A 'Visual Analysis' Graphic Summary of the IEA Conceptual & Analytical Framework

http://iea-macro-economics.org/visanal2.html

Diagrams and equations for those who like to think in visual terms -- "One picture is worth a thousand words."

A. Introduction

In a modern money economy, money is the life-blood of the system. As it circulates endlessly around the economy, it is the medium of exchange with which people buy things and make payments; the buyers' spending is the sellers' income.

Empirically, the now-traditional **Keynesian analytical framework** is based largely on the conceptual framework of the **National Income and Product Accounts (NIPA)**. But the NIPA spending and income flows are merely the dollar values of the "real" goods and services that the economy produces. The NIPA are conceptually unable to deal with either the financial saving and credit flows that are so important in financing the spending, or the money-creating flows of the Federal Reserve and banking system that finance the overall growth of the spending and income flows.

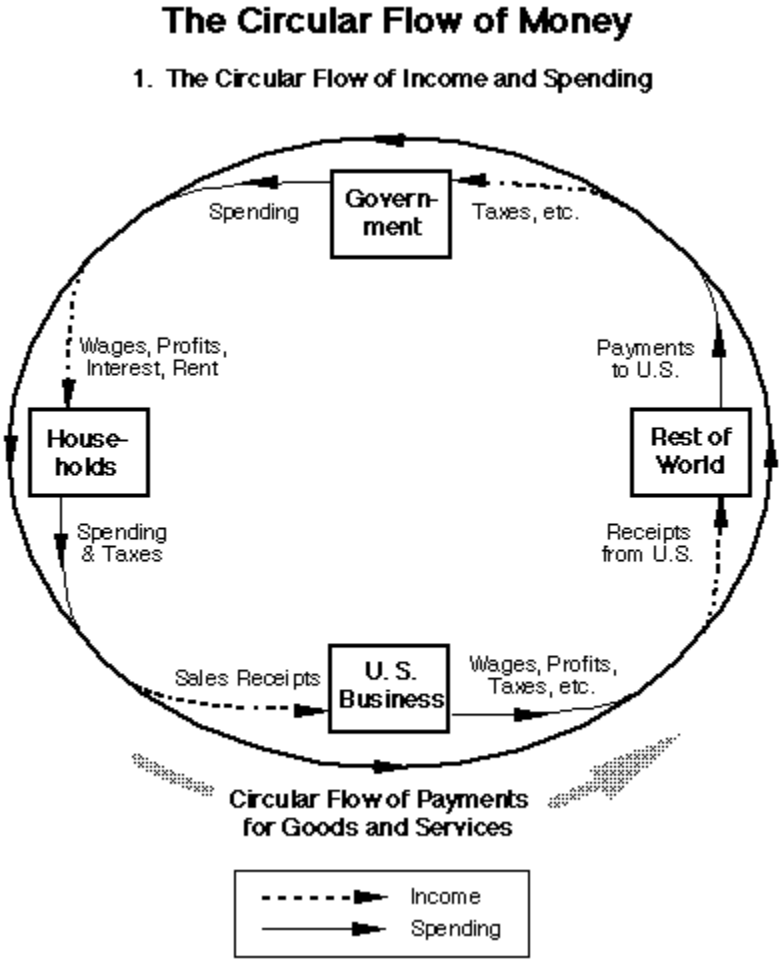
As a result, the key Keynesian/NIPA concept of saving is empirically measurable only indirectly, as the difference between income and spending, leaving an empirical "financial gap" between actual financial saving and the credit-financed investment that returns this saving to the "circular flow" of spending and income. Moreover, the Keynesian/NIPA conceptual framework provides no way to analyze empirically the way "newly-printed" money actually finances the growth **Gross Domestic Product (GDP)**.

IEA's **Integrating Dynamic Money Flow (IDMF)** conceptual framework "completes the Keynesian Revolution" by bridging the Keynesian/NIPA financial gap between saving and investment, thereby making it possible to functionally integrate the NIPA with the Federal Reserve's money-and-credit **Flow of Funds Accounts**, and by opening up the traditional "black box" between money creation and economic growth.

B. The IDMF Circular Money-Flow Diagram

To facilitate understanding of the IDMF conceptual framework, its graphic exposition is developed in three steps. Each step includes a **circular-money-flow diagram**, the corresponding macroeconomic equation, and a brief explanation of the functional relationships.

Step 1:
The basic NIPA-Keynesian Spending/Income Flows --
the money payments for goods and services.



This diagram shows the flow of money payments in the National Income and Product Accounts (NIPA) conceptual perspective. (The actual goods and services purchased by these payments are the implicit but unshown opposite flow.)

Each payment **transaction** also has two aspects: the **spending** of the purchaser is the **income** of the seller. This dual nature of money transactions is the basis for the NIPA's double-entry accounting, and for the basic Keynesian/NIPA macro equation: **Spending = Income**. They are conceptually equal "by definition." And since NIPA output is measured by what is spent for it, **Output = Income**.

(However, in measuring total NIPA output and income, the double-counting in intermediate-type transactions is netted out by a "value added" concept. At each stage of production, **net** output and income (in the form of wages, profit, interest, and rent) is calculated as gross sales income minus taxes and purchases from previous stages of production (if any.)

The Keynesian/NIPA "Achilles heel"

