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ECONOMICS 301Y1

The Economic History of Later-Medieval and Early-Modern Europe

LECTURE TOPIC NO. 4:

II. MACRO- AND STRUCTURAL CHANGES IN THE EUROPEAN ECONOMY, 1300 - 1520

C. The Course of Prices and General Economic Trends, 1300 - 1520

D. Money and Population in Late-Medieval Price Movements

II. MACRO- AND STRUCTURAL CHANGES IN THE EUROPEAN ECONOMY, 1290 - 1520

C. Changes in Prices and Price Trends (Inflation and Deflation): the Role of both Population and Money, from ca. 1300 - 1520

1. Historical Importance: and our objectives in studying money and prices

a) **From the 12th century to the 20th century,** or at least until World War I, when most of the developed world based their currencies on gold (the 'gold standard'): [1] we can observe the following:

i) **oscillating cycles of rising prices (inflation) and falling prices (deflation),** following each other in long series, in what call 'secular trends' or 'long waves';

ii) **on the other hand,** many economic historians do not recognize the existence of these oscillating cycles of prices (and implicitly of economic activity), and

iii) **therefore** – either explicitly or implicitly – these historians reject the very concept of secular trends and long waves.[2]

b) **Questions:**

i) **What were the causes of these oscillations,** these alternating cycles of inflation and deflation: i.e., if we do believe that these long-term price cycles existed.

ii) **Thus, we can consider these possibilities to explain the causes and natures of these 'long waves'**

(1) monetary factors and forces

(2) or demographic factors –

(3) possibly combined with other 'real' forces: involving capital investments, technological changes, changes in patterns of settlement and long-distance, especially overseas trade

(4) or some combination of monetary and real factors

ii) **What were the economic and social consequences of these alternating cycles?:**

(1) did these long-term price movements influence changes in the economy or reflect changes

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[1] The world-wide economic dislocations of World War I forced all countries to abandon the full-fledged gold standard, which, in the 1920s, was replaced the gold-exchange standard (very different, in fact); and that in turn broke down with the Great Depression 1929-39. In effect, from 1914, most countries issued 'fiat' paper moneys, with no fixed or real metallic backing. That situation totally changed the nature of monetary phenomena and related price changes.

[2] An important American historian caused a considerable stir of interest and controversy in publishing the following in the late 1990s: David Hackett Fischer, *The Great Wave: Price Revolutions and the Rhythm of History* (Oxford and New York: Oxford University Press, 1996). Pp. xvi + 536. As one sympathetic to the concept of the 'long waves', I should have welcomed the book; but instead I found it badly argued, with an undue emphasis on demographic factors, undermined by fallacious arguments, and with an unjustified neglect of monetary forces. I wrote a review for *EH.Net Review*, which appeared on 24 February 1999; and it may be accessed on the internet (www) at this address: ehreview@eh.net.

(2) did these cycles of inflation and deflation themselves influence changes in relative prices, including changes in factor costs (i.e., in terms of real wages, real interest rates, rents, etc).

2. Secular Economic Trends: François Simiand's A and B Phases

a) **Simiand, Kondratiev, Juglar: Phases, Long-Waves, and Business Cycles:**

i) **In the 1930s, the French economist François Simiand,** in response to the 1929 crash and ensuing depression, began investigating economic cycles in European history.[3]

ii) **His studies led him to conclude that for centuries the European economy has fluctuated in an alternating waves:**

(1) with very long term, mirror- like economic cycles or secular economic trends,

(2) which he called Phase A and Phase B

iii) **Characteristics of the Economic Phases: prices and population**

(1) **Phase A**: periods were those of economic expansion and growth, marked by:

- rising prices (inflation), population growth,
- expansion of settlement and overseas colonizations,
- expansion of international trade, business optimism,
- increased capital investment, industrial outputs, i.e., with a rising GNP.

(2) **Phase B**: periods were the exact contrary: periods of economic stagnation or actual economic contraction, marked by:

- stable or falling prices, stagnant or falling population,
- contraction of settlement, contraction of or dislocations to international trade,
- business pessimism, reduced investments (or falling rate of investments),
- economic stagnation or actual decline in industrial outputs and in the GNP.

iv) **Krondatiev Cycles:** Previously, in 1924-1928, in several papers and then a major book, the renowned Soviet economist Nikolai Kondratiev (1892-1938: executed under Stalin) had also devised a theory of long-waves in the economy of about 50 years duration.[4]

v) **Juglar Cycles:**

(1) **Even much earlier, the renowned French economist Clémont Juglar (1819-1905),** evidently almost

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[3] François Simiand, *Recherches anciennes et nouvelles sur le mouvement général des prix du XVIe au XIXe siècle* (Paris, 1932).

[4] Nikolai Kondratiev: 1892-1938: he was executed by firing squad during Stalin's 'Great Purge'. He was 'rehabilitated' on 16 July 1987.

forgotten today, developed a theory of business cycles, each lasting on average about ten years;

(2) according to Joseph Schumpeter, 'the modern morphology of cycles dates from Juglar'.[5]

b) **How to View These A and B phases**:

i) **these alternating long term trends should be seen, however,** only as very broad generalizations about trends in the European economy as a whole; and the dates assigned are thus only very approximate, with wide margins of error.

ii) **The following are the major A and B phases in European economic history (according to Simiand and his successors):**

ca. 1100 - ca. 1320: Phase A: Medieval 'Commercial Revolution'

ca. 1320 - ca. 1460: Phase B: Late-Medieval 'Great Depression'

ca. 1460 - ca. 1520: weak Phase A Early-Modern Economic Recovery

ca. 1520 - ca. 1640: strong Phase A: 'Price Revolution'

ca. 1640 - ca. 1750: Phase B: 'General Crisis of the 17th Century'

ca. 1750 - ca. 1870: Phase A: Industrial Revolution Era

iii) **As broad generalizations, these A and B phases do not necessarily apply to all regions of Europe within the assigned time periods:**

(1) Thus, some regional economies may have experienced these trends sooner or much later than others,

(2) while some other regions might have gone against the trend entirely

(3) Note especially that regional price trends will or may be heavily influenced by monetary policies, especially by coinage debasements and the opposite, *renforcements* (see the last lecture).

c) **Nor should these phases or long term secular trends be taken as continuous, uninterrupted trends**:

i) **within each long-wave, or secular phase,** we would normally expect to find shorter term business cycles (i.e., Juglar cycles) weaving above and below the trend lines.

ii) **But during an upward trend,** the peaks of the booms may have greater amplitude than the troughs of the depressions; and conversely, with a downward trend.

iii) **Normally there are about five or six Juglars cycles to each Kondratiev long-wave,** at least for those economies who still give credence to the concept of long-waves in economic history.

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[5] Joseph A. Schumpeter, *History of Economic Analysis* (New York: Oxford University Press, 1954), pp. 1123-24. I myself have checked about a dozen modern textbooks in economics principles and in macro-economics, money and banking, etc.; and found that none refers to Juglar. The historical view is sadly lacking in our profession, so that most universities barely recognize the history of economic thought.

3. Monetary and Real (Demographic) Factors in Long-Term Price Trends

a) **Economists still debate whether or not such long waves have ever existed -- many see only irregular fluctuations;**

i) **but there are at least discernible long-term price trends**: inflationary and deflationary, which may reflect the movement of real economic trends.

ii) **As I have observed several times previously,** there is some obvious correlation between

- the movements of both population and money supplies on the one hand
- and the upward or downward movement of these price trends.

b) **The Debate between the Real and the Monetary Schools:**

The interpretation of long-run or secular price trends, from the Middle Ages to the 20th century, has engaged economists and economic historians in a long-run and quite fierce debate between two camps or schools: the so-called 'Real' and 'Monetary' Schools.

i) **REAL SCHOOL:** whose supporters are chiefly Keynesian economists.

(1) They argue that the key determinants of economic change and growth, from medieval to modern times, have been the so-called 'real' forces in the economy.

(2) These 'real' forces are above all:

- demographic or population change in pre-industrial Europe;
- but they also involved capital investment, technology, new settlements, etc.

(3) For the 'Real' school, beginning with the Classical School of Economics in the 19th century, money and monetary changes are merely a veil that disguises the *real* forces at work in the economy.

(4) Hence the reason for the term 'real' factors and 'Real School.'

(5) Amongst medieval and early-modern economic historians, the undisputed leader and indeed founder of the Real School was the late Michael Postan of Cambridge University.

ii) **MONETARY SCHOOL:** whose supporters are supposed to be followers of the American economist Milton Friedman;

(1) The so-called Monetarists argue, on contrast, that monetary changes were not just a mere veil, but often constituted active and positive forces for economic change, forces that were on occasion equally or even more important agents than population or other real factors.

(2) Many or most historians who argue for consideration of monetary factors in economic changes do not hold views that are so strictly speaking 'monetarist' [i.e., as espoused by Milton Friedman]-- which in any event is often used as a hostile, negative term.

(3) Indeed, while most of those belonging to the Real school deny any significance to monetary forces, very

few if any in the Monetary School are so uncharitable (or stupid) as to deny the significance of the real forces, especially demographic forces.

(4) Some in the Monetary School will also argue that, on many occasions, demographic changes, in particular, were really reflections or consequences of much more general economic changes. i.e., passive rather than active.

(5) Those in the so-called Monetary School are themselves often split over the nature of monetary forces, debating whether they were and are exogenous to the economy, or in fact truly endogenous factors within the economy.

