二松学舎大学国際政治経済学部

Discussion Paper Series

A Microeconomist's Monologue: Lecture Notes on Japan in the World Economy

Yoshimasa Nomura

Revised, September 2016

Discussion Paper (Econ) No.6

FACULTY OF INTERNATIONAL POLITICS AND ECONOMICS

NISHOGAKUSHA UNIVERSITY

A Microeconomist's Monologue: Lecture Notes on Japan in the World Economy*†

Yoshimasa Nomura, Ph.D.
Specially Appointed Research Professor of Economics,
Nishogakusha University;
Professor Emeritus of Economics, Chiba University

Preliminary, May 1990;
Completed with Updates, April 2016;
Revised and Expanded for Economics Majors, September 2016

Acknowledgments: It is a great honor and privilege to acknowledge academic indebtedness of the subject matter to the legacies of three expatriate Hungarian scholars: John von Neumann (1903-1957), Nickolas Kaldor (1908-1986) and Bela Balassa (1928-1991), who also share connections with Eötvös Loránd University at some stage of their lives.

Even on the introductory level, economics profession owes quite a few original reasonings to John von Neumann. A case in point is an "intuitive" derivation of the non-arbitrage price of Consols which the anecdote in the subsequent Footnote 48 of **9.4.10, APPENDIX** will explain in some detail.

We owe to Nickolas Kaldor one way of salvaging the "Knife-Edge" instability property of Harrod-Domar steady state path with a resort to variable saving ratio via stabilizing changes in income distribution between household and corporate sectors. Remark in **9.1.5** will report our discovery that Japanese prolonged recession has been so severe as to resurrect the "Knife-Edge" instability throughout the recent two decades, and the divergence became especially conspicuous after the 2011 East Japan Earthquake.

Lastly but not the least among the three scholars is my indebtedness to the Late Professor Bela Balassa, one of my former teachers at the Johns Hopkins University. The subtitle of the present lecture notes, after his monograph (1988) with Marcus Noland, fondly vindicates my indebtedness to Professor Balassa on the subject matter. Professor Balassa, Yale Ph.D., was awarded an Honorable Doctorate Degree from his *alma mater* Eötvös Loránd University on one of his return trips (See his "Obituary" (1991) by Professor Carl F. Christ, referred to in the subsequent Footnote 65.).

My foremost indebtedness is to Professor M. Ali Khan and the Late Professor Peter Newman, my thesis advisors at the Johns Hopkins, for exposures to the fascinations

*The present lecture notes were originally prepared for one-quarter Comparative Economics course on "Japanese Economy" at the University of Alabama, US, back in the Spring Qtr., 1990. Recently, mostly hand-written manuscripts back then are updated and supplemented for one-week Intensive Course on "Japan Studies" at Eötvös Loránd University, Hungary, in the Spring Qtr., 2016, by including a compilation of Lecture Notes delivered every summer in the meantime at Training Institutes of Ministry of Finance, Ministry of International Trade and Industry, and Chiba Prefectural Government.

†**Disclaimers:** Due to the sketchy nature of the present notes, references to the data sources are far from complete (Most are quoted from the official HP's of the Japanese Ministries.). I am solely responsible for opinions, *if any*, expressed in these lectures.

with the "Good Ol' G.E." General Equilibrium Analysis, which have motivated my entire subsequent research activities[1].

I am also pleased to acknowledge my indebtedness to my current colleagues Kazunori WATANABE and Katsushi TABATA for their hospitality. In particular, Katsushi TABATA has brought to my attention a "7th" sort of STYLIZED FACT characteristic of the Japanese Economy, as summarized in REMARK of the subsequent **4.2.1**, especially to its third reason.

[1]The transcript of my Final Lecture delivered on February 4, 2015 on the occasion of my retirement from Chiba University is circulated as: NOMURA, Yoshimasa (2015): "Reflections on Hyperfinite Approaches to General Equilibrium Analysis and Welfare Economics: 'Back to the Basics'." *Discussion Paper Series*, No. 5. Tokyo, JPN: Nishogakusha University. The essay also contains an extensive account of the strands of my on-going researches at the current affiliation, Institute of East Asian Studies of Nishogakusha University.

Contents

Introduction

Microeconomist's Basic Concerns about Government's (Macroeconomic) Interventions:

Throughout the subsequent lectures, our hypothetical presumption is that **the apprehensions about the *ever increasing national debts* have infiltrated into many aspects of Japanese economic activities, causing widely spread distrust in economic policies and their consequential ineffectiveness**. This standing hypothesis will be vindicated by our careful examinations of the surfaced problems.

Specifically, the following concerns arise naturally in apprehension of the economic consequences of the *Abenomics* under way in Japan.

- Applicability of the "Market Mechanism" to those markets, or else forced "Market Failures" thereof, encompassing
  - The Government Bonds Market with cumulative issuance of government bonds to finance the continued governmental overspending, the price thereof is the inverse of the long-term interest rate.
  - International Money Market with active international capital movements, the price thereof is the flexible exchange rate.

- Consistency of the government interventions with specific markets, i.e., "Sustainability" of individual choices by the prices the government *arbitrarily* sets in those markets, needs to be judged *in the General Equilibrium context*
  - *Negative* interest rates, with the resultant "corner solutions" of individual choices
  - Government-led labor-management wage negotiations,
  - Manipulation of exchange rates is such a way as to "poor thy neighbor" or "beggar my neighbor," reminiscent of days of fixed exchange rate, etc.

- Together with the above "Sustainability" question, one must address the "Welfare Assessments" of the distortions caused by government deficits and/or negative interest rates specifically *in the "Intertemporall" General Equilibrium context*
  - *Intergenerational (Dis-)Equity*

The present series of lectures begin with delineations of the fundamental problems of the recent Japanese economy in the international context, with special emphases on her strengths built and taken advantage of during the economic growth period, and her fragilities revealed especially after the burst of Economic Bubbles around 1990.

Among others, the most notable behavioral change over the last couple of decades is the drop in the Household and national saving rates, together with the shift of saving sector from the Households to the Corporates to the extent that has triggered the structural "Knife-Edge" Instability. The aforementioned sectoral shift has also resurrected the Corporates' Own Financing, which is tantamount to the denial of the attempted reversal from Indirect to Direct Financing under the post-Bubble "Big Bang".

In due course, we shall make the above mentioned "Concerns" tractable within the reach of Introductory Microeconomics (and partly Macroeconomics) and actually carry out their Introductory-Level analyses.

Our line of tackles with the issues in Japanese Economy takes advantage of our "Synthesis of Microeconomics and Macroeconomics from the General Equilibrium point of view," which hinges on our Fixed-Point characterization of Keynesian Under-Employment Macroeconomic Equilibrium. Our analytical framework based on the proposed "Synthesis" will be summarized at the onset in the subsequent **Section 1.4**.

Our "Synthesis" will prove to be particularly convincing in shedding extra light on the serious Microeconomic consequences of such recent Macroeconomic anomalies as Cumulative Government Deficits and the *Negative* Interest Rate

1 Why Study Japanese Economy Now?

1.1 Back in the 1990's, Especially in the US: Learn from the Japanese Success

- **(Former) Merits of the Japanese Economy:**
  - Long-term Perspectives: Successful economic policies such as "Income-Doubling Policy", "High Saving = High Investment", "Specializations in High Income Elasticity Products, etc.
  - Long-term Commitment: Life-time Employment System (Seniority-based salary schedule, Bonus-payment as part of regular salaries, Retirement Allowance = Delayed salary payment), On-the-Job Training, Higher education, etc.
  - Well-established internal communication network: Labor-management relation, "*Kamban* (or Billboard)" System of inventory management, Well-connected personnels.
  - "X-Efficiency" or internal efficiency, particularly of Labor-Management relationship

- **Weaknesses of the Japanese Economy:**
  - Weak competition: Labor immobility, Little wage incentive, Priority to group-incentives (Especially apparent in the so-called "Convoy" of commercial banks

after the burst of the economic bubble, Inter-corporate financing among the group members)
$\longleftrightarrow$ Far from the "Global Standard of Competition" based on "transparency", "self-responsibility"

- Poor social security (Some attribute high saving propensity to this.)
- After 2001, partial improvement due to an introduction by small businesses of Individual Retirement Account (IRA, or Article 401k *Defined Contribution* Pension Plan) $\longleftrightarrow$ *Defined Benefit* Pension Plan among big business and government employees.

- Economic growth, culminating in overheated economic bubbles in the latter half of 1980's
  - Plaza Agreement in 1985, permissible of high ¥
  - Prolonged low interest rate policy

    $\Longrightarrow$ Excess liquidity
    $\Longrightarrow$ Emergence and transmission of economic bubbles in stock market
    $\longrightarrow$ real estate market

- Burst of economic bubbles no later than 1990
  - With the resultant debt balance of "non-performing" loans, estimated to have been approximately ¥200Tr.

1.2 The So-Called "Blank Decade (or Two Decades)"

- Disposition of non-performing loans
  - Legal liquidation: Governmental infiltration with tax money, ¥70Tr. in December, 1999, at the expense of tax payers;
  - Virtuous act of lending commercial banks: Up to ¥100Tr., ultimately at the expense of consumers (= tax payers) who had to bear with extremely low saving interest rate.

$\Longrightarrow$ Nearly resolved by 2003, with the non-performing loans reducing from 6.1% of all loans by commercial banks in March, 1999 to 1.5% in September, 2006.

REMARK: During the *Lost Two Decades*, the Household Savings dwindled significantly, while the Corporates cumulated substantial savings.

Our finding is that the Japanese prolonged recession has been so severe that the adverse effect on the saving has triggered the "Knife-Edge" Instability throughout the afore-mentioned period, and the divergence from the steady-state growth path became especially conspicuous after the 2011 East Japan Earthquake (⟶ **9.1.5**.).

No wonder it has taken so long to appreciate the economic recovery, and not quite yet!!

The shift of saving sector from the Households to the Corporates has also resurrected the Corporates' Own Financing, stopping short of achieving the reversal from Indirect to Direct Financing promoted by the post-Bubble "Big Bang" (⟶ **9.3.5**.).

- Structural Changes ⟸ Revive the resource allocative function of the market mechanism
  - "Small government", supplemented by private initiatives: Deregulations and Privatization
  - "Decentralization": Shifts of functions and tax revenues from the central government to local governments

  ⟹ Not much accomplished.
- No visible sign of economic recoveries

1.3 What Went Wrong in the Japanese Economy after December 2012?: Diagnostics and Prescriptions

- **The Overall Diagnostic:** In the subsequent analyses, our hypothetical presumption is that the concerns about the *ever increasing national debts* have infiltrated into many aspects of Japanese economic activities, causing widely spread distrust in economic policies and their consequential ineffectiveness.

This tentative diagnostic proves to be all the more consistent with our findings from our subsequent detailed examinations of the surfaced problems.

Economic Principles at Work: In the subsequent chapters, I would like to demonstrate the use of Economic Principles, when applied to real economic problems.

I would emphasize that the economy consists of individual choices, which are intertwined at the same time.

Therefore, *economic practitioners should not single out one economic policy measure by caprice, but scrutinize the "ripple effects" that particular choice of policy measure causes in the light of learned Economic Principle.*

- **Wrong Prescription**:

  1. After 2008 Lehman Shock $\Longrightarrow$ Strong ¥, hurting exports;
  2. Aggravating budget deficits $=$ Cumulating government bonds.

  $\Longrightarrow$ "Unprecedented" Easing of Money Supply since December 26, 2012, keeping the cheap ¥, reminiscent of "Poor-thy-neighbor" or "Beggar-my-neighbor" policies in the days of fixed exchange rate

  – *Dubious* 2% Inflationary Target

  (Moderate) Inflation $\Longleftarrow$ Economic Recovery
  Inflation "*Not* $\Longrightarrow$" Economic Recovery

> Remark (*"Admissible" vs. "Inadmissible" Inflation*):
>
> – *"Admissible" Inflation*:
>
> *Demand-Pull* due to recovered "domestic" demands,
> *Cost-Push* due to higher wages from the tighter "domestic" labor market.
>
> – *"Inadmissible" Inflation*:
>
> *Cost-Push* due to higher input prices,
> In particular, *Imported Inflation* due to higher "imported" input prices caused by the "induced" weaker ¥,
>
> *Demand-Pull* due to "export" demand caused by the "induced" weaker ¥.

– Purchase of government bonds on the scale of ¥80 trillion (> newly issued amount), with the ending balance exceeding ¥300 trillion, comprising more than 30 % of the outstanding balance as of August 2015.

$\Longrightarrow$ "Hollowing" of the Government Bond Market

– "Primary Balance" Requirement is *too loose* a criterion: Balanced government budget excluding the bond-related expenses, which are to be financed by repeated issue of *consol*-like government bonds.

In short, sustenance of the cumulative government deficit by absorptions by the central bank of consol-like government bonds.

– "Zero → Minus Interest Rate Policy" from January 29, 2016.

REMARK (*Dangers of the Forced Market Failure*): Together with the "Hollowing" of the Government Bond Market, by the Minus Interest Rate Policy the Central Bank of Japan doubly imposed a tactical "Market Failure" on the G.B. Market, i.e., a complete isolation of the G.B. Market from the rest of the economy, and consequently, the nullification of the G.B. Market in the economy-wide market mechanism.

Indeed, the *Failure of the Government Bond Market* is all the more problematic when one recalls:

1. The *Efficiency* Test of the government investments with a resort to the activated market mechanism in the G.B. Market was the main reason for the privatization in 2007 of the Japanese Postal Services and Savings (⟶ **9.3.7**.).
2. The higher interest rate (= lower G.B. price) would function as a *signal* forewarning the policy makers against the allocative danger of cumulating government deficits as a result of loose management of government expenditures (⟶ **9.4.8** and **9.4.9**.). We have indeed embarked on the risky maneuvering of the economy solely on our own without any alarming devices against such human errors as oversights, misconceptions and wrong policy prescriptions, nor any self-correcting built-in measures known as the "Invisible Hand" of the market mechanism.
3. The *foregone* interest income, due to a *hyper-low*, 0 and *negative* interest rates, which otherwise would have constituted a substantial amount to supplement the pension income for most of the *well-prepared* retirees (⟶ **9.1.1**.), increasingly calls for more reliable social security system, which is already recognized by many to be insufficient and to be unsustainable in the future.

- **Remedies for Sustainable Economic Growth, or "How to get mature gracefully."**
  - "Marginal" tactics vs. "Total" outcomes, "Flow" vs. "Stock", or Short-term vs. Long-term plans

It is by far the most imperative for the government to restore the *Fiscal Balance*, "strict" or definitely "more stringent than the *Primary Balance*," to say the least.

⟺ Recognition of the government budget constraint with the threat of national bankruptcy in the horizon

⟹ Abstinence from dependence on deficit-financing government bonds.

– Clear recognition of "constraints" due to aging and/or lowered fertility
  $\Longrightarrow$ Balanced budget, not to mention the primary balance:
  Reform of "Pay-as-you-go" Social Security System

– Solidify economic recovery by restoring domestic demands, especially consumption and investment, instead of resorting to the distorted export demand by artificially devaluated ¥.

1.4 SUMMARY PREVIEW OF THE ANALYTICAL FRAMEWORK: A Synthesis of Microeconomics and Macroeconomics from the General Equilibrium Point of View (*)

[2]

- *General Equilibrium Analysis*
- *A Specialization: Microeconomic Analysis of Partial- or Related Market Equilibrium*
- *Another Specialization: Neoclassic Aggregate Macroeconomic Analysis of Full-Employment Equilibrium*
- *Yet Another Specialization: Keynesian Aggregate Macroeconomic Analysis of Under-Employment Equilibrium*

A General Equilibrium Prototype

- **Commodities:**

  $$\textit{Commodity Bundle } x = \left(\underbrace{x^1, \ \dots \ , x^k}_{\substack{\text{Present} \\ \text{Consumption}}}, \underbrace{x^{k+1}, \ \dots \ , x^\ell}_{\substack{\text{Future} \\ \text{Consumption}}} \right) \in \mathbf{R}^\ell_+, \text{ with}$$

  - the first k commodities are for *present consumption*, while
  - the remaining $(\ell - k)$ commodities are for *future consumption*, by way of saving by consumers and investment by producers.
  - $p = \left(p^1, \ \dots \ , p^\ell\right) \in \mathbf{R}^\ell_+$ their prices.

- **Factors of Production:**

  W.o.l.o.g., restrict to 2 factors of production, *Labor* and *Capital* (L, K), whose prices are *wage rate* w and *rental rate* r, respectively.

- **Consumers** $a \in \{a_1, \ \dots \ , a_n\}$**:**

  - *Individual Tastes* as represented by her *utility function* $u_a(x, \bar{L_a} - L)$, where $\bar{L_a}$ is her maximum amount of labor, L her choice of *Individual Labor Supply*, and consequently $\bar{L_a} - L$ is her choice of the amount of leisure she would like to consumed personally for herself;
  - *(Initial) Endowments* $\left(e(a), \bar{L_a}, \theta_a\right)$, including $\bar{L_a}$ her maximum amount of labor to be allocated between *Individual Labor Supply* and its personal use *Leisure*; and the profit shares $\theta_a = \left(\theta_a^{f_1}, \ \dots \ , \theta_a^{f_m}\right)$ the consumer a claims to the firms $\{f_1, \ \dots \ , f_m\}$. .

[2] Materials marked with (*) are analytical. You may skim them through on your first reading. Accompanying graphs would be readily provided by the author upon request.

- **Producers** $f \in \{f_1, \ \dots \ , f_m\}$**:**

  Let the technology be characterized by *one-output production function* $F_f : \mathbf{R}^2_+ \ \rightarrow \ \mathbf{R}_+$ of the form $F_f(L, K)$.

  - Firms may be understood as plant units producing *at most* one output: $(\forall f \in \{f_1, \ \dots \ , f_m\}) \ (\exists \ i \in \{1, \ \dots \ , \ell\}) \ y^i = F_f(L, K)$.
  - A natural presumption is: $m \gg \ell$.
  - For each $f \in \{f_1, \ \dots \ , f_m\}$, specify the *Profit shares* $\theta^f = \left(\theta^f_{a_1}, \ \dots \ , \theta^f_{a_n}\right)$ such that $\theta^f \geq 0$ and $\sum_{a \in \{a_1, \ \dots \ , a_n\}} \theta^f_a = 1$.

- **Structural Linkage of Consumers and Producers:**

  Form the $(n \times m)$ *Profit Share Matrix* $\theta = \left(\theta^{f_j}_{a_i}\right) = \begin{pmatrix} \theta^{f_1}_{a_1} & \dots & \theta^{f_m}_{a_1} \\ & \ddots & \\ \vdots & \theta^{f_j}_{a_i} & \vdots \\ & & \ddots \\ \theta^{f_1}_{a_n} & \dots & \theta^{f_m}_{a_n} \end{pmatrix}$,

  with θ_{a_i} in the preceding **Definition of Consumers**, as its i^{th} row, and θ^{f_j} in the **Definition of Producers**, as its j^{th} column.