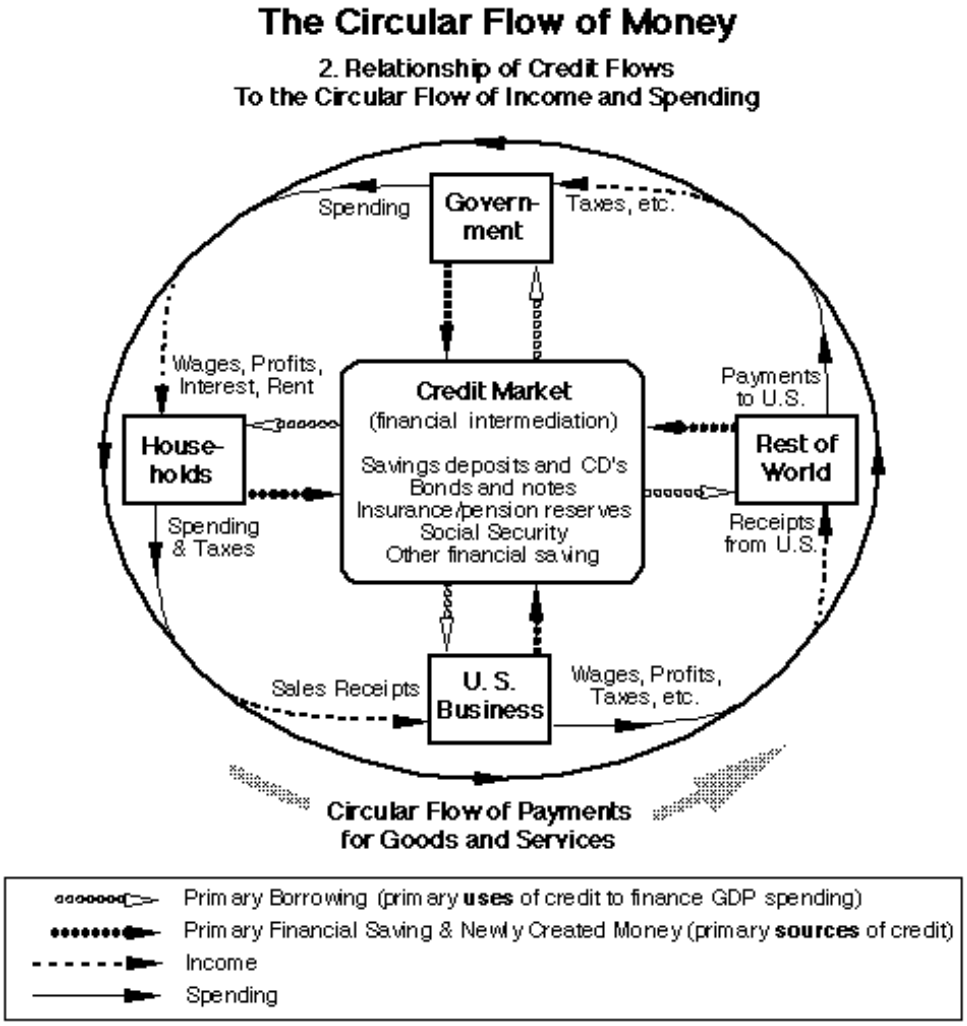
Keynesian theory is conceptually based largely on the NIP accounts (which happened to be in development about the same time). But for comprehensive money-flow analysis, the Keynesian/NIPA system has a **dual** conceptual and empirical **financial gap**:

1. **Between saving and investment**. It does not show who does the financial saving and how it goes back into the circular flow via business investment and credit-financed consumer consumption.
2. **Between money growth and GDP growth**. It does not show how New Money created by the banking system **enters** the circular flow (as the main means of financing its overall growth), or how it finally **exits** the circular flow by becoming locked into individual transactors' money-inventory **stocks**.

Resulting conceptual and analytical anomalies and errors

1. In the NIPA, "saving" is merely an accounting residual between income and spending, not a directly measurable independent money-flow.
2. Thus, Keynesian analysis has to resort to confusing, abstract, imprecise, non-empirical concepts like "ex ante/ex post," "propensities," "liquidity preference," and IS/LM curves.
3. Keynesian theory uses a basically **two sector** analytical framework: households do the saving and business does the offsetting investment spending. In fact most business investment is internally financed (from depreciation allowances and profits); while households do about as much investment spending as business (for houses, cars and consumer durables), and provide an even larger "outlet" for the economy's financial saving.
4. To make the NIPA accounts fit Keynesian two-sector theory, household investments in houses are put in the business sector, and household investments in autos, durables and education are implicitly treated as "consumption," (and thus netted against income along with non-durables and services) as are government investments in dams, roads, schools, office buildings, satellites and aircraft carriers.
5. In Keynesian theory, changes in business investment are the main causes of GDP fluctuations, and have a "multiplier effect." In fact, changes in business investment are largely the result of structural changes in the economy affecting profit prospects. And M1 money growth, largely controlled by the Fed, is the main factor initiating recessions and recoveries, and provides the main multiplier effect.

Step 2:
Inclusion of the *Credit Market* -- conceptually, one big central "bank" -- and the *Primary Credit Flows* -- financial saving and the credit-financing of GDP spending



A **Credit** money-flow is a *transfer of money* with expectation of repayment.

The IDMF **Primary Credit** concept fills the NIPA "financial gap" between saving and investment.

Primary Financial Saving is a money-flow "detour" from the main circular flow of income and spending.

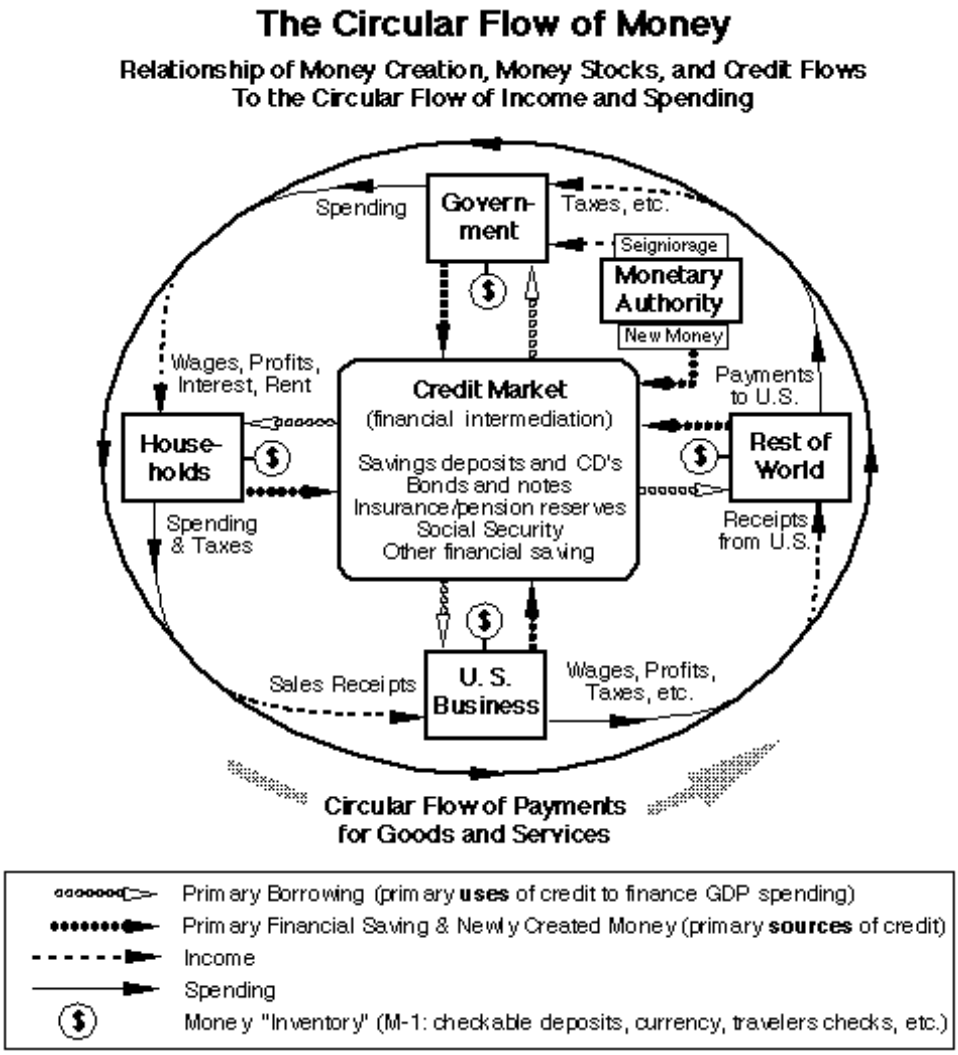
Primary Borrowing is money borrowed (or obtained as an equity investment) to actually finance GDP spending. It ends the Financial Saving detour by returning the money to the main circular flow of income and spending.

