Modern Capital Theory:
Foundation for Macroeconomics
(A Companion Guide for Bloomberg Market Concept)

By

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Preface

This set of notes grew out of lectures and discussion in MBA classrooms over the years. The need for MBA students to acquire some understandings of macroeconomics cannot be more imminent; judging from the daily economic news a typical business person is exposed to in the real world that we live in these days. Yet, businessmen often also find the discussion of macroeconomics, various terminologies used, and the reasoning behind an expert opinion to be somewhat difficult to understand. This book is a compilation of notes developed to offer insight to businessmen and managers who wish to navigate, and strategize for their organizations, in a macro environment where conditions and policies are ever changing. The accumulated notes together with some you might gather yourself over time in the format of a book is formatted to assist this understanding.

You can think of these formatted notes as an invitation to a traveler into the complex world of macroeconomics. A traveler needs a map. This format is sort of like a thought-map, showing different city names and how the cities are connected by roads on the map. Further investigation of any city can be done by discussing current event topics with your peers, both inside and outside of the classroom, researching on the internet, and using the resources at the library. In short, this book is specifically designed for giving flexibility to a reader's own quest for macroeconomics in the sense that specific emphasis can be explored by readers based on their specific needs and interests. For those who are more driven by how their own views would be consistent with classic theoretical literature on the subject, they can also study it more intensively with the reference at the end of the notes accumulated in this book.

The “cities” chosen for this map highlight the significance of understanding capital as a foundation for understanding macroeconomics. In this sense, the intension of this book is different from a conventional macroeconomic textbook, both in terms of emphasis and the flow of thoughts in its explanation. You might consider the explanation here to be too abstract and too theoretical, but that may be unavoidable, as the world that we live in is indeed a very complex world that we can only try making sense of it at a higher level.

The higher level is the equivalence of the highways that connect cities, i.e. analytical reasoning. From time to time, you encounter people from certain city who speak an incomprehensible dialect. This may be particularly so when hearing people giving opinions about the future and matters related to macroeconomics. Sometimes you hear words that you know the meaning when each word stands alone, but somehow make no sense when they are put together. This is a workbook that will force you to go through the exercise of connecting thoughts, ideas, and events surrounding you. Hopefully, by knowing how the highways in the thought-map are connected, you can discern what a person is saying (or what the person is trying to say), using knowledge you have about cities you’ve visited, in order to know something more about the cities who have people speaking a different dialect.

There will be metaphors used throughout the notes, relating to common sense observations and general understanding of things, rather than relying on a pure scientific formulation based on logic. The intention is to link abstract economic concepts with things people know or imagine to have known in everyday life. Visual graphics are inserted to assist quick understanding, and as visual reference for studying supplementary materials. Readers may find specific economic terminologies not explained fully in the notes. This is intentionally designed to be so, to provide flexibility and agility. A reader can glance through the notes quickly in couples of hours to get a feel for the gist of issues, or google for longer reads on specific terminologies, graphs, names of scholars, mathematical equations, model titles, academic writings, depending on the depth of knowledge that a reader wishes to get out of the material. Readers are advised to take handwritten notes, as any deep learning can only be enabled if one writes out an idea in one’s own words.

Our goal is to help business students/businessmen to carry on a conversation about macroeconomics among themselves, and more ambitiously, to talk to economists,

without being intimidated by them. The book therefore strives to achieve explaining complex concepts with the least number of words. This thinking exercise will not be completed until a reader also write their own written notes, perhaps on quotes they hear or read from the news, on lectures and public speeches in memorable occasions, and more likely than not, questions and challenges you want to make on the material in this set of notes. The notes also contain an Appendix, extending and elaborating economic system comparisons.

For those impatient to apply concrete decision-making tools, it is suggested to study this set of notes in conjunction with the Bloomberg Marketing Concept (BMC) produced by *Bloomberg For Education*. You'll find the modules on Economic Indicators and Fixed Income to be particularly relevant, as those two modules brought out the importance of understanding capital theory, as well as for real world applications. Discussion on currency exchange rates and equities are relevant, but they are not essential to the understanding of capital theory in the macroeconomic sense of the term used by economists. All in all, you may find discussions in this book to be helpful for motivating a study and an understanding the BMC material. Bloomberg's permission to use their templates for visual reference is gratefully acknowledged.

The book will have four chapters:

I. Introduction—an Overview of Economic Systems:
How economic activity in terms of GDP is related to various factors. Capital being an important factor in propelling a system, and how an internal system of an economy operates, using the metaphor of a spaceship.

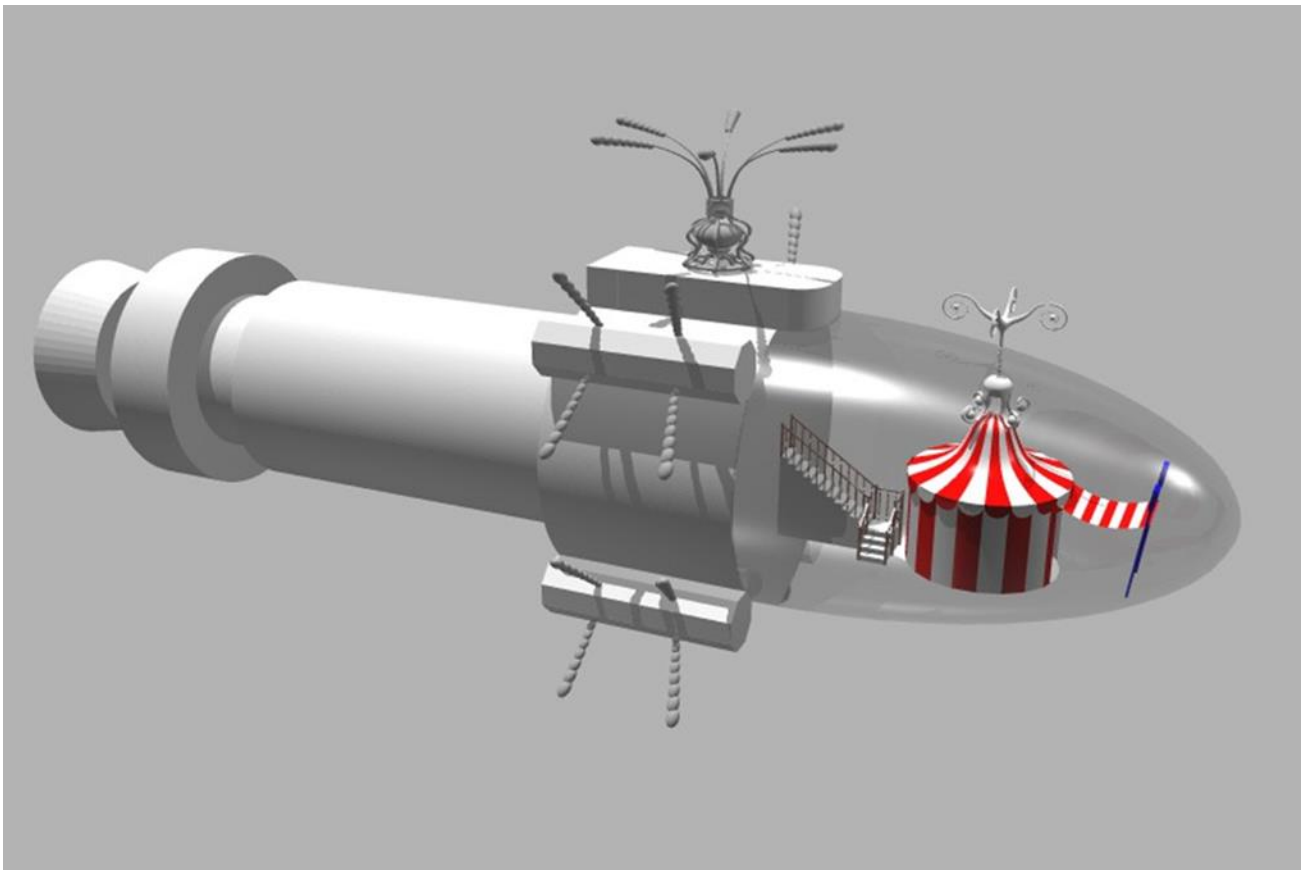
II. Capital Value in Real Sector and Financial Sector:
What is capital?—some generic characteristics of capital. How their values are determined? How do the different values interact in real and financial sectors, putting financial derivatives into a simple, but broader perspective.

III. Capital Accumulation:
The process of adding new capital to existing capital—cyclical pattern and secular growth will be explained theoretically. IPO as a race between future perception affecting stock demand and flow supply can generate new insights about "bubbles". The model of aggregate demand and supply, not usually treated as a capital accumulation problem, is discussed here in its broader context for the concept of "new normal".

IV. Interest Rate and Government Policies:
Capitalism and capital market— we study underlying fundamentals of interest rate and how government policies can affect the rates and the yield curve. The heart of macroeconomics focuses on real interest rate and its various ramifications in an economic system.

Chapter I: Introduction: An Overview of Economic Systems

When economist Armen Alchian was asked about the most important subject to study in economics, he answered without hesitation: Capital Theory. A theory can be viewed as a model, but it is also a philosophical thinking. A model, borrowing a phrase articulated by a famous physicist, Richard Feynman, is broadly a thinking paradigm to facilitate a *process to get better*. But unlike models of physical science which originate from minds of genius such as Feynman and Einstein, *models* of economic systems of the world can come about by a dialogue among policy makers, each contributing their *perception of realities*, which are contingent upon different theories and sub-models. A creative collaborative learning (CCL) platform for shaping and integrating various perspectives is essential for understanding macroeconomic systems of the world for the 21st century.



Source: Lou Crockett Design, 2007, graphic work commissioned by the Author*

The macroeconomics of a country can be thought of as a spaceship, wandering in the universe, collecting information, and interacting with other spaceships (other countries). As is with a spaceship, the economy of a country has many components. The engine that propels the economy is at the rear of the spaceship, which can be loosely identified as the **capital** of the economy. The capital of an economy can be of various types; but mostly physical capital and human capital, with the later including also social capital. An economy requires various types of capitals to make it functions. The aggregate contribution of the various types of capital is extremely important for an economy. Even a very primitive society requires some capital to survive—starting with the physical capital of a cave, a shelter. However, cavemen need to grow smart (increasing their human capital), if they wish to improve their livelihood. Otherwise, they will remain forever in caves, may be even the same old cave.

Source: Bizarro.com

Before we talk about the internal mechanisms of this spaceship economy, let's jump to the front part of the spaceship where an open tent is staged, an area of *Performance*. This is usually how an economy is monitored and viewed by

analysts. In some sense, you can imagine someone in the control room of this spaceship behind the front stage, engineering whatever is in the back stage, for performances at the front, as well as steering the spaceship moving forward.

The typical macro-economic performance indicators are- Gross Domestic Product (GDP), growth rate, % change in real GDP, inflation, unemployment rate, business confidence(PMI), housing, as well as various socio-economic measures, many of them are cyclical. Other indicators such as industrial output, nonfarm payroll, interest rates, money supply, automobile sales, etc. can also be used. You can think of those measures as performance, or you can think of them as monitors and indicators, measuring the health of a person (economy), e.g. blood pressure, pulse, tongue reading, etc. etc. Note that they are not perfect predictors of health. They are only references that you must use together with other educated interpretations to evaluate the health of an economy and to formulate opinion for decision making.

GDP is a statistical calculation based on data generated in an economy, but it can also be categorically decomposed as

GDP= C+I+G+ (X-M)

where

C = Consumption

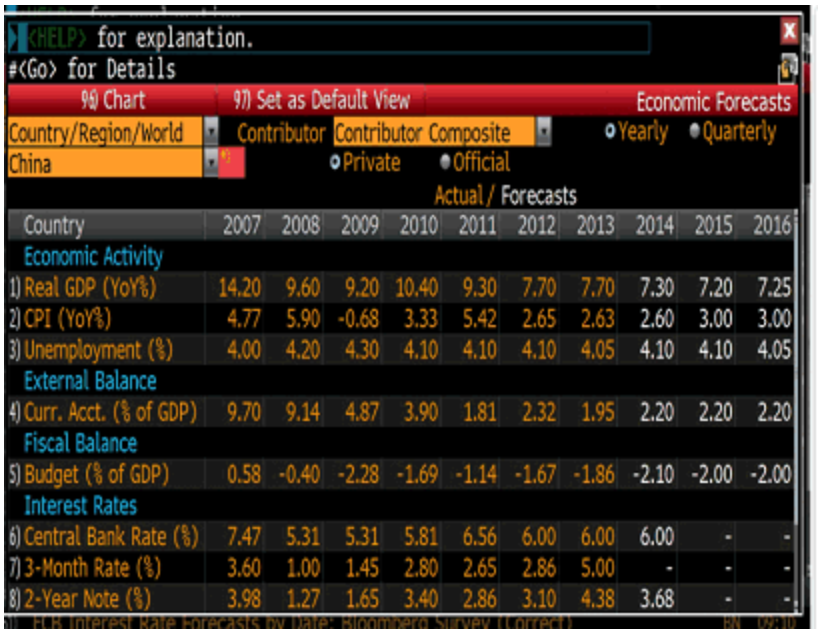
I = Investment

G = Government spending

X-M = Export- Import

The different components listed above, all in turn driven by other factors, can affect GDP differentially. Collected data are usually expressed in nominal terms, using final (not intermediate) goods' reported prices and quantities at the time of transaction. However, it is real GDP that can measure the health of an economy better. Real GDP is nominal GDP divided by a general price index of an economy. It is an adjustment made for creating a false impression of GDP increases due to inflation.

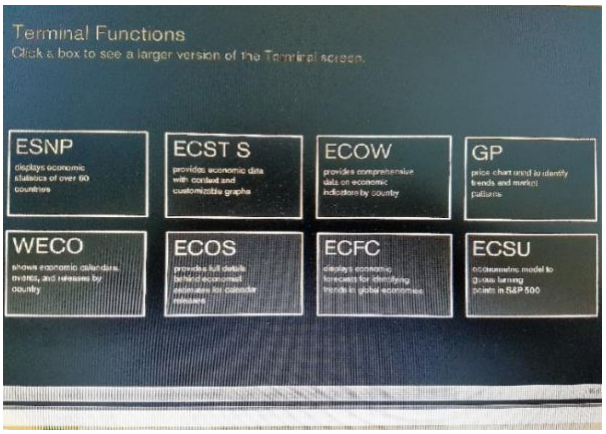
Real GDP growth rate is widely monitored. Some governments formulate policies aiming for a targeted level, others just let the data tells the fact. Regardless, the growth rate of a country, among other broad categories such as external balance, fiscal balance, and interest rate, are monitored and forecasted, as a Bloomberg terminal screen shows in the accompanied template.



Country	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Economic Activity										
1) Real GDP (YoY%)	14.20	9.60	9.20	10.40	9.30	7.70	7.70	7.30	7.20	7.25
2) CPI (YoY%)	4.77	5.90	-0.68	3.33	5.42	2.65	2.63	2.60	3.00	3.00
3) Unemployment (%)	4.00	4.20	4.30	4.10	4.10	4.10	4.05	4.10	4.10	4.05
External Balance										
4) Curr. Acct. (% of GDP)	9.70	9.14	4.87	3.90	1.81	2.32	1.95	2.20	2.20	2.20
Fiscal Balance										
5) Budget (% of GDP)	0.58	-0.40	-2.28	-1.69	-1.14	-1.67	-1.86	-2.10	-2.00	-2.00
Interest Rates										
6) Central Bank Rate (%)	7.47	5.31	5.31	5.81	6.56	6.00	6.00	6.00	-	-
7) 3-Month Rate (%)	3.60	1.00	1.45	2.80	2.65	2.86	5.00	-	-	-
8) 2-Year Note (%)	3.98	1.27	1.65	3.40	2.86	3.10	4.38	3.68	-	-

Source: BMC

In USA, a variety of economy measures can be constructed in National Income and Product Accounts (NIPA). For analysts who want to track other countries as well as USA, they can use the World Economic Calendar in a Bloomberg Terminal to find a list of data scheduled to be released for a chosen country. The *relevance column* in that function provides an indication on what other analysts are paying attention to that data. It is sometimes not important to ask how theories look at data, but how the global community of analysts is looking at the data. Analysts compare emerging statistics in reference to an average opinion among economists to look for surprises, as surprises are likely to drive the financial markets. They can also access economic forecasts in various countries by functions such as ECFC as one among various examples of functions in Bloomberg Terminal as listed below.



Source: BMC

The Internal Engines of Economy

The economy spaceship model's back end (capital) and front end (performance) have an internal operating mechanism that is supplemented by four chambers. You can think of the chambers as acting as some sort of balance to propel the spaceship. Generalizing, we can identify the chambers as *culture, history, ideology, military.* Things from these chambers can also be thought of as vitamin pills (or addictions) a person takes to make their internal body (healthy or unhealthy) functioning more smoothly. Many of us can think of examples how each of the above factors can play in different economic systems of the world. We will not dwell on them here, but we should not overlook the importance of these elements in understanding the macro-economics of the country at the outset, primarily noting that these chambers serve only as a balance, but not the true engine that propels an economy. An overreliance on one or more of the chambers will steer the spaceship to a direction that will drain the internal resources of the economy.

