>1961</b>	5.8510	7.037	0.14211	18.70	220.176	41.1730	18,224,500	1.22%	3.061	12,081.34
<b>1962</b>	6.0770	7.350	0.13606	18.87	236.740	44.6650	18,570,750	0.89%	4.477	12,748.02
<b>1963</b>	6.2960	7.618	0.13127	19.22	249.561	47.9610	18,919,000	1.86%	3.875	13,191.00
<b>1964</b>	6.6930	7.851	0.12737	19.57	268.564	52.5490	19,277,250	1.81%	4.042	13,931.65
<b>1965</b>	7.1300	8.125	0.12308	20.03	289.288	57.9300	19,633,500	2.34%	4.292	14,734.43
<b>1966</b>	7.7180	8.398	0.11907	20.78	311.875	64.8180	19,997,500	3.79%	5.167	15,595.69
<b>1967</b>	8.3550	8.342	0.11987	21.53	323.675	69.6980	20,363,750	3.61%	4.979	15,894.66
<b>1968</b>	8.9070	8.547	0.11700	22.39	339.997	76.1310	20,692,000	3.99%	6.792	16,431.33
<b>1969</b>	9.2410	9.071	0.11024	23.43	357.717	83.8250	20,994,250	4.65%	7.458	17,038.80
<b>1970</b>	9.7620	9.238	0.10825	24.21	372.512	90.1790	21,287,500	3.31%	7.125	17,499.11
<b>1971</b>	11.4840	8.571	0.11667	24.87	395.827	98.4290	21,747,314	2.72%	5.188	18,201.19
<b>1972</b>	13.1660	8.348	0.11979	26.08	421.392	109.9130	22,187,140	4.89%	4.750	18,992.61
<b>1973</b>	14.6350	8.811	0.11349	28.06	459.600	128.9560	22,453,775	7.57%	6.125	20,468.70
<b>1974</b>	15.4930	9.942	0.10058	31.13	494.769	154.0380	22,772,045	10.96%	8.500	21,727.02
<b>1975</b>	19.0380	9.120	0.10965	34.46	503.858	173.6210	23,102,980	10.68%	8.500	21,809.21
<b>1976</b>	19.3950	10.312	0.09698	37.06	539.673	199.9940	23,414,365	7.55%	9.292	23,048.82
<b>1977</b>	21.7090	10.179	0.09824	40.03	552.087	220.9730	23,694,035	8.01%	7.708	23,300.69
<b>1978</b>	23.6170	10.369	0.09644	43.61	561.537	244.8770	23,935,651	8.95%	8.979	23,460.28
<b>1979</b>	24.5860	11.371	0.08794	47.59	587.449	279.5770	24,170,445	9.13%	12.104	24,304.45