(6) I suppose that most true monetarists would adhere to the first view, namely that monetary forces are exogenous (outside the economy).

iii) **It is my firm conviction, however -- as one often labelled a monetarist (usually meant as pejorative term) -- that:**

(1) **real and monetary factors can rarely be disentangled,** especially for long-run trends;

(2) **and thus that the two forces -- monetary and real -- are related,** and that both have to be utilized to explain those price trends.

c) **Marc Bloch's Peculiar Seismograph: Monetary and Demographic Changes**

i) **The great French economic historian Marc Bloch (1886-1944):** referred to monetary changes as peculiar 'seismographs that not only register earth tremors, but sometimes bring them about'.

ii) **That simile could equally be applied to demographic changes,** and indeed to both of them together.

iii) **Thus, if demographic and monetary fluctuations were more often the consequences of economic change,** they sometimes acted on their own as partial causes of change.

iv) **We can thus view both demographic (population) and monetary forces as the two of the most crucial variables** or agents in analysing the long-run historical patterns of economic growth;

v) **but we also want to know whether these variables,** real and monetary, separately or together, have acted as active or passive agents of economic changes, as further explained in the next section.

d) **Nominal and Real Prices:** the distinction between relative prices and price trends.

i) **Nominal prices:** are those that are expressed in the current money-of-account, whether in terms of the old system of pounds, shillings, and pence, or the current system of dollars and cents

ii) **Nominal vs real prices:**

- In October 1966 a Ford Mustang cost $3,500.00 CAD — that is the price that I paid for one in 1966
- In October 2013, the starting price for a basic For Mustang (basic V-6 model) is $22,069 (before

taxes: but up to $35,000 in some models, and even $50,00 in ultra deluxe modes).[6]

- i.e., a 6.43 fold increase (530.54% increase)
- So: we can see the extent of inflation over the past four decades.
- But we could also calculate that, while its nominal price has risen substantially, its real price has actually fallen:
- because the Consumer Price Index (base June 2002 = 100) has somewhat less: a 6.970 fold increase (614.80%): from 17.46 in 1966 to 121.70 in December 2012.[7]
- The significant difference lies in *quality changes*, the product composition, over this period – a problem that always creates difficulties in comparing prices over time.
- Economists, in taking into account such quality changes, would argue that the real price of the Ford Mustang has actually fallen even more, since 1966, than these prices would indicate.[8]

iii) **The Relative Price or Price Relative:**

- is simply a comparison of the change in the price of one commodity -- say wheat -- in relation to the price, or changing price, of another commodity -- such as bricks.
- In micro-economics, we can demonstrate a change in the price of wheat with a simple demand and supply graph.
- We begin by assuming that the supply schedule for wheat is fairly inelastic, steeply upward-sloping;
- and if we shift the demand schedule from D_1 to D_2, say as the result of population growth, we will find a sharp rise in the price of wheat (relative to price changes for other commodities -- such as bricks).

iii) **If we construct a consumer price index,** from a weighted basket of commodities, and plot the changes year after year for that aggregate price index we are thus portraying a long-term price trend (using this index to portray some weighted average of all prices).

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[6] The lowest price quote I got was for $23,779 + HST; but $26,000 - $27,500 was more standard for basic models, but with airconditioning, etc.

[7] With this base of June 1992 = 100, the index for June 2008: mean of 2006) of 135.78 means that the level of prices on the consumer basket was 35.78% higher in June 2008 than it was in June 1992.

[8] My 1966 Ford Mustang (purchased in Vancouver, B.C.) , needless to say, had no radio – let alone a CD player (non-existent then), no air conditioning, no power steering, no power windows, no air bag, etc. , etc. It did, however, have automatic transmission, as does the V-6 model just quoted, for October 2013, which also has air-conditioning, power-steering, power-windows, CD-player, etc – but no sun roof, power-seats, etc.

4. Modern Quantity Theories of Money: from Fisher to Friedman

a) **If we were to pose the traditional question WHAT CAUSES INFLATION, the traditional response would be:** 'too much money chasing too few goods'.

i) **There is still much merit to that response, in containing three important variables, of equal importance:**

(1) 'too much money' -- an increase in the stock of money; and

(2) 'chasing' -- the rapidity of money circulation, the vitality of monetary activity, and what is called **velocity**; and finally

(3) 'too few goods' -- the inability of production and trade to supply enough goods to meet the increased demand resulting from 'too much money' and also from the 'chasing' variable.

ii) **The Quantity Theory of Money:**

(1) Most economic historians who give some weight to monetary forces in European economic history usually employ some variant of the so-called Quantity Theory of Money;

(2) And that Quantity Theory of money indeed is very old, going back at least to the 16th century when the French philosopher Jean Bodin (in 1568) attributed the contemporary Price Revolution era inflation to the influx of American treasure), opposing Malestroit's views on the paramount role of debasements.[9]

(3) Most of these so-called quantity theories, however, also employ real factors along with monetary factors.

b) **The Fisher Identity:**

i) **Even in the current economic history literature, the version most commonly used is the Fisher Identity,** devised by the Yale economist Irving Fisher (1867-1947) in his book *The Purchasing Power of Money* (revised edn. 1911).

ii) **For that reason we cannot avoid it,** even though most economists today are reluctant to use it without significant modification.

iii) **The Fisher Identity**, or **The Equation of Exchange**: **M.V ≡ P.T**

M = stock of money in coin, notes, bank chequing deposits ('high-powered money')

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[9] George A. Moore, ed., *The Response of Jean Bodin to the Paradoxes of Malestroit and The Paradoxes, translated from the French Second Edition, Paris 1578* (Washington, D.C.: Country Dollar Press, 1946). The first edition was published in 1568, in a debate with Malestroit, who espoused the argument that coinage debasements remained the chief cause of inflation. Some, however, give the credit for the first enunciation of the Quantity Theory to the Spanish cleric Azpilcueta Navarra, of the Salamanca School, with a treatise dated 1556. See Marjorice Grice-Hutchison, *The School of Salamanca: Readings in Spanish Monetary Theory, 1544 - 1605* (Oxford, 1952), Appendix III.95: 'And even in Spain, in times when money as scarcer, saleable goods and labour were given for very much less than after the discovery of the Indies, which flooded the country with gold and silver'. Even so, Bodin's views had by far the greater impact.

V = the velocity of money circulation: the rate at which a unit of money circulates in effecting transactions in course of one year

P = some measure of the price level; e.g., the Consumer Price Index

T = the total volume of monetary transactions that take place in the economy during the course of that same year.

N.B. This is more of an identity (≡) or tautology than it is a causal equation: that the values on the left side of the equation (M.V) equal the values on the right side (P.T).

- it simply states that **total spending**, in terms of the money stock multiplied by the rate of its turnover or circulation, necessarily equals **total spending** in terms of the total volume of monetary transactions multiplied by the current price index.
- The two values on each side of the = sign are thus necessarily identical.

c) **Problems with the Fisher Identity**:

i) **M and P, it has been argued, are extremely difficult to estimate or calculate.**

(1) For both the 16th century and the present this is a form of nitpicking that in no way invalidates the model.

(2) Good proxies can be provided for both, certainly to indicate movements of both prices and monetary stocks.

(3) The other two objections are far more important.

ii) **Thus T really is quite impossible to calculate for any period or even to comprehend.**

(1) That is, even if we could attach a numerical value to T, it would be rather meaningless: T = the total volume of all transactions in the economy, both intermediate and final, from raw materials to fully manufactured products along with all services.

(2) How can we resolve the problem of multiple counting?

- How can we add up all the transactions involving so many different commodities and services: with what common denominator?
- Adding together apples and oranges (as pieces of fruit) is a very simple task by comparison.

iii) **V, as a measure of the velocity of circulation or turnover of money, is not in fact an independent variable,** but rather a residual one.

(1) It has to be calculated algebraically by first knowing the other three.

(2) Thus we can calculate V only by this formula: V = (P.T)/M; or more simply, as we shall see in a moment: GDP/M.

iv) **V and T, furthermore, are considered by many to be strictly dependent on each other (i.e., in a**

linear fashion):

(1) many people have argued that any increase or decrease in the volume of transactions must be reflected by a corresponding change in Velocity.

(2) That may be so, but it is *not* necessarily so: an increased volume of transactions can be accommodated by an increased supply of money;

(3) and a decreased volume of transactions may result in a reduction in the money supply (as defined by M1).

d) **The Cambridge Cash Balances Equation: M = k.P.T**

This is a lesser-known rival to the Fisher Identity that emerged during the 1920s at Cambridge, with a formula that resolved at least the problems concerning Velocity:

i) **Its originators at Cambridge (especially A.C. Pigou) asked two principal questions**:

(1) how much 'high-powered' money (usually called M1), do people currently wish to hold in the form of *cash balances* (money held in coin, notes, bank deposits), rather than being spent or invested?

(2) What, therefore, is the ratio of those cash balances to the total money value of all transactions in the economy?

ii) **That ratio:** is indicated by the letter **k;**

iii) **and this form of the Quantity equation** now becomes: **M = k.P.T**

(1) The letter **k** thus indicates the proportion of the total value of all monetary transactions, and thus the total value of the Net National Product (or rather the Gross National Product, or Gross Domestic Product) that the public chooses to hold in cash balances;

(2) Thus it tells us the necessary amount of **M** that is required for that level of **P.T** (total spending), or to achieve the current level of the **GNP or GDP**.