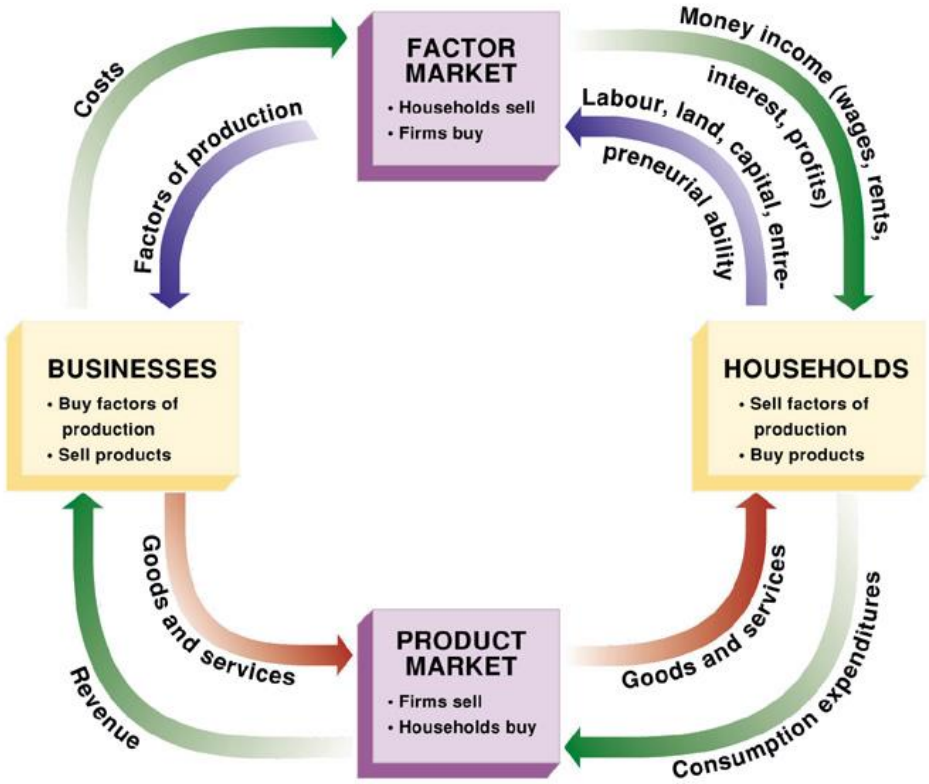
What are the internal mechanisms of the economy? Let's address to the middle section of the spaceship—how an economy functions, or what can be called the macroeconomics of a system. What is considered a healthy economy can be subjective. The performance of an economy may or may not reflect what is being subjectively considered as *healthy.* What is being measured sometimes can be different from how the body is feeling. Regardless, the anatomy of a body is a science and not only feelings, even though health and feelings are related.

Again, the analogy of a person's body can be used for viewing an operation of an economy. There are *circulations* of things. Like body fluid, things inside a body need to move. Sluggish movement is a sign of poor health. Movement creates flow and generates growth. We can think of movements in the internal organ of system to be categorized in terms of circulations in 4 intermingled rings. These rings each has its own unique elements, but are meshed together like a bunch of interlocking key chains.

Source: Internet picture

1. Real sector ring
2. Financial sector ring
3. Inside Circular Flow Ring
4. Outside Circular Flow Ring

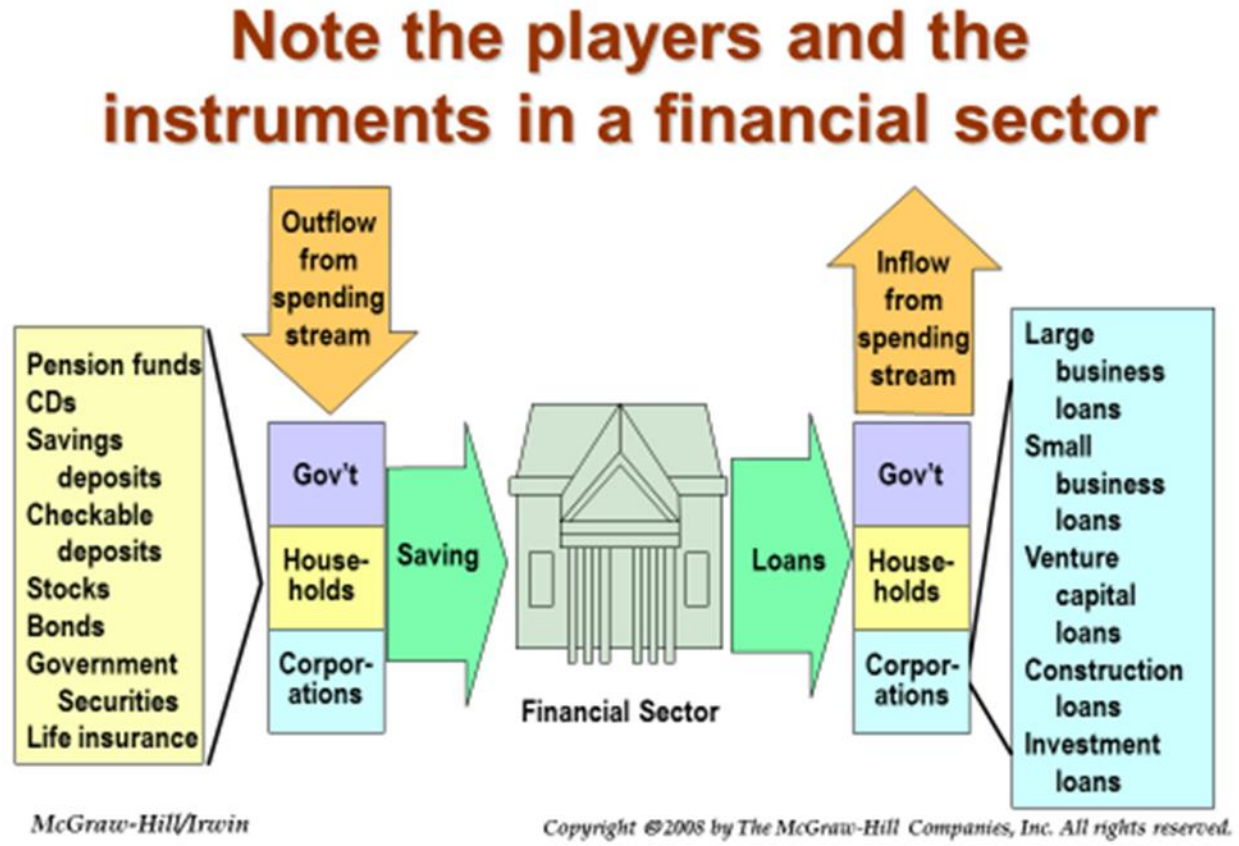
Most macroeconomic topics study the operation of the first two rings. The first ring, the real sector ring, consists of households, product market, businesses, and factor market, for producing and consuming goods and services of an economy. A pictorial description is given below. The volume of flow of this circulation is GDP, which is estimated by summing the value of all *final* goods and services of an economy passing through the Product Market Box in the diagram below in a given time period.



Source: Internet picture

The accompanied diagram, called the circular flow diagram of an economy in many economic textbooks, e.g. Evans, 2004, p.56, is referred to as the real sector of an economy, as the players in this sector are involved in the actual production, manufacturing, supplying services, and consuming real GDP in the economy.

The second ring of the internal operation of an economy is the financial sector circular flow, also discussed in many textbooks, e.g. Colander, 2008, p.634. In the circulation in the real sector, neither the households nor the businesses need to spend all they receive. The difference between what they receive and spend is *Saving*. It goes into the financial sector as "Outflow from spending stream", labelled at the top left corner of the diagram below.



The left column of a financial sector lists some of the instruments of saving. Note that buying stocks, like buying bonds, is a form of savings in this framework. Practitioners often consider buying stocks as investment. But in this framework, most people buy stocks just to get a higher return on saving. It is not investment in the sense that enters into a calculation of GDP. Saving, depending of which forms being used, brings with it a certain degree of risk, higher risk has higher return.

The center of a financial sector of an economy, the middle part of the diagram, consists of banks, financial institutions, companies that operate in the financial sectors, as well as the financial markets. They take the savings in monetary terms from the real sector by offering various financial saving instruments on the left hand column. The money is then channeled to players on the right hand side of the diagram, reclassified again as government, households and corporations. On the left hand side of these financial institutions, the instruments are labelled collectively as saving. On the right hand side of the diagram, they are labelled as

loans. Borrowing and lending could be across player groups, e.g. from households to corporations.

The loans coming from financial institutions and markets have various uses as given as examples on the far right hand column. But those are just the names of the loans. The loans are spent on buying things, which are not listed. Most of the loans are for buying some type of capital asset which need someone to produce it in the real sector. In this way, the financial resources in the form of a loan will be plowed back as "Inflow" into the real sector. You can think of the inflow as monetary representation of real consumption and real investment as loan amounts are spent in the real sector.

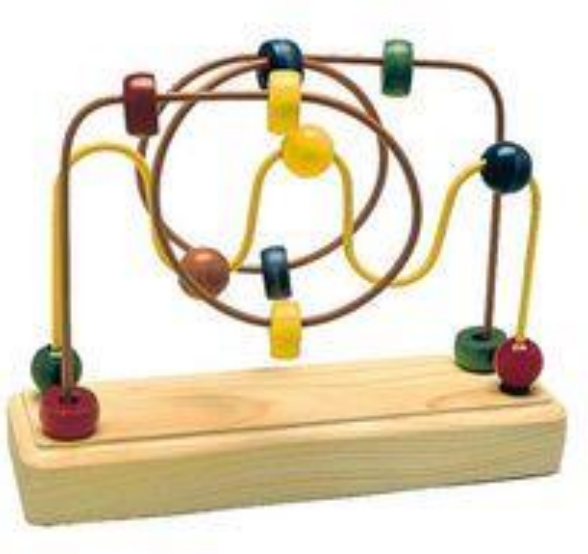
The balance between real sector and financial sector of an economy is important; the two in principle should be in sync for a good system to work. However, that is not necessarily the case in many economies. Even for advanced economies such as USA, there are now many discussions on how "wall street" might not be in sync with the "main street". For examples, the loans taken at the right side of the financial sector diagram, instead of spending them on investing or buying things in the real sector, have simply recirculated themselves back to the left hand side of the ring, without actively seeking outlets in the real sector, e.g. using loans to purchase additional stocks or even more volatile financial assets for speculative purposes. As a result, money keep circulating in the financial sector, with the rich getting richer, but without benefiting the players in the real sector of the economy, at least not enough. This is not supposed to the case if the system is in sync to function smoothly.

For the financial sector, policy reforms are important for advanced countries such as USA, as well as for emerging economies, such as China and India. The latter two countries' financial sectors are not as *deep* as that in the West, and reforms are still on-going, with government intervention playing a very important role in the process. These are key reform initiatives on going worldwide. Future regulations in North American may need to focus on financial sector policy reforms like emerging economies, but of a different character, as depth (volume, number and varieties) is not an issue there. In North America, *the perception of reality* by the analysts can be quite important. Analysts are there to make profit, for themselves as well as the clients they serve, the stability and synchronizing the rings are not their concerns. There are currently no indicator designed yet to evaluate whether an economic system is "in sync" or not.

The reality is complicated already with descriptions of the above two rings. It can be a little mind boggling to know that the reality is even more complicated than that with still another two rings: the inside and outside rings. We intend to only briefly comment them here, as they are usually not the subject matter of a macroeconomic classroom discussion, even though there are no strong reasons why they shouldn't be so. Those who have interests on this subject can further study the Appendix.

Joseph Schumpeter in 1912, articulated a concept of economic development expressed as a form of inside vs. outside circular flow. Even though this vocabulary is seldom used, policy discussions in the real world from time to time refer back to some elements of the last two rings. That is why we know that they are of some importance. As an example of propositions coming out from policy discussion, Canada has always been very proud of its financial sector, hailing its prudent banking sector as the primary reasons for escaping the 2008 US financial crisis. However, some people believe that Canada lacks innovation as compared to the US, where the two Schumpeterian rings work with a better flow in its overall coordination for its economy.

As mentioned earlier, the four rings mesh together in actual practice. An activity can be simultaneously in the tracks of all four rings. You can think of what drives these activities are the "beads" in four wires. The beads circulate themselves within and across the four rings. Loosely put, the beads are money, and different forms of money, which come from the financial sector; but they can also be human resources, time, how individuals in a society want to place themselves in which ring and what segment of the ring(s).



Source: Internet picture

The beads--how do we define money?—not an easy question. Broadly speaking, they are mediums of exchange, and methods to get people to do things. They are units of accounting. They are also stores of values for speculative purposes. William Goetzman, in *Money Changes Everything*, describes many examples on how finance had made civilization possible. Indeed, the power of money can be vast, immense, and influential. But beware, my friend, any assets that can be exchangeable can be considered as money. A boost of the balance sheet of a company can be used to exchange for more borrowed money. Financial innovations can pump in too many currency collaterals (like-money) into the economy, which can result in devaluation. Financial assets can become toxic when going through drastic devaluations.

Many people, including influential policy makers of the world, still refuse to admit the role of money being different for a *new* reality for the world. Ex-US Fed Chair, Ben Bernanke, in describing problems on what the world might need to face post 2008 crisis, only lightly touched upon the subject of *hot money*. Warren Buffet calls *financial derivatives* a modern day WMD (Weapon of Mass Destruction). It is called WMD as they have the capability to destroy the financial and economic structure of the economy, which could result in the collapse of the economy. Fortunately, so far, we've been surviving, perhaps jokingly only as a chapter in a *divine comedy* of macroeconomics. Money's definition is expanding, with

innovations such as bitcoins and various cryptocurrencies competing with each other on various platforms of blockchain.

The other resource that individuals in an economy can choose to place themselves among segments of the 4 rings is their own time. Because the 4 rings are meshed together sharing some channels of common passages, an individual in an economy can be simultaneously in different segments of the rings at the same time. Although as one would expect, some individuals are likely to allocate more efforts in certain segments of the rings rather than in all segments of the 4 rings. In other words, time, similar to the resource of money, is up to an individual's will to allocate, at least in the case of a free society. Time provides labor hours and entrepreneurial activities in the real sector, all being represented by some type of transactions via the use of some kind of money.

The final important component of this spaceship economy is the control tower—the role of government for an economy. Government roles often can be influenced by the four chambers of culture, history, ideology, and military; but they cannot be overwhelmed by the chambers by ignoring the internal operation of the 4 rings. Otherwise, the economy has nothing survived to feed people, and ultimately, the control tower. Because of this, tracking national income, GDP, is usually of importance to the control room of the spaceship.

For macroeconomics, governments can use fiscal and monetary policies, together with ad-hoc regulations to improve economy performance. In the BMC material, you'll hear example of USA government accommodating excess savings from the rest of the world by providing them with US bonds. US Central bank under different chairmen had played an important role in affecting policies. BMC gave examples of other countries too, such as Abenomics in Japan, etc. US government has often been perceived by other countries as wanting to exert influence outside their national boundaries. Conflicts and coordination with other countries (other spaceships) are usually the roles of governments, which can result in various *circles of influence.* Therefore, macroeconomics also touches on as well as being affected by the geopolitics of the world.

To conclude this lengthy chapter on system economics, a Table listing some examples of things happening in a meshed-up 4-ring of an economy can provide further thinking exercises on how an economy operates. In the Table, economic activities in the real and financial sectors (vertical columns) are further dichotomized into markets and institutions (horizontal rows). The latter is a

conceptual/theoretical approach of looking at the economy still from another angle, institution engineering (see later chapters). For purpose of discussion on the real and financial sectors, examining the features in the 2 vertical columns will suffice, noting that there are features linking the two sectors as well (horizontal rows). The government's role is listed and defined in the bottom of the Table. The Table can also be used as an exercise for inductive thinking based on specific feature you observe in an economy.