The **Credit Market** is a conceptual abstraction ("super-giant bank") that accepts all **Primary Financial Saving** and finances all **Primary Borrowing**. It services the saving/investment

money-flow detour, and nets out intermediate ("pass-through") credit flows -- such as when General Motors issues bonds to finance consumer car loans, or a local store borrows from a bank to finance its "book credit" to customers, or an individual investor borrows from a stock broker to buy newly-issued stock "on margin." (These "pass-through" credit flows are netted out very much the way intermediate income/output flows are netted out by the NIPA "value added" concept.)

The **National Credit Balance** between total Primary Financial Saving and total Primary Borrowing is the main determinant of interest rates -- the prices of credit -- because interest rates respond to the market balance between supply and demand like other relatively competitive prices.

Step 3:
The complete IDMF circular money-flow diagram, including the *Monetary Authority* and the *Sector Money-Inventories*



IEA's **Integrating Dynamic Money Flow** (IDMF) conceptual framework makes it possible to analyze empirically the key dynamic relationship between money growth and economic growth by making a clearcut distinction between **Money** and **Credit**, using two devices:

- It limits the definition of Money to the actual means of payment -- the checkable deposits and currency that people pay bills and buy things with (M1). (Only about one-fourth of the Fed's "M2" is **Money**; the rest is savings deposits and other **credit** assets.)
- It treats Money conceptually as a non-credit "pseudo-commodity," which is "created" and "stored" like gold and silver coins were before the medieval goldsmiths invented "fractional reserve" checkable deposits.

This diagram adds two conceptual abstractions to the money-flow analysis:

- The **Monetary Authority** (essentially, the Federal Reserve) exogenously initiates the flow of **New Money** into the economy.
- The individual sector **Money Inventories** (the dollar signs in circular "pocketbooks") are where this money-flow ends.

Although newly-created Money can flow directly to governments as **seigniorage,** in this diagram it flows to the Credit Market because, in our credit-money economy, most New Money is actually created by individual banks in the process of making loans.

The Reserve Multiplier. The banks' money-creating power is limited by the reserves they are required to hold against checkable deposits. When the Fed wants to increase the supply of New Money, it buys Treasury securities with Fed-created **Reserve Money**, which comes back to the Fed as bank reserve deposits. The amount of New Money created this way is equal to the reciprocal of the required **reserve ratio** -- now about 10%. Thus, each dollar of new reserves enables the banks to create ten dollars of New Money.

The Money Multiplier and the Money Demand Ratio (MDR). The New Money created by banks is not "used up" when it's first spent; it continues to circulate around the economy, re-spent over and over. Each time it's re-spent it adds something to the economy's total spending/output (the GDP). But this **multiplier effect**, like the reserve mutliplier, is limited. As the **flow** of GDP (and corresponding national income) increases, so does the **stock** of **Money Inventory** needed to service it -- just as a super-market's **stock** of grocery inventory needs to increase as its **flow** of sales increases. Thus, all the New Money becomes progressively locked into people's increasing money-inventory stocks -- just as additional reserve money becomes progressively locked into the banks' **required** reserves.

The Money Demand Ratio (MDR) is the ratio of money **stock** to GDP **flow**. The value of the money multiplier is the reciprocal of the MDR -- just as the value of the reserve multiplier is the reciprocal of the reserve ratio. With the present MDR of about 14%, the money multiplier is about 7 -- each dollar of new money finances seven dollars more GDP.

The Basic Money-Growth/GDP-Growth Equation. Since GDP growth is usually measured in growth-rates rather than dollars, it is useful to express the money-growth/GDP growth relationship the same way (gr= growth rate):

GDP gr = M1 gr - MDR gr

Note that an **increase** in MDR growth rate has the same effect as a **decline** in M1 growth rate. As a monetary policy guide, the formula could be stated another way:

M1 gr = policy-desired GDP gr + MDR gr

That is, the Fed can manage the economic growth rate by very precisely **monitoring** the current MDR **trend** growth rate, and managing M1 growth accordingly. Managing economic growth by this transparent and easily understandable formula would be more precise than its present focus

on interest rates, and also make Fed-watching much simpler and less disturbing to the capital markets.

The Fed's Money-Management leverage problem. If you like mind-benders, how about this: if the reserve multiplier is 10, and the money multiplier is seven, then the combined reserve/GDP multiplier is 70 -- each dollar of new reserves creates $70 more GDP. Talk about **leverage**! Actually, it's even greater and less precise than that, because the required reserve ratio is now so low that a large proportion of banks need that amount of vault cash anyway, and are effectively out of Fed control.

In any case, that leverage is too great for the Fed to directly target reserves as its means of managing the GDP growth rate. That is undoubtedly a key reason why the Fed resorts to the conceptually less precise method of ostensibly targeting short-term interest rates. When the Fed sells Treasury securities to reduce bank reserves and money creation, this also reduces the total supply of credit and increases interest rates. But the relationship between interest rates and money creation is not precise -- particularly since an increase in interest rates also tends to reduce the MDR by inducing the movement cash into higher-interest assets and the development of ways to function on smaller cash balances. This has the same effect as an increase in the money supply. As a result, the Fed is now forced to resort to an ad hoc, trial-and-error approach to money and GDP management.

But whether the Fed ostensibly uses interest rates or M1 as its control lever, the obvious solution for the excessive reserve/GDP leverage is to increase the required reserve ratio -- optimally to 100%. Unfortunately, bank resistance has made that reform, long recommended by leading economists, politically difficult.