(3) Note that **P** times **T** again equals the total monetary value of all transactions; and thus suffers from the same problems of estimating the value of **T,** as indicated above for the Fisher Identity.

iv) **Liquidity Preference:** a concept further developed by Keynes, who asked a fundamental question: Why do people wish to hold cash balances, instead of immediately spending or investing that money?

v) **For his concept of Liquidity Preference, he suggested three or actually four motivations.**

(1) transactions motive: people hold a stock of ready cash in order to meet their day to day needs in buying goods and paying for services, etc. This is deemed to be the major need for holding ready cash.

(2) **precautionary motive:** to have ready cash on hand in order to meet some unforseen emergency, as a contingency fund for future needs.

(3) **investment motive:** is added by some economists to distinguish between speculation as gambling and more rationally oriented investments to produce an income stream.

(4) **speculative motive:** to have ready cash to take immediate advantage of some special investment opportunity -- a cash fund to speculate with.

iv) **Real Cash Balances and Opportunity Cost:** What is the cost of holding these cash balances?

(1) The true cost is the **opportunity cost:** i.e., the interest or other investment income *foregone* by not investing those balances.

(2) Consequently, we should find that cash balances are to some extent interest-sensitive,

(3) and thus that they vary inversely with interest rates.

(4) That is, the proportion of national income held in cash balances (**k**) should:

- fall as real interest rates rise, because rising interest rates will increase the opportunity cost of holding those balances;
- and conversely that proportion of NNI held in cash balances, as **k**, should rise with falling real interest rates.

(4) Is that theory born out by recent Canadian monetary experience: see the table on Canadian money supplies, GDP, CPI, interest rates, and population, in the appendix (also the handout).

v) **Relationship between the Fisher and Cambridge equations**:

(1) Note that mathematically, the Fisher and Cambridge Cash Balances equations are related: **k** is the reciprocal of **V;** and **V** is the reciprocal of **k**, as can readily be seen in their calculations**.**

- **V = 1/k; k = 1/V**
- **V = GNP/M = Py/M**
- **k = M/GNP = M/(P.y)**

(2) What is the difference between **k** and **V?** Why is **k** a more useful variable than **V?**

- Because **k** is much more 'predictable;' and conceptually **k** is an 'active' variable -- i.e., we should be able to predict roughly what proportion of total national expenditures people wish to hold in cash balances.
- But **V**, on the contrary, is a passive (i.e., resulting from) or 'residual' variable, calculated as noted only by first knowing **M, P,** and **T.**
- Thus one might say that **k** (cash balances) is a **predictive** measure of velocity, while **V** measures only the resulting velocity, and only as calculated by this equation.

e) **The Basic Suppositions Concerning the Older Quantity Theories of Money**: from the 19th century:

i) **The Demand for Money is chiefly a TRANSACTIONS DEMAND.**

ii) **The Transactions Demand for Money will be proportional to the aggregate value of transactions:** i.e., k as proportion of P.T; and this proportion will not vary in the short run.

iii) **The Supply of money is *exogenously* determined,** determined independently of the economy (by some external authority or events).

iv) **Full Employment prevails:** so that any increase in aggregate demand will not increase the volume of output or transactions (T).

v) **Those with excess money will spend it on goods and services, so that conversely,** those with insufficient supply of money will cut their expenditures on goods and services.

vi) **Now it is very important to realize that today, no scholar -- economist or economic historian -- would accept these rigid propositions,** indeed none of them without serious qualification.

vii) **But that does not mean that either of these identities, Fisher or Cambridge,** has been rendered invalid or useless.

f) **The Modern Form of the Quantity Theory: Friedman's Income Version: M.V = P.y**

i) **While the Cambridge cash balances approach apparently resolved the problem of V,** it did not resolve the quite intractable problem of T.

(1) Modern economists, however, have more or less resolved that problem by ignoring the total volume of transactions,

(2) and thus by looking instead at the Net National Income or the aggregate of net national expenditures, though most of have to be content with using Gross Domestic Product at factor cost.

ii) **To understand this, we can begin with the Gross National Product or its equivalent, the Gross National Income**: as the total current money value of all final goods and services produced in the economy in a given year.

(1) From that dollar amount we deduct a sum for 'depreciation' (for depreciation of worn out, wasted capital stock) in order to arrive at Net National Product.

(2) Thus, just as Gross National Product (GNP) = Gross National Income (GNI), so Net National Product (NNP) = Net National Income (NNI), which is represented here by the capital letter Y.

(3) That letter Y will be familiar to anyone who has studied at least the rudiments of Keynesian economics:

Y = C + I + G + (X - M).

That is, Net National Income (Y) equals the sum total of national Consumption (C) plus total Investment (I) plus Government Expenditures (G) plus the net difference between total Export incomes (X) and total expenditures on Imports (M).

iii) **Since this value Y is usually expressed in terms of current dollars, we must now express that net national income in dollars of unchanging values:**

(1) i.e., in what are called 'constant dollars' that reflect a constant or stable purchasing power, which has been

adjusted for inflation (thus the term: 'deflated net national income').

(2) That value of a deflated NNI, or 'real NNI,' or 'net national income in constant dollars,' is expressed by lower-case **y.**

(3) Upper-case **Y** of course measures NNI in current dollars, which currently has meant a declining purchasing power, because of inflation.

(4) National income statistics, especially those provided by Statistics Canada, generally provide data in terms of GNP (Gross National Product), or more commonly in GDP (Gross Domestic Product).

(5) In any event, I am not convinced that NNP or NNI provides a better measurement than GNP or GDP, since financial transactions and expenditures obviously involved the purchase of goods that represents the replacement of depreciated capital stock.

iv) **This new value y or real NNI (or real GDP) is obviously much more measurable than T.** (1) To calculate **y:** divide **Y** by **P.**

(2) That is, calculate the NNI by deducting depreciation from the GNP;

(3) and then divide that result (NNI) by some agreed upon price index (e.g. consumer price index): **y = Y/P**.

v) So, by using that **'y'** value to express constant or deflated net national income (NNI), in place of unmeasurable T, in the two quantity theory equations, those Fisher and Cambridge equations now become:

(1) Fisher: **M.V = P.y**

Thus **V** measures the *income* velocity of money: the rate at which a unit of money circulates in producing total net national income (or net national expenditures or net national product).

(2) Cambridge Cash Balances: **M = k.P.y**

Thus **k** measures the proportion of aggregate national income that the population collectively holds in cash balances.

vi) **While the Cambridge version is conceptually preferable,** it is, as just noted, mathematically related to the much more widely used Fisher equation, in that:

(1) or better the modern *income* version of that equation, so that: k = 1/V.

(2) So you will presumably also prefer to use it: but at least please use it in this modernized form: **M.V = P.y**

vii) **For the current relationships of these four variables**

(1) in the Canadian economy, from 1961 to 2008 (last which for which I have data): see the tables on the screen: [tables at the end of the lecture notes], in terms of both:

- M* : aggregate monetary base, consisting of currency (notes and coins) in the hands of the public and the reserves of the chartered banks (the base determining the ability of the banks to make loans, and thereby create money)

- M1B: the sum of currency in the hands of the public and the sum of all chequeable deposit accounts in all financial institutions (broader than traditional M1)

(2) Note that the behaviour of **V** or **k** is different from each other in each table: in your handout, the tables begin with 1990 (but with 1961 in the Appendix, below)

- using the very narrowest possible definition of money (Table 1),[10] the Monetary Base, we see that over time V has steadily risen, from 14.414 in 1961 to and thereafter slowly rising with a peak of 28.223 in 2000, after which it decline somewhat, rising again in 2004, and reaching 29.395 in 2008 (annual mean).
- conversely, of course, we see that Cambridge 'k' (the reciprocal of V) fell over this period: from 0.069 in 1961 to 0.056 in 1975; and was only 0.034 in 2008 (as it was in 2005).
- I would have preferred to use broader monetary measures: but unfortunately both CANSIM and IMF have ceased providing current data on M1 and M1B.

(3) then, compare the changes in M and V in the Mayhew table [table also at the end of the lecture notes] providing monetary variables and changes in national output (and population).

(4) Note again that changes in Cambridge **k**

- do seem to be fairly closely related to changes in interest rates (here: Bank Rate),
- thus Cambridge **k** fell from 1987 (0. 377) to 1991 (0.0369, when interest rates (or Bank Rate) rose (from 8.40% to 13.05%)
- If we used MB1 data, we find that Cambridge **k** fell from 0.149 in 1987 to 0.132 in 1991 – a fall of 11.4%.
- that is to expected: the rise in interest rates represent a rise in the opportunity cost of holding cash balances.
- and so many investors evidently shifted cash balances into interest-bearing investments
- at the same time, do remember that this theory assumes that liquidity preference (and the demand for money) remains stable, which may not have been the case

g) **What factors affect V and k?**

i) **Any changes affecting those three elements of liquidity preference**: for the transactions, precautionary, and speculative demands for money.

ii) **Changes in population**: demographic structures, market structures, transaction costs, etc., requiring that a greater or smaller proportion of national income be held in cash balances.

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[10] The so-called 'Monetary Base': = Total supply of currency in the hands of the public (notes and coins) and reserves of the chartered banks; but it does not include chequable deposit accounts (in M1B).

iii) **Changes in financial instruments**: many of which economize on the use of money, coined money, and so speed up the effective velocity of coinage.

iv) **Interest rates and levels of national income**:

(1) Cambridge 'k' for cash balances: should vary inversely with interest rates

- since 'k' reflects the opportunity cost of holding cash balances (yielding no income)
- thus when interest rates are high, one holds a smaller quantity of cash balances
- conversely, when real interest rates are low, people are more inclined to hold a larger stock of cash balances
- Income velocity of money should thus vary inversely with interest rates – though this was never part of the concept of the income velocity of money (in either Fisher or Friedman)

(2) national income levels: be careful to distinguish between changes in nominal net national income and in real incomes.