<table>
<tr><th></th><th>REAL SECTOR</th><th>FINANCIAL SECTOR</th></tr>
<tr><td rowspan="2">MARKETS</td><td>Central
• Consumer Markets
• Producer Markets
• Commodities Markets

Peripheral
• Secondary Markets
• Nontaxable Markets</td><td>Central
• Stock Markets
• Bond Markets
• Foreign Exchange Markets

Peripheral
• Derivatives Markets</td></tr>
<tr><td colspan="2">Interaction of Real and Financial Markets:
The Schumpeterian rings
• Venture Capital and Entrepreneur Relationships
• IPO and Securitizations (e.g.CMOs,REITS,etc)
• Merger and Acquisitions</td></tr>
<tr><td>INSTITUTIONS</td><td>Central
• Manufacturers
• Professional Service Industries
• Organized Middlemen

Peripheral
• Craftsman, Farmers
• Nontaxable institutions</td><td>Central
• Depository Institutions
• Contractual Savings Institutions
• Investment Intermediaries

Peripheral
• Informal relationship lending
• Development banks</td></tr>
</table>

	Interaction of Real and Financial Institutions • Alliances of Banks with Manufacturers • Projects of Development Banks • Other Real Investments by Financial Institutions

ROLE OF GOVERNMENT

- Determination of the scope of Private vs. Public activities with respect to

1) ownership of means of production
2) economic decision-making (by firm or by central planner)
3) factors of production (tradable commodities vs. state allocation)

- Macro-economic balance vs. macro and micro-management regarding

1) Industries and Economic Policies
2) Monetary and Fiscal Policies

- Infrastructure Development

1) Tangible Public Goods ,e.g. bridges, highways, national defense…
2) Government internal structure, Court systems, Law and Order
3) Welfare and Education
4) International Relationship

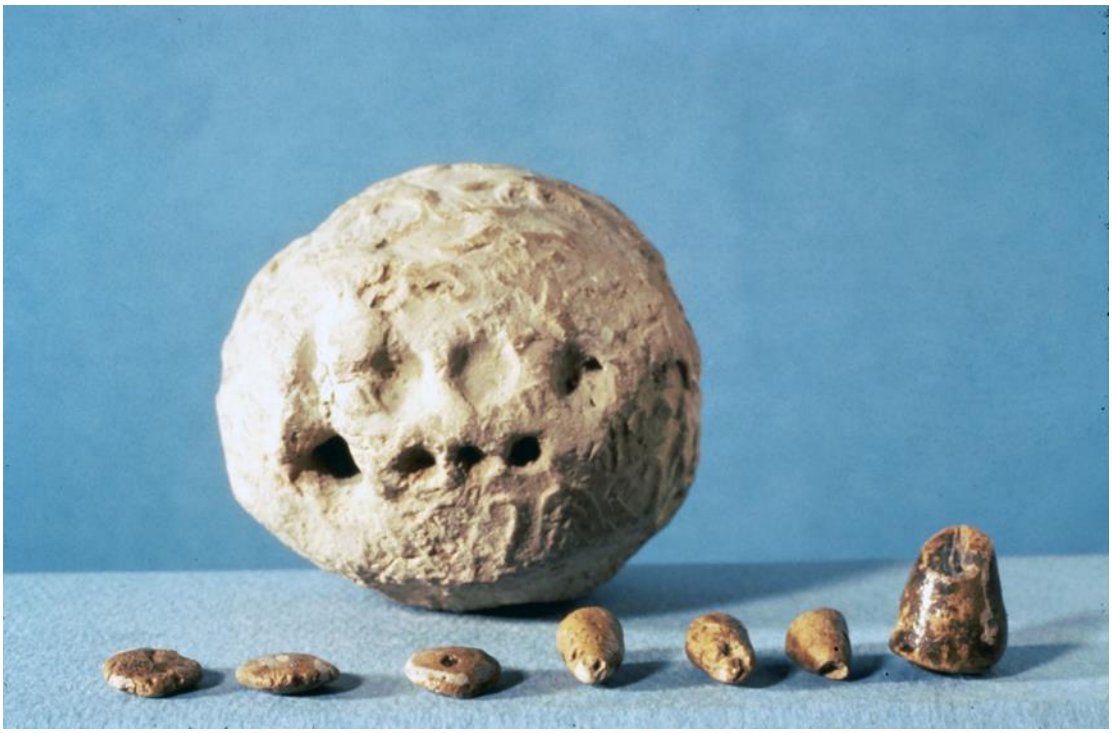
Readers may ask: Is the framework provided in this chapter a well-recognized scientific model of macroeconomics taught in most universities? And more importantly, where will all this discussion leading to?

For the first question, unfortunately, the short answer is “no”. Thinking through this framework will not help you pass through examinations in economics classes. Indeed, for economics, there isn’t something “delightfully simple” as in physical science, e.g. the Maxwell equations in electromagnetism. But this does not mean a heuristic elaboration as described in this chapter is not useful. Every day, you experience and hear events happening in our world that may or may not have impact on your personal and business life. How should you perceive and digest the emerging information for making your next step? This question depends on where you are in the framework so described in this chapter.

The framework also can help to identify where in the framework an observed event is taking place. How immediately it will affect you, or how distant it may eventually affect you. For example, let's say the government is planning to raise interest rate, will it affect you? The answer is: it depends how it is done, and what your role is in this system framework. Within an interlocking system of the world where events trigger ripples of varying degrees, this chapter provides an anatomy of macro systems that may track the ripples of an event. We can have a better sense to manage our bodies if we understand the anatomy of our bodies. Understanding which part of the body may affect which other parts of the body can maintain a balanced health for the body.

Chapter II: Capital Value for Real and Financial Sectors

The most important concept of capital to understand is Time. A physical capital asset can be imagined to have 4 dimensions, (x,y,z, t). The first three denote the physical dimensions and location, the fourth is time. Time means durability as well as dates, meaning that a capital asset has values depending on its date and durability. Because the value of a capital asset can be dated across time periods, there needs to be a method to link values across time periods, as *fixed* physical appearance nevertheless transcends via *changing* values. Even at very early stage of human civilization, assets in primitive societies have a time dimension marked by number and sizes.

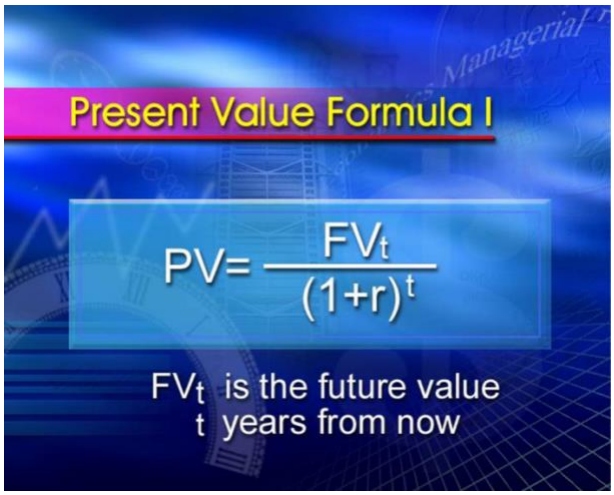


Source: Internet picture

Because capital assets have a time dimension, an important concept to understand for capital is borrowing and lending, which involves the transfer of physical assets at different points on a timeline backward and projecting forward. In early history of civilization, people recorded borrowing and lending in the form of symbols and tokens. The recording revealed the concept of compounding, i.e. a sum loaned out will grow as time progresses to a larger amount to be paid back. These financial

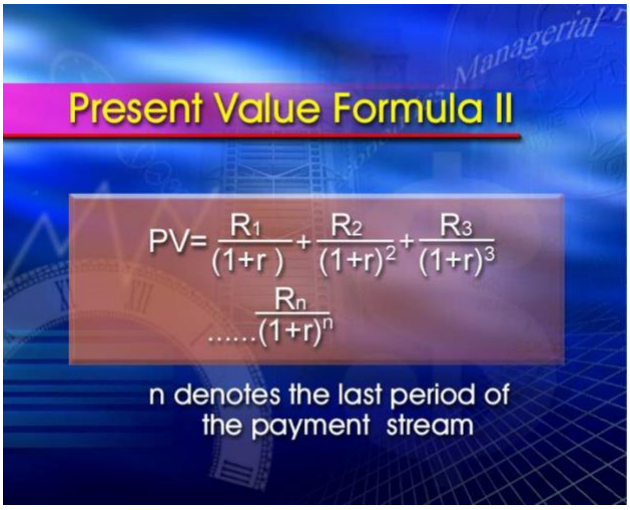
instruments are now called IOU in modern day language. They are also called bonds, or fixed income assets.

The relationship between the amount loaned and the future payback, though practiced probably informally by the cavemen, was at one point in human civilization being systemized as a mathematical concept called Present Value (PV). PV can be linked with Future Value (FV) of an asset, by an interest rate, r, via the method of compound (amount projected from present into future) and discount (amount abstracted from a future, time t, to present).



Source: Author's powerpoint

Formula I is fundamental for capital value determination, whether one talks about real assets, e.g. a gold bar, or a financial asset, i.e. a stock or a bond. Many other capital asset valuation formulae evolved as variations of this basic formula. For example, a house that has rental values, Rt, for every time period t, will have a present value below:



Source: Author's powerpoint

Formula II has wide application particularly when it comes to stocks and bonds. Bloomberg Terminal provides Ri for many bonds. Ri is a series of number, stipulating coupon and principal payment of a bond per period of time that is collectively called Debt Distribution. For example, a Rwanda 10 year bond has a coupon of 27million, with a principal of 400million. BMC shows a debt distribution bar charts that give the values of all the Ri. The total payment is 642 million, which is fixed. A buyer of this bond pays 400million, and gets 642 million (in total) back, giving the buyer (the lender) an effective annual interest rate of 6.8%. (See BMC for explanation of the calculation).

In a real world trading of this Rwanda bond, traders post bid and ask price for the bond throughout the day, based on the business needs of the trader and their expectation of the macroeconomic condition at the time of trading. The transacted price moves throughout the day of trading. The use of the present value equation above is now interpreted differently, the left hand side of the equation is not a derived quantity based on an interest rate r, but a revealed number via the act of trading. Note that the right hand side of the equation, Rt, is contractually fixed at the time that the bond was issued; the result is that, the yield of the bond, r, is every minute changing, as the price (rationalized by PV) is also changing from the bid-asked actions of trading. That is why a fixed income asset does not mean a fixed APR. On a Bloomberg Terminal screen, the price and the yield of a bond over time is displayed. It is a good idea to familiarize yourself in reading the template. They are common vocabulary used by traders tracking changes throughout the day, based on emerging economic environment and future expectation of changing events.

Source: BMC

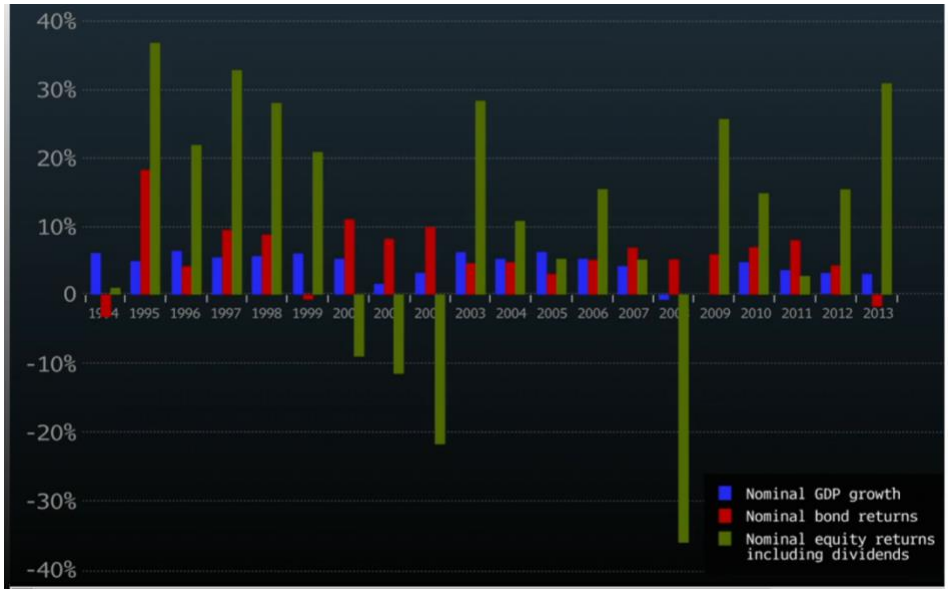
Learning how to read a Bloomberg screen does take some practice. The screen generally shows an inverse relationship between price and yield, i.e. when price is high, yield is low; and when price is low, yield is high. On the particular day when this screen was read, there was an increase in price and a dip in yield. You can see that on the top rows of the chart by noting the current price of the bond at 89.265 with a down arrow next to it, while the number next to it reads +.458. The down arrow denotes a drop in yield at that moment, while the plus refers to the increase in price since the previous day closing price. Professional bond traders can read these tables quickly because they check the price and yield every minute for getting the most updated information to place orders.

Source: CNBC picture on the internet

The CNBC picture shows a well known bond reporter with many bond traders at his background. Each bond trader represents some financial institutions in the world, wanting to buy or sell bonds of their choice for investment or for liquidity management for the institutions. At any moment in time, there are tens of thousands of these traders all over the world trading. They collectively together determine the price and the yield of a particular currency specific to the macro condition at the time. Some currencies have more active bond trading activities than others. The yields of particular currency can be affected by internal as well as external circumstances. They are like blood pressure of a body. Blood pressure can be affected by many external or internal condition at any particular point in time, but it is their stabilized readings that can truly monitor the health of the body.

Theoretically, yields vary between types, maturities, and countries, all depend on risk considerations also. On a given day, Bloomberg Terminal reports the yield movements of about 1.7 million bonds all over the world. 1.2 million of which are corporate bonds, the rest are government bonds. Typically, other things remaining the same, a higher risk bond is likely to have a higher yield, and a lower price as implied in the PV formula. About a quarter of the world's bond originated in USA.

As a side remark, in considering saving or investing through bonds, one might evaluate the returns on equities in relationship to bonds and nominal GDP growth in evaluation of the whole picture, as the accompanied BMC template suggests.



Source: BMC

Capital Asset value and Rental value

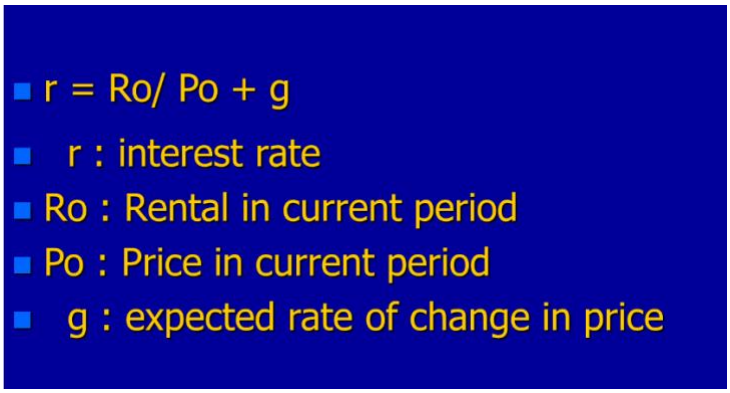
Although the present value of an asset is the price of the asset, it is not the price of capital. This statement seems contradictory, but it is not. The price of capital is the cost of owning the capital for one period, which may or may not be equal to renting the capital for one period. A cost is only a cost if paying for it requires an unrecoverable expense. For many capital assets, such is not the case, because the present value of the asset is recoverable after one period's usage by selling the asset to others at the end of the period. Therefore, the true cost of capital must be evaluated on a per period basis, even though the asset price is a present value, calculated pointwise on a moving timeline, with money exchanged for that present value when asset is purchased. Present value is not the true cost (or the true price) of the asset. We'll revisit this interesting property of capital value in latter chapters.

We stated earlier that an important characteristic of capital is that it is a durable asset lasting multiple periods. For analytical reasons, the discussion in the previous paragraph necessitates us to consider the per period cost of owning capital to be the relevant cost for consideration. For economics, it is always the opportunity cost that matters, which, in this case, is interest forgone by purchasing the asset at present value, plus physical depreciation of the asset.

Source: Author's powerpoint

Economists are also interested in the concept of equilibrium, which is a condition reached if everyone rationally considers alternatives in arriving at a theoretically stabilized condition. Therefore, the above opportunity cost will be compared with the rental value of capital, R, for anyone deciding whether to own or rent a capital asset. A perfect capital market with no transaction costs, conceptually, can allow people to switch between being an owner and being a renter. People will always

choose the alternative that has a lower cost. The action of choosing renting vs. buying, if aggregated with the actions chosen by many people, will change the purchase price of the asset and the rental price. Thus, with asset price and rental value adjusting, the equilibrium relationship between capital value and rental value is determined by the following formula:



Source: Author's powerpoint

The Ro/Po is the *yield* refers to in earlier paragraphs, although the method of calculating it is different here. Ro/Po refers to rental value derived from a capital asset. This formulation of an equilibrium condition is completely general, as it can be applied for all assets in the real sector as well as in the financial sector. Also, this formula explicitly recognizes the possibilities of appreciation/depreciation of the asset, as captured by g, the expected change in price for next period.

The term yield is widely used in businessmen conversation. BMC refers to it as APR. Generally, you'll see that it is sometimes being referred to as the "rate of return". Sometimes it is being referred to as the "interest rate". Rarely will businessmen refer them to as "cost of capital", however, although in the academic language of finance, the "cost of capital" has other more specific meanings, being sometimes used as an evaluation tool for making financial purchases. Finance uses other formulae that provide estimates and calculations for micro decision making. The elaboration here is macro, an approach of evaluating effects by aggregating many people's decision makings together.

For a macro understanding of the term, the important thing to note is that the yield of an asset by itself has little meaning, it must be considered in conjunction with the market interest rate, r, and a possible appreciation/depreciation factor, g, in order to consider the proper timing of a purchase or a sale of an asset. At any given time, a decision maker considers his/her own estimate of g and r in comparison with a given yield to decide whether "owning" or "renting" capital is a better

choice. It is when many people all making this type of micro calculation that all together, the market equilibrium condition is reached. The equilibrium condition so derived serves as a bench mark for evaluating whether the market is too high or too low.

In the market of equities (stocks), the concept of price/earning ratio has often been used to evaluate whether stocks are under or overpriced. The price/earning ratio is simply the reciprocal of yield in the above formula. Thus, a "reasonable" price/earning ratio must be considered in relation to the interest rate prevailing in that market, as well as the macro expectation of whether it will be a rising bull market (+g), or a falling bear market (-g). (E.g. see Evans, 2004, p.653-665)

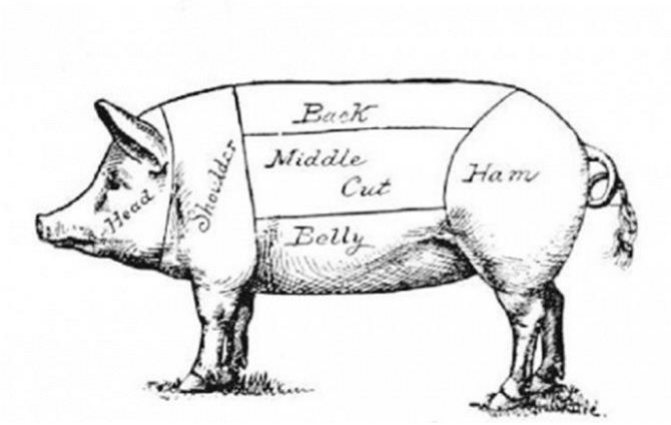
Source: Internet picture

For years, Wharton Finance Professor Jeremy Siegel has debated former White House budget management director, David Stockman, on whether the US stock market was heading for a bull or a bear, primarily using built-in assumptions that each proclaimed as appropriate for the price/earning ratio prevailing at the time of their discussions.