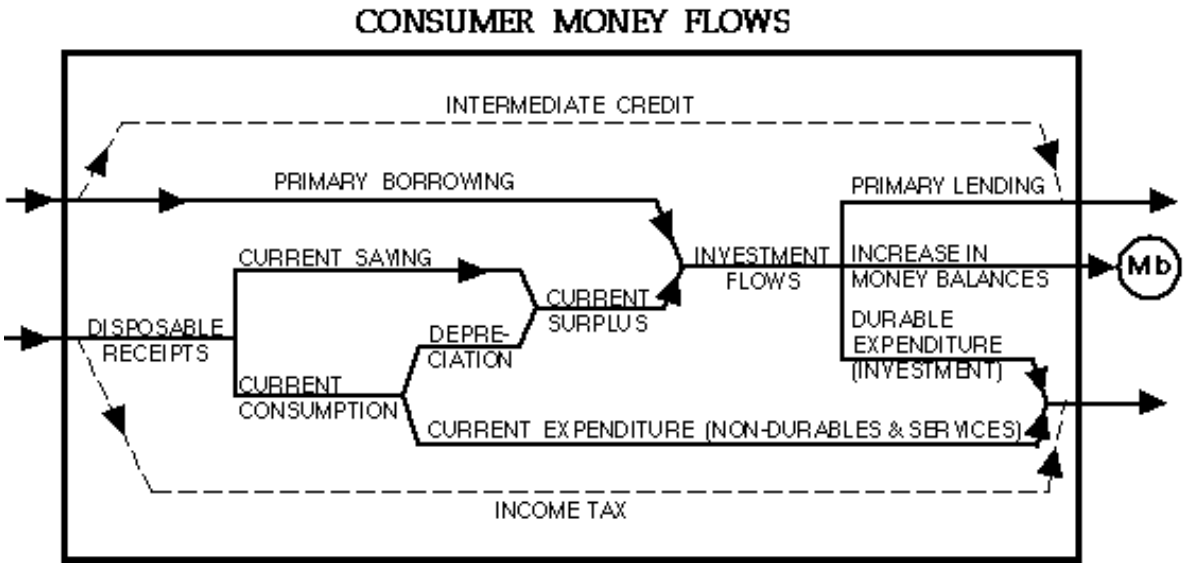
The IDMF Macro Equation

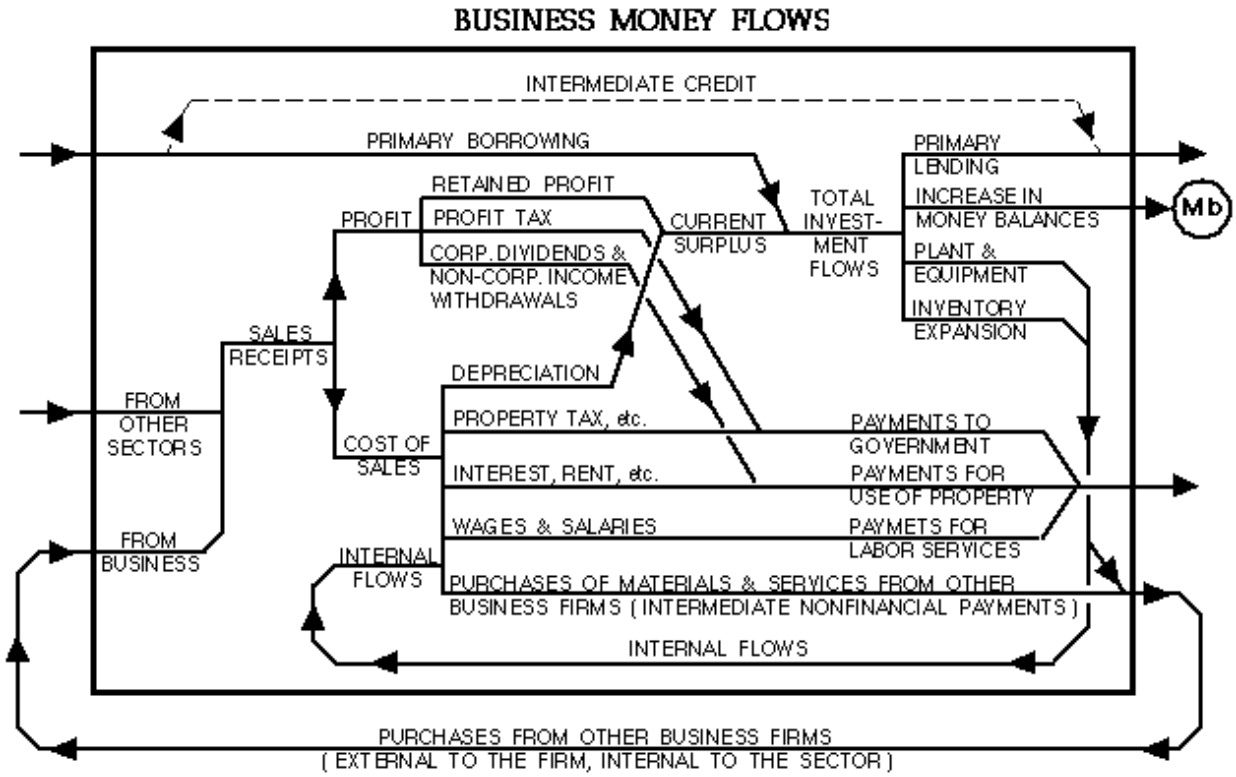
This modification of the traditional Keynesian/NIPA macro equation expresses the money-flow relationships in the above full IDMF circular-flow diagram, and provides the basis for functional integration of the NIP and FOF national economic accounts. Unlike the Keynesian/NIPA macro equation, this one is also applicable on a micro basis, providing a macro-oriented framework for the accounts of individual economic units.

	Income	**+**	**Primary Borrowing**	**+**	**New Money**
=	**Spending**	**+**	**Primary Financial Saving**	**+**	**Increase in Money Inventory**

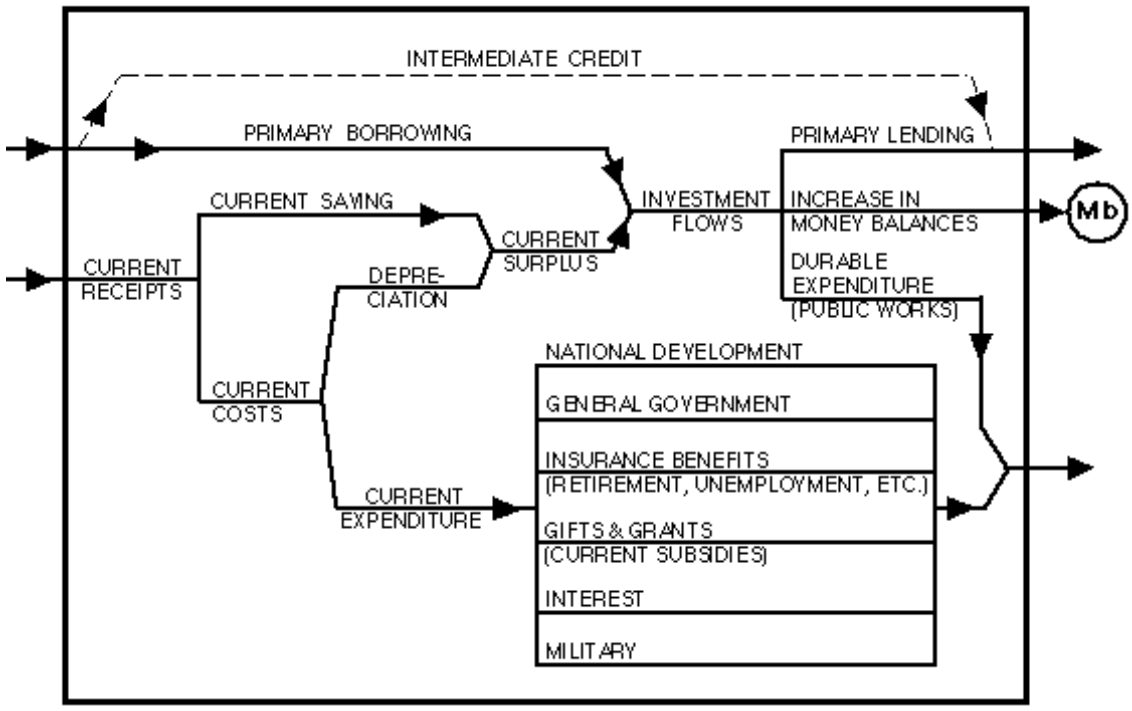
C. The Intra-Sector Money-Flow Diagrams

Unlike the Keynesian/NIPA macroeconomic equation, the basic IDMF macroeconomic equation is equally applicable in a micro perspective.