1.4.1 General Equilibrium Analysis

[3]

Formally, a *general equilibrium economy* $\mathcal{E}$ enlarges the *exchange economy* $\check{\mathcal{E}}$ by incorporating the *production economy* $\hat{\mathcal{E}}$, i.e., $\mathcal{E} = \check{\mathcal{E}} \times \hat{\mathcal{E}}$ where $\check{\mathcal{E}} : \{a_1, \ \dots \ , \ a_n\} \ \rightarrow \ \mathbf{R}_+ \times \mathbf{R}^{\ell+1}_+ \times \mathbf{R}^m_+$ and $\hat{\mathcal{E}} : \{f_1, \ \dots \ , \ f_m\} \ \rightarrow \ \mathbf{R}_+ \times \mathbf{R}^n_+$, such that for $a \in \{a_1, \ \dots \ , \ a_n\}$

$$\check{\mathcal{E}}(a) = \left(u_a(x, \ \bar{L_a} - L), \ \left(e(a), \ \bar{L_a}\right), \ \theta_a\right)$$

and for $f \in \{f_1, \ \dots \ , \ f_m\}$

$$\hat{\mathcal{E}}(f) = \left(F_f, \ \theta^f\right) \ ,$$

respectively.

[3] For more rigorous and general treatment, refer to the dictum by

DEBREU, Gérard (1959): *Theory of Value: An Axiomatic Analysis of Economic Equilibrium.* A Cowles Foundation Monograph 17. New York, NY: John Wiley & Sons.

An alternative source of references for those with more policy-oriented interests may well be:

LAYARD, P. Richard G. and Alan A. WALTERS (1978): *Microeconomic Theory.* New York, NY: McGraw-Hill, Inc. Especially, "Part 1: Welfare Economics and General Equilibrium."

Consumption Equilibrium in $\check{\mathcal{E}}$, Relative to $\hat{\mathcal{E}}$:

- *Consumer's Choice*:

$$\begin{array}{rl} & \max\ u_a(x,\ \bar{L_a} - L) \\ \text{s.t.} \quad & p.x + w(\bar{L_a} - L)\ \leq \\ & p.e(a)\ +\ \underbrace{w\bar{L_a}}_{\substack{\text{Imputed} \\ \text{Value of } \bar{L_a}}}\ +\ \underbrace{w(-L)}_{\substack{\text{Wage} \\ \text{Income}}}\ +\ \sum_{f\in\{f_1,\ \dots\ ,f_m\}} \theta_a^f \tilde{\pi}_f\,, \end{array}$$

  where $\tilde{\pi}_f$ is the *maximized* value of π to be carried out in the subsequent interdependent step in $\hat{\mathcal{E}}$.

  Remark: When F_f exhibits *Constant Returns to Scale*, which is prevalent in $\hat{\mathcal{E}}$, $\tilde{\pi}_f = 0$.

  Indeed, suppose otherwise, i.e., $\tilde{\pi}_f = \pi_f(y^*) > 0$, where y^* is the *maximizer* of $\pi_f(y)$, and write $y^* = F_f(L^*, K^*)$. Recall $F_f(\lambda L, \lambda K) = \lambda F_f(L, K)$ for any $\lambda > 0$ since F_f exhibits constant returns to scale.

  Then, for *any* $\lambda > 0$,

$$\pi_f(\lambda y^*) = p^i F_f(\lambda L^*, \lambda K^*) - (w\lambda L^* + r\lambda K^*) = \lambda \pi_f(\lambda y^*) = \lambda \pi_f(y^*)\,.$$

  Therefore, for *some* $\lambda > 1$,

$$\lambda \pi_f(y^*) > \pi_f(y^*)\,,$$

  which is a contradiction to y^* being the *maximizer* of $\pi_f(y)$ ■.

- *1st Order Conditions*:

$$\Longrightarrow \quad \begin{cases} MRS^{ij} = \frac{p^i}{p^j} \quad (\forall i, j \in \{1,\ \dots\ ,\ \ell\})\,, \\ p.x = p.e(a)\ +\ +\ \sum_{f\in\{f_1,\ \dots\ ,f_m\}} \theta_a^f \tilde{\pi}_f\,. \end{cases}$$

- *Individual Demand for Commodities and Labor Supply*:

$$\Longrightarrow \quad \begin{cases} D(p,w,r,a) = \big(D^1(p,w,r,a),\ \dots\ ,\ D^\ell(p,w,r,a),\ \bar{L_a} - L(p,w,r,a)\big)\,, \\ S(p,w,r,a) = L(p,w,r,a)\,. \end{cases}$$

Production Equilibrium $\hat{\mathcal{E}}$, Relative to $\check{\mathcal{E}}$:

- *Producer's Choice*:

$$\begin{array}{rl} \max & \pi_f(p,w,r) = p^i y^i - (wL + rK) \\ \text{s.t.} & F_f(l,K) \leq y^i\,. \end{array}$$

  Remark:

  1. Recall the hypothesis of the production of at most one output by each firm.

2. By *Private Ownership Economy*, we stipulate the maximized objective function to be the profit to be distributed to the share-holders, i.e., consumers according to the predetermined share-holding ratio θ^f.

   In the present static context, we do not address the issue of capital accumulation nor their ownership, and simply treat the total as given $\bar{K}$ instead.

- *1st Order Conditions*:

$$\Longrightarrow \quad \begin{cases} MRTS_f = \frac{w}{r}\,, \\ F_f(L,K) = y^i\,. \end{cases}$$

- *Individual Supply of Commodities and Factor Demands*:

$$\Longrightarrow \quad \begin{cases} S^i(p,w,r,f)\,, \\ D_f(p,w,r,f) = (L_f(p,w,r,f), K_f(p,w,r,f))\ . \end{cases}$$

General Equilibrium:

$$\begin{cases} \bullet \text{ "No Arbitrage" among Consumers or Producers :} \\ \quad (\forall i,j \in \{1,\ \dots\ ,\ \ell\})\ MRS^{ij}_{a_1} = \ \dots\ = \ MRS^{ij}_{a_n} \ = \ \frac{p^i}{p^j}\,, \\ \quad \text{which in turn will be equated to the economy} - \text{wide } Marginal\ Rate\ of\ Transformation \\ \quad MRT^{ij}, \text{ the slope of the Production Possibilities Curve;} \\ \\ \bullet \text{ "No Reshuffling of Resources" among Producers :} \\ \quad MRTS_{f_1} \ = \ \dots \ = MRTS_{f_m} \ = \ \frac{w}{r}\,. \\ \\ \bullet \text{ Clearance of Commodity Markets : } \forall i \in \{1, \dots\ \ell\} \\ \quad \underbrace{\sum_{a\in\{a_1,\ \dots\ ,a_n\}} D^i(p,w,r,a)}_{\text{Market Demand for } i} \ = \ \underbrace{\sum_{a\in\{a_1,\ \dots\ ,a_n\}} e^i(a) \ + \ \sum_{f\in\{f_1,\ \dots\ ,f_m\}} S^i(p,w,r,f)}_{\text{Market Supply of } i}\,; \\ \\ \bullet \text{ Clearance of Factor Markets : } (L,K) \\ \quad \underbrace{\sum_{f\in\{f_1,\ \dots\ ,f_m\}} L(p,w,r,f)}_{\text{Market Demand for } L} \ = \ \underbrace{\sum_{a\in\{a_1,\ \dots\ ,a_n\}} L(p,w,r,a)}_{\text{Market Supply of } L}\,, \\ \\ \quad \underbrace{\sum_{f\in\{f_1,\ \dots\ ,f_m\}} K(p,w,r,f)}_{\text{Market Demand for } K} \ = \bar{K}\,. \end{cases}$$

REMARK(*Relative Prices*): Since the above "Market Clearance Conditions" constitute $(\ell+2)$ "*linearly dependent*" simultaneous equation system in $(\ell+2)$ *real price* variables (p,w,r) by *Walras' Law* (Refer to FOOTNOTE 15.), one may hope for solving at most $(\ell+1)$ *relative prices*. Thus, the need for price normalization arises.

1.4.2 A Specialization: Microeconomic Analysis of Partial- or Related Market Equilibrium

"*Ceteris Paribus*" Hypothesis: Assuming "other things being unchanged," i.e., other markets are in equilibrium, and their prices will be unchanged and remain at the equilibrium levels.

Typical Partial Equilibrium Analysis - Extraction of a Single Market: Assume *Ceteris Paribus*, " i.e., all but one market, say i^{th} market, are in equilibrium and their prices remain at $\left(p^{)i(^*}, w^*, r^*\right)$ where $p^{)i(} \in \mathbf{R}_+^{\ell-1}$ is such that given any $p \in \mathbf{R}_+^{\ell}$, $p = \left(p^i, p^{)i(}\right)$.

Then, solve

$$\sum_{a \in \{a_1, \ \dots \ ,a_n\}} D^i(p^i, p^{)i(^*}, w^*, r^*, a) \ = \sum_{a \in \{a_1, \ \dots \ ,a_n\}} e^i(a) \ + \sum_{f \in \{f_1, \ \dots \ ,f_m\}} S^i(p^i, p^{)i(^*}, w^*, r^*, f)$$

for $p = p^{i^*}$.

Slightly Generalized Partial Equilibrium Analysis - Concentrating on Strongly Related 2 or a Limited Number of Markets, "Substitutes" or "Complements": Assume *Ceteris Paribus*, " i.e., all but two market, say i^{th} and j^{th} markets, are in equilibrium and their prices remain at $\left(p^{)i,j(^*}, w^*, r^*\right)$ where $p^{)i,j(} \in \mathbf{R}_+^{\ell-2}$ is such that given any $p \in \mathbf{R}_+^{\ell}$, $p = \left(p^i, p^j, p^{)i,j(}\right)$.

Then, solve linearly dependent simultaneous equations by Walras Law,

$$\begin{cases} \sum_a D^i(p^i, p^j, p^{)i,j(^*}, w^*, r^*, a) \ = \ \sum_a e^i(a) \ + \ \sum_f S^i(p^i, p^j, p^{)i,j(^*}, w^*, r^*, f) \\ \\ \sum_a D^j(p^i, p^j, p^{)i,j(^*}, w^*, r^*, a) \ = \ \sum_a e^j(a) \ + \ \sum_f S^j(p^i, p^j, p^{)i,j(^*}, w^*, r^*, f) \end{cases}$$

for the *relative prices*, say $\left(p^{i^*}, \ p^{j^*}\right) = \left(1, \ \dfrac{p^{j^*}}{p^{i^*}}\right)$.

Two specific relationships between 2 commodities of our concerns are:

- Substitutes
  - Definition: $\dfrac{\partial}{\partial p^j} \sum_a D^i(p^i, p^j, p^{)i,j(^*}, w^*, r^*, a) > 0.$

    Remark (*Symmetry of Substitution Effect*): In the present specialization with two commodities,
    $\dfrac{\partial}{\partial p^i} \sum_a D^j(p, w^*, r^*, a)$ is *always* of the same sign as $\dfrac{\partial}{\partial p^j} \sum_a D^i(p, w^*, r^*, a)$
    Also, $\dfrac{\partial}{\partial p^i} \sum_a D^i(p, w^*, r^*, a) < 0$ (*Own Price Effect*).

    With the introduction of a third and/or additional commodities, the symmetry of the Substitution Matrix no longer holds, and would be salvaged at best as that for *Compensated Demands*.

– Interpretation:

1. $p^j \uparrow \implies \sum_a D^j(p^i, p^j, p^{)i,j(^*}, w^*, r^*, a) \downarrow$, since the *Market Demand* for j, $\sum_a D^j(p^i, p^j, p^{)i,j(^*}, w^*, r^*, a)$ is *always* downward-sloped due the negative own price effect as pointed out in the preceding Remark.
2. Substitute $x^j \downarrow$ for $x^i \uparrow$, i.e., the *rightward shift of the Market Demand for* i.

– Intuition: Commodities i and j serves to satisfy similar needs. "Consume i *or* j."

- Complements

– Definition: $\frac{\partial}{\partial p^j} \sum_a D^i(p^i, p^j, p^{)i,j(^*}, w^*, r^*, a) < 0$.

– Interpretation:

1. Same as 1. in the above Interpretation of "Substitutes".
2. Combine $x^j \downarrow$ with $x^i \downarrow$, i.e., the *leftward shift of the Market Demand for* i.

– Intuition: Commodities i and j would better be consumed jointly. "Consume i *and* j."

1.4.3 Another Specialization: Neoclassic Aggregate Macroeconomic Analysis of Full-Employment Equilibrium

"Aggregation" into *Composite Commodity Bundles*: Given

$$p = \left(\underbrace{p^1, \ \dots \ , p^k}_{\substack{\text{Consumption} \\ \text{Goods}}}, \underbrace{p^{k+1}, \ \dots \ , p^\ell}_{\substack{\text{Production} \\ \text{Goods}}} \right) \in \mathbf{R}^\ell_+ ,$$

denote by P^C and P^I the *Consumer Price index (CPI)* and the *Wholesale Price Index (WPI)*, respectively.

Then, given a *Commodity Bundle* $x = \left(\underbrace{x^1, \ \dots \ , x^k}_{\substack{\text{Consumption} \\ \text{Goods}}}, \underbrace{x^{k+1}, \ \dots \ , x^\ell}_{\substack{\text{Production} \\ \text{Goods}}} \right) \in \mathbf{R}^\ell_+$, $\hat{x}_k = (x^1, \ \dots \ , x^k) \in \mathbf{R}^k_+$, the truncated "head" of x corresponding to *Consumption Goods*, and $\check{x}_{k+1} = (x^{k+1}, \ \dots \ , x^\ell) \in \mathbf{R}^{\ell-k}_+$, the "tail" of x corresponding to *Investment Goods* may be "aggregated" into the *Composite Consumption Good* C and the *Composite Investment Good* I as follows:

DEFINITION (*Aggregation into Composite Goods*): *A Composite Commodity Bundle* (C, I) *is defined by*

$$(C, I) = \left(\frac{\sum_{i=1}^{k} p^i x^i}{P^C} \,,\; \frac{\sum_{i=k+1}^{\ell} p^i x^i}{P^W} \right) .$$

Consumption Equilibrium: $MRS = \dfrac{P^C}{P^W}$.

Production Possibilities

$$\left.\begin{array}{l} (i) \text{ Full Employment :} \\ \quad L_C + L_I \;\leq\; \bar{L}\,;\; K_C + K_I \;\leq\; \bar{K}\,; \\ \\ (ii) \text{ Efficient Productions :} \\ \quad F^C(L_C,\, K_C) \;\leq\; C\,;\; F^I(L_I,\, K_I) \;\leq\; I\,. \end{array}\right\} \Longrightarrow \begin{array}{l} \textit{Production Possibilities Curve :} \\ \quad T(C,\, I) \;=\; 0\,, \\ \textit{Production Set :} \\ \quad Y = \left\{ (C, I) \in \mathbf{R}^2_+ \,\middle|\, T(C,\, I) \;\leq\; 0 \right\} . \end{array}$$

Production Equilibrium: Determination of Full Employment *GDP* Denote by $\hat{Y}$ *GDP*, the monetary value of (C, I), evaluated at $(P^C,\, P^W)$, i.e., $\hat{Y} = P^C C + P^W I$.

Production Equilibrium $(C^*,\, I^*)$ solves: $\max P^C C + P^W I$ s.t. $T(C,\, I) \;\leq\; 0$, and satisfies the 1st-order Condition: $MRT = \dfrac{P^C}{P^W}$.

Full-Employment GDP $\hat{Y}_F$ is the monetary value of $(C^*,\, I^*)$, i.e., $\hat{Y}_F = P^C C^* + P^W I^*$.

1.4.4 Yet Another Specialization: Keynesian Aggregate Macroeconomic Analysis of Under-Employment Equilibrium

[4]

"Unique" Aggregation under the Price Rigidity: Typical with economies with surplus production abilities in excess of insufficient "Effective Demands" is the "Price Rigidity," i.e., the prevalence of rigid *relative* prices.

Therefore, the (*absolute*) prices p may well be written down in terms of "rigid" *relative* prices of consumption goods $\left(\bar{p}^1,\; \ldots\;,\; \bar{p}^k\right)$ and those of production goods $\left(\bar{p}^{k+1},\; \ldots\;,\; \bar{p}^{\ell}\right)$

[4]For the subsequent Fixed-Point Characterization and the detailed discussions thereof, refer to:

NOMURA, Yoshimasa (2004): "Fixed Point Structure of the 'Principle of Effective Demand': An Exposition." *Economic Journal of Chiba University*, Vol. 19, No. 3, pp. 301-317.

Certainly, the original reference is:

KEYNES, John Maynard (1936): *The General Theory of Employment, Interest and Money.* London: Macmillan.

as:

$$\begin{aligned} p &= \left(\underbrace{p^1, \ \dots \ , p^k}_{\substack{\text{Consumption} \\ \text{Goods}}}, \underbrace{p^{k+1}, \ \dots \ , p^\ell}_{\substack{\text{Production} \\ \text{Goods}}} \right) \\ &= \left(P^C . \left(\bar{p}^1, \ \dots \ , \bar{p}^k \right) \ , \ P^W . \left(\bar{p}^{k+1}, \ \dots \ , \bar{p}^\ell \right) \right) , \end{aligned}$$

where P^C and P^W denote the *CPI* and the *WPI*, respectively.

Remark (*Inflation or Deflation*): Despite the misleading nomenclature of "*Price Rigidities*", the above characterization emphasizes the rigidity of *relative* prices, and admits either inflation or deflation, phenomenon plagued with the general increase or decline of *absolute* prices.

Equipped with the preceding characterization of p, $x = \left(\underbrace{x^1, \ \dots \ , x^k}_{\substack{\text{Consumption} \\ \text{Goods}}}, \underbrace{x^{k+1}, \ \dots \ , x^\ell}_{\substack{\text{Production} \\ \text{Goods}}} \right) \in \mathbf{R}^\ell_+$ may be aggregated into (C, I) as follows:

Definition (*"Unique" Aggregation*): *A Composite Commodity Bundle* (C, I) *is defined by*

$$(C, I) = \left(\frac{\sum_{i=1}^k \bar{p}^i x^i}{P^C} \ , \ \frac{\sum_{i=k+1}^\ell \bar{p}^i x^i}{P^W} \right) .$$

Remark (*Macroeconomic Real Variables*): In Macroeconomics, such variables in the *Real Market* (in contrast to *Money* and *Labor Markets*) as the consumption and investment $\left(\hat{C}, \hat{I} \right)$ are redefined *in monetary values* as $\left(\hat{C}, \hat{I} \right) = \left(P^C C, P^W I \right)$ in the present terminology.

"Principle of Effective Demand": The "Principle of Effective Demand" may be stated in terms of the preceding notation as (Recall $\hat{X}$ stands for the monetary value of X.):

- $\hat{C}(\hat{Y})$: *Consumption* will depend on the level of Aggregate Income $\hat{Y}$, the relation of which is governed by the psychological characteristic of the community, i.e., its *Propensity to Consume* (Keynes (1936, p. 28, (2))).