Contract Engineering

When we visualize a physical capital, we usually think of something lumpy, e.g. a factory, a highway, a stadium, something that requires time and money to build that will last a long time (durable). That is quite different from the notion of stocks and bonds many people also identify as capital, which are liquid financial capital that can more easily be converted into different forms, including cash. How are the two views related? The answer is contract engineering.

A lumpy capital asset can be divided and sold in separate parts. The whole asset could be lumpy, but a certificate designating a segment of that asset can be separately sold. The contract, a legal instrument that is nothing but pages of paper with words, now becomes a physical financial asset. The financial assets and the real capital assets backing them are supposed to be a one to one relationship, but they need not always be the case.



Source: Internet picture

Consider a pig with its many different body parts. A live pig is a lumpy asset, and when one says he is buying a pig, he is buying the whole pig. But a dead pig's parts can be sold separately, as ham, belly, etc.; indeed, possibly as future contracts before the pig is slaughtered and disembodied. Each of the contract so created becomes a new asset. Each will has its present value that, if added together, it should be equal to the present value of the pig, which may include the value of the live pig; or even with the added value as a pet perhaps, with the body parts to be consumed after the pig is dead.

You can think of a rental contract of a capital asset as a form of contract engineering operating in the same way. A house is lumpy, but only in physical form. The whole house can be rented, or its bedrooms can be separately rented. The owner of the house can also sign a long term contract to give a "renter" the right to use the garage of the house only. Renting and buying, in present value term, are identical. In terms of formula II described in the last section, renting is paying by the right hand side of the equation for different time periods, buying is paying by the left hand side of the equation all in one lump sum. Equality does not mean an identity, renting and buying are different type of contracts, their values are the same at equilibrium in present value terms.

Financial Engineering

Financial engineering is just a small extension of contract engineering. It can be used to create new assets *before* the pig is seen (dead or alive), or a house before it comes to its physical existence. Those are *future contracts*. Some of them are very actively traded in the financial sector of an economy.

Again, formula II can be used as a basis for explanation. *Financial derivatives* are often contracts of specific components of the formula, either on the left hand side or on the right hand side of formula. There is an infinite number of "packaging methods" one can make on the right hand side of that equation. Indeed, you can make a contract on only certain components for the right hand side of the formula, on certain hypothetical future values of them, or simply on the left hand side based on future date of delivery. Many financial engineering can be made based on future market prices of something, e.g. price of pork, or the future rental values of an asset.

You can create *calls and puts options*, all that can become financial assets once they are created and actively traded. The values of such capital assets, once created, enter the left hand side of a balance sheet of the people and the entities owning them. The balance sheet is an accounting method to measure wealth. When the market values of those assets go up, the wealth of the person and the entity owning them goes up. The increase in wealth can be used to finance and borrow additional loans to purchase more, strategically bidding up the underlying asset prices on the left and the right side of the equation.

Some would say: why invent this crazy game? The answer is: they are invented for a different purpose—to provide liquidity, and to hedge risks. They, like certain drugs, were invented to help people, although they can be misused. For example, the credit default swaps (CDS) was created as a form of insurance against government or corporation defaulting on the debt. The buyer of CDS is getting an insurance on assets they are holding, while the seller of CDS receives their payment as an insurance premium for betting that the debt will not default. The higher is the CDS spread, the higher is the perceived risk of default. A CDS spread of 593 means insurance for a notional amount of US$1million will cost 59,300 annual, paid quarterly. (See BMC for explanation)

Source: Internet picture, from* https://www.anatomywarehouse.com/4d-vision-pig-anatomy-puzzle-a-104344

Financial assets created by financial engineering, via portfolio choice decisions made by an entity, will end up on the balance sheet of an entity. The pig will not enter into the balance sheet of most entities, but the financial assets created from it will. This suggests an element of vulnerability in evaluating the asset value of a company. The philosophical difficult question to ask is: does an evaluation reflects the true potentials of an asset. The pig analogy can be used here again by looking into the internal health of the pig. Imagine toxic material is in the internal organ of the pig (the balance sheet). An unhealthy pig will have lower present value. A temporary sickness might be recoverable, and if left alone, it could be self-healed. However, if the market thinks the pig is sick, the pig is sick. Without given sufficient time to self-healed, the pig can be bankrupted, dead, and out of sight all

together. Some believe that was the case with Lehman Brothers in 2008, which was the trigger point of a world financial crisis.

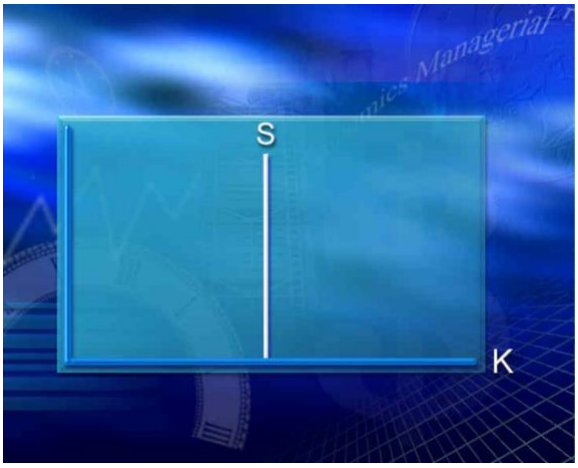
Is financial engineering growing too rapidly? According to BMC, there were only couple hundreds of corporate bond back in 1980s. Considering the number of financial assets we have nowadays, it is reasonable to question whether innovative derivatives have been invented too rapidly. Financial engineering is certainly a more recent development in the operation of the financial sector of an economy in the timeline of historical financial development in civilization. Whether this is a healthy development for emerging economies and at this speed can be a reflective question for students in macroeconomics to further contemplate.

Chapter III: Capital Accumulation

In the spaceship analogy in the introduction, we described capital to be what is propelling the spaceship/economy. Most people think that GDP is what propels an economy, but it is not, GDP is only the performance. The GDP of an economy does not grow out of thin air. GDP, a concept of calculating value of goods and services within a certain time period, yearly or quarterly, is a FLOW concept. That flow of goods and services comes from a STOCK of capital that the economy is endowed with, which can accumulate over time. Thus, studying capital accumulation is an important component of macroeconomics.

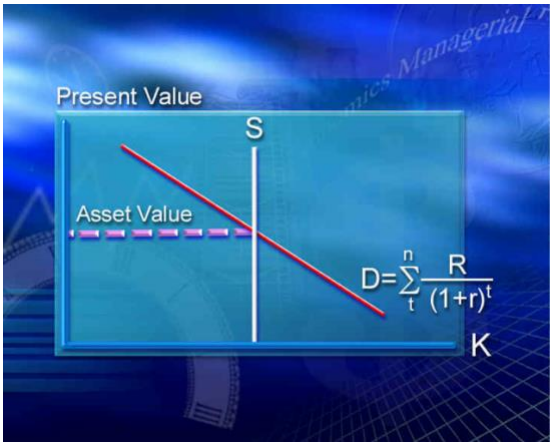
Although GDP is not a driver (but only the performance) of an economy, GDP is affected by capital accumulation in the form of investment made in the real sector of an economy. In the introductory chapter, we have discussed the financial sector and the real sector, two of the four rings of the internal component of an economy. The financial sector creates and distributes financial capital, which comes from savings in the real sector, but it must flow back to the real sector to create new physical capital. Or else, it will just be a financial game which benefits only the financial players. It will not engage in creating investment for real capital, giving the real sector the technology and productivity to generate GDP. Investment in every period itself can contribute to current period's GDP because it is a flow, the accumulating capital. Though contribute to calculation of GDP at the time investment is made (see the categorization of GDP in the last chapter), it is the capital's income generating potential, i.e. future GDP, that investment can truly contribute for an economy for future periods beyond the time period when investment expenditure is made.

We can describe the stock and flow of capital in the economy using the following set of diagrams, starting with a representation of the stock of capital, K.



Source: Author's powerpoint

The supply curve denoting stock in existence is vertical because no matter what the price is, the stock is still there. In other words, price in the short run does not affect supply. Price of the stock capital is thus solely depended on demand.



Source: Author's powerpoint

The demand for capital asset is the value that the capital can generate, which is a series of R as explained in Chapter II. Discounting those rental values by interest rate and summing them up is the present value of capital, or on a per unit of capital basis based on the reading of this graph. Thus, the intersection of demand, D, and the stock supply, S, determines the asset value of per unit of real capital. The above diagram is a graphical summary of what was discussed in Chapter II.

Generally, the stock demand D depends on the following factors:

Source: Author's powerpoint

The first two factors are obvious from the present value formulation of the stock demand. Risks come in the form of using appropriate interest rate (yield) incorporating risks for discounting. Recall proposition in previous chapter that a more risky asset needs a higher yield to compensate. Therefore, a more risky capital asset should have a lower asset value, a shift of the asset demand curve, and a higher APR.

Inflation expectation affects the D in some interesting way in that it affects both the numerator and the denominator of the present value. Generally, inflation will bring up asset prices such as real estate properties, because the right hand side of the formula, R, goes up by inflation. The R in the numerator for bond, on the other hand, is fixed, while the interest rate incorporating inflation expectation in the denominator will be higher; thus, bond price is likely to be lowered due to inflation. Another way to understand this is that inflation makes lenders worse off, since the money returned to them when a loan is matured can buy less things.

Source: BMC

Government policies can affect D in numerous ways, but perhaps the most obvious one is capital gain tax. Taxing capital will lower D and leads to lower asset values and corresponding higher APR. It seems paradoxically that a tax can raise APR, but not if one recognizes that higher APR is needed to pay for the tax.

Flow is the accumulation

Flow can be considered as the net new capital assets added to an economy every period. It can be a continuous flow because capital assets usually take times to construct or create. It is measured as a change between the capital newly created and the those that are depreciated, and it is usually labelled as a ^K.

Source: Author's powerpoint

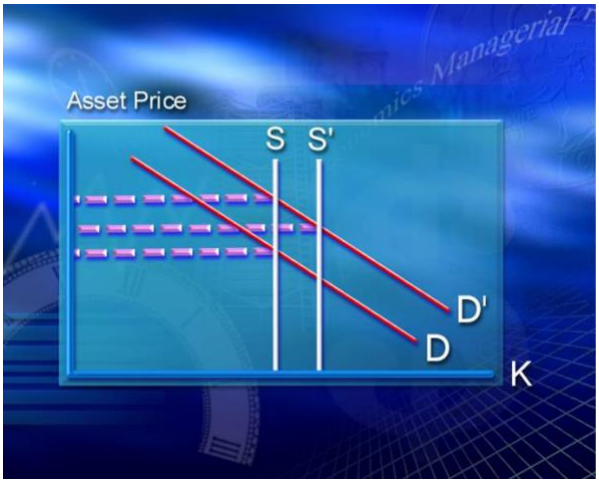
The flow supply is a marginal cost. It refers to the costs of creating new capital, e.g. new houses, new bridges, new companies. As such, the flow supply can be affected by the following factors:

Source: Author's powerpoint

Generally, other things equal, all factors that contribute to a lowering of costs of creating new capital assets will expand accumulation, because the flow supply shifts downward while the price of capital remains the same. Governments often provide subsidies of various types to stimulate this expansion. The debate concerning the mix of measures to pursue for private versus public is most acute on this issue. Private initiatives have good results in the US, but often not sufficient to affect the general employment level of the whole economy. In that respect, the secular lowering of labor participation rate could be a good thing in that it reflects a shift of the labor population from employed status to self-employment or start-ups, even though it might take a while for their contributions to flow back into the real sector, via the four rings mentioned in Chapter 1.

There are numerous examples of government policies to induce capital accumulation, although not all are successful, particularly with the end result of raising future GDP. Government expenditure is part of a fiscal policy a country can adopt to improve short run and hopefully long run performance of an economy. The debate here is that conservative economists usually advocate private initiatives with the government playing a minimal role, government's role as an enabler is often being questioned, and any direct government subsidies is likely perceived as to be inefficient and likely to fail. This proposition should best be evaluated at a pragmatic level rather than purely on some ideological ground. Indeed, governments all over the world themselves are going through a stage of experimentation.

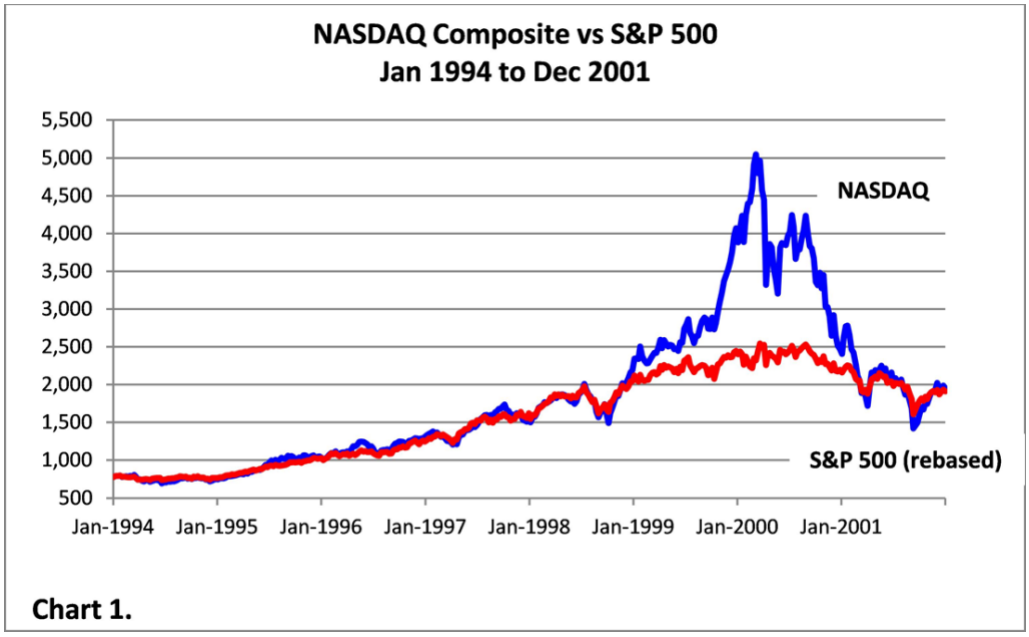
Theoretically, the interaction between stock and flow of capital (the accumulation problem) can be captured by placing the stock diagram and the flow diagram side by side. A stock demand increase will first bid up the asset value. Investment in the flow diagram will then adjust capital accumulation according to the perceived increased asset values. When the flow is brought back into the stock of capital by shifting S to S', the asset price will come down. Thus, there can be a cyclical pattern of asset price as shown in the accompanied diagram.



Source: Author's powerpoint

This notion of a cyclical pattern is useful for an explanation of the dot com bubble of 2000 in the US. Internet technology and E-commerce have led a first generation of internet entrepreneurs to dreams of conducting everything on the internet, with them and venture capitalists telling "stories" of how future values of a business can be created by the technology. As long as the stories of future value continued and the prospect of success was not diminished, D would be increasing, making stock

prices higher and higher. The higher price prior to 2000 induced a flow of IPOs (initial public offerings). New firms were created rapidly to build on expectation of a technology future. This expectation continued in spite of an increase in IPOs, increasing the stock of capital. Indeed, the outward shift in D and the IPO accumulation could be thought of as a race between D and S. So long as expectation in D continued to rise, new IPO could not substantially reduce price. The trend prior to 2000 continued until the technology story was found exaggerated; and thus the bubble burst in 2000.



Source: Internet picture

The dot-com bubble has been noted by most historians as the cause of a mild recession during the turn of the century. However, it is not the theory usually used for explaining recessions. The notion of what actually can cause a recession is a matter of macroeconomic theories. The cyclical adjustment of capital stock as explained above could be one among many theories. For various reasons to be further explained in this chapter, one should not expect recession to be explained by one single macroeconomic theory.