GOVERNMENT MONEY FLOWS



D. Saving-Investment Money Flows

A "table-diagram" of the flow of **Primary Credit** from initial **Primary Financial Saving** to its final **Primary Credit Financing** of GDP investment and consumption. The vertical spaces show the relative amounts of the individual flows.

Investment Money Flows

Financial Saving and the Financing of GDP Investment Spending and Money Inventories

Primary Sources of Funds Primary Saving through:			Credit Market Borrowed by:		Primary Uses of Funds Used for:	
Mn	New Money					
Primary Financial Saving	Net Foreign Saving Invested in U.S.		Whole U.S. Economy		Deficit on International Trade & Services	Other Credit-Financed Spending
	Household, Direct	Sav\Deposits & CDs Money Market Mutual Funds U.S. & Other Debt Securities Corp. Stock & Mut Funds	Federal Government		Federal "deficit financing" (no separate investment account yet)	
	Life Insurance and Pension Funds	Household	State & Local Govt.		State and Local "deficit financing"	
		Business	Households	Installment Credit	Credit-Financed Consumption Autos & Other Durables	
		State & Local		Home Mortgages	Houses	Credit-Financed Net "Real" Investment
		Federal	Business		Non Corp & Farm	
		Social Security Trust Fund			Corporate Stocks & Bonds	
	Checkable Bank Deposits & Currency	Household Business	Money Inventory			Mi
"Income-Financing" of Net "Real" Investment	Household and Nonprofit		Autos Houses			"Internally-Financed" Net "Real" Investment
	Noncorp. & Farm					
	Corporate (Retained Profits)	Details ?	Details ?			
Depreciation Allowances	Business	Corporate	Investment Expenditure			Depreciation-Financed Investment
		Noncorporate				
		Farm				
	Consumer	Houses				
		Automobiles				
		Other Durables				
	Public	Federal Government				
		State and Local Government & Nonprofit Orgs.				

Investment Expenditure	Gross	Net
Business	11.0	3.8
Corporate Domestic	7.3	2.8
Corporate Foreign	.2	.2
Noncorporate	2.3	.5
Farm	1.0	.1
Financial	.2	.2
Consumer	12.9	4.3
Houses	3.8	3.1
Autos	3.8	1.2
Other Durables	5.3	0
Public (Construction)	3.5	? .4
State & Local Govt.	2.3	?
Federal Govt.	.7	?
Nonprofit Orgs.	.5	.4
Total (incl. Govt. Constr.)	27.4	? 8.5

E. Macro Structural Analysis

Historical "pile-up" charts of macro components, for evaluating the effects of fluctuations and long-run trends.

A-1 -- GNP Spending & Unemployment Loss, as % of Capacity GNP
(http://iea-macro-economics.org/charts/charta1.html)

A-2 -- GNP Income Side, as % of GNP
(http://iea-macro-economics.org/charts/charta2.html)

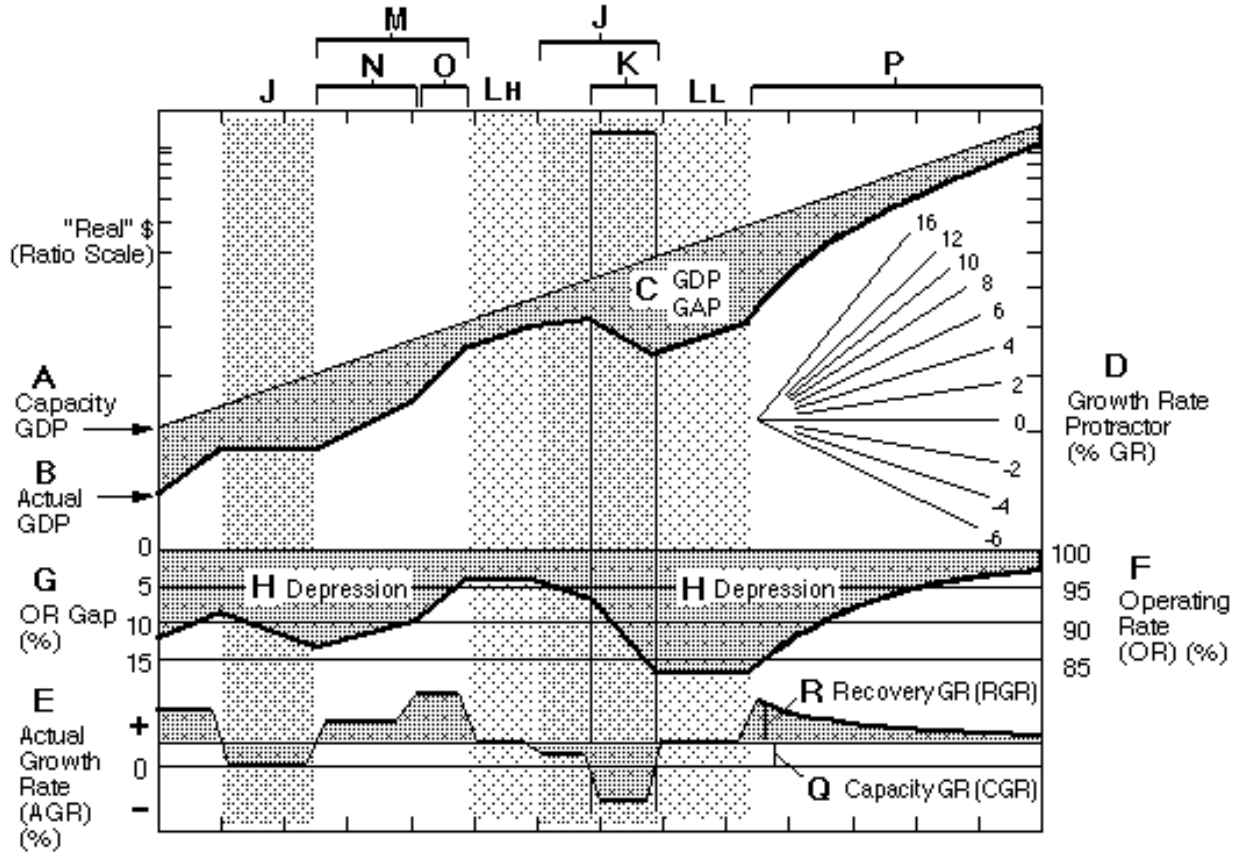
A-3 -- Primary Debt (Credit Uses) as % of Trend GNP
(http://iea-macro-economics.org/charts/charta3.html)

A-4 -- Household Credit Assets & Money Stock (Credit Sources) as % of Trend GNP
(http://iea-macro-economics.org/charts/charta4.html)

F. The Full-Employment Growth-Trend Conceptual Framework For Analyzing Fluctuations & Managing Growth

The words we use influence the way we think. An essential attribute of a real science is its use of precise, consistent, and analytically significant definitions. Traditional uses of the terms "recession," "depression" and "recovery" do not meet this requirement. This conceptual framework provides a more scientific basis for analyzing and evaluating economic performance.