- $\hat{D}(\hat{Y})$: The *Effective Demand* is "the sum of two quantities, namely $\hat{C}(\hat{Y})$, the amount which the community is expected to spend on Consumption, and $\hat{I}$, the amount which it is expected to devote to new Investment (Keynes (1936, p. 29, (3)))."

  In the context of a full-fledged open mixed economy, in addition to $\hat{C}(\hat{Y})$ and $\hat{I}$, the Government Expenditures $\hat{G}$ and the Export Demand $\hat{X}$ constitute $\hat{D}(\hat{Y})$.

- $\hat{Y}$: The *Aggregate Supply* $\hat{Y}$ is determined by "$\hat{C}(\hat{Y}) + \hat{I} = \hat{D}(\hat{Y}) = \hat{Y}$ (Keynes (1936, p. 29, (4)))."

  In an open mixed economy, the Aggregate Supply includes the Tax Revenue $\hat{T}_{-1}$, the supply transferred from the economic activities of the private sector in the previous year, emphasized by the suffix (-1), and the Import $\hat{M}$, the supply from the foreign countries as well as the aforementioned *GDP* $\hat{Y}$, the domestic supply.

SUMMARY (*Principle of Effective Demand*): The Principle of Effective Demand $\hat{Y} = \hat{D}(\hat{Y})$, "Demand creates *its own* (an equal amount of) Supply," in words, consists of two propositions:

1. "Demand creates Supply," i.e., the Aggregate Supply $\hat{Y}$ is determined by, and indeed some function of, the Aggregate Demand $\hat{D}(\hat{Y})$, say $\hat{Y} = \Phi(\hat{D}(\hat{Y}))$.
2. "Creates an *equal* amount of," i.e., the function Φ takes a special form, the *Identity Map* $\mathrm{id}_{\mathbf{R}} : \mathbf{R} \to \mathbf{R}$ defined by $\mathrm{id}_{\mathbf{R}}(x) = x$ for all $x \in \mathbf{R}$.

Therefore, $\hat{Y} = \hat{D}(\hat{Y})$ for all $\hat{D}(\hat{Y}) \in \mathbf{R}$.

Fixed-Point Characterization of Under-Employment Macroeconomic Equilibrium

- Dual Nature of *GDP* $\hat{Y}$
  1. "Income" on which the consumption demand $\hat{C}(\hat{Y})$ depends;
  2. "Aggregate Supply" that is generated by the Effective Demand $\hat{D}(\hat{Y}) = \hat{C}(\hat{Y}) + \hat{I}$ so that $\hat{Y} = \hat{D}(\hat{Y})$.

- "45 Degree Line Analysis"
  - The Diagram with the Horizontal $\hat{Y}$-Axis and the Vertical $\hat{D}$-Axis
  - To be precise, the Aggregate Supply $\hat{Y} = \hat{D}(\hat{Y})$ is depicted as the *"45 Degree Line" against the Vertical $\hat{D}$-Axis.*
  - The *Equilibrium GDP* $\hat{Y}^*$ is determined at the intersection of the Aggregate Supply as represented by the 45 Degree Line, and the Aggregate Demand, i.e., such that $\hat{Y}^* = \hat{D}(\hat{Y}^*) + \hat{I}$ and $\hat{I} = \hat{Y}^* - \hat{C}(\hat{Y}^*)$ (The *IS Equilibrium*)

- "Fixed Point"
  $\hat{Y}^*$ is a *Fixed Point* of the single-valued continuous Effective Demand Function $\hat{D} : [0,\ \hat{Y}_F] \to [0,\ \hat{Y}_F]$, defined by $\hat{D}(\hat{Y}) = \hat{C}(\hat{Y}) + \hat{I}$, i.e., $\hat{Y}^* = \hat{D}(\hat{Y}^*) = \hat{C}(\hat{Y}^*) + \hat{I}$.

PROPOSITION (NOMURA (2004, THEOREM 2.5)): *Let $\hat{Y}_F$ be the full employment GDP.*

Define the Effective Demand Function $\hat{D} : [0,\ \hat{Y}_F] \to [0,\ \hat{Y}_F]$ by $\hat{D}(\hat{Y}) = \hat{C}(\hat{Y}) + \hat{I}$.

Then, there exists an Under-Employment Macroeconomic Equilibrium $\hat{Y}^*$ as a Fixed Point of $\hat{D}$, i.e., $\hat{Y}^* = \hat{D}(\hat{Y}^*) = \hat{C}(\hat{Y}^*) + \hat{I}$, such that the IS Balance $\hat{I} = \hat{Y}^* - \hat{C}(\hat{Y}^*) = \hat{S}(\hat{Y}^*)$ holds.

Remark (*Precedences*): The present Fixed-Point characterization is an appropriate *highbrow* mathematical restatement of the familiar 45-Degree Line Analysis, explicit on the subtle causative relationship where the Effective Demand is indeed the *cause* from which the Aggregate Supply follows.

In:

> Nikaido, Hukukane (1975): *Monopolistic Competition and Effective Demand*. Princeton Studies in Mathematical Economics, Vol. 6. Princeton, NJ: Princeton University Press,

Nikaido (1975) successfully exploited a similar insight to our characterization, on the *self-fulfilled nature of Effective Demand* as explicated in Nomura (2004, Remark 2.2), to construct an "Objective Demand" in the General Equilibrium Analysis of Monopolistic Competition.

"Spill-Over" of the Deflationary Gap in the Real Market to the Unemployment Rate in the Labor Market

- For the preceding *Full-Employment GDP* $\hat{Y}_F$ and *Under-Employment Macroeconomic Equilibrium* $\hat{Y}^*$, the gap $\left(\hat{Y}_F - \hat{Y}^*\right)$ measures the *Deflationary Gap*.
  - The ratio $u^* = \dfrac{\hat{Y}_F - \hat{Y}^*}{\hat{Y}_F}$ serves as a proxy variable for the *Economy-Wide Resource Under-Utilization*.
- Denote by $u = \dfrac{\bar{L} - (L_C^* + L_I^*)}{\bar{L}}$ the *(Labor) Unemployment Rate* associated with $\hat{Y}^*$.
  - Then, $u \in [0, u^{\max}]$, where $u^{\max}$ is the *maximum unemployment rate* corresponding to the *extreme* case where Labor absorbs all resource under-utilization due to the shortage of Effective Demand, i.e., $u^{\max}$ is the maximum value of $u(\alpha)$, w.r.t. α, the allocation ratio of $(1-u)\bar{L}$ to 2 industries C and I, satisfying
    $$P^C F^C\left(\alpha(1-u)\bar{L},\, K_C^*\right) + P^W F^I\left((1-\alpha)(1-u)\bar{L},\, K_I^*\right) = \hat{Y}^*\,.$$
  - When L and K absorb the economy-wide resource under-utilization *proportionately*, $u = u^* \in [0, u^{\max}]$.

> Remark (*Remnant of General Equilibrium Characteristics in the Keynesian Macroeconomics*): The present Fixed-Point characterization reckons the Unemployment as *not* caused within the Labor Market.
>
> Indeed, the *Deflationary Gap* $\left(\hat{Y}_F - \hat{Y}^*\right)$ is identified as the cause of the *Unemployment* $\left\{\bar{L} - (L_C^* + L_I^*)\right\}$, or in the *(Labor) Unemployment Rate* $u = \dfrac{\bar{L} - (L_C^* + L_I^*)}{\bar{L}}$, as demonstrated in the above.

For the alternative characterization of the *(Labor) Unemployment Rate* u by way of the *inverse* of the *Employment Function* due to Keynes (1936, Chapter 20), refer to Nomura (2004, Remark 2.3).

SUMMARY TABLE A: PRICE THEORY

GENERAL EQUILIBRIUM PROTOTYPE	**Subjective Equilibrium**	**$\Longrightarrow$ Marginal Conditions $\Longrightarrow$ *"Ex Ante"* Individual Choice**	**Multiple Market Equilibrium**
Consumers	Utility Maximization (s.t. Income Constraint)	$\boxed{(\forall i,j)}\ MRS^{i,j} = \frac{p^i}{p^j}$ $\Longrightarrow$ Individual Demand $D(p,a)$	Market Demand $D(p) = \sum_{a\in A} D(p,a)$
Producers	Profit Maximization (s.t. Technique and Market Structure)	$\boxed{(\forall i)}\ \left.\begin{array}{l} MRTS^i = \frac{w}{r} \\ MC^i = p^i i \end{array}\right\}$ $\Longrightarrow$ Individual Supply $S(p,f)$	Market Supply $S(p) = \sum_{f\in F} S(p,f)$
Markets			• "No Arbitrage" among Consumers or Producers $MRS^{i,j}_{a_1} = \ldots = MRS^{i,j}_{a_n} = MRT^{i,j} = \frac{p^i}{p^j}$ • "No Reshuffling of Resources" $MRTS_{f_1} = \ldots = MRTS_{f_m} = \frac{w}{r}$ • Market Clearance $X^* = D(p^*) = S(p^*)$ $\Longrightarrow$ Market Equilibrium (p^*, X^*) - "Walras' Law" $\Longrightarrow$ *Relative* p^*
PARTIAL EQUILIBRIUM MICROECONOMICS	**• Further Specializations**	**$\Longrightarrow$ Marginal Conditions $\Longrightarrow$ *"Ex Ante"* Individual Choice**	**Partial Market Equilibrium**
Market(s) for i^{th} and/or j^{th} commodity	• "*Ceteris Paribus*", i.e., Markets other than i (and possibly j) are in equilibrium.	$\boxed{(\exists i,j)}$ The Preceding Marginal Conditions Hold $\Longrightarrow$ Individual Demand for i [or j] $D^{i\ [j]}(p^{i\ [j]}, p^{)i[j](}, a)$; Individual Supply of i [or j] $S^{i[j]}(p^{i[j]}, p^{)i[j](}, f)$.	• i^{th} [or jth] Market Clearance: $X^{i[j]^*} = D^{i[j]}(p^{i[j]^*}, p^{)i[j](}) = \sum_{a\in A} D^{i\ [j]}(p^{i\ [j]}, p^{)i[j](}, a) = \sum_{f\in F} S^{i[j]}(p^{i[j]}, p^{)i[j](}, a) = S^{i[j]}(p^{i[j]^*}, p^{)i[j])(}).$ **In addition, Partial Equilibrium Conditions *hold* $\boxed{(\forall i,j)}$ *simultaneously* $\Longrightarrow$ General Equilibrium.**

SUMMARY TABLE B: INCOME THEORY

NEOCLASSIC AGGREGATE MACROECONOMICS	• ***Further Specializations*: Specific Characterizations Thereof**	**Subjective Equilibrium**	***"Ex Ante"* Production Choice** (C^*, I^*) **$\Longrightarrow$ Full-Employment GDP** $\hat{Y}_F$
Real Market	• *"Aggregation":* A *Commodity Bundle* $\left(\underbrace{x^1, \ \ldots \ , x^k}_{\substack{\text{Present} \\ \text{Consumption}}}, \underbrace{x^{k+1}, \ \ldots \ , x^\ell}_{\substack{\text{Future} \\ \text{Consumption}}} \right)$ is aggregated into a *Composite Commodity Bundle* $(C, I) = \left(\frac{\sum_{i=1}^{k} p^i x^i}{P^C}, \ \frac{\sum_{i=k+1}^{\ell} p^i x^i}{P^W} \right)$. where P^C, P^W are *CPI* and *WPI*. *GDP* $\hat{Y}$ is the monetary value of (C, I) evaluated at (P^C, P^W), i.e., $\hat{Y} = P^C C + P^W I$.	Marginal Conditions for Optimizations in TABLE A determine Individual Demands for and Supplies of (C, I).	*Production Equilibrium* (C^*, I^*) solves: $\max \ P^C C + P^W I$ s.t. $T(C, I) \leq 0$, and satisfies the 1st-order Condition: $MRT = \frac{P^C}{P^W}$. *Full-Employment GDP* $\hat{Y}_F$ is the value of (C^*, I^*), i.e., $\hat{Y}_F = P^C C^* + P^W I^*$.

KEYNESIAN UNDER-EMPLOYED MACROECONOMICS	• ***Further Specializations*: Specific Characterizations Thereof**	**Subjective Equilibrium**	**Shortage of Effective Demand in *"Ex Post"* Realized Values $\Longrightarrow$ Under-Employed GDP** $\hat{Y}^*$
Real Market	• *"Aggregation" under Price Rigidity* $\Longleftarrow$ Excess Supply Potential: "Unique" Aggregation in Money terms: $(\hat{C}, \hat{I}) = (P^C C, P^W I) = \left(\sum_{i=1}^{k} \bar{p}^i x^i, \ \sum_{i=k+1}^{\ell} \bar{p}^i x^i \right)$ • *Principle of Effective Demand*: *Effective Demand Function* $\hat{D} : [0, \ \hat{Y}_F] \ \rightarrow \ [0, \ \hat{Y}_F]$, defined by $\hat{D}(\hat{Y}) = \hat{C}(\hat{Y}) + \hat{I}$.	. *N.A.*	*IS-Equilibrium* *The 45-Degree Line Analysis*: $\hat{Y}^*$ is a *Fixed Point* of $\hat{D}(\hat{Y})$, i.e., $\hat{Y}^* = \hat{C}(\hat{Y}^*) + \hat{I}$, which satisfies the *IS Balance*: $\hat{I} = \hat{Y}^* - \hat{C}(\hat{Y}^*) = \hat{S}(\hat{Y}^*)$.
Money Market	• *"Speculative Demand"*: $L_2(r)$	*N.A.*	*LM-Equilibrium* $L_1(Y) + L_2(r) = M_S$
Labor Market	• *"Walrus' Law"*: *"Triple-Sided Identity"*: $GDP \equiv GDI \equiv GDE$. • *"Spill-Over" from the Real Market*: Via e.g., *Derived Demand for Labor* $L = f^{-1}(\hat{Y})$.	*N.A.*	$IS \wedge LM$ *Eqilibria* $\Longrightarrow$ *Automatically* in Equilibrium. Otherwise, *"Spill-Over" of the Deflationary Gap* $\left(\hat{Y}_F - \hat{Y}^* \right)$ *to the Unemployment* $\left\{ \bar{L} - (L_C^* + L_I^*) \right\}$.

2 Historical Backgrounds of the Japanese Economy

2.1 Edo Era (1603 - 1868)

Feudal Unification of Provincial States ("*Han*") by the Shogunate Family ("*Bakuhu*")

- Appointment of "Provincial Governor (*Daimyo*)" by the Shogun, in the guise of Emperor's "Marshall-in-Chief (*Seii-Dai-Shogun*)", with the specification of the amount of rice crop (*Kokudaka*) expected of the appointed province.
- Provincial governments with the secured autonomy
  - *Not* independence, with the obligations of maintaining the "Edo Satellite (*Edo-Yashiki*)" inhabited by the spouse of the provincial governor (as Shogun's hostage), and extremely costly respect visits to the Shogun every other year
    $\Longrightarrow$ Enticing pledge of loyalty from provincial governors, and eliminating the possible rebellions by sufficiently impoverishing them
    – The same exploiting technique employed by the local governors to tax provincial farmers heavily.
  - Some provincial success stories of economic reforms:

    Yozan Uesugi in *Jyoh-etsu* Province (now in Niigata Prefecture);

    Hohkoku Yamada, a Japanese precursor of the Keynesian Revolution in *Bicchu* Province (now in Okayama Prefecture).
- Peaceful 250 years
  - Solid social hierarchy by the occupation: "Warriors (ruling class)-Farmers-Manufacturers-Merchants (*Shi-Noh-Koh-Shoh*)" in this order, indicating rice as the main staple and the low esteem for commerce or money-making activities.
  - Exclusion of Christian influence as the expense of "Isolation (*Sakoku*)" from the rest of the world
  - Mitigated fluctuations in the rice price with an introduction of the world's first "futures market" participated by the dealers ("*Hudasashi*") in the Dohjima District of Osaka, who are in charge of selling rice on behalf of local governors and prepaying the expected revenues to them in advance.
  - Highly cultural and academic sophistications

    Ruling Warriors (*Samurai* or *Bushi*) class of no practical use in the peacetime
    $\Longrightarrow$ Dedication to martial arts, practice of the Religion *Zen*, and the spiritual and philosophical meditations and self-inquiries
    $\Longrightarrow$ Culminates in the *stoic* "Warriors' Principle of Life (*Bushidoh*)", later to be publicized to the Western World by Nitobe, Inazoh (1900): *Bushidoh: The Soul of Japan.* Philadelphia, PA: The Leeds & Biddle Co.; and Benedict, Ruth (1946): *The Chrysanthemum and the Sword: Patterns of Japanese Culture.* Boston, MA: Houghton Mifflin, to name the few.

    Another peculiar transcendental but *materialistic* viewpoint on the transitional world (from life to death), promoted by ordinary citizens (*Chohnin*-Culture): "Floating (and Worrisome, both pronounced *uki*) World (*Ukiyo*)",

visualization of which is *Ukiyo-ye*, circulated by mass-produced colorful wood-cut prints.

Original "Japanese Arithmetics (*Wa-San*)"; Highly accurate map-making.

$\Longrightarrow$ Origins of many of today's highly skillful craftsmanships

2.2 Meiji Restoration and Thereafter (1868 -)

Catching-Up Period with Westernization and Industrialization

- Return of the throne by the last Tokugawa Shogun to Meiji Emperor (*Taisei-Houkan*, 1867)
  - Revolution initiated by the *non-warrior class youngsters* from the (far-)western "Estranged (*Tozama*)" Provincial Governments with a partial access to foreign trades, such as *Satsuma* (now in Kagoshima Prefecture), *Chohshuh* (now in Yamaguchi Prefecture), *Tosa* (now in Kohchi Prefecture) and *Higo* (now in Kumamoto Prefecture).
  - Civil wars before and after the Meiji Restoration

    Before: Opening the country, or abolishing foreign enemies

    After: Counter-reactionary rebellions from remnants of the former ruling class
- Decentralization by "Prefectures (*Fu*/*Ken*)" in place of Provincial States (*Haihan-Chiken*) (1871)
- Meiji Imperial Constitution (1989)
- Meiji Imperial Parliament, consisting of the House of Representatives and the House of Noblemen
- "Coupling the Japanese spiritualism with the advantage of the Western talents (*Wa-Kon-You-Sai*)"
- "Enriching and Militarily Strengthening of Japan (*Hukoku-Kyohhei*)", the belated Industrial Revolution in Japan
  - Sino-Japanese (1994 - 95) and Russo-Japanese (1904 - 05) Wars
  - World War I (1914 - 18)

2.3 Militarization and Plunge into the World War II

Military Expenses,
Multiples of National Budget,
1930 - 1945 (¥ Thousands, %)

Year	Amount	Ratio
1930	444,302	28.5
1931	461,204	31.2
1932	701,033	35.9
1933	881,056	39.1
1934	948,391	43.8
1935	1,039,235	47.1
1936	1,085,454	47.6
1937	3,293,989	69.5
1938	5,979,059	77.0
1939	6,489,572	73.7
1940	7,963,490	72.5
1941	12,515,349	75.7
1942	18,836,742	77.2
1943	29,828,910	78.5
1944	73,514,945	85.3
1945	55,242,895	72.6

- (Second) Sino-Japanese War (1937 - :1945)
- World War II (1940 - 1945)

3 Post-War Performance of the Japanese Economy

3.1 Postwar Reforms (1945 -)

- "Ban on Excessive Concentration of Economic Powers" $\Longrightarrow$ Resolution of "Family Syndicates (*Zaibatsu*)";
- Agricultural Land Reform (1952): 43.7% of arable land was sublet in 1945 $\longrightarrow$ 11.7$ in 1950;
- Liberalizations of Labor Force $\longleftarrow$ "3 Labor Laws" (Labor Standards Law, Labor Union Law and Labor Relations adjustment Law);
- "Production Priority" Methods: Priorities to investments in coal mining and steel industries;
- The New Peace-Abiding Constitution, with the Article 9 on the Declaration of the Abolishment of Wars;
- Dodge Line (1949): Dodge, Joseph, President's Envoy. Balanced Budget $\Longleftarrow$ Deficits from irresponsible "Boot-Strapping" dependent on economic aids from the US and excessive fiscal assistance expenditures
- Shoup's Recommendations on Tax Reform (1950): Shoup, Carl Sumner. Dependence on the income taxes (*Direct Taxes*) to secure the tax revenue (Effective until the 1989 Tax Reform).