Recession itself has many definitions too, depending on a country and a particular policy body defining it. It is generally considered that a measure of two consecutive quarters of negative growth rate of real GDP being a recession. However, this definition does not apply well for emerging economies, because their economies usually have a high real growth rate, and thus, very difficult to see a recession according to this definition. Emerging economies usually experience

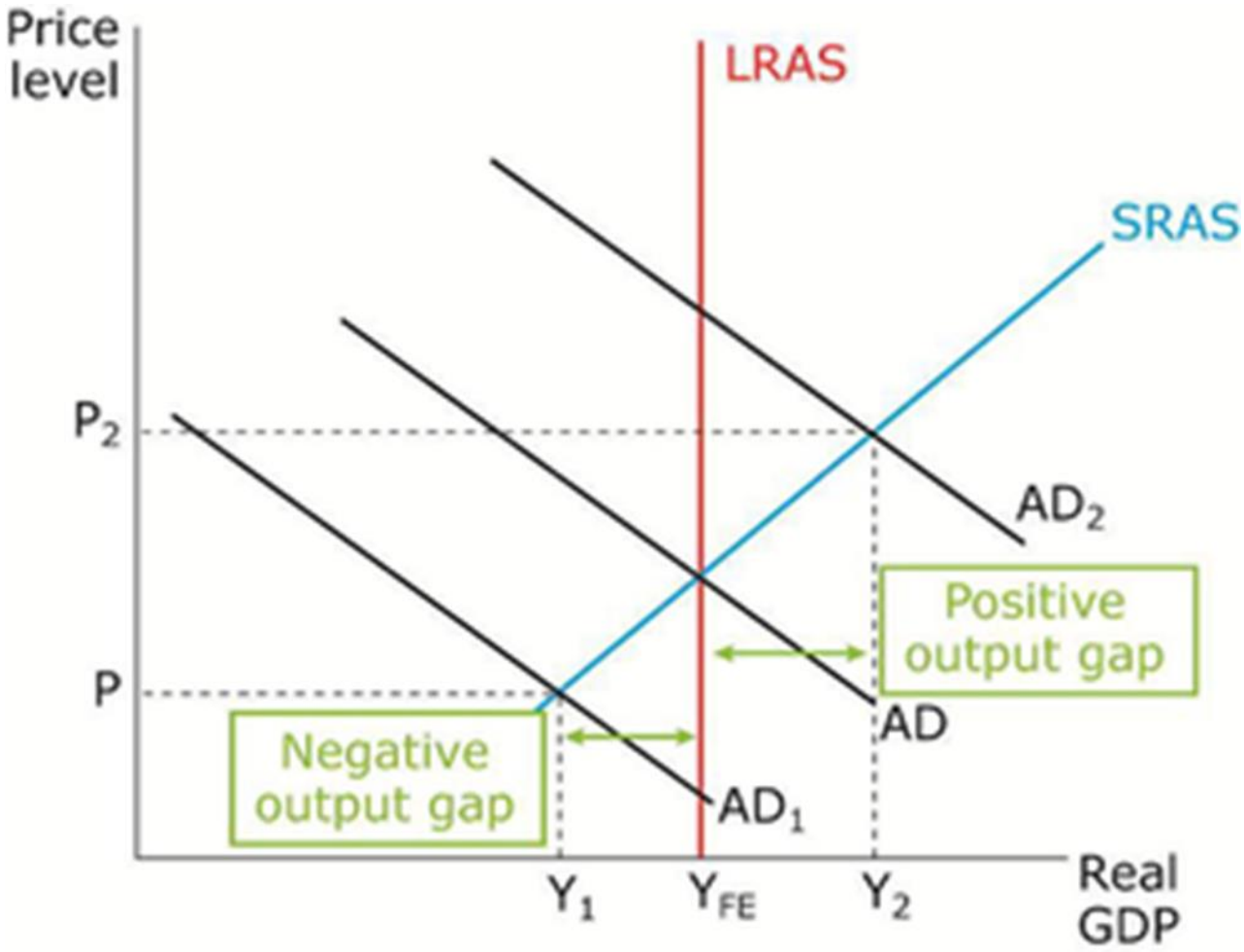
phenomenal secular growth rates, which should be distinguished from a cyclical pattern that is around the secular trend. It will be more accurate to say that recession refers to some overall sluggishness in the economy, however sluggishness is being measured.

Keynesian View of a Recession

The cyclical pattern of capital accumulation revealed by the dot com bubble is to be contrasted with a theory popularized by an economist called John Keynes for the 1930 Great Depression in the US. The so-called Keynesian economics explained the depression as caused by a reduction in Aggregate Demand, which consists of the four components of GDP of C, I, G, and (X-M). The economy was not doing well because people didn't spend! He advocated government spending to get the economy back on its feet. A variant of this remedy is to use monetary policy to stimulate the four components by lowering the interest rate.

Classical economists object to Keynesian economics because they believe the proper remedy to a weak Aggregate Demand is simply to let the general price (including the wages) level to fall. They assert that an economy can be back to full employment as long as wages could be adjusted downward when there is high unemployment rate during a recession. This is usually not a popular position for politicians to endorse because, as a practical matter, most people would not accept falling prices and falling wages to be a sign of a healthy economy, even though it could get the economy back into full employment. Most people care most about their own wages.

Keynesian economics can be illustrated by a set of tools consisting of Aggregate Demand (AD), Short run Aggregate Supply (SRAS), and Long run Aggregate Supply (LRAS). The model is often used for generating what is called a *Philips Curve,* which is an empirical generalization macro policy makers like to debate.



Source: Collander

BMC provides some easy learning tool for this thinking paradigm. The Negative Output gap is also called a Recession gap, while a positive output gap can be called an Inflationary gap. Central bank in US, has for a long time, used this model in conducting Monetary Policy in that if a negative output gap is happening, the Federal Reserve Bank,FED, will ease money supply by lowering interest rate; and if an inflationary gap is happening, the FED will tighten money supply by increasing interest rate.

The traditional FED model perceives the LRAS literally constant as represented by the red line. The full employment real GDP (Y_{FE}) in the graph is determined by the long run production capability of an economy, i.e. when all production capacity of an economy is utilized. The terms that people have used to refer to output at LRAS are numerous.

- Full Employment level
- Potential output
- Targeted output
- Normal output
- Long run equilibrium output

Source: Author's powerpoint

As explained in the BMC material, US Central Bank looks at inflation expectation and output gap to adjust interest rate. It is usually believed that inflation expectation is low when there is a recession gap; and inflation expectation is high when the output gap is positive.

The output gap formula is in % =
(Actual Output in $B- Potential Output in $B)/Potential Output in $B

Source: BMC

The US FED sees its primary role to smooth out fluctuation of Aggregate Demand by monetary policy. Their *perception of reality* is largely grown out of this vision on how the economy operates, i.e. whether the economy is on the left, or on the right hand side of LRAS. This is the model believed by them as well as many people who are evaluating FED interest rate policy, particularly for the US economy.

Is this perception of reality for an economy correct? Unfortunately, there is no easy yes and no to this question, particularly if one were to include capital accumulation as described in this chapter into the analysis. Like assuming the stock supply of capital being fixed while actually they are not (because the flow will interact with the stock), there is probably no reason to expect LRAS to be fixed. Yet, as a framework to read the economy and to formulate a policy, a *moving* LRAS is an uncharted territory. Indeed, traditionally, the FED does not consider capital accumulation to be its goal, achieving the *dual mandate* of full employment and price stability is. A dual mandate focuses on getting the economy to the point where AD, SRAS, and LRAS all intersecting at one point, the holy Y_{FE}. This is how *normal* has been defined in the US in many years of its macroeconomic decisions in the past.

The difficulties and the intricacies in managing the US cyclical problem have been noted in a humorous way in a song on the YouTube: https://www.youtube.com/watch?v=WTGok1W_mNI

Source: Internet picture

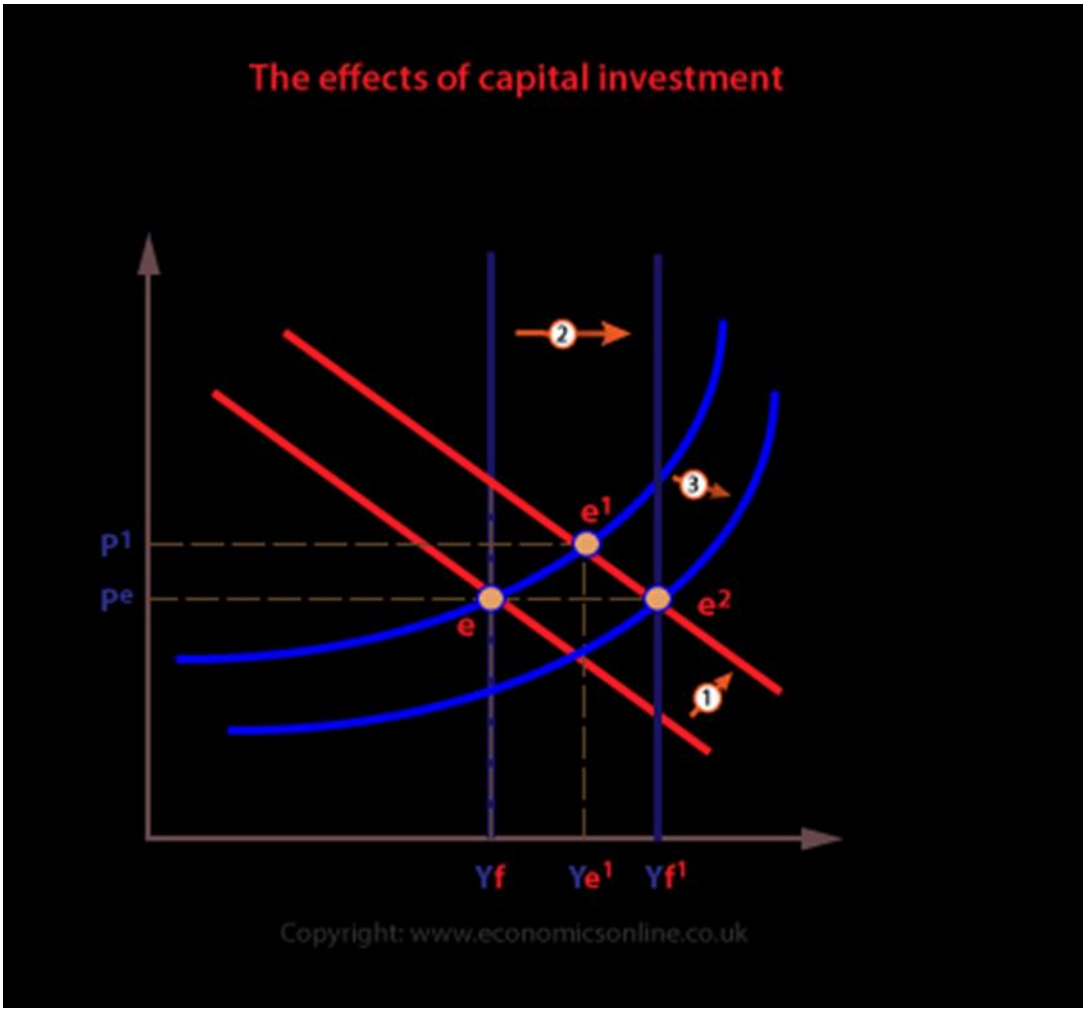
The New Normal

We can combine the traditional framework of viewing a business cycle with a cyclical pattern of capital accumulation in digressing what a new *normal* would be like.

In the last 20 years or so, the world has gone through a rapid change in technology and globalization that some of the macro tools developed over the years solely for a US application may need to be modified. This sentiment has increasingly surfaced from policy makers in the emerging economies, including China and India, but it has not been fully integrated into a *consensual perception of reality* via a unifying theory yet. Thus, the process is on-going.

The truth of the matter is that the 2008 financial crisis in the US, which spread all over the world at the time, was of a different nature than the 1930 depression as well as the dot com bubble of 2000. It was a different beast that needs to be addressed and tackled differently. Those using a conventional framework to evaluate will find policy and evidence somewhat disconnected. For that reason, the slow recovery of 2008 crisis in US has been heavily criticized by many, and almost costed US President Obama a re-election in 2012. The slow adjustment of the unemployment rate in US since 2008 has bothered economists and policy makers alike, all working within an evaluation framework based on Aggregate Demand and Supply, assuming LRAS to be fixed. Recovery speed evaluated within this framework is way too slow to many people—leading to the conclusion that either the Obama administration was not doing its job, or the theory is wrong.

A modified version of the Aggregate Demand and Supply model is to explicitly recognize the capital accumulation process described in this chapter. The SRAS is a flow, as such, similar to a flow supply of capital, it will add capital stock to the economy's income generating potentials. Some countries can do this more effectively than others. Through private ingenuities, government policies, and a combination of both, technology factors in SRAS can move LRAS to the right. Indeed, emerging economies and globalization have opened up underutilized resources to the world that a LRAS being fixed may no longer be realistic. This is a theoretical point that is not normally accepted in the economic literature, but can be shown below as a possible explanation of what the *new normal* might entail.



Source: Internet picture

More detailed exposition of this concept can be found in the link below. Note particularly the sequence of 1,2,3 events in its explanation. Although there could be other sequence of events leading to an explanation of a new normal, the theoretical treatment of this version is quite plausible:

http://www.economicsonline.co.uk/Managing_the_economy/Aggregate+supply.html

The same website also provides an excellent exposition of the circular flow idea described in the introduction module:

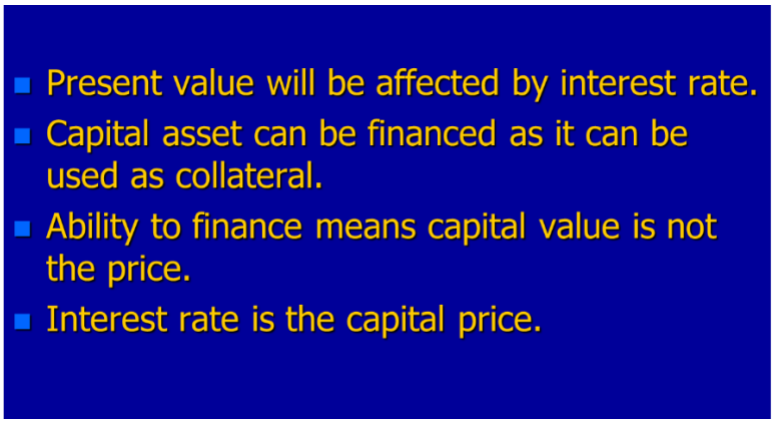
http://www.economicsonline.co.uk/YouTube/Circular_flow_video.html

The type and the quantity of new capital accumulating in countries of the world will decide the winner for the 21st century. This factor, along with the four chambers of balance mentioned in Chapter I, will map out a future path for a global economy that cannot be determined in advance. That said, all factors in an economy must operate according to some principles in the *internal organs* (i.e. the 4 rings) of an economy. In the context of the metaphor used in this set of notes, a person can eat a lot and take a lot of vitamin pills; but if the person doesn't understand how food and vitamins interact with the body in producing energy in the mind, the soul and the body, the person will still be unhealthy. The person in this case of course is the economy.

Chapter IV: Interest Rate and Government Policies

Interest rate is the life and blood of capital theory. It measures the condition of the capital market of an economic system, but it can also be manipulated by government policies. Some countries administratively stipulate it as a matter of economic policy. Some countries stipulate certain aspects of it. But no country can stipulate ALL types of interest rates in its economy because the important underlying forces behind interest rate setting are determined by the underlying preferences of the people to borrow and lend—a grassroots force too big for any government to totally determine or manipulate, even if they have the power to set certain official interest rates they can directly control.

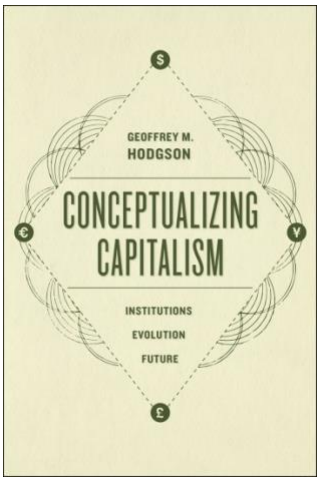
Interest rate affects the operation of an economy because of the following reasons:



Source: Author's powerpoint

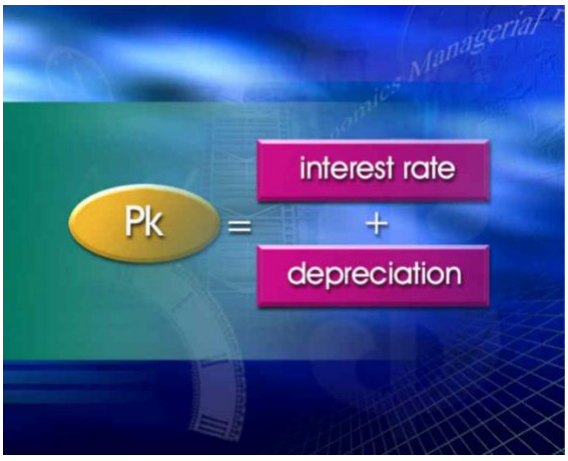
Everything durable has a present value. All present values are affected by interest rates because of the discounting formula. But the key distinguishing feature of capital is not limited only to interest rate. The key being that capital, as a durable asset, can also be used as a collateral to borrow money to finance that capital.

Collateral is often used for transactions between the borrowers and the banks, or issuers of debt instruments in the financial markets. When someone buys a property (a capital asset), he/she does not own the title of the property until the mortgage is paid off. The property is used as a collateral. It is this ability of collateralized borrowing that furnishes the power of capitalism-a system of providing leverages often built on pure trust and honor, and a legal institution designed to prevent misuse and dishonesty.



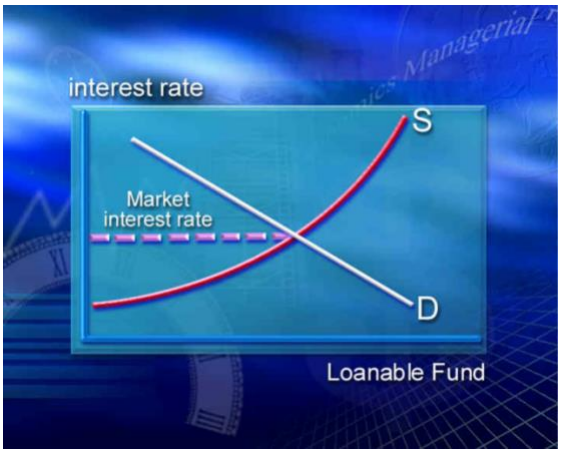
Source: Internet picture

Capitalism could mean using the power of capital to drive an economy. But why is it capital and not other things else? The short answer to that is that capital lasts, it generates a flow, and flow contributes to GDP. But everything comes with a price (or cost). What is the price (or cost), Pk, of capital? There is something very subtle for this inquiry here. Unlike the price a product is usually expressed, as $/unit. The price of capital is expressed as a %. And more precisely, a percentage (interest rate) plus depreciation rate.