1. The Growth-Trend Conceptual Diagram (Figure 1)



The letter-designated aspects of this chart illustrate the following conceptual definitions.)

1a. Statistically Measurable Concepts

[A,B & C] are in "real" dollars of constant purchasing power (which exclude inflation effects), and are on a ratio scale -- where a straight line has a constant growth rate and equal vertical distances have equal percentage changes. [F,G & H] are **% of CGDP**. [E,R & Q] are **growth rates**. These are different essential ways of quantitatively analyzing and evaluating the basic GDP measure of economic performance.

A. **Capacity GDP (CGDP)** -- also called Potential GDP or Full-Employment GDP. This is an

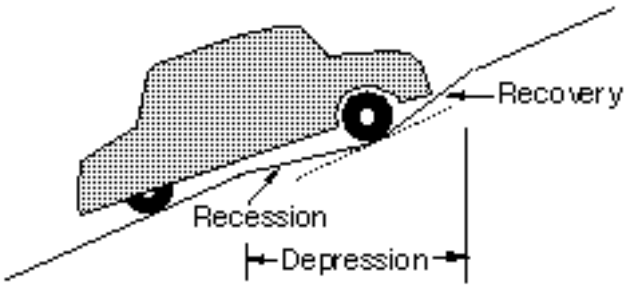
estimate of the economy's optimum output with effective full employment of its labor force. (See "Conceptual Definitions and Statistical Estimates," below, for more on the conceptual definition and statistical estimation of Capacity GDP and Full Employment.)

B. **Actual GDP (AGDP)**. This series is preferably smoothed to approximate the underlying trend (see "Smoothing Actual GDP", below, under "Conceptual Definitions and Statistical Estimates").
C. **GDP Gap** (CGDP - AGDP). The dollar amount of GDP lost from depression.
D. **Growth Rate Protractor**. Used with a clear parallel-line overlay, this invaluable analytical tool makes it possible to measure the growth rate between any two points, or the trend growth rate during any particular period.
E. **Actual Growth Rate (AGR)** (right scale) -- preferably smoothed (see "Smoothing Actual GDP", below, under "Conceptual Definitions and Statistical Estimates"), to approximate the underlying current trend. Its two functional components are:
    Q. **Capacity Growth Rate (CGR)** -- the long-run trend growth rate of CGDP [A]. This is the **standard of reference** "normal" line for the AGR [E] (left scale) and for determining the RGR [R] (right scale) -- and whether the economy is in **recession** ([J], below, under "General Descriptive Terms for Economic Performance") -- i.e., below zero RGR -- or **recovery** ([M,P,R], below).
    R. **Recovery Growth Rate (RGR)** (AGR - CGR). AGRs above (and below) the CGR "normal" line are **shaded** for quick "visual analysis" of economic performance. (Such deviation-from-growth-trend analytical presentations are so useful that they inspired the IEA logo.) See also **optimum RGR** ([P] below, under "Achieving the fastest non-inflationary recovery.")
F. **Operating Rate (OR)** -- the ratio of Actual GDP to Capacity GDP. This corresponds to the traditional manufacturing industry term, "Capacity Utilization Rate," which, for individual plants, is also often abbreviated to "Operating Rate."
G. **OR Gap** (100% minus OR). This corresponds to the unemployment rate -- according to the "Okun's Law" rule-of-thumb, a 1% change in unemployment rate corresponds to a 2 1/2 - 3% change in the OR Gap.

1b. General Descriptive Terms For Economic Performance

The growth-trend conceptual framework, as illustrated in the diagram above makes it possible to give precise conceptual definitions and empirical dimensions to traditional business fluctuation terms. An diagram illustrating an analogy to a hole in a road on a hill may also prove helpful.

Figure 2
Hole-in-the-Road Model of Economic Fluctuations



H. **Depression** (below Capacity GDP) -- When actual GDP is **depressed**, and unemployment is correspondingly excessive. The **severity** and **cost** of depressions are precisely measured by the **OR Gap** (%) and **GDP Gap** ($ amount). (The traditional idea that a "depression" is a "severe recession" is too imprecise, both conceptually and empirically, for a real **economic science!**)
   Since, in the past, the economy has sometimes gone for long periods of more or less continuous fluctuation without ever closely approaching Capacity GDP, it is also appropriate to think in terms of several briefer but more severe depressions within a longer span of sub-capacity OR -- like craters on the moon or potholes in a road -- as illustrated in the diagram, and during 1930-42 and 1973-97.

J. **Recession**. **The Operating Rate is receding** -- even if the GDP growth rate is above zero):
   - **Actual GDP** [A] is **receding** in relation to the ever-growing Capacity GDP [B];
   - **AGR** [E] is **below CGR** [Q];
   - **GDP Gap** [C] and **OR Gap** [G] are **widening**.
   - **unemployment rate** is **rising**

K. **Contraction** -- as "officially" designated by the prestigious National Bureau of Economic Research (NBER). This refers generally to a period of **absolute** negative economic growth, as distinguished from the **relative** decline of a growth-trend **recession**. (For a discussion of other misleading analytical implications of the "static" (absolute-based) NBER conceptual framework, see the last section, below.)

L. **Stagnation** -- when there is no significant change in the OR and the OR Gap. **LH** is high-level stagnation, **KL**, low-level stagnation.

M. **Recovery** -- an increase in the **Operating Rate** (not just the growth rate).
   - **Actual GDP** is **recovering** in relation to the ever-growing Capacity GDP;
   - **AGR** [E] is **above CGR** [Q]:
   - **GDP Gap** [C] and **OR Gap** [G] are **narrowing.**.

2. Evaluating and Managing the Recovery Growth Track (RGT)

Almost everybody today realizes that the Federal Reserve is able to, and actually does, manage the economy's overall growth and unemployment rates with a fair degree of precision. In that perspective, it is important to analyze past and potential Recovery Growth Tracks (recoveries [M, N, O and P] in Figure 1, above) and to recognize explicitly that every RGT has two distinct growth-rate components:

- **Capacity Growth Rate (CGR)**, which provides the standard of reference for telling **whether** the economy is in recession or recovery;
- **Recovery Growth Rate) (AGR-CGR)**, which tells **how fast** the economy is recovering or receding.