**Money Supply, GDP, and Prices in Canada, 1955 - 2007: Annual Means of monthly data**

<b>Year</b>	<b>M1</b> Money: M1 narrow in billions IMF data*	<b>V</b> = Y/M Income Velocity of M: M1 (MIF)	<b>k</b> Cambridge cash balances k = 1/V	<b>P</b> CPI June 1992= 100.00 CANSIM	<b>y</b> Real GDP: in billions of 1992 dollars CANSIM	<b>GDP = Y</b> Gross Domestic Product in billions current market prices CANSIM	<b>Population</b> Canadian population in millions	<b>Inflation:</b> Percent Change in CPI	<b>Bank Rate</b> in percent	<b>Real GDP</b> per capita in dollars
<b>1980</b>	27.2790	11.525	0.08677	52.43	599.695	314.3900	24,471,129	10.16%	12.891	24,506.22
<b>1981</b>	27.4590	13.128	0.07618	58.94	611.572	360.4710	24,785,059	12.43%	17.931	24,675.05
<b>1982</b>	28.4780	13.339	0.07497	65.31	581.639	379.8590	25,083,479	10.80%	13.958	23,188.15
<b>1983</b>	30.8670	13.328	0.07503	69.13	595.062	411.3860	25,336,505	5.86%	9.553	23,486.34
<b>1984</b>	31.0720	14.469	0.06911	72.11	623.481	449.5820	25,577,353	4.30%	11.312	24,376.30
<b>1985</b>	34.3750	14.130	0.07077	74.97	647.907	485.7140	25,813,854	3.96%	9.647	25,099.18
<b>1986</b>	36.6630	13.980	0.07153	78.10	656.262	512.5410	26,068,353	4.18%	9.214	25,174.68
<b>1987</b>	39.7930	14.046	0.07119	81.49	685.897	558.9490	26,399,956	4.34%	8.403	25,981.00
<b>1988</b>	42.5870	14.396	0.06946	84.79	723.059	613.0940	26,754,940	4.05%	9.686	27,025.26
<b>1989</b>	44.0600	14.928	0.06699	89.03	738.813	657.7280	27,219,748	4.99%	12.293	27,142.53
<b>1990</b>	43.6960	15.560	0.06427	93.27	729.008	679.9210	27,638,583	4.76%	13.045	26,376.44
<b>1991</b>	46.1710	14.844	0.06737	98.51	695.745	685.3670	27,987,829	5.62%	9.034	24,858.85
<b>1992</b>	49.1970	14.238	0.07023	99.98	700.655	700.4800	28,319,473	1.49%	6.783	24,741.11
<b>1993</b>	56.5290	12.864	0.07774	101.83	714.092	727.1840	28,648,235	1.86%	5.088	24,926.22
<b>1994</b>	60.9850	12.640	0.07911	102.00	755.758	770.8730	28,958,270	0.16%	5.766	26,098.17
<b>1995</b>	65.5270	12.368	0.08086	104.21	777.698	810.4260	29,262,649	2.17%	7.308	26,576.47
<b>1996</b>	77.9190	10.740	0.09311	105.85	790.613	836.8640	29,570,577	1.58%	4.531	26,736.48
<b>1997</b>	86.4950	10.206	0.09799	107.57	820.638	882.7330	29,868,726	1.62%	3.521	27,474.83
<b>1998</b>	93.6230	9.773	0.10232	108.63	842.258	914.9730	30,125,715	0.99%	5.104	27,958.11
<b>1999</b>	101.1830	9.710	0.10299	110.52	888.953	982.4410	30,369,575	1.73%	4.917	29,271.16
<b>2000</b>	116.1030	9.264	0.10795	113.53	947.357	1,075.5660	30,650,631	2.73%	5.771	30,908.24
<b>2001</b>	133.8580	8.273	0.12087	116.41	951.357	1,107.4590	30,973,522	2.53%	4.313	30,715.17
<b>2002</b>	140.1970	8.233	0.12147	119.03	969.716	1,154.2040	31,322,332	2.25%	2.708	30,959.24
<b>2003</b>	153.7390	7.911	0.12641	122.32	994.297	1,216.1910	31,626,552	2.77%	3.188	31,438.68
<b>2004</b>	170.1790	7.581	0.13190	124.56	1,035.808	1,290.1850	31,932,015	1.83%	2.500	32,437.91
<b>2005</b>	188.7220	7.267	0.13761	127.34	1,076.965	1,371.4250	32,258,138	2.23%	2.917	33,385.84
<b>2006</b>	215.3450	6.716	0.14889	129.90	1,113.400	1,446.3070	32,603,606	2.01%	4.313	34,149.61
<b>2007</b>	226.3917	6.783	0.14742	131.65	1,166.461	1,535.6460	32,881,904	1.35%	4.604	35,474.26

**Money Supply, GDP, and Prices in Canada, 1955 - 2007: Annual Means of monthly data**

	<b>M1</b>	<b>V</b> <b>= Y/M</b>	<b>k</b>	<b>P</b>	<b>y</b>	<b>GDP = Y</b> <b>Gross</b> <b>Domestic</b>	<b>Population</b>	<b>Inflation:</b>		
<b>Year</b>	<b>Money: M1</b> <b>narrow</b> <b>in billions</b> <b>IMF data*</b>	<b>Income</b> <b>Velocity</b> <b>of M:</b> <b>M1 (MIF)</b>	<b>Cambridge</b> <b>cash</b> <b>balances</b> <b>k = 1/V</b>	<b>CPI</b> <b>June 1992=</b> <b>100.00</b> <b>CANSIM</b>	<b>Real GDP:</b> <b>in billions of</b> <b>1992 dollars</b> <b>CANSIM</b>	<b>Product in</b> <b>billions</b> <b>current</b> <b>market</b> <b>prices</b> <b>CANSIM</b>	<b>Canadian</b> <b>population</b> <b>in millions</b>	<b>Percent</b> <b>Change</b> <b>in CPI</b>	<b>Bank</b> <b>Rate</b> <b>in percent</b>	<b>Real GDP</b> <b>per</b> <b>capita</b> <b>in dollars</b>

\* M1 data not available after 2007.

<b>Money</b>	<b>Source</b>	<b>Definition</b>
Monetary Base	CANSIM	notes and coin in circulation, chartered bank and other Canadian Payments Association members' deposits with the Bank of Canada
M1	IMF	notes, coins, chequeable deposits: narrowly defined
M1B	CANSIM	currency outside banks, chartered bank chequeable deposits, less inter-bank chequeable deposits
M1+ Gross	IMF	M1 broadly defined: notes, coins, chequeable and other deposits; Canada Savings Bond and other liquid asset

CANSIM = Canadian Socio-Economic Information Management System: operated by Statistics Canada.