Source: Author's powerpoint

When interest rate in an economy is going up, the cost of capital is going up. But is that a good news or a bad news for people in that economy? The loanable fund model of interest rate can help us to answer that question by understanding the fundamentals of interest rate:



Source: Author's powerpoint

In talking about loans, we see that often long term loans have a collateral. This is the loanable fund market. This market sees a demand and a supply curve as shown in the accompanied diagram. Demand represents the incentive to borrow, and supply represents the incentive to lend. Borrowers use the funds to buy capital assets for investment, as well as for consumption. Lower interest rate increases the incentive to borrow. The supply of the lenders is saving, *loanable funds* supplied, for a higher return realized when loans mature. Higher is the interest rate, higher is the incentive to save. The "market interest rate" represented in the diagram is a conceptual rate that represents the prevailing interest rate based on the aggregate borrowing and lending activities for the whole economy. It should not be interpreted as the rate a bank offers in its advertisement, or as a particular yield in a particular debt instrument. The observed rates in the real world all move up and down in some related way if given time to reach an equilibrium, unless for particular ones that are being regulated, or those institutionally set for strategic reasons. We see many examples of that in many economies of the world, so the loanable fund model above as described by a demand and a supply curve does not always operate smoothly in different countries. However, the more depth of the financial sector of an economy, exhibited by a large varieties of alternatives and options for borrowers and lenders, the more likely that the loanable fund model can play to its fullest.

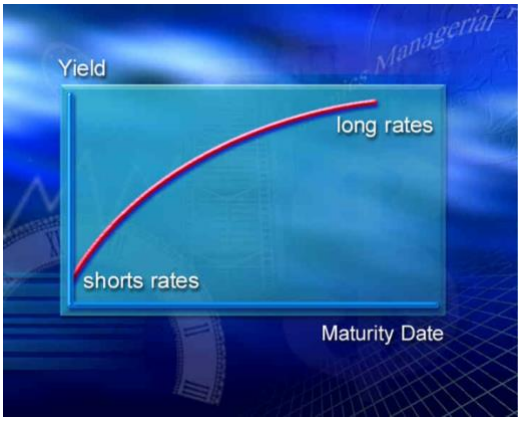
The number of borrowers and lenders, and their willingness to borrow and lend, are the key determinants of interest rates. When the demand for loanable funds shifts to the right, because the economy is getting out of a recession and businesses want to invest more, interest rate will rise. For this scenario, an increase in interest rate is not a bad news, as it is risen because the business climate has improved.

Indeed, expected profit (rate of return) of business could be the driving force of interest rate. When profit pulls up interest rates, one may not want to consider that as a bad news.

There can be other causes for interest rate to go up. When people want to spend (consume) more and save less, the supply curve will shift to the left. In this case, interest rate rises, but it will be perceived as a bad news to most people, as the cost of loans increases without corresponding increase to return on investment for the loan borrowed.

A smooth interaction between demand and supply of loanable funds can give a country a well-functioning capital market. It can also induce capital accumulation, which acts as an engine of economic growth. The depth of a capital market takes a long time to build up. Cities like London, New York, and Hong Kong, etc. have the presence of a long history of their financial institutions. In countries that lack such financial institution infrastructure, interest rate may not be allowed to operate according to the fundamentals of this loanable fund model. Indeed, more often than not, in emerging economies, interest rates are selectively chosen for investment projects based on the strategic needs in that country. Countries that have low saving rates also need to rely on sovereign funds (foreign money) to provide supply of loan which the government will then internally allocate for their investment needs.

For countries with sufficient financial depth in their capital market, a *yield curve* is typically observed, which is a curve plotting yields according to the maturity of dates of government bonds in that country. In countries without a thick government bond market, interest rates can still be ranked according to maturities in something resembling a yield curve, but they may be just a mixed bag of interest rates with different maturity dates, consisting both government and private bonds.

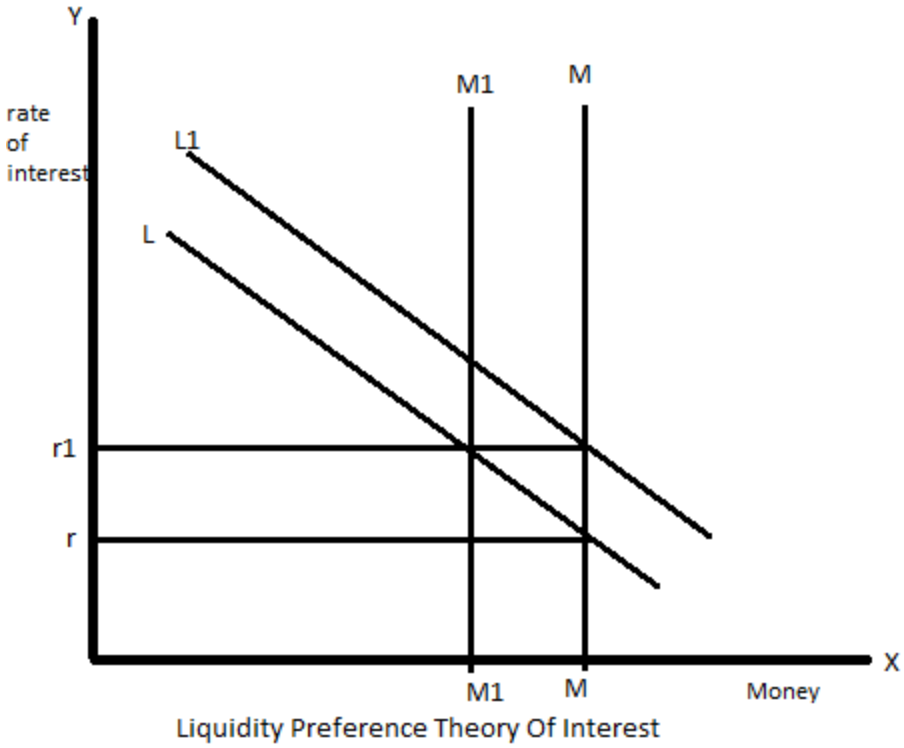


Source: Author's powerpoint

The yield curve is generally upward sloping, meaning long rates are higher than short rates. The long rate usually incorporates a future short interest rate expectation as well as a liquidity premium (because long debt is more difficult to sell).The slope of the yield curve can be represented also by the *yield spread* between the long and the short rate, sometimes called the *term premium.*

The determination of short rates is different from that in the loanable fund model. Short rates can be influenced by Central bank's changing of money supply and the demand for money. The incentive for the public to hold on to money (demand for liquidity) is different from the incentive to take out loans. The demand for liquidity (money) is based on the three factors: (1) Transactions: people's ability to do basic transactions, i.e. buy things. (2) Precaution: in cases of social or physical emergency that require unexpected spending. (3) Speculation: in cases people hold on to money to wait for the best time to invest or the timing of market swings.

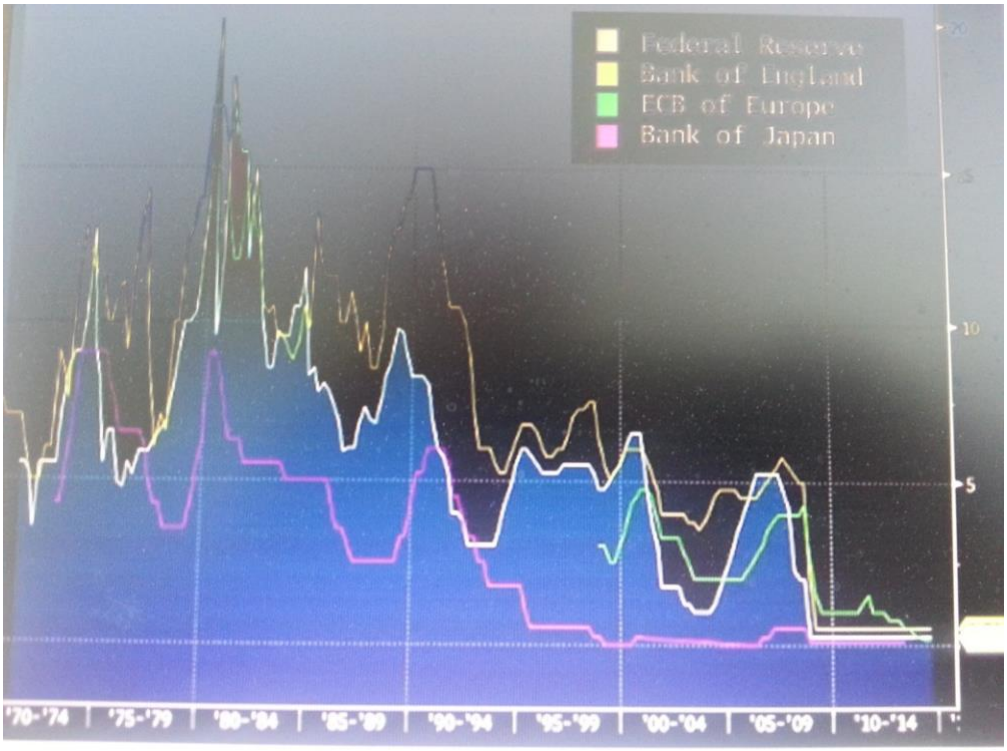
The demand for liquidity is a function of interest rate, because the alternative to holding on to money is to invest the money into buying capital assets. This demand is the inverse of the *velocity of* money. When people passes money from one to another more quickly, it means that they are holding them for a shorter period of time on the average. That means the demand of liquidity is lower. The velocity of money in relation to the Supply of Money and GDP of an economy is usually described by the *Equation of Exchange.* The demand and supply of liquidity determines the short rate.



Source: *http://www.readorrefer.in/article/Liquidity-preference-theory--Keynesian-theory--of-interest_1590/*

The liquidity preference model above is what contributes to the public impression that it is the Central Bank that controls interest rate. Central Banks can control the supply of money, thus making interest rate higher or lower depending on whether they increase or decrease the supply of money, but the rate so affected is the short term interest rate only. The Equation of Exchange is often used to explain inflation in that if the government pumps too much money into the economy. This conclusion, however, rests on the assumption that the demand for liquidity is relatively stable, i.e. the velocity of money is constant, and the economy is at full employment.

Below screenshot can be accessed at the Bloomberg Terminal via a function called Global Economy General Statistics (GEW). The reported rates for US, England, Europe, and Japan had been on a secular decline since 1980. Thus, according to the model above, the central banks of the world have been continuously increasing money supply.



Source: BMC

This secular decline pattern is significant since the 80s. The world market went through a cycle of very low interest rates, pursued by the central banks of major countries who were afraid that a rise in interest rate would adversely affect the currency and consumption, impacting GDP, leading to recession. This pattern can be a hotly debated and monitored policy discussion question.

Although US Central Bank can affect short term interest rates via the liquidity market, the long term interest rates cannot be easily changed. Below diagram from BMC shows that overnight interest rates effect only the left tail-end of the yield curve, the long-end of the yield curve cannot be easily manipulated.

Source: BMC

In an economy's down cycle, US Central Bank usually adopts an easy monetary policy by increasing money supply and the lowering of short term interest rate to stimulate the economy. For the up cycle when the economy is overheated, US Central Bank usually adopts a tight monetary policy by raising short term interest rate. That means for a slowdown economy, one can see an inverted yield curve. Market analysts talk about the economy approaching the point of an impending recession if they note a *flattening yield curve*.

Central bank of a country sometimes manipulates short term interest rates not so much to speed up or slow down an economy, but to make the country's currency stronger or weaker relative to other countries' currencies, i.e. the exchange rate. Recall that one component of GDP is net export, X-M, which can be affected by exchange rate, as well as affecting the exchange rate at equilibrium. Governments setting short term interest rates have been known to have significant effects on exchange rates. For example, when a country's currency is under speculative attacks, central bank of that country can counter that by raising short term interest rate to slow down the outflow of foreign currency from that country. For example, one of the well-known currency speculators is George Soros. His attack on currencies in Asia in 1997 had caused an Asian Financial Crisis, as Central Bank manipulation of short term interest rate will also have a significant impact on the equity market of a country.

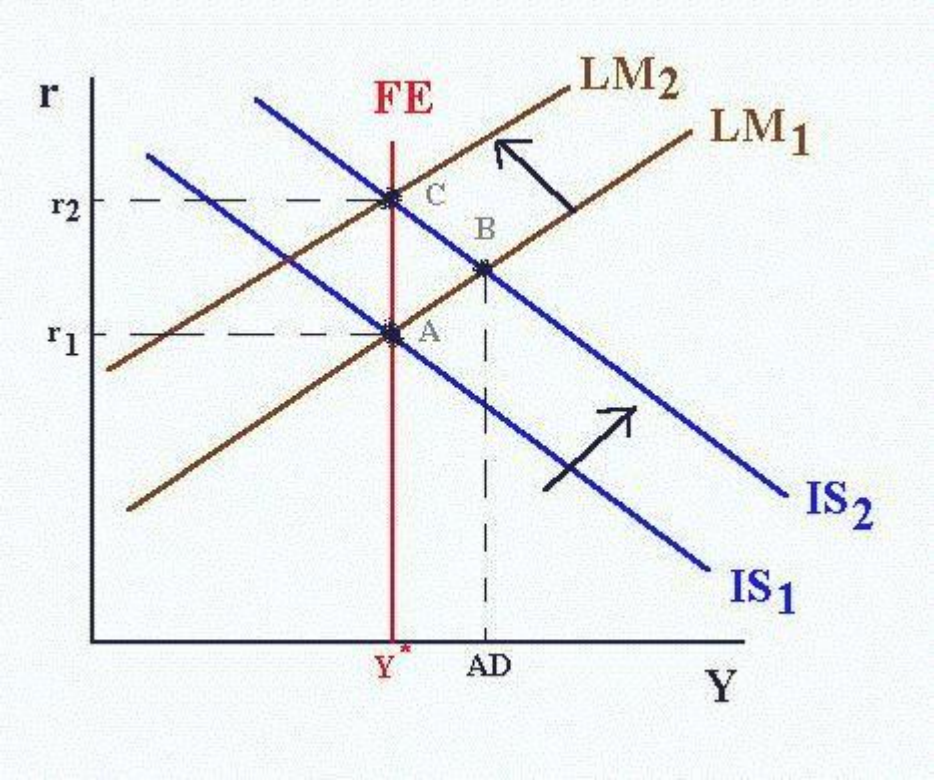
Source: Internet picture, from* http://theduran.com/george-soros-web-unravelling/

Interest rates effect on the equity market of a country is a probabilistic and not a deterministic relationship in the short run. Theoretically, it is often believed that interest rate and the stock market has an inverse relationship such as the relationship between interest rate and bond price; but this is not always the case. When US Fed announced a delay of raising interest rate from a down cycle during the Fall quarter of 2015, the news did not result in an increase in the stock market price. In fact, it fell. Hedge fund managers painted a pessimistic view of the economy, and also criticized FED action as losing its leadership role on steering global macro conditions.

Another example of this is in the Spring of 2019 when after the FED has started tightening the short term interest rate in December of 2018, it abruptly announced that there will not be interest rate increase again in 2019. Normally, that news will trigger a rally in the stock market. That, however, did not happen. Indeed, the inflow of funds from Europe because of a negative interest rate environment there turned the yield curve sloping downward on a particular day in the Spring of 2019,

triggering a selloff in the stock market. Thus, the relationship is not always play out according to the present value formula. Reading the economy as a snapshot is an art. The happening of each snapshot depends on many other things too.

Another theoretical model that is often used in macroeconomic analysis is called ISLM. This model operates similar to that of Aggregate Demand and Supply, but putting interest rate on the y-axis instead of price level.



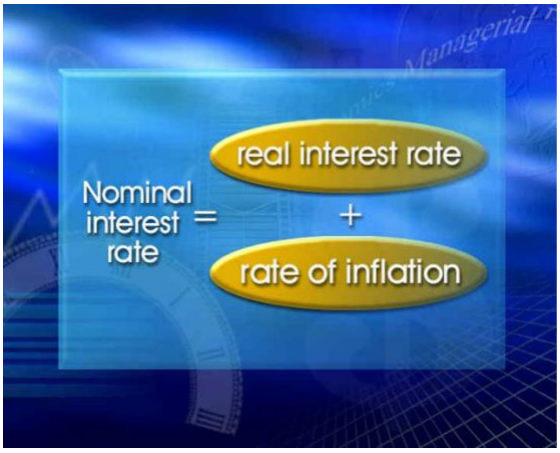
Source: Internet picture

For example, the above diagram can be used to denote why interest rate is risen when there is an overheated economy. Similar to the Aggregate Demand and Supply model, the economy starting at long run equilibrium point A may experience an overspending. The IS curve thus shifts to the right, leading to an inflationary gap denoted by AD-Y*, as the economy at B will be over capacity as compared to point A. The Central bank counters by tightening money supply, which will shift the LM curve to the left, bringing about a new equilibrium at C, with a higher interest rate, thus getting the economy back to full employment equilibrium of Y*. If over spending is continued onward, this process will be repeated, and interest rate will climb higher and higher.