The Unemployment/growth-rate/inflation relationship. For effective empirical research on this relationship it is important to separate the RGR from the CGR, and to focus on the interaction between the OR Gap and the RGR. This is a far more scientific and productive approach than the crude Phillips-Curve/NAIRU approach, which relates inflation only to the unemployment rate (which tends to lag the OR Gap by several months), and ignores the

functionally-crucial RGR. Moreover, it is only the RGR component which can be **managed** effectively by Federal Reserve monetary policy.

2a. Achieving the fastest non-inflationary recovery

This requires a "**soft-landing**" (asymptotic) RGR -- initially fast, when the economy has many unused resources, then gradually slowing as it approaches Capacity GDP, to allow our free-market economy to make the necessary structural readjustments and capital investments -- including labor force (re)education and training -- that are needed to reach a full Capacity OR. The growth-trend conceptual diagram above illustrates three types of RGR.

N. **Growth too slow** -- initially slower than optimum for a large OR Gap. This implies a missed opportunity to avoid further depression-induced structural distortion and economic and social damage.
O. **Growth too fast** -- faster than optimum for later stages of recovery. This tends to cause "bottleneck" shortages of supply, which tend to cause inflationary increases in prices and wages, which in turn invite the Federal Reserve to induce another "tight-money" recession.
P. **Optimum growth rate** -- This can best be achieved by the Fed adopting a simple, easily-understandable, "rule of thumb" **formula** which achieves an asymptotic "soft landing" RGT that gives businesses and households **confidence** to plan ahead.

Past history suggests that in a typical recovery the fastest non-inflationary RGT is produced by an RGR equal to approximately 1/2 of the OR Gap. For example, if the OR Gap is about 12% (and the corresponding unemployment rate about 7%), the optimum **initial** RGR would be about 6% and the initial AGR about 8-9%.

However, if the recession-inducing inflation is caused by factors other than "free-market" supply/demand relationships -- i.e., by monopolistic price manipulations such as the OPEC cartel's 1970s "oil tax" price increases, or by government taxes or regulations which directly impact business costs and/or prices, the formula growth rate must also be accompanied by specific government interventions to counteract these non-market (and "inflation factors.

Moreover, sophisticated selection of the most appropriate specific formula should take account of several key "environmental factors" which make it more difficult for the Federal Reserve to quickly achieve a capacity OR without inflation unless the Feds monetary policy is accompanied by coordinated assistance from other government policies:

Duration of preceding depression. The longer the preceding depression (regardless of its depth), the more damage it will have done to the economy's basic productive capacity - - its physical buildings and equipment, properly skilled labor force at appropriate locations, experienced and well-organized management, actual application of available new technology, etc. -- and the longer it will take to achieve the necessary rebuilding and structural readjustments.

Preceding inflation experience and "inflation expectations." The two bouts of world-wide inflation after the OPEC cartel quadrupled oil prices in 1973-74 and levied another huge "oil

tax" in 1979-80 caused a severe inflation phobia. In this environment, economically appropriate rapid growth tends to be considered inflationary and causes central bankers to place highest policy priority on preventing inflation, while everyone else (particularly bondholders) try to make sure that **their** incomes stay ahead of **anticipated** inflation.

Political environment. In a political environment dominated by free-market laissez-faire philosophy, where the **inherent cyclical tendencies** of capitalist economy (including "boom" financial excesses during recovery) are allowed to play out unmitigated by government intervention, achieving a full-employment OR without inflation is very difficult. It is easier where government accepts responsibility for managing the economy for that objective.

For example, in 1940, after 10 years of the 1930s Great Depression, with 25% unemployment in 1933, many economists despairing of ever again reaching 1929's 3% unemployment rate because workers had "lost their job skills and work discipline". But after Hitler's invasion of Europe in May 1940, the political environment became strikingly different as America began rearming for our active participation in World War II. When the government put maximum output ahead of ideology and systematically coordinated all available economic policies, GDP shot up far above its long-run capacity growth-trend, and unemployment plummeted from 15% in 1940 to below 2% in 1943. Formerly unemployed Southern sharecroppers, housewives and even "disabled" people suddenly became skilled workers in Detroit and California airplane factories. All with quite limited inflation! Nowhere was the old adage more relevant: "Where there's a will there's a way!"

Public confidence (business and consumer). The **investment** decisions which are so vital to economic recovery and which usually involve **borrowing**, whether by businesses for plant and equipment or by households for houses and cars, are best made with a relatively long economic time-horizon. Their volume will be greater and earlier when people have confidence in their economic future.

Thus, the optimum **soft-landing recovery formula** at any particular time depends very much on the degree to which the federal government explicitly accepts responsibility for managing the economy, has credible policy tools for doing so, and systematically coordinates them so as to promote balanced growth and optimum output -- including responsible use of all potentially available **anti-inflation policy tools** [1].

3. Conceptual Definitions and Statistical Estimates

3a. Conceptual Definitions

"Capacity GDP" and "potential GDP" are often used synonymously. But "capacity" has the advantage that it is also used in the same sense for individual manufacturing plants and industries, where it is the denominator of the key analytical ratio, "capacity utilization rate," (often shortened to "operating rate," as it is in this conceptual diagram [F]).

And just as manufacturing plants often operate above 100% of their normal "rated" capacity for brief periods by postponing maintenance, working extra shifts or using high-cost "reserve"

equipment, Actual GDP usually exceeds 100% of normal capacity during wartime. Thus, it is useful to reserve the term "potential GDP" for that higher limit.

"Full-Employment," like "Capacity GDP," can best be defined in practical but explicit terms: an **economic environment** in which everyone who needs and wants to work for pay can with reasonable effort and minimum seek-time find a job which reasonably fits his/her education and skills, and pays a corresponding income.

(The liberal explicit proviso of "a living wage" for even the lowest-wage workers is probably unnecessary because a sustained economic environment of stable full-employment growth can only be achieved by a systematically coordinated package of economic policies which also maintains a sustainable **structural economic balance**,[2] and such a proviso is impossible to define explicitly because in practice it depends on the number of workers and dependents in a household and how efficiently their income is spent.) In a dynamic, flexible economy like ours, some workers will be always be "between jobs," even in a generally full-employment environment. But extended involuntary unemployment is one of the greatest affronts to individual human dignity, family values and youth welfare. In an effective democracy, people should be not forced into long periods of unemployment or involuntary early retirement by mismanaged economic policy. Moreover, experience around the world continues to demonstrate that high unemployment is a major threat to social and political stability, fiscal solvency, and social insurance programs.

Labor market effects. The other side of the full-employment coin, of course, is that some employers, in some locations or industries will, have difficulty finding additional employees with the optimum experience and skills they want at the wage or salary they would prefer to pay. Thus, there will be continuous incentive for both employers and governments to assist workers in obtaining the education and skills they need for optimum participation in the economy, and to develop a more efficient "labor market" for matching workers and jobs.