- As an absolute, **k** should rise with increasing real income;
- but unless other factors vary, **k** should remain the same proportion of real net national income.

v) **Supply shocks**:

(1) effects of famine, war, war financing, etc;

(2) sudden increases in the cost of supplying food, fuel, etc., and other necessities of life.

vi) **Predictions about the future value of money, i.e., a form of 'rational expectations'**: [11]

(1) if you believe that in the future money will lose its purchasing power, you will get rid of it,

(2) i.e., exchange it for assets of more stable value: and thus reduce cash balances and increase money velocity.

(3) That was one obvious consequence of medieval/early-modern coinage debasements:

- if people, experiencing one debasement, anticipated that others would follow
- they would seek to get rid of money – exchange coins for real assets – as soon as possible
- thereby increasing the income velocity of money

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[11] **Note:** On 9 October 2006, the Nobel Prize in Economics was awarded to Edmund Phelps, a professor at Columbia University in New York, 'for exploring the relationship between inflation and employment, work that has influenced monetary policy around the world. He built on a previous model predominant in the 1960s, called the Phillips curve, which said that inflation quickens as the jobless rate drops. Mr. Phelps argued, however, that the relationship was not so simple and that inflation depends on both unemployment and *expectations of where prices are headed* [my italics added: JHM]. That concept has been incorporated into the thinking of central banks globally, economists say'. Source: *Globe and Mail*: 10 October 2006. For the Phillips curve, see note 12 below.

h) **Keynesian Criticisms of the Quantity Theories of Money**:

i) **While quantity theorists believe that k or V demonstrate relative stability,** at least in the short run, Keynes and his followers believe(d) that these variables are highly unstable and volatile.

(1) in particular, they argue that **k** and thus **V** are highly sensitive to interest rates in the short run, which in turn are functionally related to changes in the money supply.

- In short, Velocity varies inversely with the money supply and directly with interest rates;
- alternatively, that k varies directly with the money supply and inversely with interest rates; and thus V = 1/*k* and *k* = 1/V, since each variable is the reciprocal of the other
- remember, once again, that the interest rate represents the opportunity cost of holding cash balances.[12]

(2) Thus, in the short run at least, an increase in the money supply M should lower interest rates,

- which in turn should reduce Velocity (or permit a rise in k).
- furthermore, a more plentiful money supply reduces the need to **economize** on the use of money,
- thus also reducing Velocity (or encouraging larger cash balances).

(3) See the table on the screen for Canada, and my previous comments,

- which do not seem to support the Keynesian view on the short-term volatility of V (or k);
- but these data also do not support the Friedman view on the stability of these variables, in the short to medium run.

ii) **Is a nation's money supply exogenous or endogenous?**

(1) Quantity theorists have looked upon the aggregate money supply (continental or world -- depending on the era) as largely **exogenous**,

(2) but Keynesians have considered it to be largely **endogenous**, and a function of the real factors determining production and trade.

(3) Historically, arguments and evidence can be adduced to support both cases – in different regions, and at different times:

- when the money supply was essentially composed of precious metals, exogenous factors may have been more important in determining M, at least in the long run

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[12] See J. M. Keynes, *General Theory of Employment, Interest, and Money* (1936), p. 298: 'The primary effect of a change in the quantity of money on the quantity of effective demand is through its influence on the rate of interest'. And further, on p. 336: 'Now, if the wage-unit is somewhat stable..., if the state of liquidity-preference is somewhat stable..., and if banking conventions are also stable, the rate of interest will tend to be governed by the quantity of the precious metals, measured in terms of the wage-unit, available to satisfy the community's desire for liquidity'.

- In modern times, with government determined fiat paper money, M is clearly far more endogenous than exogenous

iii) **Full Employment or Underemployment of Resources?**

(1) **The classic Quantity Theory of Money,** as noted earlier, assumed a normal or equilibrium state of Full Employment,

- meaning that all resources would be fully employed,
- so that any increase in monetized spending would have to drive up prices proportionally, since any further increase in production and trade was impossible (in the short run).

(2) John Maynard Keynes, writing during the Great Depression years, argued:

- that underemployment of resources was more often the normal state;
- and that an increase in monetized spending would induce the productive employment of further resources,
- resulting in an increased output and trade that would counteract any potential inflation from that increased spending.

iv) **Keynes on longer-term inflation**: In criticizing the classical Quantity Theory of Money, he stated [in his *The General Theory of Employment, Interest, and Money* (1936), p. 306]:

> So far, we have been primarily concerned with the way in which changes in the quantity of money affect prices in the short period. But in the long run is there not some simpler relationship? This is a question for historical generalisation rather than for pure theory...

v) **Some of My Own Observations and Questions to Pose**:

(1) **Can we assume such perfect elasticity of response of V or k to changes in M and to changes in interest rates**: Would an historian, usually studying somewhat 'longer runs' than those assumed by economists, believe that V or k would always change in exact proportion to changes in M, over long periods of time?

(2) We may deal with that question by assuming that, to the extent that changes in V or k are not exactly proportional to the changes in M, the difference is taken care of by increases in production and trade, i.e., by the changes in **y**.

(3) But again the historian may doubt that all the changes -- in **M, V or k, and y** -- are always so neatly counterbalancing, so that **P** (the price level, as measured by CPI) remains stable.

(4) We may agree that the money supply, especially for any given region or country, is far more endogenous than was assumed by the classical Quantity Theory;

- and that changes in real factors, changes in investment, production, and trade, may well induce necessary changes in the money supply,

- especially if the money supply is heavily based on credit instruments.
- but what about a pre-modern money supply that is far more based on precious metals?

(5) Are changes in the supply of precious metals and in mint outputs so fully endogenous in the Keynesian sense?

- Furthermore, what about coinage debasements: what determines them?
- Economic or military considerations?
- Remember that I had argued that later medieval and early modern coinage debasements were generally fiscal rather than monetary policies;
- and that the prime motivation for debasements was to secure mint profits for war financing.
- and furthermore that medieval debasements usually succeeded: succeeded in fooling the public who generally found the changes in both coinage alloy and weight difficult to detect.
- as I had argued, the success of debasements depended on asymmetric information: information available to merchants (supplying mints with bullion) but not to the general public

(6) **In summary**: supposing that the money supply was essentially endogenous, one may argue that the various economic processes increasing the variable **y** (NNI) – e.g., population growth, technological changes, investment, changing foreign trade patterns -- induced the requisite monetary expansion: in M, or in V, or in both together.

(7) If, however, inflation also occurred, as ΔP [i.e., a rise in the Consumer Price Index], historians must then explain why the evident monetary expansion was greater than the rise in real output: why, with ΔP, we find that $\Delta (M.V) \rangle \Delta y$.

(8) The following section develops this theme; but to make the argument perfectly clear and to ensure a logical flow, many of the points made in this series of observations are necessarily repeated.

(i) **Monetary and Real Factors in the Quantity Theory Equations**

i) **If you look carefully at these equations,** you will see that they are not in fact purely monetary, but contain a *real* element, which is much more clearly seen in the modern versions: i.e., **y** for *real* NNI or NNP.

ii) **Thus,** in terms of **M.V = P.y**, what will happen when you increase the stock of **M,** increase the Money Supply?

iii) **Some combination of any or all of the three following might well happen:**

(1) Some increase in **y:** an increased quantity of **M** in circulation stimulates the economy and promotes increased production and trade, thus increasing incomes: thus producing a rise in NNP and NNI.

(2) Some reduction in **V:**

- since money is more plentiful, there is less need to economize on its use; its rate of circulation slows

down;

- or some fraction of that increased **M** goes into hoards or larger cash balances.

(3) Furthermore, if an increased **M** results in lower interest rates -- as Keynes suggested, **V** should also fall for that reason (i.e., **k** would rise).

(4) If a fall in the interest rate induces increased capital investment and production (in all sectors of the economy), then we would also expect to find some rise in **y** [i.e., real net national product and thus real net national income.

(5) But also, we would normally find some increase in the Price Level **P**.

- But note carefully: to the extent that **y** rises, and to the extent that **V** falls, then the rise in the price level (**P**), the degree of inflation, will be proportionally much less than the increase in **M.**
- Conceivably, an increase in **M** could be totally offset by both a fall in **V** and an increase in **y** -- so that no inflation would result.

(6) Thus inflation is far from being an automatic result of increasing the money supply -- it is from being predictable; and thus price changes depend upon purely real as well as monetary factors.

(7) But we have reason historically to doubt that all these factors will so automatically and neatly counterbalance each other.

iii) **Consider the older views on these issues of inflation**:

(1) Old-fashioned quantity theorists of 19th century, and even Fisher, were looking essentially only at short term changes:

- and they assumed that any economy in 'equilibrium' must be operating at full employment, with no capacity for increased output, and with a constant money velocity.
- Thus, in their view, a 10% increase in **M** must produce a proportionate or 10% increase in **P,** the price level.
- **Historically, however, that proves to be quite false:** there is almost never any linear relationship between changes in money supplies and prices.

(2) **J. M. Keynes**: in formulating his *General Theory of Employment* (1936) during the grim depression years of the 1930s, with mass unemployment.