The ISLM model has some inherited logical fraud that we should elaborate a little, noting first that interest rate is not just a rate as the Y-axis of ISLM model seems to imply, but a set of rates as we've explained earlier by the yield curve. Another complication is whether the rate used in ISLM should be the nominal rate or the real rate. Regardless, this model has been commonly used in many textbooks and in classrooms to illustrate Central Bank policy of influencing interest rate. Again, this is a perception of reality issue that has been emphasized throughout this set of notes. Some analysts feel more comfortably to perceive the economy through the lens of this model than the Aggregate Demand and Supply model. You'll see sometimes people express varying opinions depending on which model they are using to interpret the economy.

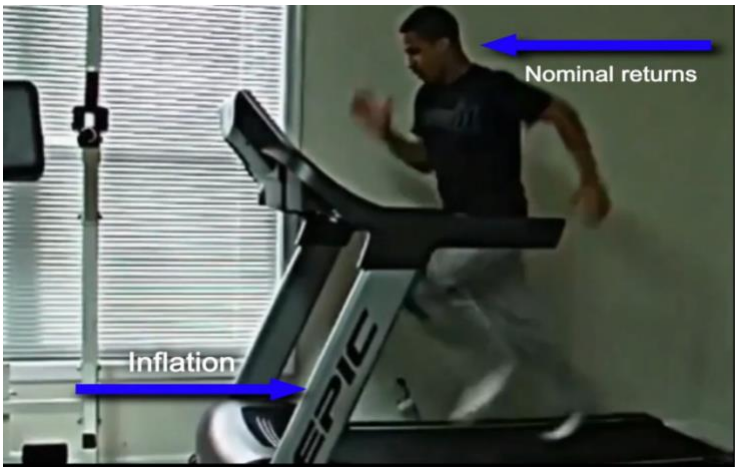
There is a message embedded in ISLM that we wish to uncover beyond using it as a tool for explaining Central Bank actions. It is that there is an implicit assumption in this model that interest rate being the linchpin for linking the real sector with the financial sector in the economy. This can be a big assumption. Reviewing how these two sectors operate in the introductory chapter, we see possibilities that the two sectors may not always be in sync.

The logic of the model, however, is the following: The IS curve, as derived from activities on investment in the real sector on GDP, illustrates how interest rate affects investment. The LM curve, as derived from the liquidity model in the financial sector, illustrates how the supply of money can change interest rate. If the two sectors are in sync, government's action in the financial sector via monetary policies can affect the real sector. This is equivalent to saying that a government can create money to change the real performance of an economy. Many classical economists would not be able to accept this implication, as it would imply that people can create real goods and services just by printing money. To them, the more important question to examine is: how interest rate can affect real sector in the long run, and in particular, how it would affect capital accumulation, which is the engine for growth.



Source: Author's powerpoint

The above discussion brings up the notion of real interest rate. Real interest rate exists as an abstract concept, but it is actually quite simple. It is the adjustment of interest rate based on inflation. The real rate of interest is a calculation, obtained after deducting the rate of inflation from a nominal interest rate given. Suppose a savings account gives 6% rate of interest and the inflation is 4%, then the real rate of interest actually received by the lender is 2%. In BMC, you see below picture of how an investor would want to keep up with the rate of inflation just to stay even; but for saving, obviously one wants to do better by having a positive real rate of return on their saving or investment.



Source: BMC

The variation of this simple formula and its interpretation on its effect on the economy can be subtle. For example, if an economy is at a low nominal interest rate, say 0.5%, and inflation rate is 1.5%, the real rate of interest will be -1%. This is a negative real rate scenario that if applies to a long term interest rate, it would

imply the real productivity of capital is negative. No one should do investment in a country with negative real return, because it suggests that any investment made in that country will not be paid off in real terms. The dilemma is that sometimes what we are hearing from policy makers is the proposition that governments should invest more—to take advantage of the low interest rate environment. This may indeed be a practical route that economy can get back to some type of a normality. There is no verdict on this until the future unfold.

In the US, there is a way to track real rate of interest by an investment instrument called TIPS-Treasury Inflation Protection Securities. The yields on TIPS gives approximation of real rate of interests for investment of different terms of maturity.

Source: BMC

The yields on TIPS are derived from investors expected rate of inflation. One can legitimately ask whether investors can indeed formulate an expected rate of inflation, perhaps next year or two years after. But having an expected rate of inflation for over 10 years may seem a far-fetched presumption. Nevertheless, that is how the investment instrument is structured, which is also an example of how financial engineering can be invented. Buying TIPS will insure a rate of return on a saving/investment that has a terminal amount of actual buying power when the loan matures.

As long as the yields on TIPS are positive, the possibility of a real rate of interest being negative has yet to bother policy makers, as most people have treated the secular low nominal interest rate environment since 2008 to be transient; so long as real interest rate is still positive, particularly at the long end of the yield curve, there is nothing to worry too much. There were negative real interest rates for some countries in recent years, at least for the short end of the yield curve. There can be

strong policy debates on this matter, with many continuing treating that as a transient phenomenon that will eventually self-adjust into positive numbers again.

Speed of adjustment aside, perhaps there are practical reasons on why a negative real rate of interest has not bothered decision makers too much. The reality is that most people in the real sector have assets in the financial sectors. As long as nominal wealth is accumulated in the financial sector, people think they can escape to the real sector before inflation actually affecting the things they want to buy. As long as they are confident about the timing of switching assets between the financial sector and the real sector, they will ignore the possibility of a real rate of interest being negative, as they believe they can react faster than the long run market equilibrium. This is yet another form of the so-called animal spirit of humans. We are often over-confident about ourselves.

Negative real rate of interest is one thing, but negative nominal rate of interest is quite another, which is a very strange phenomenon given the theory of interest rate described in this chapter. It would never happen to a country with stable currency regime. Proactively as a government policy, a negative nominal rate of interest should never be promoted as a policy of its Central Bank, as it implies that they are paying people to take the money they print. Why would anybody want to print money but also to declare that? There are devious reasons one can concoct to explain that. But it will not be a useful exercise to go into that. Suffice to say that it will be a self-declaration that your country's currency is heading towards being worthless if a negative nominal interest rate is adopted as a proactive measure to stimulate the economy.

It pays to remind readers that short term interest rate is not only a money supply phenomenon, but an outcome of both supply and demand in the liquidity market. Even if a Central Bank does not actively pursue a negative interest rate policy, it does not mean that interest rate in that country will never be negative, given that there may be currency risk in other countries. In the 21st century international finance economy, often involving large banks and financial institutions, there will be currencies exchanged across country borders in large volume for all sorts of reason. In search of safe havens reacting to external shocks, and constrained by intergovernmental fees, risks, and transaction costs of various types, the theoretical possibility that the supply of loanable fund in certain country being shifted all the way to the right, reaching a negative point of intersection, is rather unlikely. However, it is entirely possible that the demand for money in certain currency can

shift down so much; and given that the supply of that currency in the short run is perfectly inelastic, that the intersection point of demand and supply of that currency indeed is negative. In periods where a currency regime is vulnerable, perhaps due to some political events, e.g. a Grexit, or a Brexit, a negative nominal interest rate for its supporting currency (i.e. the German Bund) is not inconceivable. Even for a country such as USA, a finance futurist recently claimed that if all US dollar account holders are to appear on the same day to demand paper cash from their banks, it will take the US government 20 years to fill that demand!

What does that leave us in the grand scheme of things in reading macroeconomics of the world? The monetary policies pursued by advanced countries of the world since 2008 had not seemed to get the world economy back on its feet quickly. Meanwhile, *the circle of influence* pointed out in the introductory chapter has emerged in some unpredictable fashion arising from geopolitical dynamics. The role of fiscal policies, and possibly a coordinated international fiscal policy, could possibly evolve to be the next chapter for the macroeconomics of the world economy. This, together with innovation the forces happening in the Schumpeterian rings, would make it virtually impossible to predict the outcome of the monetary world of the 21st century.

It is not a very encouraging remark to conclude this chapter with the anomalies of negative interest rate. Yet, this discussion reinforces the purpose of this book—to provide a framework for further discussion. Capital and macroeconomics are serious subjects. However, the factors affecting the interplay of various features of an economic system can be so complicated that for decision makers seeking answers for a perfect system, it might be an impossible task. Discussion of such abstract issues is a noble task; indeed, somewhat divine. Anomalies in macroeconomics will continuously appear in different forms and circumstances. There will be another financial crisis. Unfortunately, we don't have tools developed yet to insure that will not ever happen again.

Mark Twain once said: "Humor is tragedy with time". In hope that the next macro tragedy (crisis) will be tamed, discussion is not a complete waste of time, as it is discussion that will lead to solutions. With that spirit of optimism, we can treat anomalies in macroeconomics as challenges with endless frustrations; and yes, revoking one more, and the last, metaphor we will use in this book, a *divine comedy*. Whether a system will be heading for a heaven or an inferno remains to be an open question.

A blank page for note taking is provided to end this chapter for the readers to jolt down anomalies, puzzles, outrageous proclamations, wise men predictions as well as pitches from snake-oil salesmen that you have encountered, and indeed might come across in real world interactions with things and people to talk to. Understanding macroeconomics is a journey. There is no silver bullet. Your vision of the future has yet to be formulated by your collective thinking with others.

Source: Picture from Internet,* http://www.theimaginativeconservative.org/2015/07/dantes-global-vision-seeing-and-being-seen-in-the-divine-comedy.html

End Notes

You've survived a mental torture by going through a web of highways of analytical reasoning. A reader goes so far in finishing this four chapters of Capital Theory should immediately go back to the first chapter to read it again because, as a 19th Century philosopher said about reading, "one grasps the matter in its entirety the second time".

The four chapters of notes preceding this end note were written in hope of providing a framework for businessmen to quickly understand and discuss macroeconomic issues. This framework should be broad enough that can illustrate the interconnectivity of various factors in affecting the macroeconomics of any economy. As pointed out in the preface of the four chapters, the intention is to show a thought-map of highways with "cities" important to illustrate the significance of capital in affecting macroeconomics. The choice of which "city" (topic) to concentrate on studying is an entirely subjective choice of a reader or an instructor, who may want to use this as an introduction to an intense in-depth tour of a "city". The book culminated in a discussion of capital in the last chapter in terms of what exactly is capitalism, which, briefly stated, is a system relying on capital markets to provide the growth for an economy.

The methodology promoted in our exposition of macroeconomics is to enable a forward-looking view of the world. This approach may not be shared by the academic community, which emphasizes the logic of a system in terms of mathematical modeling, and the testing of hypotheses based on historical data. Yet, in order for knowledge to be useful, it is important for policy makers (businessmen included) to make decisions "ahead of the curve", rather than "behind the curve". An over reliance on scientific methodology, while highly respectable and should always be pursued in the academic community, may not be directly useful for a majority of the common people, who wake up every morning, sometimes wondering "What is this world coming to?"

Dante Alighieri's poem, *Divine Comedy*, which many believe to be the greatest literary work composed in the Italian language and a masterpiece in world literature, chronicled Dante's journey to God as consisting of three levels: the Inferno (Hell), Purgatorio (Purgatory), and Paradiso (Paradise). There is a passage in the poem on the part of the Inferno, describing the penalties given to fortune tellers who claim that they know the future:

They had their faces twisted toward their haunches
and found it necessary to walk backward,
because they could not see ahead of them.
... and since he wanted so to see ahead,
he looks behind and walks a backward path.

An over reliance on a data driven methodology of predicting the future will give you precisely that. Decision makers of the world have to formulate their own visions about what will happen in the future. Based on educated guesses and good analytical reasoning, a decision maker can use this book to ignite a thought process to evaluate the macro environment of the organization or entity he/she serves in planning and making decisions. Not only that, the decision maker must articulate proposals to others who can understand, debate and sharpen the particular proposal for the next move. This is the purpose of this set of notes. In spite of advances in modeling, AI, blockchain, etc. which will undoubtedly breed new professionals in help making decisions more efficiently in one form or another, that will not be the mission of an MBA. For general understanding of the nature of the problem affecting the economy, it is likely that a human common sense approach remains. This is what MBA students should strive to achieve. This is the reason why MBA students should study macroeconomics.

Appendix: The Study of Different Economic Systems

1. Different phases of Comparative Systems

Comparative Economics Systems (CES) is a subfield of study in economics. It has evolved from various government policies emphases in the past, commensurate with the metamorphism of systems in different parts of the world. Although system analyses can go far back in history, starting with the origin of human civilization, economic studies of *modern* systems may have begun in the 50s, when a Marxism-Leninism philosophy dominated policy making in the East, while a Bentham-Smith philosophy of materialism and self-interests constituted the core thinking in the West. Modern study of Comparative Economic Systems in the field of economics typically started with a dichotomy based on a "Command" economy on the one extreme, and a "Laissez Faire" economy on the other extreme. Economic as well as operational efficiency have always been the main guiding criteria in this comparison. The West position is that the East has made a mistake in their system choice, due to a deep ideological bias. That was how courses on CES in economics were usually taught in many universities in N. America in the 60s.

In reality, the two polar systems had been changing even during the early phases in the study of CES. The East went through political and propaganda adjustments of various sorts, while the West revised policies on social welfare, regulation of markets, and methods of curbing business cycles and inflation, etc. Indeed, by the early 80s, the dichotomy of Command vs. Laissez Faire had blurred, and system choice became a spectrum. Experimentation of mixed systems can be found in many countries, more notably in Eastern Europe, characterized by various worker management schemes with uneven results. On the other side of the globe, the world watched the rise of the economic performance of Japan with amazement. America woke up to the reality of recognizing the importance of international trade, in that external forces could significantly affect domestic economy.

These mixed systems stimulated various debates, evolving around theoretical justification for worker managed institutions, methods of co-determination, industrial policies, indicative planning, etc. New system names, e.g. the "Four Tigers" of Asia, Social Market economy, Market Social economics, Social Democracies etc. began to emerge. The list of economic systems evolving could be as broad as party names used in different countries.

In the 90s, there were drastic political changes in the command system. Changes in the East, particularly in the Soviet Union and China, resulted in the abandonment of many significant features of the command system. The market system of the West, while survived harsh tests via episodes of financial crises, also increasingly recognized rooms for improvement, sometimes calling for a drastic overhaul of the system, e.g. position taken by a US politician, Bernie Sanders, who gathered significant support during the 2016 presidential election in that country.

The market system is not flawless, as the Asian Financial Crises in the late 90s revealed. However, it is one thing to recognize its weakness, but quite another to reject it totally in that in changing the system, one can also throw the baby out with bathwater. The modern capitalistic system as explained in the main text of this book is still considered by many to be most pragmatic system adopted so far in human civilization for mobilizing economic resources, as no better system has emerged yet. It is therefore no surprise that during and after the crises, various types of integrative system continue to appear, including the European Union, the "One Country-Two Systems" model of China, and various proposed changing roles for the World Bank, IMF, and recently, emerging international financial institutions, such as AIIB. These are all titles and names, of course; and until the underlying essential features can be uniquely identified, they remain to be just names. Indeed, some people would argue that the more relevant study of systems should be the study of ecosystems.

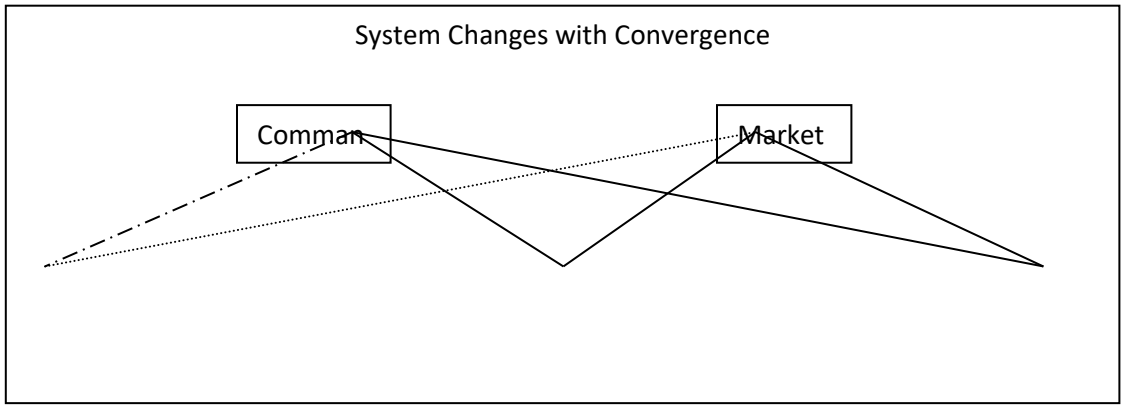
In light of the changes described above since the 50s, and now looking forward to the 21st century, there is a real question as to how CES ought to be studied, as the old paradigm of a dichotomy comparison seems no long applicable. Indeed, countries that traditionally grounded itself in strong socialism have been moving towards redefining socialism. Regardless, utilizing BMC tools, e.g. ECOW for Economic Data Watch for different countries, one can seek helps in looking into various indicators of a particular country and tracking their changes. This can be a way to monitor system evolvement.