"The inflation threat." .....(incomplete)

The conceptually and morally malignant concept of a "natural" unemployment rate. After 10 years of the 1930s Great Depression, many economists despaired of ever regaining full employment. Similarly, after 30 years of seemingly intractable inflation (due only partly to OPEC's 1973 and 1979 "oil tax" increases), many economists despaired of ever again achieving full employment without inflation. They argued that there was a "natural" rate of unemployment that is consistent with stable prices (the Phillips-Curve-based NAIRU -- non-Accelerating-Inflation rate of Unemployment) and called the resulting output "Full Employment GDP." But just as the depression-era pessimism was discredited by WW II experience, the inflation-era pessimism was discredited by the joint reduction of both unemployment and inflation during 1992-97. Neither is any more "natural" than high rates of poverty and economic inequality, political corruption, polluted rivers and oceans, depleted fish stocks and poorly-educated labor force; all are the results of bad public policies which need to be changed.

3b. Statistical Estimates

For really scientific analysis of economic growth and fluctuations, statistical estimates of

Capacity GDP must be based the economy's two basic functional components, **labor force** and **productivity** (GDP per hour of work).

Making a credible estimate of the long-run trend of Capacity GDP is much more difficult during a long period of depressed operating rates. But credible estimates both the labor force and productivity components can be made by adjusting the actual current values for the effects of sub-capacity operating rates. And since the U.S. economy is nearer to real full employment in mid-1997 than at any time since 1969, it is extremely important that this year be used as a benchmark for making new estimates of the long-run trend of Capacity GDP.

3c. Smoothing Actual GDP

Erratic reported GDP growth rates which fluctuate wildly from 6% to 1% to 4 1/2% in successive quarters are analytically confusing and make it difficult to formulate sound economic policy. There are several ways to reduce this statistical "noise."

By better Fed monetary Policy. Part of this "noise" is due to imprecise Fed monetary policy. In the context of more systematic coordination of all available <> economic policy tools, the Federal Reserve could significantly stabilize actual GDP growth by more precisely **monitoring** the basic trend of the economy's <> **Money Demand Ratio (M1/GDP)** and **managing** money growth accordingly.

But much of the apparent erratic performance is functionally unimportant "statistical noise" which makes it difficult to determine the underlying economic growth-trend. To provide financial markets, economic forecasters, business planners and government policy makers with a more useful analytical tool the Bureau of Economic Analysis should estimate and publish a **"Trend GDP"** series which eliminates inventory fluctuations that don't correspond with the basic trend of GDP growth, the effect of computerized seasonal adjustment formulas which don't accurately reflect current "seasonal" influences, and other such influences. This series would serve analytical purposes similar to the Labor Department's "core" inflation series that excludes volatile food and energy prices.

Inventory fluctuations. When the growth rate of final demand falls abruptly (often due mainly to imprecise money-growth policy), inventory in the production and distribution "pipeline," which tends to be geared to the previous rate of final demand, tends to back up -- particularly in terms of closely-watched inventory/sales RATIOS. This causes business firms to cut back production rates, which leaves pipeline inventory inadequate for the next spurt of final demand.

Focusing on **Final Sales** rather than total GDP, and using an average of GDP and final sales are sometimes useful for estimating the underlying growth-trend. But both are inadequate because official Final Sales data are also adversely affected by transitory factors such as automobile price "rebates," other business "promotions" and weather factors. To the extent that consumer purchases of cars and other major durables are basically limited by current income and the current burden of installment debt repayments, the effect of special sales promotions is mainly to borrow from future sales. So, data on **consumer spending minus increase in installment debt increase** is also highly useful analytically.

But a more sophisticated approach is to recognize that business inventory fluctuations are strongly influenced by corresponding fluctuations in **consumer inventories**, which in turn are closely related to fluctuations in consumer installment borrowing. The basic trend of consumer durable goods inventory stocks can be derived from the Bureau of Economic Analysis Wealth Data Tape and related to consumer spending, income and installment borrowing, as basis for adjusting GDP.

Poor seasonal adjustments. This is a major cause of statistical noise when actual "seasonal" factors, particularly weather, do not correspond with the historical-based averages. With the power of modern computers it should be possible to take specific account of the effects of "unseasonal" events (heat and cold waves, rainfall, floods, changes in auto model changeovers, number of days and holidays in a survey period etc.) which have significant effect on economic activity. A major cause of bad GDP seasonal adjustments GDP in the 1970s was the fact that the OPEC "oil tax" caused huge changes in economic patterns, while the BEA continued to use a historical- based computer adjustments. Appropriate "seasonal" adjustments should take account of all the known factors causing deviations from the current basic trend of the data.

3d. Conceptual Problems with the NBER "Business Cycle" Model

Although popularly called "recessions" NBER-designated "contractions" should actually be considered **severe** recessions because a year of even zero AGR (Actual GDP Growth Rate, [E] under "Statistically Measurable Concepts," above) tends to cause about 1% more unemployment, as well as more than 2 1/2% loss of GDP, and over $70 billion increase in federal deficit.

Many years ago, when the NBER realized the problem caused by this popular mis-designation, they started using the term "growth recession" for a decline in the AGR. But since a "soft-landing" (asymptotic) decline in the AGR is actually **beneficial** during an optimum recovery ([P], under "Achieving the fastest non-inflationary recovery," above) the "growth recession" concept also tended to give an analytically wrong impression and wasn't very useful.

Another misconception stemming from the NBER "static" (absolute-base) "business cycle" conceptual framework is the purported "lead" of the so-called "Leading Indicators" [3], which is largely conceptual rather than economically functional. Since a growth-trend **recession** (negative RGR -- [R] under "Statistically Measurable Concepts," above) necessarily precedes (leads) an NBER **contraction** (negative AGR), and since most of the "leading" indicators are functionally related to the AGR, the durations of their highly variable "leads" depend mainly on the time-lag between the onset of a growth-trend **recession** and an NBER **contraction** -- the longer this lag, the longer the indicator "lead."

In the typical "cyclical" upturn, which tends to be relatively abrupt and clearcut, the timing difference between the beginning of the growth-trend **recovery** and the NBER-designated **"expansion"** is relatively insignificant. However, since the basic concept of "business cycle" is a myth, there have been several significant periods (1971, 1975-76, 1990-91) when the economy had a relatively long period of continued growth-trend recession or **low level stagnation** after the NBER-designated beginning of "expansion" before beginning recovery of the **Operating Rate**

G. Putting It All Together: IEA Pocket Charts

Please see the charts at: http://iea-macro-economics.org/pockchrt.html

H. Notes

1. (p. 16) See *Full Employment Anti-Inflation Tools* (http://iea-macro-economics.org/fe-anti-inf-tools.html)
2. (p. 17) See *Structural and Dynamic Macro Equilibrium Analysis* (http://iea-macro-economics.org/equlib2.html)
3. (p. 19) See *A New Look at the NBER/BEA Leading Indicators* (http://iea-macro-economics.org/leading.html)