3.2 From Recovery to Growth (1950 -)

- Becoming one of the major industrialized countries in the world.

Effects of "Income-Doubling Policy" on per-capita GDP

1950	$<$	$\frac{3}{4}$ of the prewar per-capita GDP level
$\vdots$		(Economic Recovery)
mid-50's	$\simeq$	prewar level
$\vdots$		(Onset of Economic Growth)
Dec. 1960		Initiation of "Income Doubling Policy"
1963	$\simeq$	Double the mid-50's (prewar) per-capita GDP level
1967	$\simeq$	Double the 1960 per-capita GDP level

- Stronger ¥ (Yen).

¥ vs. $ Exchange Rate (Interbank Spot Market)

	Annual Average (In ¥ Denomination)	**Fluctuation** (Highest - Lowest)	**Rate of Fluctuation** (%)
July 1-22, 1944[5]			
1945[6]			
(Apr. 25, 1949)[7]			
⋮	Fixed at 360.00		Within 1.00 % Permissible
Dec. 1971[8]	308.00		Within 2.25 % Permissible
1973[9]	271.70		
⋮			
1980	226.45	61.05	27.0
1985	238.05	63.85	26.8
1990	144.88	36.30	25.1
1995	93.07	24.95	26.5
2000	107.78	13.52	12.5
2005	110.21	19.53	17.7
2010	87.76	14.46	16.5
2011	79.77	10.01	12.6
2012	79.80	10.76	14.0
2013	97.71	18.58	19.0
2014	105.94	21.10	20.1
2015	121.04	10.00	8.4

[5] The Bretton Woods Conference (The United Nations Monetary and Financial Conference)

[6] **The Bretton Woods System:** Fixed exchange rate. The International Monetary Fund (IMF) and the International Bank for Reconstruction and Development (IBRD), which today is part of the World Bank Group, became operational after a sufficient number of countries had ratified the agreement.

[7] The new floating rate supplied by the IMF, revised from ¥270 on July 5, 1948 .

[8] The Smithsonian Agreement following the Nixon Shock on August 15, 1971, when the US unilaterally terminated convertibility of the US dollar to gold.

[9] **The Smithsonian System:** Flexible exchange rate. The Smithsonian Agreement took effect upon ratifications by Japan and European countries in February, 1973.

- 1987 per-capita GDP at the exchange rate (\$1.00 = ¥144.64).
  - Japan: \$23T.
  - Germany: \$21T.
  - US: \$18T.

> REMARK (*Externally Strong ¥*): ¥ is *overvalued* at 1987 exchange rate[10].

- 1987 per-capita GDP in P.P.P. (Purchasing Power Parities[11])
  - 84% of the US level
  - 94% of the German level
  - Outperformed France, Italy and the UK

> REMARK (*Internally, or Domestically Weak ¥*): ¥ is undervalued in 1987 P.P.P.
>
> 1. Intrinsically due to the "Index Problem," devoid of the "Substitution Effect." (Known as the "Hamburger Index Paradox.")
> 2. Since P.P.P. precludes non-tradable goods and services, it is significant only in the *relative* sense, i.e., as a trend over time.

[10] Refer to the preceding TABLE in the present SECTION or the comparable TABLE in SECTION **10.1** for the actual transition of π's. Note well that $\frac{PI_J}{PI_{US}} > 1$ in the formula in the subsequent FOOTNOTE 11.

[11] Let PI_i be the price index of Country i, π the exchange rate in ¥ denomination, i.e., \$1.00 = ¥π. Then, PPP_t may be computed by the formula:

$$PPP_t = \frac{PI_J}{PI_{US}}.\pi_0\,.$$

3.3 Stages of Economic Growth: Turning Points

REMARK (Turning Points of Economic Growth):

- Ceilings suppressing the Booms in the Business Cycle from:
  - "Foreign Currency Ceiling" $\Longleftarrow$ Lack of foreign currencies to pay for increased demand for imported raw materials;
  - "Full employment Ceiling" $\Longleftarrow$ Labor shortage for further expansion;

  and
  - "Environmental Ceiling" $\Longleftarrow$ Environmental concern for sustainable growth.
- Turning points as characterized by the transition of binding ceilings
  - The Late 1970s: Foreign Currency Ceiling $\longrightarrow$ Full Employment Ceiling;
  - The Late 1980s: Full Employment Ceiling $\longrightarrow$ Environmental Ceiling.

3.4 PREVIEW: Intuitions on Economic Growth

3.4.1 Review of Production Possibilities Curve

Recall the derivation of the P.P.C. in **1.4.3** for a Neoclassical Aggregate Economy:

$$\left.\begin{array}{l}(i)\ \text{Full Employment}: \\ \quad L_C + L_I \ \leq\ \bar{L}\,; \\ \quad K_C + K_I \ \leq\ \bar{K}\,; \\ \\ (ii)\ \text{Efficient Productions}: \\ \quad F^C(L_C,\, K_C) \ \leq\ C\,; \\ \quad F^I(L_I,\, K_I) \ \leq\ I\,.\end{array}\right\} \Longrightarrow \begin{array}{l}\textit{Production Possibilities Curve}: \\ \quad T(C,\, I) \ =\ 0\,, \\ \textit{Production Set}: \\ \quad Y = \left\{(C,I) \in \mathbf{R}^2_+ \,\middle|\, T(C,\, I) \ \leq\ 0\right\}\,.\end{array}$$

3.4.2 Economic Growth as an Outer Shift of the Production Possibilities Curve

Also recall from **1.4.3**, the definition of the *Full Employment GDP*: $\hat{Y}_F = P^C C^* + P^W I^*$.

- *Economic Growth* is an outer shift of the *Production Possibilities Curve*.
  - The *Rate of Economic Growth* measures the the extent of such shifts in terms of the *Growth Rate of GDP*, i.e., $\dfrac{\Delta \hat{Y}_F}{\hat{Y}_F}$.

- *Translate* the "Causative Relationship" highlighted in the Box of **3.4.1** above in terms of "Changes,".i.e.,

$$\left.\begin{array}{l}\text{Changes in the "Cause" } (i)\\ \quad \Longleftarrow\ \Delta\bar{L} > 0 \textit{ or } \Delta\bar{K} > 0\\ \quad \textit{or}\\ \text{Changes in the "Cause" } (ii)\\ \quad \Longleftarrow \text{ Improved } F^C \textit{ or } F^I\end{array}\right\} \Longrightarrow \begin{array}{l}\text{Changes in the "Result" :}\\ \quad \text{Outer Shift of } T(C,\, I) \,=\, 0\,,\\ \quad \text{i.e., "}\textit{Economic Growth.}\text{"}\end{array}$$

  - Changes in the Cause (i):

$$\begin{cases} \Delta\bar{L} > 0 : \textit{Natural Growth};\\ \Delta\bar{K} > 0 : \textit{Capital Accumulation.}\end{cases}$$

  - Changes in the Cause (ii): *Technical Progress* or *(Technical) Innovation.*
  - If one conceives "affluence" in terms of *per capita GDP* $\left(\dfrac{\hat{Y}_F}{\bar{L}}\right)$, a growth strategy with a resort to "Natural Growth" may end up as "growth without appreciable affluence." Therefore, capital accumulation and technical progress are all the more important growth strategies.

3.4.3 Measurement of Sources of Economic Growth (*)

Consider a further aggregation of (C, I), as introduced in the Neoclassical Aggregate Macroeconomic Preview in **1.4.3**, into a single output Y, and its sort of price P, the *GNP Deflater* such that

$$\hat{Y} = PY = P^C C + P_W I$$

in the terminology developed therein.

Remark (*Linear Expression of Growth Factors*): Suppose the *Aggregate Production Function* $Y = F(L, K)$ takes the form of Cobb-Douglas *type* (← Cobb, Charles W., and Douglas, Paul Howard (1892-1976)), and incorporates *Labor-Augmenting* or Harrod-*Neutral Technical Progress* (← Harrod, Roy Forbes (1900-1978)), i.e.,

$$Y = \left(e^{\tau t}L\right)^{\alpha}.K^{1-\alpha} = e^{\alpha\tau t}.L^{\alpha}.K^{1-\alpha},$$

where τ denotes the *Rate of Technical Progress*, and α the *Labor Share of GDP.*

Then,

$$G(Y) = \alpha\tau + \alpha.G(\bar{L}) + (1-\alpha).G(\bar{K})\,,$$

where $G(X) = \frac{\dot{X}}{X}$, the *Growth Rate* of X, and in particular, $G(\bar{L})$ and $G(\bar{K})$ are the *Natural Rate of Growth* and the *Rate of Capital Accumulation*, respectively.

α is the *Labor Share of GDP*, and $(1-\alpha)$ the *Capital Share of GDP.*

Indeed,

$$\frac{wL}{PY} = \frac{MP_L.L}{Y} = \frac{\left(\frac{\alpha.Y}{L}\right).L}{Y} = \alpha\,,$$

$$\frac{rK}{PY} = \frac{MP_K.K}{Y} = \frac{\left(\frac{(1-\alpha).Y}{K}\right).K}{Y} = 1-\alpha\,.$$

3.5 Source, or Residual, Analysis of Economic Growth (1975 -)

$$\frac{\dot{Y}}{Y} = \underbrace{\alpha\frac{\dot{L}}{L} + \beta\frac{\dot{K}}{K} + \gamma\frac{\dot{M}}{M}}_{\substack{\text{High total factor}\\ \text{productivity growth}}} + \tau,$$

where τ is the rate of technical progress, and the coefficients α, β and γ are derived from the underlying production function, such that $\alpha + \beta + \gamma = 1$ for the constant returns to scale technology.

Comparisons of Annual Growth Rates and Factor Productivities between the US and Japan (1960-1979) (Adapted from: Jorgenson, Kuroda and Nishimizu (1988, Table II, pp. 12-).)

Annual Growth Rate	**Japan**	**US**
$\frac{\dot{Y}}{Y}$	8.46%	3.48%
$\frac{\dot{K}}{K}$	9.96%	3.76%
$\frac{\dot{L}}{L}$	2.71%	1.47%

- $\frac{\dot{K}}{K}$ High investment rate, financing high (domestic) investment rate.
- Since $\frac{\left(\frac{\dot{Y}}{L}\right)}{\frac{Y}{L}} = \frac{\dot{Y}}{Y} - \frac{\dot{L}}{L}$ and $\frac{\left(\frac{\dot{Y}}{K}\right)}{\frac{Y}{K}} = \frac{\dot{Y}}{Y} - \frac{\dot{K}}{K}$, $\frac{\left(\frac{\dot{Y}}{L}\right)}{\frac{Y}{L}} > 0$ and $\frac{\left(\frac{\dot{Y}}{K}\right)}{\frac{Y}{K}} < 0$.

US-Japan Comparison of Technical Progress
$\tau = \dot{Y} - \left(\alpha \dot{L} + \beta \dot{K} + \gamma \dot{M} \right)$ by Sectors
(Adapted from: Jorgenson, Kuroda and Nishimizu
(1988, Tables IV and V, p. 22 and pp. 26, 27).)

Primary Sector (Agriculture, Forestry, Fishery)	Gap Widening
Secondary Sector Light (Textile, Food, Furniture, etc.)	Gap Not Closed
Heavy (Metal, Precision Instruments, etc.)	Gap Closed
Tertiary Sector (Except for Utilities, Trade and Other Services)	Gap Closed

- $\frac{\dot{Y}_i^J}{Y_i^J} > \frac{\dot{Y}_i^{US}}{Y_i^{US}} \implies$ Japan overtaking the US in Sector i, thus gap closed;
- $\frac{\dot{Y}_i^J}{Y_i^J} \leq \frac{\dot{Y}_i^{US}}{Y_i^{US}} \implies$ Gap not closing in Sector i.

- Factors affecting τ:
  1. High $\frac{\dot{K}}{K} \implies$ Invest heavily to replace the most productive "vintaged" K.
  2. Amount of available land $\implies$ Widening gap in agriculture.

3.6 Investment-Saving Balance vs. Export-Import Balance (1970's -)

Recall the *"Ex Post" Macroeconomic Identity*[12]:

$$\underbrace{Y + T_{-1} + M}_{\substack{\text{Aggregate Supply} \\ AS}} \equiv \underbrace{C + I + G + X}_{\substack{\text{Aggregate Demand} \\ AD}},$$

where

[12] In contrast to *"Ex Ante" Microeconomic* variables, which are planned, *not necessarily realized.*
Since demand components, C, I, G, X are *realized* values, they should have been *actually* supplied either *domestically* as GDP Y or *from abroad* as Import I, or yet third possible source is by *transfer from the previous year*, signified by the suffix -1, as Tax Revenue T_{-1}, in the form of income and corporate taxes which are based on the economic activities of the private sector in the preceding year.

Components of an "Open Mixed Economy"

Open	Mixed	**Economic Agents**	AS Aggregate Supply	AD Aggregate Demand
Domestic	Private	**Consumers**		C Consumptions
		Firms	Y G.D.P.	I Investments
	Government		T_{-1} Tax Revenues	G Government Expenditures
Foreign			M Imports	X Exports

Itemized Gross Domestic Expenditures, 2010
(Trillion ¥'s, %)

Items	**Expenditures**	**Composition**
$C + I + G + (X - M)$	**479.2**	**100.0**
C	**284.2**	**59.3**
I	**73.6**	**15.3**
I_{Housing}	13.0	2.7
I_{Plant}	62.1	12.9
$I_{\text{Inventory}}$	-1.5	-0.3
G	**117.1**	**24.5**
$G_{\text{Consumption}}$	95.8	20.0
$G_{\text{Investment}}$	21.4	4.5
$G_{\text{Inventory}}$	-0.1	-0.0
$X - M$	**4.3**	**0.9**
X	73.8	15.4
$-M$	-69.5	-14.5

Rearranging the above Identity, we have an equivalent Identity in terms of respective balances:

$$\begin{aligned} \{(Y - C) - I\} + (T - G) + (M - X) &\equiv 0, \\ \underbrace{(S - I)}_{\substack{\text{Domestic} \\ \text{Balance}}} + \underbrace{(T - G)}_{\substack{\text{Government} \\ \text{Balance}}} + \underbrace{(M - X)}_{\substack{\text{Current} \\ \text{Balance}}} &\equiv 0. \end{aligned}$$

- Domestic savings (S), which stayed stable at 33% of the GDP > Domestic investment (I) at 30% of the GDP and slightly decreasing in trend. $\Longrightarrow$ Outflow of savings to overseas.
- "*IS* ($I - S$, (Domestic) Investment - Saving) Balance" vs. "*EM* ($X - M$, Export - Import) Balance"
  - *EM* Balance $\longrightarrow$ "Current Balance" to cover not only the *EM*'s of tangible goods but also those of intangible services.
  - *IS* deficit, i.e., the surplus of S over I, is the source to finance foreign investment which may well sustain the *EM* surpluses.

– Indeed, the *EM* Balance is the Current Account position of Japan viewed from the standpoint of foreign countries

= (-) Net position of all domestic sectors in Japan put together.

⊖ 1973-74 (First Oil Crisis), 1979-80 (Second Oil Crisis); and *possibly again as recently as 2014 and persistently after, despite the intentionally driven cheaper ¥ ?!*

⟶ Refer to **10.2.6** and FOOTNOTE 50 therein.

⟶ Refer also to **10.4.2**, especially the "J-Curve Effect" of structural changes of export industries.

REMARK (*45-Degree Line Analysis of Determination of GDP*):
The *Aggregate Demand AD* is given by $AD = C(Y) + I + G + X$, while the *Aggregate Supply* $AS = AD$, the 45-*Degree Line* against the AD-axis since as John Maynard KEYNES (1936, PRINCIPLE OF EFFECTIVE DEMAND) contends "Demand creates its own supply," typically in an underemployed economy with excess supply potential.
An intersection of AS and AD determines the equilibrium GDP Y^*, i.e.,

$$AS \equiv Y^* + T_{-1} + M = C(Y^*) + I + G + X \equiv AD\,.$$

3.7 Effects of the Devaluation of the US Dollars, and Economic Bubble (1985 -)

- Shift from the export-led growth to the domestic-demand-led growth.

3.8 Speculative Demand and the Real Estate Bubble in the Metropolitan Area

Denote by $D_1(p)$ the demand for real estates for "productive" purposes, i.e., for residential and regular corporate activity uses, and by $D_2(p)$ their speculative demand.

- Excess Liquidity $\implies$ $D_2(p)$.

3.8.1 Dominance of the Speculative Demand during the Real Estate Bubble

$$D(p) = \begin{cases} D_1(p) & \text{[Negligible during the Bubble; Dominant Thereafter]} \\ + & \\ D_2(p) & \text{[Dominant during the Bubble; Negligible Thereafter]}\,, \end{cases}$$

where $D_1(p)$ is a usual downward-sloped demand, while $D_2(p)$ is (i) upward-sloped and (ii) more responsive to changes in p, or *more price elastic* than $S(p)$ in terms of elasticities to be introduced in the subsequent **Section 7.1.**

3.8.2 Stability Analysis of the Real Estate Market (*)

Specify the *Price Adjustment Rule* that explicates the market pressure of the shortage or surplus on the price:

$$D(p) \left\{ \begin{array}{c} > \\ = \\ < \end{array} \right\} S(p) \implies p \left\{ \begin{array}{c} \uparrow \\ \rightarrow \\ \downarrow \end{array} \right\},$$

or $\dot{p} = \alpha \{D(p) - S(p)\}$ $\alpha > 0$, in short.

Then, in light of the preceding Price Adjustment Rule, we may conclude the instability, or non-restorability of the market equilibrium of the real estate market characterized by $D(p)$ with the properties noted above and the usual downward-sloped $S(p)$.