- He assumed an economy with a large amount of unemployed resources, a highly elastic economy very responsive to changes in demand.
- He was also assuming that changes in **M** resulted endogenously from changes in investment or government expenditure, increasing output, income, and aggregate demand.
- Such increases in an economy of unemployed resources would be reflected by a rise in real net

national product and income (**Y)** without any inflation, at least until the point of Full Employment was reached.

- But, Keynes argued, once that point of full employment was reached, the traditional quantity theory would then finally apply: further increases in spending would be purely inflationary -- his concept of the 'inflationary gap'.

j) **Population, Aggregate Demand, and Inflation:**

i) **Suppose, however, we apply the Keynesian concepts of aggregate supply and aggregate demand,** drawing on a graph a series of upward-moving aggregate-demand curves that intersect an upward-sloping aggregate-supply, which becomes increasingly inelastic

ii) **With this model can we not explain inflation -- i.e., a rise in the general price level -- solely in terms of population growth?**

(1) Suppose, for now, that the only factor increasing and thus shifting upwards the aggregate demand schedules is population; and

(2) Suppose, consequently, that population growth and diminishing returns explains why the aggregate supply does become increasingly inelastic (as demand shifts upward).

(3) Why does this model, therefore, not fully explain inflation?

(4) Because it takes no account of the fact that inflation, in particular that of the 16th and 17th centuries, is measured in terms of a money-of-account based on the current **silver** coinage.

(5) Thus consider that we examine not just the consequent rise in the price level, from $\mathbf{P_2}$ to $\mathbf{P_2}$, but the resulting product in terms of price x quantity transacted, P.Q: and note how much larger a sum is $\mathbf{P_2.Q_2}$ than is $\mathbf{P_1.Q_1}$: on this graph, from £17,220 to £122,960.

(6) Thus the vital question: where did all that extra money to transact those expenditures come from?

- Either it came from an increase in the money stock,
- or from an increase in the money flow (i.e., an increase in Velocity),
- or -- more likely -- from a combined increase in the two variables, together.

(7) So, even though the monetary component of inflation in this model remains absolutely essential, we can turn to a variant of an essentially Keynesian model to discover a more valid explanation, not only of inflation, but in fact of the price trends of the later 15th, 16th, and 17th centuries, the Phillips curve.

k) **The Phillips Curve:**

i) **Phillips is a modern British economist (1958) who found a close correlation between changes in the**

price level and unemployment rates, from the 1860s to the 1950s:[13]

(1) the closer that an economy approached full employment, the higher or faster rose the price level; the higher the rate of unemployment, the more stable was the price level.

(2) This is not the either/or proposition of the traditional Keynesian backward L-shaped macro-diagram for Y = C + I + G + (X-M), but a relationship plotted along a rising or falling curve, demonstrating a trade-off between unemployment and inflation: the less of the one, the more of the other.

ii) **An inverted form of the actual Phillips curve (in the form of an upward sloping aggregate supply curve) can best demonstrate this in terms of what we are talking about.**

(1) Here full employment means not just full employment of the labour force, but full employment of all resources in the economy. We thus begin, as did Keynes, with an economy with considerable underemployment of resources -- at much less than FULL EMPLOYMENT.

(2) Thus, as aggregate demand rises, and as supply increases to meet that demand, resources in some sectors become more or less fully employed, producing some price increases in those sectors.

- That is, diminishing returns set in and supply becomes less and less elastic, less capable of expanding except at very high cost, thus producing price increases.
- But in other sectors, supply remains more flexible, more elastic, so that production can expand there without rising prices.

(3) As aggregate demand further increases, however, more and more sectors encounter these rigidities with rising costs, and a rising price level becomes more and more general.

(4) To repeat: the more fully employed resources become across all sectors and markets with rising aggregate demand,

- the greater proportionally will be the increase in the price level
- and the less proportionally will be the increase in real output.

(5) But it is difficult to envisage any economy, over time, which has no capacity for further output -- absolute full employment.

(6) There are always some technological and organizational changes possible to achieve some real gains.

iii) **In fairness to Keynes, he virtually said as much in his *General Theory of Employment, Interest, and Money* (1936), p. 300:**

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[13] A. W. Phillips, 'The Relation Between Unemployment and the Rate of Change of Money Wage Rates in the United Kingdom, 1861 - 1957,' *Economica*, 25 (1958), 283 - 299. See note 10 above, on the Nobel-prize winning work of Edmund Phelps (Columbia University) in revising the Phillips curve (by taking into account rational expectations of future price changes).

> It is probable that the general level of prices will not rise very much as output increases, so long as there are available efficient unemployed resources of every type. But as soon as output has increased sufficiently to begin to reach the 'bottle necks', there is likely to be a sharp rise in the prices of certain commodities.

iv) **To put all this in terms of the modern quantity theory**:

(1) As was said earlier, but is worth repeating with more stress:

- in so far as an increasing **M** or increasing **V,** or an increase in both variables, means an increased aggregate demand,
- we can expect to find some unpredictable combination of rising output and incomes on the one hand (i.e., increasing **y**); and then rising prices (**P)** on the other;

(2) the closer the economy approaches full employment, the more increased spending will be inflationary.

(3) Conversely with heavy unemployment, in an economy with much of its resources lying idle, unutilized, an increasing **M** and rising aggregate demand will produce increased real output and incomes (in **y**), without any significant price increases.

(4) Thus the extent of inflation, or price increases, depends as much on these real factors as on the purely monetary factors.

v) **Friedman and other 'monetarists' have criticized the economic logic involved in the Phillips curve (concerning expectations of real vs. nominal or money incomes, etc.)**. They have offered a radically revised version – involving real rather than money wages; but time and space, and our mutual energies, do not permit an extended discussion of that debate here.

k) **The role of population in changing relative prices and price trends: what are the relationships between and among Population, Money, and Prices?**

i) **In essence we can argue that population changes often did,** in the manner described earlier, bring about or induce significant changes in *relative* prices.

- During periods of population growth, the relative prices of grains should normally rise;
- and during periods of population fall, the relative prices or real prices of grains should fall.

ii) **Population changes, however, can neither produce inflation or deflation in the same manner:** to repeat with the strongest possible emphasis the proposition just explained above:

- and to argue such a case is a fallacy that confuses micro-economics and macro-economics,
- one that confuses changes in relative prices with changes in the overall price level, as expressed by some consumer price index.

ii) **The only possible way in which population growth or decline can influence inflation or deflation, respectively, is indirectly:**

- if demographic changes stimulate broader economic changes that in turn induce further changes in either the stock or the flow of money:
- i.e., changes in the aggregate supply of money supplies (i.e., lead to a net outflow of metals, a net inflow, or the discovery of new gold and silver mines);
- or in the circulation of coins (Velocity).

iii) **Thus long-term price trends are essentially monetary in nature:**

(1) that means that both inflation and deflation have essentially monetary causes,

(2) even if real factors -- such as demographic changes -- themselves can influence the stock and/or flow of money in the economy, over some time period.

iv) **Some historically possible relationships between population and money:**

(1) Population growth that provides a positive economic stimulus, which leads to an expansion of the money supply or an expansion of monetary circulation.

- Such population growth may have led to rising agricultural prices, in the manner just shown;
- rising prices may have induced new settlements, capital investments, technological changes, etc., to expand the economy;
- and an expanding economy may have sought new sources of precious metals, while increasing the volume and rate of monetary circulation.

(2) An independent or exogenous increase in the money supply: which also stimulates economic expansion and growth, leading to an increased demand for labour and thus to earlier marriages with higher fertility rates (gross reproduction rates) leading to net population growth.

(3) The impact of other external or exogenous economic factors that stimulated economic growth, which in turn induced an expansion both in population and money supplies (or circulation).

l) **The effect of population growth may be twofold**:

i) **on the supply side**: i.e., for **y**:

(1) population growth can lead to fuller or full employment of resources, diminishing returns, rising marginal costs across most sectors of the economy,

(2) but only in the absence of further technological changes: including changes in markets, financial instruments.

ii) **on the demand side**: i.e., for **M** and **V:** population growth will initially increase the demand for money (and will thus increase **k**), and thus reduce any inflationary impact from any increase in **M.**

(1) But population growth may also or subsequently change the structure and distribution of that population;

(2) and increased urbanization, and consequent changes in markets and financial structures, may lead to a

reduced **k**

(3) or, to say the same thing, an increased **V**, an increased velocity of money circulation.

m) **The Demographic-Income Velocity Models of Goldstone and Lindert:**

i) **According to Keynesian expectations,** the income velocity of money should have fallen with the increases in money stocks

(1) such an increase in aggregate money stocks most clearly did occur during the sixteenth-century Price Revolution era (c. 1520-1650).

(2) But, contrary to Keynes' predictions, the income velocity of money did not fall – and apparently in rose, instead (as will be seen in a moment).

ii) **As we shall see next term, this same era also experienced a rapid recovery and growth in population**, one that has led several historians to argue that demographic factors played a role in the Price Revolution, i.e., in increasing the price level: Harry Miskimin (1975), Jack Goldstone (1984), and Peter Lindert (1985).[14]

ii) **The Goldstone Model:**[15]

(1) that demographic growth and structural economic changes, involving *inter alia*

- disproportionate changes in urbanization,
- greater commercialization of the rural sectors,
- far more complex commercial and financial networks,

(2) thereby allowed a given sum of money to effect far many more transactions, thus increasing the income velocity of money.

iii) **the Lindert model: [16]** elaborated on the Goldstone model by noting that an increase in the income velocity of money could have taken place from two additional factors:

(1) demographic growth would have led to increased family sizes, and thus an increase in the dependency ratio, thus increasing family expenditure transactions, with a greater number of dependents.