2. Development and System Changes

Perhaps the study of economic systems for the 21st century should be based on a paradigm of *system changes*, rather than a static view of *comparative systems*. This entails the study of economic development, which is usually considered to be another sub-discipline in the field of economics. But like system classifications evolving with changes, the boundary between disciplines in economics has also changed. Broadly speaking, development has been referred to by economist Joseph

Schumpeter as an "outside circular flow" activity, sometimes occurring gradually and democratically, other times occurring violently and dictatorially. This idea has led Schumpeter to coin the term *Creative Destruction*, which refers to how old methods of doing things can be replaced by new methods. Indeed, the process can be continuous, with resources switching between "inside circular flow activities" and "outside circular flow activities."

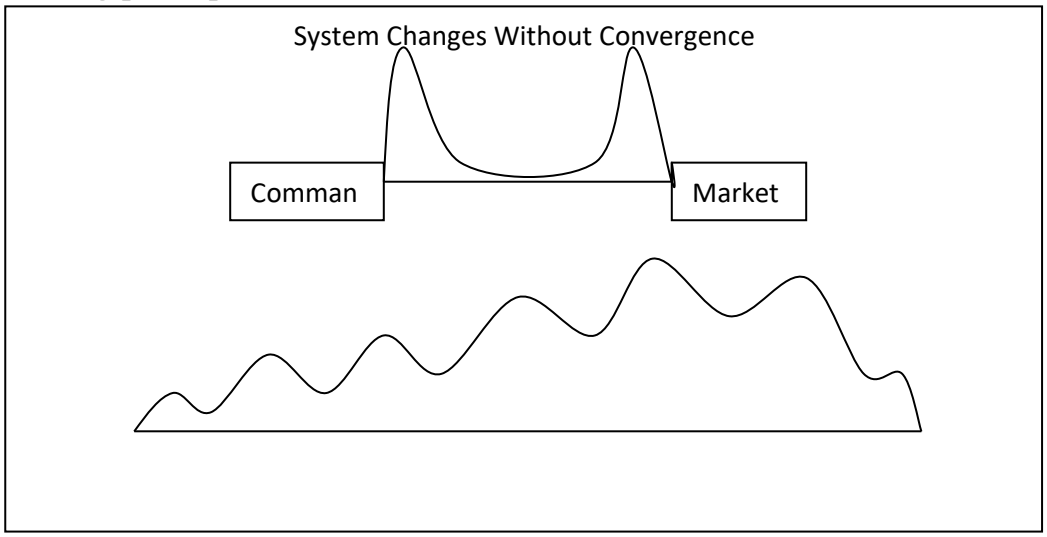
If systems are to be ultimately sorted out by economic efficiency, some believe that there will be only one system in the long run. This, referred to as the theory of convergence, is not something that concerns development economists from a methodological perspective. They most likely will see any changes as independent isolated incidents without a choice of system as the underlying motive. But taken holistically, cumulative changes in regulation and people's adjustment to those regulation can result in an overall system change. It doesn't have to be a violent overthrow of a regime in order to define what is a system change. A *new* perspective on economic comparative system, recognizing changes, goes beyond a pure development economics methodology.



With convergence theory, all systems converge, in the middle. The starting points of the Command vs. Market dichotomy, however, could move in the other direction as well. The market system could move farther to the right, with the government taking more a hand-off policy attitude, drastically reducing regulations, while a command system could move farther to the left, with more stringent military and police control.

Although we have yet to discover the criteria for convergence, convergence along the dotted line, i.e. to the farthest left, is considered to be unthinkable and irrational by most economists before the turn of the century. Yet, the rise of terrorism in the new century, coupled with refugee problems of various kinds, the rise of populism sentiment, etc., can move the system dichotomy to their extremes. For those in the

right who believe a convergence to the left is a good idea, the event of Sept. 11 in USA can be a wake-up call. Security and anxiety have increasingly drive policy discussion and adaptation of tight prevention measures in the West. For this and perhaps other underlying factors have yet to be discovered, development and system changes can alternatively be looked at NOT as a convergence, but as an evolution from the bi-modal distribution of the two polar systems of command vs. market, to a multi-modal distribution of systems, with varying characteristics and operating principles.



The new comparative system study should address problems and exogenous shocks, exploring the underlying economic forces that would lead to single convergence or multiple convergences.

The problem can also be crafted in the language used in chapter I of this book, on how *the Circle of Influence* will emerge for the 21st Century. The question of single vs. multiple convergences will map out an international relationship between countries and between systems. As one can imagine, countries sharing similar system characteristics, including ideologies, are more likely to converge to form its circle of influence. In terms of the spaceship paradigm mentioned in the text, the four chambers of the spaceship, particularly on ideology, could determine how clusters of spaceships will evolve.

3. Motivation for Studying Comparative Systems "as is"

If you are an ambiguous dictator of a country, you may want to study comparative systems for obvious reasons, since you want to do better than your competitors, and be the best in the World. However, most of us are not emperors; the question arises as to why ordinary educated persons and business professionals should study

comparative systems. There are at least three reasons that the study of comparative systems is of general interest. Firstly, citizens of the world have increasingly interacted and traveled across their national borders, understanding other countries' system of operation will be useful both for traveling as well as for doing business. This is true whether systems across the world are converging or not. Good communication across borders requires good understanding of each other's economic system.

Secondly, domestic business communities have increasingly operated outside their national boundaries. Multinational corporations position themselves in various regions of the world, sometimes not only for the purpose of marketing their products, but also as methods of managing various logistic and production needs. Nowadays, the productions of many products are fragmented into different stages of supply chain in different countries. The car we drive has many of its parts produced in many countries of the world. An oil venture in Philippines may be carried out by a consortium of European petroleum companies and Exxon, financed by funds from syndicates, or international financiers, e.g. the bank of Tokyo and Swiss Re. The coordination of various components of a production process would require an understanding of the local rules and the system under which an operation is to be conducted.

Thirdly, decision-makings of people in different systems are molded and constrained by the mentality ingrained in their respective systems. What might be considered as a practical solution for a problem in one system may be considered as totally impractical in another system. Citizens and businessmen of the world therefore must seek some sort of rationality within a system in order to guide their actions within that system and to operate or negotiate successfully. Whether we are talking about negotiating for a particular business deal in a narrowly or a trade agreement broadly between countries, recognition of the mentality and the workable circumstances of what one is dealing with can be exceedingly important.

Whether globalization will continue, or whether the trend will reverse itself is still an open question. But regardless of whether systems are moving towards convergence or divergence, individuals need to study systems, cultures, and the various implicit rules of getting things done in various system environments. This is what can help in formulating educated guesses in making decisions. This is the basic negotiation skill that is needed in being "ahead of the curve".

4. Identify Your Role in a System

Again, you need not only be working for a multinational corporation in order to be motivated to learn about comparative systems. Every one of us in any system of the world has a part to play. You may be a merchant, a banker, a broker, a plumber, an artist, a teacher, a student, or even a monk,… the actions of everyone together constitute a broad picture of what can be called a system. In observing and studying a system change, it is often the words and actions of an individual that could cause a ripple effect. For a static system, the roles are predefined, understanding your role can help you being more successful in that system.

Conceptually speaking, activities in every system can either take place in the market or within an institution. Markets refer to activities that are coordinated by contracts, usually with freedom of choice prior to the entering of contracts. Markets need not only be what can be observed in a street bazaar. They can be large scale(industrial), grey (underground), via wires and telephones, and on the internet (digital) and wireless. Institutions refer to activities that are coordinated by commands or some sort of decision making process such as voting, negotiation, persuasion, etc. An institution can be a corporation, a private business, a State-operated enterprise, a finance company, a university, a church, a club, an NGO, or as small as a family of only husband and wife.

Each day and every moment, every one of us operates either in the market or within the confines of institutions, or what O.E. Williamson called hierarchies. A person could be a manager of a corporation, moonlights as an entrepreneur either underground or on the weekends, prepares food for her husband or his wife, prays to the rising sun every morning or attends church on Sunday. The mix of activities that we do varies, within a system as well as across different systems of the world. Understanding your role in a system, and how your role would be different in another system, would allow you to alleviate some of unavoidable frustrations that many of us have to confront. A study of the broad picture of a system therefore helps you to find a road map and to improve your daily activities, regardless of *which* occupation, *which* role you are currently playing, and in *which* system.

5. Just "What the Hell" is a system?

First of all, there is no point in drawing a distinction between economic systems and non-economic systems. All activities are economic in nature. People operate with a system of beliefs that have rewards and penalties, although the nature of the rewards and penalties could be materialistic or spiritual. But decisions, by nature,

are made by individuals themselves. In this sense, we need not agree with some conventional textbooks on comparative systems in that an important distinguishing feature between systems is how decisions are made. All decisions are made by the persons taking the actions. Superficially, for some systems, individuals may appear to be letting others to make decisions for them, but they appear to be so only because the system of rewards and penalties in which they operate require them to operate as such in order to survive.

The following definition of an economic system may be typical from a textbook: "An economic system is a set of mechanisms and institutions for decision making and for the implementation of decisions concerning production, income, consumption within a given geographic area." *Gregory and Stuart, Comparative Economic Systems, 4th Edition, p.16, (Houghton Mifflin, 1992)*

Unfortunately, broad definition of such nature does not allow an individual to identify his/her role within a system. The study of economic systems under this approach becomes more or less an intellectual exercise. It does not help individuals to improve their interaction with one another.

The proposal here is to suggest an alternative definition of system: A system, simply put, is a collection of markets and institutions. Individuals within that system have to continuously making choices between markets and institutions, e.g. working for one company versus another, buying from the market or doing something yourself. Comparative systems study how this mix of markets and institutions varies across different countries and different cultures. From a political science perspective, this could loosely define what is the "social contract" of that system. A reader can refer back to the Table in Chapter I of this book on the meshing up of 4 rings. We can then more meaningfully ask what type of a "social contract" in the system the reader is living in.

6. Differentiating Policies and Systems

Everyone has the experience of ordering food off a menu in a restaurant, the differentiation of policies and systems could be phrased in terms of that experience. You can ask the restaurant to hold off the MSG, but you may not be able to ask the restaurant to change the color of the source. In other words, there are certain things you can ask the restaurant to change, but there are things that the restaurant could not change because of the difficulties in changing its whole administrative system of operation. Businessmen in a foreign country are liked patrons to a restaurant. From time to time, they have to confront situations where

policies in that country affect their businesses adversely. Some policies can be changed by a particular businessman's power of persuasion, some can be evaded by smart rearrangements and re-labeling. Policy changes however are not to be confused with system changes. The former is easier to be negotiated to achieve win-win than the latter.

As an example, the grey markets of many transitional economies are areas where people wheel and deal; and indeed, some people believe that these are exactly the areas where new ideas evolve. However, these activities may be permitted only to the extent that the system integrity is not affected. Without recognizing the difference between policy and system, businessmen may get themselves into trouble for "pushing the envelope" too far.

Having said that, system itself could be going through changes. This is particularly so in countries open for reforms. These changes would come through a series of cumulative policy changes. In the midst of these changes, it may be useful for a role player within a system to distinguish changes that are systemic in nature from those that are simply policy adjustments.

Generally speaking, but not always, ordinary citizens will be wise to ride on *system* changes, while defend or resist *policy* changes that will affect their own self interests or organizations they are employed to serve. Understanding the broad picture of *systems*, therefore, helps a person to find a path in the forest.
In your journey going through a jungle, just remember the following: Chopping branches of trees and moving a couple of stones are evolutionary, burning the forest is revolutionary.

7. Methodologies for understanding Changes

Usually, many forces—policy, ideology, and natural environment—pre-define an economic system. Understanding the factors that constitute system changes can help position a person or a business operation with long term objectives. Business operations across national boundaries sometimes may be able to control, direct, and modify the indigenous resources of a country. For purpose of promoting a win-win situation, it may require the system role players in both countries to know how their own "systems" can be affected by *new* forces that affect the use of *old* resources. Particularly for *transitional economies*, developing such awareness can help smooth out situations where new and old could be in possible conflicts. Recognizing the deciding factor out of many is a skill, not a science. People with

an entrepreneurial instinct usually can perform better than others. However, sometimes a winner does not even know why he is winning.

As a side remark, an important element of understanding changes had always been the ability to understand future needs. However, these needs must be identified in light of changes in the systems also. As pointed out in previous section, sometimes a system-thinking could be moving in the opposite direction of a need. The change in ideology, cultural sentiment, and external factors may act differentially as opposing countering forces to system changes that will result in policies affecting the livelihood of people working within it.

Again, the warning here is that future projection cannot be made by a single vision. A system approach, addressing to all aspects of a set of evolving relationships would be a more desirable way to cope with changes and uncertainties. Sometimes changes come about through revolution rather than evolution. Phrased in terms of individual aspirations, there may be exogenous events that trigger a change in a person's career development objectives. Reflected into business terms, there are country risks that must be evaluated holistically based on the whole system changes, rather than on a specific segment or a specific policy of a country. Studying comparative systems and be aware of possible changes allow individuals and businesses to more effectively vote with their feet.

8. Understanding Poverty

A more or less related question of development, citizens of the world have been puzzled by the disparity of income distribution within locality as well as across different countries of the world. Development economics has attempted to tackle the problem of poverty for many years now, with some suggesting that certain system specificities and constraints being the obstacles for improving poverty. These specificities and constraints will not disappear by issuing government edicts. In other words, there is a fundamental sense in which reform efforts of the world have to confront, and that is, ultimately, reforms have to be driven from below and thus requiring basic changes in the social contract.

To some reformers, the question is not whether there is enough resources, or whether IMF or the World Bank is able to lend its hand, but that whether an indigenous community will be able to change the mode of operation, their mix of markets and institutions, or in short, a change of system in order to improve their citizens livelihood.

In many instances dealing with the so-called "Third World" reform efforts, changes in system had been generally resisted in whole or in part by some of the participants. History has imposed binding constraints at all levels of operations in a community. Reform efforts therefore must take into considerations these past specificities in implementing policy changes in a community. As an example, even for the much talked about modernization efforts in China or India, a significant proportion of the country population are still in rural farming communities, struggling with poverty like the classic appearance of a Less Developed Country (LDC). Any global efforts of reforms must ultimately address the question of poverty. Marginalizing specific groups will cause disengagement, and even resentment, and will be obstacles in maintaining or revising a social contract. These are issues increasingly drawing attentions to the world community, notably by the award of the 2019 Nobel Prize in Economics, as well as a call to study Globalization 4.0 seriously at the World Economic Forum of 2019.

9. Sustainable Development and Diversity

As discussed in earlier sections, an alternative view on the convergence of systems is to think of system outcomes as trade-offs rather than all adopting the same absolute concept of efficiency, i.e. maximization of welfare by marginal benefits and costs. According to such a view, comparative systems of the world may not converge, and indeed have the tendency to be wider in scope and in forms. The idea can be discussed in conjunction with the concept of sustainable development that many countries of the world are now actively pursuing.

Like the concept of comparative systems, there is no formal definition of the term sustainable development. One feature of it that is directly relevant to the discussion here is in regard to it's advocacy of diversity. This concept is in sharp contrast to the convergence philosophy that is described in the first section of this Appendix. Proponents of this view are usually environmentalists, biologists, and natural scientists, proposing, for example, why bacteria in the North Pole or in the bottom of the ocean should be preserved.

As a role player in a system, one should perhaps also understand a little behind the rationale behind this type of arguments, as the shaping of the future may depend on more than one set of criteria. The implication of considering diversity can be quite paradoxical: the argument for diversity applied to studies of comparative systems would advocate a policy of anti-reforms with conservation being the highest priority! Systems are best to be left alone, no matter how "inefficient" they might

be. These are questions worthwhile to be debated, and should be part of the issues studied by comparative systems for the new century.

10. Economists as Systems Integrator

As pointed out earlier, the political economy of late 90s, and stretching to this new century, systems of the world have been marked by various concepts of integration. We seem to be living in an environment where constructive dialogues have been ongoing in certain parts of the world. Although there had been failed attempts tried in the East, such as the Council for Mutual Economic Assistance (CMEA), more recent integration mechanisms such as NAFTA, EU, WTO, PPT, and possibly some sort of Asian Monetary Union are on-going discussions that citizens of the world cannot ignore. More recent discussions have been around the Regional Comprehensive Economic Partnership (RCEP) and the Free Trade Area of the Asia-Pacific (FTAAP), or Comprehensive Economic and Trade Agreement (CETA).

For ministerial officials working for governments of the world, the negotiation task is on their shoulder. However, they would not know how to integrate their systems with others unless they also know the differences between systems. Understanding the difference in the mode of operation—comparative systems—is the first step towards efforts of integration. As in all negotiations, by understanding our differences, we have a better chance of arriving at consensus.

Along this line of thinking, it is then an open question as to whether there is such a thing called the "most efficient system". Proponents of system integration like to think there is one; their efforts will ultimately result in it, taking the good features of all while deleting the bad features of many. Though idealistic, efforts of this nature should not be discouraged. After all, those were the inspirational forces that had pushed for new scientific discoveries since human civilization (*Thomas Kuhn*). The changing paradigms of scientific methods of inquiry are examples to be emulated by comparative system analysts in their search for a better system. It does require an attitude of questioning traditional models of operation and various approaches, keeping an open mind for new concepts. Physical science has been doing this for centuries, computer science has been actively pursuing this now; there is no reason why study of social science cannot progress in this direction also.

Anybody can be a system integrator. Economists are unique in that the tools of thinking they adopt are usually supported by logical reasoning, whether they are

based on empirical observations or mathematical modeling. Their methods of articulation however differ immensely. It is the purpose of this book that very abstract theories can be conveyed in ordinary language for better communication.

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