Also, upon the burst of economic bubble, the speculative part $D_2(p)$ became negligible, and the real estate market regained its stability in light of the Price Adjustment Rule specified in the above.

3.9 After the Burst of the Economic Bubble (1990 -)

Non-Performing Loans, as Liabilities Inherited from the Economic Bubbles:

(1993) Disposition of non-performing loans as prerequisite to comply with the *BIS* 8% *Equity Ratio*;

(1997 -) After the Lehman Shock, domino-like bankruptcies of mega-banks and security companies;

(Mar. 2005) A mega-financial group accomplished halving the outstanding balance of non-performing loans, with the consequence of mega-banks regaining the ranking $BBB^+ \longmapsto A^-$.

For a supplementary chronology of the scale and the disposition process of non-performing loans, refer to the Introductory Sections **1.1** and **1.2**.

3.9.1 Financial "Big Bang"

Subjection of the financial system to:

- *Efficiency inherent to Free Competition.* Competition among Financial Institutions and the resultant Natural Selection
  - Strengthening of the Deposit Insurance Corporation (DIC);
  - Protection of Savers within the limit of the amount guaranteed by the "Pay-Off" rules, beyond which the savers are required to take the "Self-Responsibility" against risks of bankruptcy.
- *Fair Competition, Transparency and Accountability of Management*

  - Compliance with the 8% *Equity Ratio* set by the *BIS*(*Bank for International Settlements*)

- *Global Competition*

Financial "Big Bang" opened up:

- Crossing over the segmented financial markets by subsidiary companies;
- Protection of the entire "Convoy" of commercial banks to their supervision by Ministry of Finance;
- Bans lifted from sales of such new financial merchandises as derivatives;
- (1997 -) Exemption of Holding Companies from the Anti-Monopoly Law.

3.9.2 Privatization of Postal Services and Savings (2007 - 2017)

- Cessation of financing the ever engrossing Government Investments Account from the Postal Savings.
  - The G.I. Account used to be called as the "Second" Government Budget, second to the main General Account, comprising approximately its half in scale (Refer to the Table in **9.4.1**: Itemized Government Expenditures, Government Investments and Issuance of Government Bonds.).
  - Politically preset 0.2% extra interest margin paid to the Government Loans from the Postal Savings, eventually at tax payers' expense.

- Instead, finance the Government Investments Account by issuance of G.I. Bonds after 2000.
  - Check the efficiency/necessity of Government Investments by salability of GI Bonds to investors, and by subjection to Indexed Rankings by internationally renowned ranking establishments..

$\Longrightarrow$ No extra interest margins paid, after 2000, to the Government Loans from Postal Savings $\Longrightarrow$ Privatization of Postal Services and Savings.

3.9.3 Emergence of Holding Companies

For the adverse effects of emerging holding companies, refer to **9.1.4**, especially Remark, Stylized Fact 2.

3.10 Macroeconomic Policy Priorities: Their Transition and Reversal

3.10.1 Counter-cyclical Macroeconomic Policies

Creation of extra effective demand, i.e.,

$$D\left(\uparrow\right) = C\left(\uparrow\right) + I\left(\uparrow\right) + G\left(\uparrow\right) + X\left(\uparrow\right),$$

or more formerly,

$$\Delta D = \Delta C + \Delta I + \Delta G + \Delta X\,.$$

- Fiscal Policies
  - Additional Government Expenditure $G\left(\uparrow\right)$, i.e., $\Delta G > 0$
  - Cut in Income Tax $T\left(\downarrow\right) \implies$ Increase in *Disposable Income* $(Y-T)\left(\uparrow\right)$

    $\implies$ Increase in Consumption $C\left((Y-T)\uparrow\right)\left(\uparrow\right)$ i.e.. $\Delta C(Y-T) > 0\,.$

- Monetary Policies
  - Cut in *Prime Lending* (Central Bank's Overnight) Interest Rate $r\left(\downarrow\right)$
  - *"Buying" in Open Market Operations*, Lowering the *Reserve Requirement* $\implies$ Money Supply $M\left(\uparrow\right) \implies$ Interest Rate $r\left(\downarrow\right)$

    $\implies$ Increase in Investment $I\left(r\downarrow\right)\uparrow$, i.e., $\Delta I(r) > 0\,.$

- International Monetary Policy
  - Denote by π the exchange rate in ¥*denomination*, i.e., \$1= ¥π.
    Coordinated Intervention in Foreign Currency Markets to Prevent Stronger ¥ or to Induce Weaker ¥

    $\implies$ Increase in Export $X\left(\frac{1}{\pi}\downarrow\right)\uparrow$, i.e., $\Delta X\left(\frac{1}{\pi}\right) > 0\,.$

3.10.2 Multiplier Effect

Denote by c the *Marginal Propensity to Consume*, i.e., $c = \dfrac{\Delta C}{\Delta Y}$.

Given the increase in D, $\Delta D > 0$ or ΔC, ΔI, ΔG, $\Delta X > 0$ component-wise, the *total* effect of the increase in D on Y is known as *Multiplier Effect* $\Delta Y = \dfrac{1}{1-c}\Delta D\,.$

Derivations of the Multiplier

- By the *Principle of Effective Demand*, i.e., "Demand creates its own Supply,"

  Initial Round: $\Delta Y_1 = \Delta D$,
  2^{nd} Round: $\Delta Y_2 = \Delta C_2 = c\Delta Y_1 = c\Delta D$,
  $\vdots$
  t^{th} Round: $\Delta Y_t = \Delta C_t = c\Delta Y_{t-1} = c.c^{t-2}\Delta D = c^{t-1}\Delta D$,
  $\vdots$

- The following table summarizes the time structure more explicitly:

TRANSMISSION OF INITIAL ΔD THROUGH $\{\Delta C_t\}_{t=2}^{\infty}$
BY THE PRINCIPLE OF EFFECTIVE DEMAND
"ΔD_t CREATES ITS OWN ΔY_t"

	Initial Round	2^{nd} **Round**	...	t^{th} **Round**	...
ΔD_t	ΔD	$\Delta C_2 = c\Delta Y_1 = c\Delta D$	...	$\Delta C_t = c\Delta Y_{t-1} = c^{t-1}\Delta D$	...
ΔY_1	ΔD		...		...
ΔY_2		$\Delta C_2 = c\Delta Y_1 = c\Delta D$	...		...
$\vdots$			$\vdots$		$\vdots$
ΔY_t			...	$\Delta C_t = c\Delta Y_{t-1} = c^{t-1}\Delta D$	...
$\vdots$			$\vdots$		$\vdots$

- Therefore,

$$\Delta Y = \sum_{t=1}^{\infty} \Delta Y_t = \sum_{t=1}^{\infty} c^{t-1}\Delta D = \frac{1}{1-c}\Delta D\,.$$

– For the computation of $\sum_{t=1}^{\infty} c^{t-1}\Delta D$, apply the formula of the infinite geometric series with the initial term ΔD and the common ratio c, or

– (Recommended to those who are not familiar with infinite geometric series:)
Note

$$\sum_{t=1}^{\infty} c^{t-1}\Delta D = \Delta D + c\Delta D + c^2\Delta D + \ \ldots\ = \Delta D + c\left\{\Delta D + c\Delta D + c^2\Delta D + \ \ldots\ \right\}$$
$$= \Delta D + c.\left\{\sum_{t=1}^{\infty} c^{t-1}\Delta D\right\}.$$

Therefore, $(1-c).\left\{\sum_{t=1}^{\infty} c^{t-1}\Delta D\right\} = \Delta D$, and the desired result is immediate.

(You may wish to check your understanding of the computation of infinite series by referring to the FOOTNOTE 48 of the **APPENDIX** to **9.4.9**, where the same technique is employed to compute the non-arbitrage price of infinitely-lived government bonds.)

- Or, geometrically by the "45-Degree Line Analysis of GDP" introduced in **Section 3.5**,

$$\Delta Y = c\Delta Y + \Delta D \implies (1-c)\Delta Y = \Delta D \implies \Delta Y = \frac{1}{1-c}\Delta D\,.$$

Policy Measures and their Associated Multipliers

Policy Measures	**Multiplier Effect** ΔY	**Magnitudes of Multipliers**
Cut in Income Tax $\Delta T < 0$ $\Longrightarrow$ Increase in Disposable Income $-\Delta T > 0$ $\Longrightarrow$ Increase in Consumption $\Delta C = c(-\Delta T) > 0$	$\left(\frac{c}{1-c}\right)(-\Delta T)$	$\left(\frac{c}{1-c}\right)$
Easing Money Supply $r \downarrow$ $\Longrightarrow$ Increase in Investment $\Delta I > 0$	$\left(\frac{1}{1-c}\right)\Delta I$	$\left(\frac{1}{1-c}\right)$
Additional Government Expenditure $\Delta G > 0$	$\left(\frac{1}{1-c}\right)\Delta G$	$\left(\frac{1}{1-c}\right)$
Balanced-Budget Gov't Expend. $\Delta G = \Delta T > 0$	$\frac{c}{1-c}(-\Delta T) + \frac{1}{1-c}\Delta G$ $= \frac{1-c}{1-c}(\Delta G) = \Delta G$	1
Foreign Currency Market Intervention to Induce Cheaper ¥ $\Longrightarrow$ Increase in Export $\Delta X > 0$	$\left(\frac{1}{1-c}\right)\Delta X$	$\left(\frac{1}{1-c}\right)$

- The smaller is the *Marginal Propensity to Save* $s = 1 - c$, the larger is the Multiplier $\frac{1}{1-c} = \frac{1}{s}$. $\Longrightarrow$ Overconfidence of the Americans in the Multiplier Effect of extra effective demands, the most easily controllable item of which is the government expenditure.

- With an explicit introduction of Imports $M(Y) = mY + m_0$, often deemed to be another "Leakage" term, the actual multiplier will reduce to even smaller magnitude $\frac{1}{1-c+m} = \frac{1}{s+m}$[13].

[13] In the Western World, the textbook wisdom tends to deem the Saving S as the major source of "Leakage"

3.10.3 Transition of Priorities over the Economic Growth Period

- Inclinations for "Smaller" Government that reflects extensively the free and independent choices by the people.

  $\Longrightarrow$ Higher priority attached to the economic recovery led by the domestic private demands.

- The *Income Redistribution Effect* and the *Resource Allocation Effect* associated with the *Counter-cyclical* policies:

  1. Critical on expenditures on "*Hakomono* (Constructed *Hardware*)", General Contractors, and *IT* hardwares (subject to quick obsolescence, and excessive resource consumption).
  2. Needs for fiscal policies consistent with the social reforms on employment styles and pension system. $\Longleftarrow$ Alarmed by the unresponsive consumption to the income tax cut due to concern about the insecurity of future employment.
  3. Improvement of the social infrastructure that meets the present phase of *Secular* Trade Cycle to let the IT technology-related innovations infiltrate into the society at large, and contribute to creating the resource-recycling society in particular.

- On the problematic issues associated with the Debt-Financed Fiscal Expansion, refer to the subsequent section **9.4**.

in the circulation of National Income. However, Japanese experience during the rapid economic growth vindicates that, so long as the Saving S is utilized to finance the Domestic Investment I, a component of the Effective Demand, then it is far from a disturbing leakage.

From a heuristic point of view, the preceding fallacious view of the Saving is helpful to derive the so-called Import Multiplier, since both s and m, corresponding to the Leakages S and M in marginal propensity terms, are treated similarly, both appearing in its *denominator*.

Transition of Policy Priorities 1960 - 1990

Priority Ranking	**Policy Measures**	**Affected Effective Demand**	**Beneficial Group**
$4 \longrightarrow 1$ *"Protection of Consumers"*	Income Tax Cut	$C(Y-T)$	Consumers
$3 \longrightarrow 2$ *"Protection of Industries"*	Easing Money Supply	$I(r)$	Corporates
$2 \longrightarrow 3$ *"Smaller Government"*	Additional Government Expenditure	G	Government
$1 \longrightarrow 4$ *"Domestic-Demand Orientation"*	Induced Cheaper ¥	X	Export Industries

3.10.4 Reversal of Priorities after the Burst of the Economic Bubble

Reversal of Policy Priorities after 1990

Priority Ranking (1960 $\longrightarrow$ 1990) $\longrightarrow$ And After	**Affected Effective Demand**	**Recent**
(4 $\longrightarrow$ 1) $\longrightarrow$ 4	$C(Y-T)$	Tax Hikes on Beer Substitutes and Cigarettes, Lift of Exemption on Family Expenses; Tax Exemption on Life-time Bequeath, Hike on Inheritance Tax.
(3 $\longrightarrow$ 2) $\longrightarrow$ 3	$I(r)$	Zero Interest Rate Policy, "Unprecedented" Monetary Expansion; Cut in Corporate Tax, Tax Exemption of R&D Expenses.
(2 $\longrightarrow$ 3) $\longrightarrow$ 2	G	Debt-Financed Fiscal Expansion
(1 $\longrightarrow$ 4) $\longrightarrow$ 1	X	"Export-Led Economic Recovery," via Induced Cheaper ¥ $\Longleftarrow$ Coordinated Interventions in Foreign Currency Markets $\longrightarrow$ "Unprecedented" Monetary Expansion ($\Longrightarrow$ $r - r_W < 0$ $\Longrightarrow$ Capital Outflow.)

4 Comparative Advantage

4.1 Heckscher-Ohlin Model of International Trade

4.1.1 Specialization Based on Comparative Advantage

Allocate the factor of production to the specific better-suited productive purpose based on the "comparative" advantage.

- Absolute vs. Comparative Advantage $\Longleftarrow$ *vertical* vs. *horizontal* comparison

Example

	Law Practice	**Clerical Works**
Lawyer	10	8
Secretary	2	6

4.1.2 A Note on Convexity in Economic Analysis (*)

The title of the following monumental reference is indeed self-descriptive:

> Nikaido, Hukukane (1968): *Convex Structures and Economic Theory.* Mathematics in Science and Engineering, A Series of Monographs and Textbooks, Vol. 51. New York, NY: Academic Press.

Sufficiency Conditions for the Existence of Consumption or Production Equilibria

	Convexity of the "Better-Than" Set $\left\{(X,Y) \in \mathbf{R}^2_+ \middle\| U_i(X,Y) \geq \bar{U}\right\}$	**Convexity of the Production Set**[14] $\left\{(X,Y) \in \mathbf{R}^2_+ \middle\| T_i(X,Y) \leq 0\right\}$
Graphs	*Convex Upper Contour Set* (*Epigraph*) above the *Indifference Curve* $\left\{(X,Y) \in \mathbf{R}^2_+ \middle\| U_i(X,Y) = \bar{U}\right\}$.	*Convex Lower Contour Set* below the *Production Possibilities Curve* $\left\{(X,Y) \in \mathbf{R}^2_+ \middle\| T_i(X,Y) = 0\right\}$.
Underlying Hypotheses	$U_i(X,Y)$ *Quasi-Concave Utility Function* in (X,Y).	$X = F_i(K,L)$ and $Y = G_i(K,L)$, both *Quasi-Concave Production Functions* in (K,L), i.e., *Convex Upper Contour Sets* $\left\{(K,L) \in \mathbf{R}^2_+ \middle\| F_i(K,L) \geq \bar{X}\right\}$, $\left\{(K,L) \in \mathbf{R}^2_+ \middle\| G_i(K,L) \geq \bar{Y}\right\}$ above the *Isoquants* $\left\{(K,L) \in \mathbf{R}^2_+ \middle\| F_i(K,L) = \bar{X}\right\}$, $\left\{(K,L) \in \mathbf{R}^2_+ \middle\| G_i(K,L) = \bar{Y}\right\}$. *"Specialization based on Comparative Advantage."*
Relevant Sections	**4.1.3**, **Section 8.2**, **9.4.4**, **9.4.6**, **Section 11.4**.	**4.1.3**, **Section 8.2**.

[14] A geometric demonstration of the convexity of the production set for a simplified one-input economy, with a special emphasis on the role of Specialization Hypothesis on the basis of the Comparative Advantage is carried out in:

> Nomura, Yoshimasa (2010): "On Convexity of the Production Set: A Heuristic Exposition via an Edgeworth 'Linear' Diagram." *Economic Journal of Chiba University*, Vol. 25, No. 2, pp. 77-90.

4.1.3 2 Country × 2 Commodity International Trade Model (*)

- *2 Countries*: J (Japan), US (United States);
- *2 Commodities*: X (Grain), Y (Automobiles);
- *Prices*: Price of X = \$$p$, Price of Y = ¥q ;
- *Exchange Rate (in ¥ Denomination)*: \$1 = ¥π .

Production Equilibrium in Each Country: Country i ($i = J,\ US$) allocates her endowment of Capital K_i and Land $L_i$to the productions of X and Y as *factor allocation* $(K_i^X, K_i^Y, L_i^X, L_i^Y)$.

- Country i's technology is summarized in her *Production Possibilities Curve* (PPC): $T_i(X, Y) = 0$

$$\Longleftarrow \begin{cases} \text{Efficient Productions}: & X = F_i(K_i^X, L_i^X);\ Y = G_i(K_i^Y, L_i^Y) \\ \text{Resource Constraints}: & K_i^X + K_i^Y = K_i;\ L_i^X + L_i^Y = L_i \end{cases}$$

- Country i makes a choice from all producible (X, Y) as prescribed by $T_i(X, Y) = 0$ to maximize her $GDP_i = \pi pX + qY$, the market value of (X, Y) evaluated at the world prices $(\pi p, q)$. Therefore, Country i's *Production Equilibrium* (Domestic and International Supplies) $\left(\hat{X}_i(\pi p, q), \hat{Y}_i(\pi p, q)\right)$ is a solution to

$$\begin{array}{c} \max\ \pi pX + qY \\ \text{s.t. } T_i(X, Y) = 0\,. \end{array}$$

Consumption Equilibrium in Each Country: Given the preceding choice of the Production Equilibrium $\left(\hat{X}_i(\pi p, q), \hat{Y}_i(\pi p, q)\right)$, and faced by the world prices $(\pi p, q)$, Country i maximizes her utility $U_i(X, Y)$ subject to her income (GDP_i) constraint. That is, Country i's *Consumption Equilibrium* (Demands, or "Offer Curve") $\left(D_i^X(\pi p, q), D_i^Y(\pi p, q)\right)$ solves

$$\begin{array}{c} \max\ U_i(X, Y) \\ \text{s.t. } \pi pX + qY = \pi p\hat{X}_i(\pi p, q) + q\hat{Y}_i(\pi p, q). \end{array}$$

Trade Pattern of Each Country: Country i's *Net Demands*

$$\left(d_i^X(\pi p, q), d_i^Y(\pi p, q)\right) = \left(D_i^X(\pi p, q) - \hat{X}_i(\pi p, q), D_i^Y(\pi p, q) - \hat{Y}_i(\pi p, q)\right)$$

designates *Import* when positive, and *Export* when negative.

The rectangular triangle, with sides $d_i^X(\pi p, q)$ and $d_i^Y(\pi p, q)$ and the *Terms of Trade* $\dfrac{\pi p}{q}$ as the slope, is referred to as Country i's *Trade Triangle*.