(2) a lag in money wages behind prices would also have forced many families to reduce active cash balances, and thus to increase again the income velocity of money.

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[14] Harry Miskimin, 'Population Growth and the Price Revolution in England,' *Journal of European Economic History*, 4 (1975), 179-85. Reprinted in his *Cash, Credit and Crisis in Europe, 1300 - 1600* (London: Variorum Reprints, 1989), no. xiv. See the next two notes.

[15] Jack Goldstone, 'Urbanization and Inflation: Lessons from the English Price Revolution of the Sixteenth and Seventeenth Centuries,' *American Journal of Sociology*, 89 (1984), 1122 - 60.

[16] Peter Lindert, 'English Population, Wages, and Prices: 1541 - 1913,' *The Journal of Interdisciplinary History*, 15 (Spring 1985), 609 - 34.

iii) **The specific circumstances so portrayed,** however, apart from the demographic,

(1) are largely peculiar to 16th- century England and

(2) thus do not so convincingly explain the very similar patterns of inflation in the 16th-century Low Countries,

(3) which had undergone most of these structural economic changes far earlier.

iv) **Nicholas Mayhew (1995),** in an article implicitly endorsing Keynes' views, has contended that:[17]

- the income-velocity of money has always fallen with an expansion in money stocks, from the medieval to modern eras,
- **but** with this one anomalous exception of the 16th-century Price Revolution.

iv) **Perhaps, for this one era,** we have miss-specified V (or *k)* by miss-specifying M: i.e., by not properly including increased issues of negotiable credit; or perhaps institutional changes in credit (as Goldstone and Miskimin both suggest) did have as dramatic an effect on V as on M.

v) **In any event, we shall return to this whole question next term (in January):** when we analyse the forces involved in the 16th-century Price Revolution in much greater depth.

[17] Nicholas Mayhew, 'Population, Money Supply, and the Velocity of Circulation in England, 1300 - 1700,' *Economic History Review*, 2nd ser., 48:2 (May 1995), 238-57.

D. Money and Population in Late-Medieval Price Movements and 'Long Waves'

1. Europe from ca. 1180 - 1320: the termination of a long Phase A: 'Commercial Revolution' era or 'the long thirteenth century'

a) **We begin with Europe as it nears the end of a very long, several centuries long and very powerful A phase,** which marks what many historians call the era of the 'Commercial Revolution'

i) **The European economy then manifested all of the features of a powerful A phase:**

(1) expanding population, expanding money supplies (as noted last day) and rapidly expanding monetary circulation (with significant innovations in credit, as we shall see later);

(2) and furthermore, the following manifestations of A-phase growth

- expanding settlements into eastern, Slavic Europe;
- extensive commercial expansion, especially in the Mediterranean zone,
- expanding trade with the Byzantine Empire at Constantinople,
- with the Crusader states in Palestine,
- and with the Muslim world as well, both in the Middle East and North Africa
- from whence, as noted western Europe got most of its gold.

ii) **That Phase A expansion can also be seen in the price movements:**

(1) with a general upward swing in the aggregate price level (from at least the 1180s) to the beginning of the 14th century;

(2) i.e., prolonged inflation; and also with an even steeper climb of grain prices (so that grain prices were rising relative to other prices).

b) **But there were two ominous signs that economic expansion and prosperity could not last:**

i) **Indications of possibly Malthusian demographic crises,**

(1) especially around the time of the Great European Famine of 1315-22;

(2) and I have already noted, under the subject of population, that population declines have been well documented in at least four regions (Essex in England; Normandy and Provence in France; and Tuscany in Italy).

ii) **Spreading warfare from the 1290s:** following almost a century of relative peace in Europe and the Mediterranean basin generally. I will discuss this more when I come to international trade, but will briefly note the following:

c) **European warfare from the 1290s:**

i) **In the East:**

- the Muslim (Mamluk) conquest of the western-dominated Christian Crusader states in Palestine and Syria,
- and then a serious commercial rupture with the Muslim world;
- a decade of warfare between Venice and Genoa as the two fought to control contracting trade in the eastern Mediterranean;
- Turkish invasions of the Byzantine Empire (Ottoman Turks)

ii) **In the West:**

- North African (the Berber Merinids) invasions of Spain;
- in Italy, the horrible Wars of the Sicilian Vespers, involving Spain (Aragon), France, and all the Italian states, including Sicily;
- and then wars between England and Scotland and England and France,
- and France and Flanders;
- and finally civil wars in the Habsburg German Empire.

iii) **These wars continued on to merge with the more famous Hundred Years' War:** from 1337 to 1453.

iv) **As I will examine in greater depth when we come to international trade,** and as you can read in my chapter in the *Handbook of European History*, *Late Middle Ages and Renaissance*, Vol. I, these wars were very harmful for European commerce, especially in raising transport and transaction costs (more harmful through taxes and embargoes and currency changes).[18]

2. **The Late-Medieval 'Great Depression:' ca. 1320 - ca. 1460**

a) **This era had all the classic hallmarks of a B phase:** a stark and prolonged B phase, from perhaps the 1320s until the 1460s, or later:

i) **an era of protracted widespread warfare, famines, and plagues:** such as Europe had not seen since the end of the old Roman Empire – or since the Carolingian era.

ii) **depopulation,** followed by prolonged demographic stagnation, contraction of settlements, contractions in international trade, overall economic contraction;

iii) **and periods of prolonged deflation,** but interspersed and interrupted by periodic inflations that were closely connected to warfare and the financing of warfare through coinage debasements.

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[18] John Munro, 'Patterns of Trade, Money, and Credit', in James Tracy, Thomas Brady Jr., and Heiko Oberman, eds., *Handbook of European History in the Later Middle Ages, Renaissance and Reformation, 1400 - 1600*, 2 vols. (Leiden: E.J. Brill, 1994-95), Vol. I: *Structures and Assertions* (1994), pp. 147-95.

b) **Is the term 'Great Depression' justified for this era?**

i) **That depends on how one defines a depression:** according to the *Penguin Dictionary of Economics*: 'there is no quantitative definition of a depression as is the case with a recession. Only the period 1929-1933 ... is usually referred to as a depression.'

ii) **Recession:** 'A downturn in the business cycle characterized by two successive quarters of negative economic growth [i.e., decline] in the real Gross National Product.'

iii) **Thus,** whether we begin this Phase B in the 1320s, with some signs of demographic decline, or with the Black Death of 1348 onwards, when the population of Europe fell by a catastrophic 40% or more (perhaps 50%),

(1) there can be no doubt that aggregate output, the European GNP if you will, underwent an almost equally severe contraction -- a 'negative economic growth',

(2) an economic decline that lasted not two quarter-years, but well over a hundred years, perhaps 150 years.

iv) **Further, the European economy did not suffer a contraction merely from depopulation:**

(1) **but also warfare:** from the economic causes of protracted, prolonged, and bitter warfare from the 1290s until the 1460s;

(2) **also from all the other causes of depopulation:**

(3) For we can well imagine the economic dislocation and social chaos that would have resulted from repeated famines and plagues.

v) **for me, warfare, from the 1290s, was most likely the crucial variable:**

(1) not so much in the destruction of land and capital resources, not in dislocations to international trade routes,

(2) but rather from the role of governments engaged in both aggressive warfare and in defence: in terms of:

- the fiscal or tax policies, monetary policies of coinage debasement and bullionism (impeding international flow of metals),
- and commercial policies of protectionism and retaliatory embargoes.

c) **The Course of Prices: during the 14th and 15th centuries**.[19]

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[19] On this, see John Munro, 'Wage Stickiness, Monetary Changes, and Real Incomes in Late-Medieval England and the Low Countries, 1300 - 1500: Did Money Matter?' *Research in Economic History*, 21 (2003), 185 - 297; John Munro, 'Before and After the Black Death: Money, Prices, and Wages in Fourteenth-Century England', in Troels Dahlerup and Per Ingesman, eds., *New Approaches to the History of Late Medieval and Early Modern Europe: Selected Proceedings of Two International Conferences at The Royal Danish Academy of Sciences and Letters in Copenhagen in 1997 and 1999*, Historisk-filosofiske Meddelelser, no. 104 (Copenhagen: The Royal Danish Academy of Sciences and Letters, 2009), pp. 335-364.

Finally, see also my Working Paper (for a conference paper, presented in Montreal on 11 October 2002),

i) **The expansionary Phase A with prolonged inflation came to an end, as noted, at the beginning of the 14th century;**

(1) and that was followed by an apparent monetary contraction in many parts of northern and western Europe (for reasons that still remain unclear);

(2) and mirroring that evident monetary contraction (at least in England) is a very severe deflation, coming to an end just before the Black Death.

ii) **The Black Death and subsequent depopulations were immediately followed**

(1) not by deflation as one might expect (by the Ricardo Model)

(2) but by severe inflation, lasting about a quarter-century**.**

iii) **Chief factors:**

(1) An increase in the per capita supply of money, for although 'men were dying, coins were not' (David Herlihy).

- In other words, in the identity **M.V = P.y**,
- we can see that **y** was contracting much more severely than **M** (or than the product of **M.V),** so that prices had to rise.