International Trade Equilibrium: In *International Trade Equilibrium*, the export of one country is matched by the import of the other country, simultaneously for both commodities k ($k = X, Y$), i.e.,

$$d_J^k(\pi p, q) + d_{US}^k(\pi p, q) = 0;\ \ k = X, Y\,.$$

By *Walras' Law*[15] , when X-market is in equilibrium, i.e., export matches import

$$d_J^X(\pi p, q) + d_{US}^X(\pi p, q) = 0\,,$$

Y-market is automatically in equilibrium i.e., export matches import

$$d_J^Y(\pi p, q) + d_{US}^Y(\pi p, q) = 0\,.$$

Equilibrium Terms of Trade: Since the net demands $d_i^k(\pi p, q)$ ($i = J, US; k = X, Y$) are homogeneous of degree 0 in $(\pi p, q)$, redefine them as functions δ_i^k's in terms of the relative price $\dfrac{\pi p}{q}$:

$$\delta_i^k\left(\frac{\pi p}{q}\right) =_{\text{Def}} d_i^k\left(\frac{\pi p}{q}, 1\right) = d_i^k(\pi p, q)$$

The *Equilibrium Terms of Trade* $\tau^* = \left(\dfrac{\pi p}{q}\right)^*$ is a solution to

$$\delta_J^X\left(\frac{\pi p}{q}\right) + \delta_{US}^X\left(\frac{\pi p}{q}\right) = 0\,.$$

By Walras' Law, it also solves

$$\delta_J^Y\left(\tau^*\right) + \delta_{US}^Y\left(\tau^*\right) = 0\,,$$

simultaneously.

[15] **On the Derivation of Walras' Law and its Implication:** Since Japanese trade $\left(d_J^X(\pi p, q), d_J^Y(\pi p, q)\right)$ satisfies $\pi p d_J^X(\pi p, q) + q d_J^Y(\pi p, q) = 0$ which is immediate by rearrangement from her budget constraint $\pi p D_J^X(\pi p, q) + q D_J^Y(\pi p, q) = \pi p \hat{X}_J(\pi p, q) + q \hat{Y}_J(\pi p, q)$, $\pi p d_J^X(\pi p, q) + q d_J^Y(\pi p, q) = 0$.

Since the same is true with the U.S., $\pi p d_{US}^X(\pi p, q) + q d_{US}^Y(\pi p, q) = 0$ holds.

By adding up the budget constraints for both countries,

$$\pi p \left\{\underbrace{d_J^X(\pi p, q) + d_{US}^X(\pi p, q)}_{=\ 0}\right\} + q\left\{\underbrace{d_J^Y(\pi p, q) + d_{US}^Y(\pi p, q)}_{\Longleftrightarrow\ =\ 0}\right\} = 0\,.$$

Walras' Law follows, and the interdependence of two commodity markets is straightforward. ■

4.1.4 Heckscher-Ohlin's Specification: Comparative Advantage due to Relative "Factor Intensity" of Endowments

HYPOTHESES:
Suppose

- *Identical Technologies between 2 Countries*: $F_J = F_{US}$, $G_J = G_{US}$ (Both countries have an access to the same technology as characterized by the identical production function or isoquant map for each commodity);
- *Identical Tastes between 2 Countries*: $U_J = U_{US}$ (Consumers of both countries are characterized by the identical utility function or indifference curve map);
- *No Factor Movement between 2 Countries*;
- *Unique "Terms of Trade"*: $\frac{\pi p}{q}$ (Both countries face a unique relative price of the export and the import, either one of which needs to be converted via an exchange rate).

CONSEQUENT PATTERN OF SPECIALIZATIONS:
Then, the pattern of trades is determined by the *comparative advantage due to the "relative abundance" between the endowed factors of production.* That is, one country must be specializing in and exporting the product which employ relatively more intensively the relatively more abundant, and therefore relatively less expensive, factor of production than in the other country.

An Application to US-Japan Trade:

A comparison of relative abundance of the endowed factors of production $\left\{ \frac{L_i}{K_i} \middle| \ i = J, US \right\}$ between the US and Japan reveals

$$\frac{L_J}{K_J} < \frac{L_{US}}{K_{US}} .$$

Therefore, Japan has relative advantage in producing the more capital-intensive industrial goods, such as automobiles, while the US in the more land-intensive goods, such as grain. Consequently,

- $d_J^X > 0$ (Japan imports grain), $d_J^Y < 0$ (Japan exports automobiles);
- $d_{US}^X < 0$ (US exports grain), $d_{US}^Y > 0$ (US imports automobiles).

4.2 Empirical Analysis of Japanese International Trade

4.2.1 Determinants of Comparative Advantage

- "Net Export" conceived as a function of "Unskilled Labor", "Human Capital", "Physical Capital (Flow)", "Physical Capital (Stock)"and "Research & Development."

- Regression analysis of "Net Export Index" (Dependent Variable) $\frac{X_i^{US\,[J]} - M_i^{US\,[J]}}{X_i^{US\,[J]} + M_i^{US\,[J]}}$ on multiple "Factor Intensities" (Independent Variables) $L_{\text{unskilled}}$, K_{human}, K_{flow}, K_{stock}, $R\,\&\,D$ as:

$$\frac{X_i^{US\,[J]} - M_i^{US\,[J]}}{X_i^{US\,[J]} + M_i^{US\,[J]}} = \alpha_i L_{\text{unskilled},i}^{US\,[J]} + \beta_i K_{\text{human},i}^{US\,[J]} + \gamma_i K_{\text{flow},i}^{US\,[J]} + \delta_i K_{\text{stock},i}^{US\,[J]} + \epsilon_i R\,\&\,D_i^{US\,[J]} + \text{Constant}_i^{US\,[J]}.$$

- "Factor Intensities" are further approximated by "Factors' Share of Value Added":

"Net Export Index" $\frac{X_i^{US\,[J]} - M_i^{US\,[J]}}{X_i^{US\,[J]} + M_i^{US\,[J]}}$

(Adapted from: Balassa and Noland (1989, pp. 176, 177).)

Production Factors	**"Factor Intensities"**	**"Factors' Share of Value Added"**
Unskilled Labor	$L_{\text{unskilled},i}^{US\,[J]}$	$\frac{w_i^{\text{unskilled},US\,[J]}.L_i^{\text{unskilled},US\,[J]}}{VA_i^{\text{unskilled},US\,[J]}}$
Human Capital	$K_{\text{human},i}^{US\,[J]}$	$\frac{\left(w_i^{US\,[J]} - w_i^{\text{unskilled},US\,[J]}\right).L_i^{US\,[J]}}{VA_i^{US\,[J]}}$
Physical Capital (Flow)	$K_{\text{flow},i}^{US\,[J]}$	$\frac{\text{Non Wage Payment}_i^{US\,[J]}}{VA_i^{US\,[J]}}$
Physical Capital (Stock)	$K_{\text{stock},i}^{US\,[J]}$	$\frac{\text{Physical Capital Stock Value}_i^{US\,[J]}}{VA_i^{US\,[J]}}$
Research & Development	$R\,\&\,D_i^{US\,[J]}$	$\frac{\text{R\&D Expenditure}_i^{US\,[J]}}{VA_i^{US\,[J]}}$

- Japanese comparative advantage shifting to the H.C. and R&D intensive productions; while the US comparative advantage almost unchanged.

DETERMINANTS OF COMPARATIVE ADVANTAGE: JAPAN VS. US
(Adapted from: BALASSA and NOLAND (1989, TABLES I and II, pp. 178-181).)

	Unskilled Labor	**Human Capital**	**Physical Capital (Stock or Flow)**	**Research & Development**
Japan	$\searrow$	$\nearrow$	$\longrightarrow$	$\nearrow$
US	$\longrightarrow$ $-$ (Disadvantageous)	$\longrightarrow$ $+$ (Advantageous)	$\longrightarrow$ $+$ (Advantageous)	$\longrightarrow$

REMARK ("7th" STYLIZED FACT[16] *about Physical Capital Formation in Japan*): Contrary to what one might expect from the high saving ratio $\left(s^J = \frac{S^J}{Y^J}\right)$ in Japan, the physical capital/output ratio $\left(\frac{K^J_{\text{physical}}}{Y^J}\right)$ remains fairly low (see TABLE OF CAPITAL/OUTPUT RATIOS in the subsequent **9.1.5**.), and the preceding TABLE indicates indeed Japan's comparative advantage against the US is in the less physical-capital-intensive product.

The following 3 reasons, among others, emerge as natural explanations:

1. High human-capital-intensity $\left(\frac{K^J_{\text{human}}}{Y^J}\right)$ and its expenses from the private savings S^J_H, and consequently S^J;
2. Large capital outflow $\left(S^J - I^J\right)$ to overseas;
3. High value of land which is, by definition, excluded from the computation of Capital Stock K^J or even from that of Dwelling Capital Stock K^J_{dwelling} (Refer to the portfolio compositions of personal wealth in **9.1.7**.).

   - Indeed, real estates in Metropolitan Areas have been fairly lucrative Portfolio items in their own right. It is often the case that (speculative) investments in the real estates become especially conspicuous in the presence of excessive liquidity.

     For an analytical account of the Real Estate Bubble in the second half of 1980's, see **Section 3.7**.

[16] A summary statement of the set of 6 STYLIZED FACTS will be given in REMARK (KALDOR-SOLOW*'s* STYLIZED FACTS *about Steady-State Economies*) of the subsequent **9.1.5**.

4.2.2 Revealed Comparative Advantage for High Tech Products

- High in the content of R & D expenditures
  - In the mid-1970's, more than 3.5% in value (19 industries, in number) of the US outputs were in the High Tech category.
  - Automobile, *per se*, are *not* High Tech products.
  - New inventions after 1970 are High Tech products: Super Computers, Linear Motors, High Definition TV's; military or defense-oriented industries.
- Complementary pattern of specialization
  - US - Large sunk costs: aircraft, Mega Super Computer hardware.
  - Japan - Lower entering costs: telephone and telegraphic equipments, photographic equipment, optical instruments.
- Revealed Comparative Advantage
  - Net Export Index:

    Define the *Net Export Index* by

$$\overline{NX}_i = \frac{\frac{X_i - M_i}{X_i + M_i} + 1}{2} = \frac{X_i}{X_i - M_i}.$$

    Note

$$\frac{\overline{NX}_i}{1 - \overline{NX}_i} = \frac{\frac{X_i}{X_i + M_i}}{\frac{M_i}{X_i + M_i}} = \frac{X_i}{M_i}.$$

  - Adjusted Net Export Index

    Define the *Adjusted Net Export Index* by

$$\overline{NXAD}_i = \ln \frac{X_i}{M_i}.$$

    Then,

$$X_i \left\{ \begin{array}{c} < \\ = \\ > \end{array} \right\} M_i \iff \overline{NXAD}_i \left\{ \begin{array}{c} < \\ = \\ > \end{array} \right\} 0.$$

"Adjusted Net Export Index" $\ln \frac{X_i}{M_i}$

(Adapted from: Balassa and Noland (1989, Table III, p.184).)

Japan	**US**	**High Tech Products**
-	+	Aircraft, Aircraft Engines, Drugs
+	−	Optical Instruments, Calculating and Accounting Machines (1870's), Typewriters
$\nearrow$	$\searrow$	Photographic Equipment and Supplies, Electronic Components, Office Machinery (Japan: $- \to +$), Computers (Japan: $- \to +$), Telecommunication Equipment, Internal Combustion Engine
$\searrow$	$\nearrow$	Synthetic Fibers, Cellulosic Fibers, Steam Engines and Turbines
$\longrightarrow$	$\longrightarrow$	Agricultural Chemicals, Plate Works and Boilers

5 Japanese Corporates

5.1 "Stylized" Facts about Japanese Corporates

REMARK (STYLIZED FACTS *about Japanese Corporates*): In lieu of Neoclassical optimization ("individualistic maximizing behavior," which may lead to "Prisoners' Dilemma"),

(a) Non-maximizing behavior (Max/Non-max mixture)

(b) Incomplete contracts: Specification of wages does not necessarily specify the effort inputs $\Longrightarrow$ "Inefficiency" in labor performances

LEIBENSTEIN (1984, p. 339) demonstrates: (a) *and* (b) *imply an X-efficient choice.*

(c) Inertia

(d) Discretion

- Employees: Effort discretion
- Employers: Discretion w.r.t. working conditions, wages

(e) "*Amae* (Indulgence or dependence)" originating from the feudalistic "family" system

(f) Hierarchical gradation ($\Longrightarrow$ Association with the titles of the hierarchical ladder. Fringe benefits, Promised future income, Greater say in corporate decision making, etc.), cheaper to attain mutual satisfaction than by a resort to alternative monetary rewards.

Two Prototypes of Management Systems
(Source: Leibenstein (1984, p. 332).)

Japan	**The West**
Lifetime employment ideal.	No lifetime employment ideal.
Firm recruits people of particular age and education.	People recruit with particular skills (and/or experience) to fill specific job.
Company as a community.	Less emphasis on community ideal.
No sharp distinction between managers and workers.	Sharp distinction.
Strong emphasis on general hierarchical ranks.	Management positions not standardized-related function.
Age and service length explicitly recognized as a promotion criterion.	Age and service length only marginally relevant to promotion.
Authority and responsibility diffuse.	Authority and responsibility ostensibly specific.
Managerial authority limited by internal labor mobility.	Managerial authority challenged practically by trade union.
Enterprise unions.	Trade unions.
On-the-job training for a variety of jobs.	On-the-job training for specific jobs.
Job rotation and boundary flexibility.	Focus on specific job with specific boundaries.
Emphasis on cooperative harmony and consensus.	Greater stress on individualistic behavior within bounds of narrow job commitment.

5.1.1 "X-(In)efficiency"

Refer to Leibenstein (1987; 2008).

5.1.2 Corporate Financing

Compositions of Direct vs Indirect Corporate Funding

	Own Funding	Short-Term Borrowing	Long-Term Borrowing	Corporate Bonds	Borrowed Liabilities
1965-69	30.6%	15.7%	15.1%	4.3%	31.0%
1970-74	29.2	18.3	16.0	4.2	30.0
1975-79	38.8	14.4	8.2	9.0	22.8
1980-84	50.5	9.0	5.9	7.8	12.4
1985-89	45.9	5.3	1.2	17.7	13.9
1990-94	87.6	-2.8	7.7	11.2	-8.2
1995	84.0	-10.1	-3.4	3.6	24.7

5.2 Labor Shortage and Changes in "Stylized" Facts

- Labor shortage $\Longrightarrow$ Higher wages

  $\Longrightarrow$ Corporates' effort to suppress labor cost by substituting regular employees for non-regular and/or part-time employees

5.3 "Global Standards" and Changes in "Stylized" Facts

- Despite the *Direct Financing* being promoted by the Financial "Big Bang," corporates rather chose financing via Holding Companies.

6 Labor Market

6.1 Shift of the Labor Force in Accordance with Industrial Changes

Industrialization $\Longrightarrow$ Outflow of labor force away from the primary sector

$\downarrow$

De-industrialization $\Longrightarrow$ *Hollowing-out* of the manufacturing sector

Compositions of Labor Force

	Agriculture L_A $(G(L_A))$	**Manufacturing** L_M $(G(L_M))$	**Services** L_S $(G(L_S))$
1955 - **60**	30.1% (-2.35%)	34.0% (4.60%)	35.9% (3.35%)
1961 - **70**	17.2 (-4.10)	41.8 (3.53)	41.0 (2.73)
1971 - **80**	10.6 (-3.94)	41.3 (0.74)	48.1 (2.48)
US (1980)	App. 5	App. 35	App. 60

Compositions of Workers in Employment

	Employees	**Self-Employed**	**Unpaid Family Workers**
1960	53.9%	21.1%	24.0%
1965	60.7	19.7	19.5
1970	64.2	19.5	16.3
1975	69.1	17.7	13.1
1980	71.8	16.9	11.3
US (1980)	90.5	8.1	0.7

6.2 Dual Labor Structure

- Labor forces employed by "Parent Companies" vs. those by "Subcontractors"
- Segmentation in Japan: *Internal Labor Market* sector, or otherwise.
  $\longleftrightarrow$ Segmentation in the US: Primary vs. secondary.
  - Lifetime employment (Possibly, mobility across workshops within the corporate group);
  - Seniority wages;
  - Reactions to recessions: No lay-offs for regular employees, while the less skilled workers were the more prone to be forced to absorb shocks due to recessions
    Cf. *Economy-wide unemployment rate during 1960's and 70's was so low as 1.0 - 1.5%*;
  - Enterprise-based and enterprise-confined labor unions;
  - On-the-Job Training: OJT for workers with subcontractors was offered by their parent companies
    $\Longrightarrow$ Mobility across workshops in contrast to the horizontal *immobility* along the ladder;
  - QC-circle activities, including job rotation, labor participation to ease adaptation to newly introduced technologies
    $\Longrightarrow$ Greater need for QC-activities in the faster growing companies.

- Comparisons of QC-circle activities and productivities by the size of firms:

Breakdown of L_M by the Size of the Firm

	1 - 49	**50 - 499**	**500 -**
1960	49.4%	36.9%	13.7%
1970	40.4	33.5	26.0
1980	46.6	32.9	20.5

Prevalence of QC-Circles and their Evaluation by the Management, Classified by the Size of the Firm (1977)
(Adapted from: Koike (1987, Tables 1 and 2, p. 291).)

Firm Size	With Trade Unions	Without Trade Unions	Both	Evaluated as Successful
100 - 299	34.6%	31.7%	33.3%	45.3%
300 - 999	43.9	39.1	42.5	52.7
1,000 - 4,999	59.1	.53.6	58.5	67.2
5,000 -	77.4	67.3	77.2	82.4

Wage (w_M) and Productivity $\left(\frac{Y_M}{L_M}\right)$ Differentials by the Size of the Firm in Japan (1978), US (1967) and W. Germany (1967)

Firm Size	w_M^{Japan} $\frac{Y_M^{\text{Japan}}}{L_M^{\text{Japan}}}$	w_M^{US} $\frac{Y_M^{\text{US}}}{L_M^{\text{US}}}$	$w_M^{\text{W. Germany}}$ $\frac{Y_M^{\text{W. Germany}}}{L_M^{\text{W. Germany}}}$
1 - 9	33.8 30.4	70.0 80.5	35.6 60.6
10 - 49	54.8 46.0	73.8 73.2	69.7 75.1
50 - 99	60.3 53.0	72.5 73.2	77.1 77.1
100 - 99	73.4 71.1	75.0 79.9	84.1 89.3
500 - 999	85.5 89.2	81.3 89.6	90.5 117.4
1000 -	**100.0** **100.0**	**100.0** **100.0**	**100.0** **100.0**

- Income share of labor by employed sectors:

INCOME SHARE OF LABOR $\theta_i \left(= \frac{Y_i}{Y} = \frac{w_i L_i}{Y}\right)$ BY THE SECTOR i IN JAPAN AND THE US

	$\theta_{\text{Non-Primary, Incorporated}}$	$\theta_{\text{Non-Primary, Unincorporated}}$	$\theta_{\text{Non-Primary}}$	$\theta_{\text{Manufacturing}}$
Japan (1960)	64.5%	74.8%	67.1%	-
Japan (1968)	63.5	77.7	66.7	-
US (1960)	-	-	65%	48%

6.3 Enterprise vs. Industry Unionizations

- About the same participation rate in industry unions, 20%, in the US and Japan.
- Japanese unions are erroneously thought to be enterprise unions. Truth is, they are affiliated with industry unions at the same time.
- Factors affecting the labor unions in Japan:
  - More enterprise-specific skill-formation through QC-circle activities.
  - Competition with other enterprises in the same industry through (IT-)automatization of the office work and production lines.
- Industry labor unions of coalitional nature in the US vs co-existential in Japan
  - AFL-CIO (American Federation of Labor and Congress of Industrial Organizations) in the US: *X-(in)efficient* coalition More enterprise-specific skill-formation through QC-circle activities.
  - Labor movement in Japan led by political parties: Typically in 1980's, the General Council of Trade Unions of Japan (35.2% of the unionized workers as of 6/30/1985) was backed by the Socialist Party; the Japanese Confederation of Labor (17.4%), by the Communist Party; and the Federation of Independent Unions (12.5%), by the Socialist Democratic Party.

6.4 Labor Shortage: From "White-Collarization" to "Highly Specialization" of Workers

- "White-Collarization"
  - Emphasis on the content of intellectual skills in the "Blue-Collar" workers, including skills to cope with defective products.

$\longleftrightarrow$ Institutional aspects: Lifetime employment, Seniority wages, enterprise unionization

Behavioral aspects: Group-orientation.

– QC circle activities (Job-rotation, Labor participation in management)

$\Longrightarrow$ Improved labor-managed relationship, as inferred from the frequency of labor disputes:

Numbers of Working Days Lost due to Labor Disputes (per 1,000 Employees)

Country	**Before**		**1975 - 80**
Japan	254 (1955 - 59)	$\searrow$	69
US	451 (1960 - 74, Every 5 Yr. Average).	$\longrightarrow$	389
UK	146 (1960 - 64)	$\nearrow$	521
W. Germany	28 (1960 - 74, Every 5 Yr. Average).	$\longrightarrow$	41

$\Big\downarrow$ (Especially after 1990.)

- "Highly Specialization"
  - Education for highly specialized workers, mainly at the expense of workers themselves

6.5 Re-Emergence of the Dual Structure: Part Timers vs. Full Time Employees and/or Non-Regular vs. Regular Employees

Labor shortage $\Longrightarrow$ Higher wages

$\Longrightarrow$ Corporates' effort to suppress labor cost by substituting regular full-time employees for non-regular part-timers.

New Types of Employment

	Regular	**Non-Regular**
Full Time	*Traditional, Most Expensive* Life-time Employment With Pension & Insurance Plans	No Job Security W/o Pension nor Insurance Plans
Part Time	*NA*	*Least Expensive* No Job Security W/o Pension nor Insurance Plans

Composition of Employees by Types of Employment, 1985-2011 (Millions, %) (Source: Ministry of Internal affairs and Communications (2015): *Labor Force Statistics.*)

Population Types	**1985**	**1990**	**1995**	**2000**	**2005**	**2010**	**2010**[17]	**2011**
Total	39.98M.	43.69	47.80	49.03	50.07	51.11	48.95	49.18
Regular	76.4%	79.8	79.1	74.0	67.4	65.6	65.6	64.8
Non-Regular	23.6%	20.2	20.9	26.0	32.6	34.4	34.4	35.2
Male								
Regular	92.6%	91.2	91.1	88.3	82.3	81.1	81.2	80.0
Non-Regular	7.4%	8.8	8.9	11.7	17.7	18.9	18.8	19.9
Female								
Regular	67.9%	61.9	60.9	53.6	47.5	46.2	46.0	45.3
Non-Regular	32.1%	38.1	39.1	46.4	52.5	53.8	54.0	54.7

[17] After 2010, populations exclude those from three prefectures damaged by the East Japan Earthquake

(Continued)

Population Types	2012	2013	2014	2015
Total	51.53M.	52.00	52.40	52.84
Regular	64.8%	63.3	62.9	62.5
Non-Regular	35.2%	36.7	37.1	37.5
Male				
Regular	80.3%	78.8	78.2	78.0
Non-Regular	19.7%	21.2	21.8	22.0
Female				
Regular	45.5%	44.2	43.3	43.7
Non-Regular	54.5%	55.8	56.7	56.3

REMARK (*"Creation of Jobs" by way of Replacement of Regular Employees by a Larger Number of Non-Regulars*):

- The recently legalized non-regular employment is tantamount to a variant of "Work Sharing" by labor shifts in the Western World.
- Skepticism is prevalent as to the prospect for the working conditions, renumeration and otherwise, of the non-regular employees to be improved up to those enjoyed by the regulars. Instead, many are concerned that the "reversal" is in progress, i.e., the working conditions for what a few regular employees remaining are aggravated down to those for the non-regulars.

6.6 Higher Education as Human Investment

- Excellent cost effectiveness of the public expenditures on Higher Education
  - The percentage of college graduates grew from 34% of 25-64 year-olds in 2000 to 47 % in 2012; This trend is even more notable among 25-34 year-olds, from 48% in 2000 to 59 % in 2012 (Source: TABLE A1.4a of *Education at a Glance 2014: OECD Indicators*).
  - Excellent outcome of Japanese Higher Education, ranked at the top, as evidenced by the the quality of its attainment measured by the percentage of 25-64 year-old college graduates scoring at Literacy Proficiency Level 4/5 (Source: *Ibidem*, TABLE A1.6A (L).).

  - The preceding two facts have been achieved, *despite the relatively small expenditure by the government on Higher Education.*

- Strategic importance of increasing the government expenditures on Higher Education, as the effective means of human capital formation to sustain future economic growth
  - Despite the recent government perception to the contrary, and shift to subsidizing primary and secondary educations from the short-term social welfare considerations.
  - Such measure is reasonably expected to alleviate the ever-increasing financial burdens born by college students, and improve the educational cost-effectiveness by freeing students from their part-time jobs.

TRENDS IN $\frac{\text{Expenditures on Higher Education (\% of GDP)}}{\text{Expenditures on Total of All Levels (\% of GDP)}}$ (2000 - 2011),
AND BY SOURCE OF FUNDING $\frac{\text{Public (\% of GDP)}}{\text{Private (\% of GDP)}}$ (2011)
(Source: OECD (2014): *Education at a Glance 2014: OECD Indicators*[18].)

Countries[19]	**Literacy Proficiency** (%)[20]	**2000**	**2005**	**2008**	**2010**	**2011**	**Funding Source**
Japan	37	$\frac{1.4}{5.0}$	$\frac{1.4}{4.9}$	$\frac{1.5}{5.0}$	$\frac{1.5}{5.1}$	$\frac{1.6}{5.1}$	$\frac{0.5}{1.0}$
Finland	37	$\frac{1.7}{5.6}$	$\frac{1.7}{6.0}$	$\frac{1.7}{5.8}$	$\frac{1.9}{6.5}$	$\frac{1.9}{6.5}$	$\frac{1.9}{0.1}$
Netherlands	36	$\frac{1.4}{5.2}$	$\frac{1.5}{5.8}$	$\frac{1.6}{5.7}$	$\frac{1.7}{6.3}$	$\frac{1.8}{6.2}$	$\frac{1.3}{0.5}$
Sweden	34	$\frac{1.6}{6.3}$	$\frac{1.6}{6.4}$	$\frac{1.6}{6.3}$	$\frac{1.8}{6.5}$	$\frac{1.7}{6.3}$	$\frac{1.6}{0.2}$
Australia	32	$\frac{1.4}{5.2}$	$\frac{1.5}{5.3}$	$\frac{1.5}{5.3}$	$\frac{1.6}{6.1}$	$\frac{1.6}{5.8}$	$\frac{0.7}{0.9}$
Norway	28	$\frac{1.6}{6.8}$	$\frac{1.7}{7.5}$	$\frac{1.6}{7.1}$	$\frac{1.6}{7.4}$	$\frac{1.7}{7.4}$	$\frac{1.6}{0.1}$
Belgium	26	$\frac{1.3}{6.1}$	$\frac{1.2}{6.0}$	$\frac{1.4}{6.5}$	$\frac{1.4}{6.6}$	$\frac{1.4}{6.6}$	$\frac{1.3}{0.1}$
UK	25	$\frac{1.0}{4.9}$	$\frac{1.3}{5.9}$	$\frac{1.4}{5.5}$	$\frac{1.3}{6.2}$	$\frac{1.2}{6.4}$	$\frac{0.9}{0.3}$
US	24	$\frac{2.1}{6.0}$	$\frac{2.3}{6.4}$	$\frac{2.5}{6.8}$	$\frac{2.7}{7.0}$	$\frac{2.7}{6.9}$	$\frac{0.9}{1.8}$
Czech Rep.	24	$\frac{0.8}{4.0}$	$\frac{1.0}{4.5}$	$\frac{1.1}{4.3}$	$\frac{1.2}{4.7}$	$\frac{1.4}{5.0}$	$\frac{1.2}{0.3}$
OECD Average	**24**	$\mathbf{\frac{1.3}{5.4}}$	$\mathbf{\frac{1.4}{5.7}}$	$\mathbf{\frac{1.5}{5.8}}$	$\mathbf{\frac{1.6}{6.1}}$	$\mathbf{\frac{1.6}{6.1}}$	$\mathbf{\frac{1.1}{0.5}}$
⋮							
Austria	21	$\frac{1.1}{5.5}$	$\frac{1.3}{5.5}$	$\frac{1.3}{5.4}$	$\frac{1.5}{5.8}$	$\frac{1.5}{5.7}$	$\frac{1.4}{0.1}$
Germany	20	$\frac{1.1}{4.9}$	$\frac{1.1}{5.0}$	$\frac{1.2}{4.8}$	$\frac{1.3}{5.3}$	$\frac{1.3}{5.1}$	$\frac{1.1}{0.2}$
⋮							
France	19	$\frac{1.3}{6.4}$	$\frac{1.3}{6.0}$	$\frac{1.4}{6.0}$	$\frac{1.5}{6.3}$	$\frac{1.5}{6.1}$	$\frac{1.3}{0.2}$
⋮							
Hungary[21]	-	$\frac{0.9}{4.4}$	$\frac{0.9}{5.1}$	$\frac{0.9}{4.8}$	$\frac{0.8}{4.6}$	$\frac{1.0}{4.4}$	-

[18]Compiled from TABLES A1.6a(L), B.2.2. and B.2.3. in OECD (2014).

[19, 20] The order of appearance is in accordance with the ranking of the COLUMN 2 of this TABLE, the quality of attainment by Higher Education as measured by the percentage of 25-64 year-old college graduates scoring at Literacy Proficiency Lever 4/5 (Source: TABLE A1.6A (L). (2012) in *Education at a Glance 2014: OECD Indicators*).

[21] No appearance in OECD's TABLE A1.6A (L). Public expenditure only.

7 Industrial Policy

7.1 From Protection of Infant Industries to Promotion of Growth Industries

- Shift of the comparative advantage from unskilled labor intensive to skilled labor intensive products
- From protection of infant industries to identification of economically strategic industries
  - Tax incentives
  - Favorable depreciation allowances
  - Financing through government financial institutions
  - Large enough domestic market to permit competition among several firms

    Insufficient domestic demand to be supplemented by governmental promotion:

    Egs.: Public Car Project (60's, After pre-war Volks Wagen project;
    Toyota "Publicar" $\longrightarrow$ Toyota Carolla),
    Mid-size/Mid-distance (MD) jet project (Recent Mitsubishi MD jetliner)

Private sector from "Bicycle Operation" (i.e., barely paying for the large material costs by rapid economic growth) to the sound corporate financial balance under government economic planning as materialized in a series of Five-Year Economic Plans and "Income Doubling Policy" (1960)

$\Longrightarrow$ Recent reversal in public vs. private sectors!

- A series of Five-Year Economic Plans, culminating in "Income Doubling Policy" (1960), coordinated policies by:
  - Prime Minister's Office - Economic Planning Agency
  - Finance Ministry, Japan Bank
  - Government Financial Institutions: Japan Development Bank, Export-Import Bank
  - MITI ($\longrightarrow$ Ministry of Economy, Trade and Industry (METI), after 2001 Government Reform), Ministry of Agriculture and Fishery, Ministry of Civil Engineering ($\longrightarrow$ Ministry of Internal Affairs and Communications (MIC)), Ministry of Education ($\longrightarrow$ Ministry of Ministry of Education, Culture, Sports, Science and Technology (MEXT))

7.1.1 Protection of Infant Industries

- Sustain potentially large enough domestic demand by import restriction
- Subsidy policy
- Low interest financing through government financial institutions
- Tax incentives
- In the meantime, help cover large set-up costs on R.&D.
  - R.&D. similar in nature to public goods, i.e., prone to nonexclusive and collective consumption.

    $\Longrightarrow$ Government directly undertakes R.&D., and/or forms R.&D. cooperatives to absorb firms' large set-up costs.

7.1.2 Promotion of Growth Industries: Specialization in "High Income-Elasticity" Products

- Rapid economic growth by targeting at specialization in high income elasticity products, where the *income elasticity of demand* η measures the *responsiveness* (or *sensitivity*) of the demand $D(p, q; Y)$ to changes in income Y *alone* (i.e., when its own price p and that of the related products q remain constant), defined by:

$$\eta = \frac{\%\text{ change in } D(p,q;Y)}{\%\text{ change in } Y} = \frac{\frac{\partial D(p,q;Y)}{D(p,q;Y)}}{\frac{\partial Y}{Y}}.$$

  Typically, products with high η [22] are *luxurious* or *high tech* goods, that are more popular in highly developed countries with high Y.

- Diversification and specialization

  Increase in income through economic growth
Favorable exchange rate $\Big\}$ $\Longrightarrow$ Specialization in high η products.

  - Differentiated products
  - Innovation $\Longleftarrow$ Nonuniform and specialized curriculum at the universities, Individualistic and competitive research incentives.
  - Well-established property rights for scientific researches
  - Identifications of, and specializations in high tech industries:

    Biotechnology $\Longrightarrow$ With applications in Medicine and Agriculture in perspective.

[22] $\eta > 1$, to be exact. Products with $0 < \eta \leq 1$ are called as *necessary goods*, while those with $\eta < 0$ are *inferior goods*, frequently a *cheap substitute* for a desirable commodity, referred to as a fake or *poor man's* counterpart, say mussels being poor man's oysters, and a VW Beetle as a poor man's Porsche.

- Stronger ¥
  - Higher export price
  - Lower costs of imported raw materials
  - Higher labor costs:
    Since $w = p.f'$,

$$\begin{aligned} \dot{w} &= \dot{p} + \dot{f}', \\ \dot{p} &= \dot{w} - \dot{f}', \end{aligned}$$

    where $\dot{f}'$ reflects innovations that result from basic researches.

  - Demand side:
    Shift from rapid growth driven from export demands to moderate growth sustained by domestic demands $\Longleftarrow$ Easing housing problem in the metropolitan area.

- Modernization of backward and/or supportive sectors "Shadows of the Japanese Economy": Agriculture, and subcontracting firms
  - Regional development: Resolution of the regional disparities, Japanese North-South problem,
  - "Doughnut Syndrome" in the metropolitan areas.
  - Take advantage of the smallness of the firm, and specialize in highly technical "niche" businesses

7.1.3 Agricultural Policies Confronted by the Urge to Open Markets: "Learn from the Successful Experience of the Growth Industries"

Long-Run Problem Typical of Agriculture in Developed Economies: In developed economies which have maintained high economic growth for sufficiently long period of time, the prices of agricultural products tend to decline[23].

[23] In contrast, an awkward phenomenon known as "Poverty despite Good Harvest" is universally prevalent in the short run, in developing and developed economies alike.

The market supply curve $S(p)$ in the short run, i.e., one harvesting cycle, reduces to a vertical straight line S, since the harvested total tends to be strongly influenced by such meteorological elements as the temperature, the rain fall, etc., and independent of the price. An immediate consequence of good harvest is $S \downarrow$, a rightward shift of S, say from $S_{\text{Regular Harvest}}$ to $S_{\text{Good Harvest}}$, coupled with with no change in $D(p; I)$, causing a drop in p ($dp < 0$, or $p \downarrow$). The "Poverty despite Good Harvest" refers to the phenomenon that smaller agricultural income $p.D(p; I)$ results from a drop in p.

Here, the *(own) price elasticity of demand* ϵ plays a crucial role, where

$$\epsilon = \frac{\%\text{ change in } D(p, q; Y)}{\%\text{ change in } p} = \frac{\frac{\partial D(p,q;Y)}{D(p,q;Y)}}{\frac{\partial p}{p}}.$$

(In the preceding definition, I have included in $D(p, q; Y)$ the price q of "related" goods, *substitutes* or *complements*, for the sake of completeness, especially to distinguish the ϵ from the (cross) price elasticity of

- Implications of the long-time sustenance of economic growth on the market supply $S(p)$, i.e., Heavy and chemical industries are often reckoned as the key propellers of the rapid economic growth. Their products has found their way into agriculture as inputs such as
  - products of heavy (steel) industries as mechanizing agriculture, and
  - chemical products as chemical fertilizers and pesticides.

  $\Longrightarrow$ Productivity growth in agriculture has exceeded that of heavy/chemical industries:

  $\Longrightarrow$ Enormous rightward shift of $S(p)$.
- Implications of "Economic Growth $\Longleftrightarrow$ Increase in Income Y" on Market Demand $D(p;Y)$, which is less responsive to changes in income Y, i.e., of small *income elasticity*[24].
  $\Longrightarrow$ Relatively small rightward shift of $D(p;Y)$.
- Combining the preceding two remarks, the equilibrium price p^* at the intersection of $S(p)$ and $D(p;Y)$ declines.

"Learn from the Successful Experience of the Growth Industries": Confrontation by the foreign requests for more opened domestic agricultural markets, and a resort to specialization in the "differentiated" products.

---

demand, i.e., with respect to changes in q.)

It is worth emphasizing that the product of the positively influenced term and the negatively influenced term is not readily conclusive, but needs to be emulated with a resort to elasticities.