(2) As for Velocity, as I remarked last day, the Black Death seems to have been followed by a hedonistic spending spree, especially amongst those survivors with inherited cash balances.

(3) Warfare and coinage debasements, especially on the continent, may have been the predominant factors.

iv) **But ultimately deflation did set in, from the later 1370s or 1380s,**

(1) either because **M** contracted more than did **y**,

(2) or because of increased hoarding and thus a serious reduction in **V**; i.e. an increase in **k.**

(3) Those deflationary trends lasted until the 1460s, in general, though more so in England, than elsewhere, i.e., than in continental Europe, for two major reason

- England suffered far less from warfare, fighting most of its wars on continental soil (i.e., principally in France.
- and in having far fewer, and far less drastic coinage debasements:

(4) Thus coinage debasements, in continental Europe, as my be seen in particular from the graphs for Flanders and Brabant, debasements often produced horrendous, if short term debasements; but

- during periods of stable coinages, deflation generally resumed, until the 16th century

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on: *Postan, Population, and Prices in Late-Medieval England and Flanders*, posted at: http://www.economics.utoronto.ca/ecipa/archive/UT-ECIPA-MUNRO-02-04.html. For the graphs, see: http://www.economics.utoronto.ca/munro5/Postangraphs.doc.

- even in England, Edward IV's 25% debasement of the silver coinage in 1464 led to only a brief period of inflation, followed by renewed, prolonged deflation.

v) **Note from the accompanying table, using data provided by Nicholas Mayhew,** that, in later medieval England, Velocity demonstrated a longer-term trend to decline until the onset of the 16th-century Price Revolution, when, for a complex series of reasons, it rose rather markedly (only to fall again from the later 17th century).

d) **The Economic Consequences of Deflation: Did it Matter?**

i) **This question involves another question that explains the crucial difference between the Classical, Real and Monetary approaches in studying economic history:** did money matter?

(1) The 19th-century Classical School of Economics was fundamentally based upon a very crude (and totally unhistorical) Quantity Theory of Money, assuming as an axiom that:

- a given change in the quantity of money (say, a 10% increase) would automatically produce a proportional increase in the price level (i.e., a 10% rise in the price level or CPI)
- that, since money should be 'neutral', all prices would change in exactly the same proportional degree (i.e. all rise by 10%).
- Therefore, monetary changes do not matter and do not affect relative prices

(2) In fact, in so far as monetary changes – in both stocks (M) and flows (V or k) – do influence changes in the price levels, those changes virtually never correspond to these predictions of the 19th century Classical School of Economics.

(3) The key point to observe is that, while prices for various commodity groups may generally move up or down together in tandem, individual prices never move in unison.

(4) Our focus in particular is on the behaviour of factor prices: for land, labour, and capital.

ii) **The possible effects of monetary changes upon changes in prices:** the price level and relative prices.

(1) Non-proportional changes in the price level (i.e., the CPI):

- the price level never changes proportionally to changes in the money supply, because the impact of changes in money stocks (put into active circulation) can be offset or modified by changes in both V (or k) and in y: i.e. by successive changes in real net aggregate output and thus in NNI.
- Thus, in terms of monetary expansion and possible inflation, consider the standard equation, **M.V = P.y**: (or **M = kPy**).
    - An increase in the effective money supply might be somewhat offset by some fall in the income velocity of money (in V, or reduction in k = 1/V) – with a lesser need to economize on money;

- and by some increase in net aggregate output or product, i.e. in NNI.

- Conversely, a monetary contraction might be offset by some increase in V and a reduction in **y.**
- We have already noted that the post-Plague inflation (1348 - 1375), even with some possible contraction in M (aggregate monetary stocks), was the result of a sharp reduction in **y**, likely combined with a rapid increase in **V** (hedonistic spending sprees plus military expenditures)

(2) Furthermore, changes in individual prices depended on:

- the individual price elasticities of demand and of supply; and also
- the income elasticities of demand on the part of those who experience changes in their cash balances (increases or decreases): i.e. upon the expenditure patterns of those most affected by changes in money supplies and money circulation

(3) Such price changes will also depend upon the force of institutional rigidities hindering price responses to monetary changes and changes in the overall price levels.

(4) Thus individual prices respond with a lesser or greater degree of flexibility

iii) **Potentially negative consequences of deflation for producers and entrepreneurs:** [20]

(1) The problem of institutional wage-stickiness – or 'downward wage-stickiness':

- namely, that nominal money wages – wages paid in currently circulating silver coin – do not fall, or adjust downwards in a proportional manner, in correspondence with a general fall in the price level.
- This phenomenon that becomes more and more prevalent after the Black Death, and continued tight up to the 18th-century Industrial Revolution era.[21]
- Thus the problem for the producer or entrepreneur (including landlords running their demesnes as commercial farms): that the wages they have to pay remain the same while the prices for their products are falling.

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[20] On this see, John Munro, 'Wage Stickiness, Monetary Changes, and Real Incomes in Late-Medieval England and the Low Countries, 1300 - 1500: Did Money Matter?' *Research in Economic History*, 21 (2003), 185 - 297.

[21] Consider this comment from Adam Smith, *An Inquiry Into the Nature and Causes of the Wealth of Nations* (1776), ed. Edwin Cannan (New York: Modern Library, 1937), p. 74. ' The wages of labour do not in Great Britain fluctuate with the price of provisions, [which] vary everywhere from year to year, frequently from month to month. But in many places the price of labour remains uniformly the same sometimes for half a century.... The high price of provisions during these ten years past has not in many parts of the kingdom been accompanied with any sensible rise in the money price of labour.' In fact, in southern England, the money wage of master masons and carpenters had remained fixed at 24d per day (i.e. 2s 0d) for precisely 40 years, from 1773 to 1773, while the well-known Phelps Brown & Hopkins 'Basket of Consumables' composite price index had risen, over the same 40-year period by 57.4 percent.

(2) The problem of contractual interest rates:

- Almost all those who produces goods and services and who trades in them – farmers, manufacturers, merchants – have to borrow capital funds, both for working and for fixed capital,
- and normally they do so with contracts that specify the interest rates (implicitly or explicitly), and the principal to be repaid.
- Thus, during deflation, such farmers, producers, merchants, etc. are obligated to make annual interest payments in the same amount of current coin, whose real value (purchasing power) is rising, while the prices for their products are falling.

(3) Thus the inherent economic problem of deflation: that it punishes producers and merchants with the rising real costs of labour and capital (wages and interest).

iv) **The positive effect of deflation for the 15th South-German silver mining boom:**

(1) As I argued earlier, in last week's lecture, by the mid-fifteenth century, the prolonged deflation had in effect raised the purchasing power of precious metals, gold and silver;

(2) and their increased relative value provided the necessary stimulus or incentives:

- to engage in mining exploration in South Germany and Central Europe
- and to develop new technologies to exploit this region's untapped and vast resources of silver (with copper) in Central Europe: in both mechanical engineering and chemical engineering
- thereby producing the Central European Silver Mining Boom, from the 1460s to the 1520s.

d) **Why was that South German silver-mining boom not inflationary?**:

i) i.e., **why was there no evident inflation (see graph on the screen) until the early 16th century,** about the 1520s?

ii) **this topic actually belongs to the second term:** the question of the 16th-century Price Revolution

e) **But for now, some brief explanations on why the Price Revolution began late, not early:**

i) **The first and major answer lies in the fact that Europe was still drastically underpopulated,**

(1) with very considerable amounts of land and other resources lying idle, when this mining boom commenced in the 1460s

(2) even though demographic recovery had already commenced in Italy and several other regions, (3) though not in England nor the Low Countries.

ii) **Thus before the 1520s, with so many still unemployed resources, increased aggregate demand (monetized by new silver) stimulated economic recovery under conditions of very elastic supply:**

- that production was restored and expanded at little if any increase in marginal costs, by taking up so much slack.

- In other words, the consequences of the economic stimuli was simply that y was able to adjust as rapidly as the monetary growth, measured by the product of M.V.

iii) **Perhaps we could also argue that not until the beginning of the 16th century** did the mining boom actually increase the stocks of silver to make a major difference to prices and output

(1) Of course, increased silver stocks would increase the money supply only after it had been minted into coins and after those coins had been put into active circulation.

(2) At the same time, we have to realize that some of that increased output of mined silver did not stay in Europe but was going in increased Venetian exports to the Levant (at least until the further Turkish conquests of ca. 1515-20); then to India and the East Indies.[22]

4. **The Era of the European Price Revolution, c. 1520 - c. 1640**

a) **The ensuing period of the sixteenth-century Price Revolution**: we shall consider next generally, when we shall see very marked and prolonged inflation.

b) **I will leave that explanation,** for the inflation of the Price Revolution era, until January.

c) **But for now,** we can observe that the evident inflation from the 1520s is should now be much more readily understandable.

[22] See John Munro, 'The Monetary Origins of the 'Price Revolution': South German Silver Mining, Merchant-Banking, and Venetian Commerce, 1470-1540', in Dennis Flynn, Arturo Giráldez, and Richard von Glahn, eds., *Global Connections and Monetary History, 1470 - 1800* (Aldershot and Brookfield, Vt: Ashgate Publishing, 2003), pp. 1-34; and also John Munro, 'The Central European Mining Boom, Mint Outputs, and Prices in the Low Countries and England, 1450 - 1550,' in Eddy H.G. Van Cauwenberghe, ed., *Money, Coins, and Commerce: Essays in the Monetary History of Asia and Europe (From Antiquity to Modern Times)*, Studies in Social and Economic History, Vol. 2 (Leuven: Leuven University Press, 1991), pp. 119-83.

MODERN QUANTITY THEORIES OF MONEY: FROM FISHER TO FRIEDMAN

Most economic historians who give some weight to monetary forces in European economic history usually employ some variant of the so-called **Quantity Theory of Money**. Even in the current economic history literature, the version most commonly used is the Fisher Identity, devised by the Yale economist Irving Fisher (1867-1947) in his book *The Purchasing Power of Money* (revised edn. 1911). For that reason we cannot avoid it, even though most economists today are reluctant to use it without significant modification.

1. **The Fisher Identity**, or **The Equation of Exchange**: **M.V ≡ P.T**

   M = stock of money in coin, notes, bank deposits ('high-powered')

   V = the velocity of circulation; the rate at which a unit of money circulates in effecting transactions in course of one year; the average number of times it 'turns over'

   P = some measure of the price level; e.g. Consumer Price Index

   T = the total volume of monetary transactions that take place in the economy during the course of that same year. But this cannot be properly quantified.

2. **The Cambridge Cash Balances Equation: M = k.P.T**

   This is a lesser-known rival to the Fisher Identity that emerged during the 1920s at Cambridge, with a formula that resolved at least the problems concerning Velocity:

   M, P, and T: as defined above in the Fisher Identity

   k = the ratio of cash balances to the total money value of all transactions in the economy: the proportion of the total value of all monetary transactions that the public chooses to hold in cash balances; and thus it tells us the necessary amount of **M** that is required for that level of **P.T** (total spending).

   The 'cash balances' approach is based on Liquidity Preference: according to Keynes

   (1) **transactions motive:** people hold a stock of ready cash in order to meet their day to day needs in buying goods and paying for services, etc. This is deemed to be the major need for holding ready cash.
   (2) **precautionary motive:** to have ready cash on hand in order to meet some unforseen emergency, as a contingency fund for future needs.
   (3) **speculative motive:** to have ready cash to take immediate advantage of some special investment opportunity -- a cash fund to speculate with.

3. **The Modern Form of the Quantity Theory: Friedman's Income Version**

   y replaces Fisher's **T, so that:**

   M.V. = P.y

M = k.P.y

y = real Net National Product (NNP) = real Net National Income (NNI)

Thus: based on the Keynsian equation: **Y = C + I + G + (X - M).**

That is, Net National Income (Y) equals the sum of total national Consumption (C) plus total Investment (I) plus Government Expenditures (G) plus the net difference between total Export incomes (X) and total expenditures on Imports (M).

To calculate **y:** divide **Y** by **P.**

That is, calculate the NNI by deducting depreciation from the GNP; and then divide that result (NNI) by some agreed upon price index (e.g. consumer price index): **y = Y/P**.

The Cambridge version, which is conceptually preferable, is mathematically related to the much more widely used Fisher equation,

In that: **k = 1/V**; and **V = 1/k**

i.e., they are each the reciprocal of the other.

See all these variables in the tables on Canada's money supplies, prices, GDP, Population, Inflation

Note that Statistics Canada (CANSIM) provides estimates of GDP, and not NNP.

Mayhew's Estimates of Money Supplies, Velocity, Prices, and National Income in England, 1300 - 1670

Date	1300	1470	1526	1546	1561	1600	1643	1670
Money Supply in millions of £ sterling	0.9	0.9	1.4	1.45	1.45	3.5	10	12
Velocity (Income V)	5.178	3.889	3.571	5.517	9.31	6.286	3.5	3.407
Price Level: PBH Index	104.8	104.6	135.1	172.3	289.3	478.3	597.8	635.7
National Income Y in millions £ st.	4.66	3.5	5	8	13.5	22.000m	35.000m	40.880m
Population in millions	6	2.3	2.3	2.9	3	4.100m	5.100m	5.000m

Source: Nicholas J. Mayhew, 'Population, Money Supply, and the Velocity of Circulation in England, 1300-1700,' *Economic History Review*, 2nd ser. 48:2 (May 1995), p. 244.

PBH Index: Phelps Brown and Hopkins 'Basket of Consumables' Price Index, with the base 1451-75. See the following table.

Phelps Brown and Hopkins:

'BASKET OF CONSUMABLES' COMMODITY PRICE INDICES **M1451-75 = 100**

COMMODITY	ENGLAND				BRABANT				FLANDERS			
	Amount	Unit	Value	Percent	Amount	Unit	Value	Percent	Amount	Unit	Value in	Percent
Farinaceous							in d. gr.				in d. gr.	
Wheat	1.25	bushels							45.460	litres		
Rye	1.00	bushels			126.000	litres			39.370	litres		
Barley	0.50	bushels							18.180	litres		
Peas	0.67	bushels							24.370	litres		
Barley Malt	4.50	bushels			162.000	litres			163.660	litres		
Sub-total	7.92	bushels		42.50%	288.000	litres	54.74	35.32%	291.040	litres	57.14	44.88%
Meat, Fish, Dairy												
Sheep	1.50	sheep										
Beef					23.500	kg						
Herrings	40.00	fish			40.000	fish						
Butter	10.00	lb.			4.800	kg			13.610	kg		
Cheese	10.00	lb.			4.700	kg			13.610	kg		
Sub-total				20.00%			60.26	38.87%			44.66	35.08%
Industrial												
Charcoal	4.25	bushels			162.000	litres						
Candles	2.75	lb.			1.350	kg						
Lamp Oil	0.50	pint										

COMMODITY	ENGLAND				BRABANT				FLANDERS			
Canvas/Linen	0.67	yard			1.800	metres						
Shirting	0.50	yard										
Coarse Woollens	0.33	yard			1.125	metres			1.225	metres		
Sub-total				20.00%			40.01	25.81%			25.52	20.04%
TOTAL				100.00%			155.02	100.00%			127.33	100.00%

Money Supply, GDP, and Prices in Canada, 1990 - 2011: Annual Means of monthly data

Year	M1 narrow Money: M1 narrrow $ billions IMF	M1+ Gross M1+ Gross broad $ billions IMF	V = Y/M [narrow] Income Velocity of M1: Narrow Base	V = Y/M [gross] Income Velocity of M1: Gross Base	k gross M1+ base Cambridge cash balances k = 1/V	P (1) CPI 1992= 100 Cansim	P (2) CPI 2002 = 100 StatsCan	y Real GDP: $ billions 1992 dollars CANSIM	GDP = Y Gross Domestic Product in billions current market prices	Population Canadian population in millions	Inflation: Percent Change in CPI
1990	43.6960	128.499	15.560	5.2913	0.18899	93.27	78.40	729.008	679.921	27,638,583	4.76%
1991	46.1710	134.510	14.844	5.0953	0.19626	98.51	82.80	695.745	685.367	27,987,829	5.62%
1992	49.1970	139.841	14.238	5.0091	0.19964	99.98	84.00	700.655	700.480	28,319,473	1.49%
1993	56.5290	151.501	12.864	4.7999	0.20834	101.83	85.60	714.092	727.184	28,648,235	1.86%
1994	60.9850	156.280	12.640	4.9326	0.20273	102.00	85.70	755.758	770.873	28,958,270	0.16%
1995	65.5270	160.398	12.368	5.0526	0.19792	104.21	87.60	777.698	810.426	29,262,649	2.17%
1996	77.9190	179.464	10.740	4.6631	0.21445	105.85	88.90	790.613	836.864	29,570,577	1.58%
1997	86.4950	197.601	10.206	4.4672	0.22385	107.57	90.40	820.638	882.733	29,868,726	1.62%
1998	93.6230	205.509	9.773	4.4522	0.22461	108.63	91.30	842.258	914.973	30,125,715	0.99%
1999	101.1830	221.764	9.710	4.4301	0.22573	110.52	92.90	888.953	982.441	30,369,575	1.73%
2000	116.1030	249.199	9.273	4.3201	0.23147	113.50	95.38	948.557	1,076.577	32,352,977	2.70%
2001	133.8580	279.640	8.278	3.9624	0.25237	116.36	97.78	952.244	1,108.048	31,129,298	2.52%
2002	140.1970	297.658	8.223	3.8733	0.25818	119.00	100.00	968.828	1,152.905	31,446,719	2.27%
2003	153.7390	314.994	7.891	3.8514	0.25964	122.27	102.75	992.190	1,213.175	31,734,093	2.75%
2004	170.1790	343.417	7.586	3.7590	0.26603	124.54	104.66	1,036.514	1,290.906	32,038,401	1.86%
2005	188.7220	366.910	7.280	3.7444	0.26707	127.30	106.98	1,079.216	1,373.845	32,352,977	2.21%
2006	215.3450	403.777	6.735	3.5921	0.27839	129.85	109.12	1,116.992	1,450.405	32,690,242	2.00%
2007	226.3779	431.645	6.757	3.5436	0.28220	132.63	111.45	1,153.314	1,529.589	33,048,782	2.14%
2008	n.a.	488.047		3.2854	0.30438	135.77	114.09	1,180.986	1,603.418	33,448,916	2.37%
2009	n.a.	491.771		3.1091	0.32163	136.18	114.43	1,122.807	1,528.985	33,856,945	0.30%
2010	n.a.	551.750		2.9445	0.33962	138.60	116.47	1,172.192	1,624.608	34,254,344	1.78%
2011	n.a.	599.765		2.8431	0.35173	142.63	119.86	1,195.519	1,705.181	34,605,346	2.91%