Formally, the effect of $dp<0$ on $p.D(p;Y)$ may be concluded from

$$\frac{\partial}{\partial p}p.D(p;Y)=D(p;Y)+p\frac{\partial D(p;Y)}{\partial p}=\left(1+\frac{\frac{\partial D(p;Y)}{\partial p}}{\frac{D(p;Y)}{p}}\right)D(p;Y)=(1-\epsilon)D(p;Y)\,.$$

Therefore,

$$\frac{\partial}{\partial p}p.D(p;Y)\left\{\begin{array}{c}>\\=\\<\end{array}\right\}0\iff|\epsilon|\left\{\begin{array}{c}<\\=\\>\end{array}\right\}1\,.$$

Or, more intuitively, when $|\epsilon|<1$,

$$\left(p\Big\downarrow_{1\%}.D(p;Y)\uparrow^{\epsilon\%}\right)\Big\Downarrow,$$

where the total effect of the change in p on the product $p.D(p;Y)$, to be $\Big\Downarrow$ or $\Big\Uparrow$, is determined by the direction of the dominant of two arrows, $\Big\downarrow_{1\%}$ and $\uparrow^{\epsilon\%}$ (note well that, in accordance with $|\epsilon|<1$, $\uparrow^{\epsilon\%}$ is drawn shorter than the opposite $\Big\downarrow_{1\%}$).

[24]For the definition and implications of the *income elasticity of demand* η, refer to **7.1.2**.

- Since the declining trend of the prices of agricultural products is resultant from the relatively small increase in $D(p;Y)$ than in $S(p)$, as seen in the above analysis, it is natural to resort to specialization in products that ensure a big increase in $D(p;Y)$ as a result of increase in Y realized through the prolonged economic growth.

  As such, agricultural products of high income elasticity emerge as a natural choice which are differentiated from the rest with distinct characteristics of food safety, better taste, etc.

- $\Longleftarrow$ Manufacturing industries originally experienced a similar specialization in products of high income elasticity.

  - At an initial stage of rapid economic growth, for the purpose of *exporting* them to advanced countries with high income;
  - And then by maintaining virtually the identical industrial structure, more recently redirecting the same products instead to the more affluent *domestic demands*.

- Japanese agriculture should mimic the above strategy in reverse order, i.e., from the current domestic demands only to the future export demands, with the key words, *specialization in high income elasticity products* .

7.2 Protection of Consumers and the Environment

7.2.1 Deregulations

- Means of Deregulations

  1. Lifting regulating restrictions, or protective subsidies, to ease entries and/or to promote competition
  2. (Regional) Division of corporates
  3. Privatization

- Deregulated Industries, respectively by the above means of deregulations

  1. Airliners, Chartered Bus Services, Electricity, Agriculture
  2. Telephone and telecommunications, Railway transportation
  3. Postal and logistic services

  $\Longrightarrow$ Possibly excessive deregulations at the expense of safety of the passengers as revealed by airline and chartered bus accidents

7.2.2 Product Safety and Liabilities

Also applicable to such durable consumption goods as automobiles and electric appliances.

7.2.3 Recyclable and Sustainable Societies

Basic Stances of Resolutions against Global Warming:

$$\left\{ \begin{array}{c} \textit{Mitigations} \text{ of} \\ \text{and/or} \\ \textit{Adaptations} \text{ to} \end{array} \right\} \text{ Global Warming, Socioeconomically and/or Technologically ,}$$

including Enlightenments, International Cooperations/Coordinations, Promotions of New Technologies, and Economic Incentives such as Carbon Pricing.

- 1997 COP3: Kyoto Protocol (to the United Nations Framework Convention on Climate Change), and the sequel COP's
  - Emission reduction % targets of green-house gases based on the 1990/95 amounts, and the target completion year
  - Kyoto Mechanisms to achieve the emission reduction:
    1. Clean Development Mechanism (CDM);
    2. Emissions Trading (ET): Assigned Amount Unit (AAU), Removal Unit (RMU), Emission Reduction Unit (ERU). Certified Emission Reduction (CER);
    3. Joint Implementation (JI);

    (+) Land Use, Land Use Change and Forestry (LULUCF): Afforestation, Reforestation, Deforestation (ARD) .
- World Economic Forum (1971 -)
  - (2009 -) Dabos Annual Meetings in Switzerland
  - (2012) "The Great Transformation: Shaping New Models"
  - (2013) "Resilient Dynamism"
  - (2014) "The Reshaping of the World: Consequences for Society, Politics and Business"
  - (2015) "The New Global Context"

7.2.4 Choice of Energy Sources

Composition of Alternative Energy Sources in Japan (2010, %)
(From: Resource Energy Agency (2013): *Energy Demand and Supply Data*.)

Types of Energy Sources	**Dependence (After 2011)**	**Merits**	**Drawbacks**
Fossil Fuel	81.8 (88.4 ↘)		Emission of such harmful substances as CO_X, NO_x, SO_X Global heating
Nuclear Energy	11.3 (4.2 ↘)	Small running costs	Risk of devastating nuclear and radiation accidents, as experienced at TMI (1979), Chernobyl (1985) and Fukushima (2011) Power Plants Nuclear wastes
Natural Energy Solar, Windmill, Geothermal, etc.	6.9 (7.4 ↗)	Clean Reproducible	

8 International Trade Regimes

8.1 Short History of International Trade Organizations

- 1948 - 1995 *General Agreement on Tariffs and Trade, GATT*: *Multilateral* ($\longleftrightarrow$ bilateral), *non-exclusive*, and *mutual* agreements. Through 8 "rounds" of comprehensive trade negotiations, managed to reduce tariffs.

  - *Kennedy Round* (1964 - 1967) : Negotiations on comprehensive reduction of tariffs averaging 35% over the 5 years' lapse.
  - *Tokyo Round* (1973 - 1979) : Negotiations on comprehensive reduction of tariffs on metal products averaging 33%.
  - *Uruguay Round* (1986 - 1994) : Additional to the tariff reductions on agenda in previous rounds are the protective tariffs on services, and in particular the *Intellectual Property Rights*.
  - Uruguay Round Agreement on Agricultural Products (1993) : Gradual opening of the Japanese import market of rice, and cut in government subsidies to agriculture.

- 1973 *First Oil Shock Organization of Petroleum Exporting Countries, OPEC* hiked the petroleum export price to 4 times of the prevalent price $\Longrightarrow$ Conservation of petroleum-originated energy, including electricity.

  1978 *Second Oil Shock* $\Longrightarrow$ Search and development of substitutable energy sources, such as solar, windmill and geothermal power stations.

- 1978 *US-Japan Structural Impediments Initiative, SII*

  - Contention on the US side: Japan should increase Government Investment G_J, or more specifically $I_{G_J}\Big\uparrow$ $\Longrightarrow$ (With a due attention to monetary easing to avoid the "crowding out") Domestic Investment $I_J\Big\uparrow$ $\Longrightarrow$ Shrinkage of the Current Surplus $(E_J - M_J)\Big\downarrow$.
  - US *Omnibus Trade and Competitiveness Act* (1988), especially Article 1302, the so-called "Super Article 301" which strengthens the Article 301 of the US *Comprehensive Trade Act* (1974) by implementing punitive actions when negotiations to correct unbeneficial trade practice break up.
  - Japanese contention: Persistent Japanese Current Surplus $(E_J - M_J)$ was not to be blamed. Indeed, it had contributed to the US economy by financing the shortage of US investment funding $I_{US} - S_{US}$.

    Went so far as to claim that Article 1302 of the US 1988 Act violated the *WTO* rule.

- Uruguay Round (1995) agreed on strengthening the *GATT* by establishing the *World Trade Organization, WTO*.

- Emergence of Free Trade Areas

– 1993: *EU* $\longleftarrow$ *EC*.

– 1994: *NAFTA* (North American Free Trade Agreement, by US, Canada and Mexico); 1995: *MERCOSUR* (by Brazil, Argentina, Uruguay and Paraguay); and 1993: *AFTA* (*ASEAN* Free Trade Area).

– The most recent, 2016: *TPP* (Trans-Pacific Partnership).

8.2 Welfare Assessments of Trade Policies (*)

8.2.1 Persistent Surplus of Current Balance

- Plaza Agreement on Non-Interference with Foreign Currency Market (1985), despite the Japanese concern on the high value of ¥

  $\Longrightarrow$ By corporate efforts, Japan succeeded in achieving $q\Big\downarrow$ in the 1990s.

  However, in order to continue to be in current balance equilibrium, Japan needed to maintain the equilibrium terms of trade $\tau^* = \left(\dfrac{\pi\left(\Big\downarrow\right) \times p(\longrightarrow)}{q\left(\Big\downarrow\right)}\right)^*$, and should have born with yet higher value of ¥, $\pi\Big\downarrow$.

- In actuality, the exchange rate was not sufficiently flexible, and the capital outflow following the burst of economic bubble helped to drive down the value of ¥, i.e., the actual $\pi > \pi^* = \dfrac{\tau^* p}{q}$ (Cheaper ¥), which in turn led to

  – Current Balance Surplus: $\underbrace{q\left\{-d_J^Y(\pi p, q)\right\}}_{\text{Export in ¥}} - \underbrace{\pi p d_J^X(\pi p, q)}_{\text{Import in ¥}} > 0$

  $$\Longleftarrow \begin{cases} \text{Increase in Exports due to cheaper ¥}: -d_J^Y(\pi p, q) > -d_J^Y(\pi^* p, q) \\ \text{Decrease in Imports due to cheaper ¥}: \ d_J^X(\pi p, q) < d_J^X(\pi^* p, q) \end{cases}$$

  where π^* is an Equilibrium Exchange Rate: $q\left\{-d_J^Y(\pi^* p, q)\right\} - \pi^* p d_J^X(\pi^* p, q) = 0$.

  – *Welfare Loss*:

$$U_J\left(\underbrace{D_J^X(\pi^* p, q), D_J^Y(\pi^* p, q)}_{\substack{\text{Consumption in Current} \\ \text{Balance Equilibrium}}}\right) > U_J\left(\underbrace{D_J^X(\pi p, q), D_J^Y(\pi p, q)}_{\text{Actual Consumption}}\right).$$

- *Welfare Loss* associated with the preceding "Market Force" of the capital market also applies to government's recent collaborative interventions in foreign currency markets to induce cheaper ¥, or to prevent higher ¥ to say the least, i.e.,

$$U_J\left(\underbrace{D_J^X(\pi^* p, q), D_J^Y(\pi^* p, q)}_{\substack{\text{Consumption in Current} \\ \text{Balance Equilibrium}}}\right) > U_J\left(\underbrace{D_J^X(\pi p, q), D_J^Y(\pi p, q)}_{\substack{\text{Consumption under Interventions} \\ \text{in the Foreign Currency Markets}}}\right).$$

8.2.2 Protective Tariff

Two Types of Protective Tariffs

1. *Nominal* Tariffs: Tariffs imposed on the imported final products;
2. *Effective* Tariffs: Tariffs imposed on the imported products, both final and intermediate.

Japanese Protective Tariff on Imported Rice after the *GATT* Uruguay Round Agreement: Start by recalling the US-Japan Trade Model introduced in **4.1.2**.

Consider the case where Japan imposes a protective tariff t on the imported X to protect and promote her Domestic Agriculture.

In order to help Japanese Rice Farmers survive, given p the world price of X, after the imposition of the protective tariff, Japan faces $(1+t)\pi p$ as the imported price of X, which approximates the higher price of domestically produced X.

Therefore, in her production and consumption decisions, Japan faces the *terms of trade* $\tau^t = \left(\dfrac{(1+t)\pi p}{q}\right)$.

- *Production equilibrium with protective tariffs*

$$\left(\hat{X}^t, \hat{Y}^t\right) = \left(\hat{X}_J\left((1+t)\pi p, q\right), \hat{Y}_J\left((1+t)\pi p, q\right)\right)$$

solves:

$$\begin{array}{c} \max\ (1+t)\pi pX + qY \\ \text{s.t. } T_J(X,Y) = 0\,. \end{array}$$

- *Japan's Purchasing Power under the protective tariffs* GDP^t is the value of $\left(\hat{X}^t, \hat{Y}^t\right)$, evaluated at world prices $(\pi p, q)$, i.e.,

$$GDP^t = \pi p\hat{X}^t + q\hat{Y}^t$$

- Given the disposable income GDP^t, and faced domestically by the terms of trade $\tau^t = \left(\dfrac{(1+t)\pi p}{q}\right)$, *Japan's consumption equilibrium (demand, or "offer curve")* $\left(D_J^{Xt}, D_J^{Yt}\right) = \left(D_J^X\left((1+t)\pi p, q\right), D_J^Y\left((1+t)\pi p, q\right)\right)$ solves:

$$\begin{array}{c} \max\ U_J(X,Y) \\ \text{s.t. } (1+t)\pi pX + qY = GDP^t\,, \end{array}$$

or its first order conditions,

$$\begin{cases} MRS(X,Y) = \frac{(1+t)\pi p}{q} \\ (1+t)\pi pX + qY = GDP^t\,. \end{cases}$$

That is, $\left(D_J^{Xt}, D_J^{Yt}\right)$ is on the budget line corresponding to GDP^t, the value of $\left(\hat{X}^t, \hat{Y}^t\right)$ evaluated at $(\pi p, q)$, and the *highest* indifference curve *is tangent to* the budget line $\tau^t = \left(\dfrac{(1+t)\pi p}{q}\right)$.

- *Welfare Loss Incurred by the Country Imposing Protective Tariffs*:

$$U_J\left(\underbrace{D_J^{Xt},\ D_J^{Yt}}_{\substack{\text{Consumption under}\\ \text{Protective Tariff}}}\right) < U_J\left(\underbrace{D_J^X(\pi p,q), D_J^Y(\pi p,q)}_{\substack{\text{Consumption without}\\ \text{Protective Tariff}}}\right)$$

8.2.3 Dumping

Again back in the US-Japan Trade Model introduced in **4.1.2**.

Suppose the US *dumps* her grain export X onto the Japanese market at the lower price $\pi(1-\delta)p$, with $\delta > 0$, than the domestic price p, or πp in ¥ denomination, in order to entice increased sales.

I. Initially, so Long as the Production Equilibrium in the Dumped Country Is Not Affected

- *Production Equilibrium of Japan*, initially upon being unexpectedly dumped with the grain X, remains at $\left(\hat{X}_J(\pi p,q), \hat{Y}_J(\pi p,q)\right)$.

- *Japan's Purchasing Power* GDP^d is the value of $\left(\hat{X}_J(\pi p,q), \hat{Y}_J(\pi p,q)\right)$ evaluated at the world price $(\pi(1-\delta)p, q)$ incorporating the effect of dumping, i.e.,

$$GDP^d = \pi(1-\delta)p\hat{X}_J(\pi p,q) + q\hat{Y}_J(\pi p,q)\,.$$

- Given the disposable income GDP^d, and faced by the terms of trade incorporating the effect of dumping $\tau^d = \left(\dfrac{\pi(1-\delta)p}{q}\right)$, *Consumption Equilibrium (Demand or Offer Curve) of Japan* $\left(D_J^{Xd}, D_J^{Yd}\right) = \left(D_J^X\left(\pi(1-\delta)p,q\right), D_J^Y\left(\pi(1-\delta)p,q\right)\right)$ solves

$$\begin{array}{c}\max\ U_J(X,Y)\\ \text{s.t. } \pi(1-\delta)pX + qY = GDP^d\,.\end{array}$$

  That is, $\left(D_J^{Xd}, D_J^{Yd}\right)$ is the tangency point of the budget line corresponding to the income generated from $\left(\hat{X}_J(\pi p,q), \hat{Y}_J(\pi p,q)\right)$ evaluated at the world price incorporating the dumping effect $(\pi(1-\delta)p, q)$, and the highest attainable indifference curve.

- **Welfare Gain in the Country Dumped with Imports**:

$$U_J\left(\underbrace{D_J^{Xd},\ D_J^{Yd}}_{\substack{\text{Consumption under}\\ \text{Dumping}}}\right) > U_J\left(\underbrace{D_J^X(\pi p,q), D_J^Y(\pi p,q)}_{\substack{\text{Consumption without}\\ \text{Dumping}}}\right)$$

Right after the country is raided with import dumping, so long as her production equilibrium is immune to the dumping, the dumped country is better off. Indeed, the dumped import price is a good bargain for the raided country.

II. After the Prolonged Dumping, Long Enough for the Dumping Country to Succeed in Increasing her Export, and for the Dumping to Affect the Production Equilibrium of the Dumped Country [25]

- Since Japan duly anticipates the continuation of dumping, the *Production Equilibrium* of Japan, being dumped with imported grain X is

$$\left(\hat{X}_J(\pi(1-\delta)p,q),\hat{Y}_J(\pi(1-\delta)p,q)\right).$$

- *Japan's Purchasing Power* under prolonged dumping GDP'^d[26] is the value of

$$\left(\hat{X}_J(\pi(1-\delta)p,q),\hat{Y}_J(\pi(1-\delta)p,q)\right)$$

evaluated at the world price inclusive of the effect of dumping $(\pi(1-\delta)p,q)$, i.e.,

$$GDP'^d=\pi(1-\delta)p\hat{X}_J(\pi(1-\delta)p,q)+q\hat{Y}_J(\pi(1-\delta)p,q).$$

- Given the disposable income GDP'^d, and faced by the terms of trade incorporating the effect of dumping $\tau^d=\left(\frac{\pi(1-\delta)p}{q}\right)$, *Consumption Equilibrium (Demand or Offer Curve) of Japan* $\left(D_J'^{Xd},D_J'^{Yd}\right)$ solves

$$\begin{array}{c}\max\ U_J(X,Y)\\ \text{s.t. } \pi(1-\delta)pX+qY=GDP'^d.\end{array}$$

That is, $\left(D_J'^{Xd},D_J'^{Yd}\right)$ is the tangency point of the budget line corresponding to the income generated from $\left(\hat{X}_J(\pi(1-\delta)p,q),\hat{Y}_J(\pi(1-\delta)p,q)\right)$ evaluated at the world price incorporating the dumping effect $(\pi(1-\delta)p,q)$, and the highest attainable indifference curve.

- **Welfare Gain in the Country Subjected to the Prolonged Dumping:** Since $GDP'^d>GDP^d$ as noted in the preceding Footnote 19,

$$U_J\left(\underbrace{D_J'^{Xd},\ D_J'^{Yd}}_{\substack{\text{Consumption under}\\ \text{Prolonged Dumping}}}\right)>U_J\left(\underbrace{D_J^{Xd},\ D_J^{Yd}}_{\substack{\text{Consumption upon}\\ \text{Introduction of Dumping}}}\right)>U_J\left(\underbrace{D_J^X(\pi p,q),D_J^Y(\pi p,q)}_{\substack{\text{Consumption without}\\ \text{Dumping}}}\right)$$

If the dumping country is successful in increasing sales of exports to the extent that the production equilibrium of the dumped country is affected, then the continued dumping is yet a better bargain for the dumped country.

---

[25] Equivalent to the persistence by the dumping country to a less favorable production equilibrium by worsening the terms of trade. *Terms of Trade facing production and consumption in Japan is* $\tau^t=\left(\frac{(1-\delta)\pi p}{q}\right)$. *and the same worsened terms of trade is applied to evaluate Japan's purchasing power.*

[26] Since Japan's Production Equilibrium under the prolonged dumping $\left(\hat{X}_J(\pi(1-\delta)p,q),\hat{Y}_J(\pi(1-\delta)p,q)\right)$ is the tangency point of the budget line with the slope $-\tau^d=-\frac{\pi(1-\delta)p}{q}$ and her $PPC\ T_J(K,L)=0$,

$$GDP'^d>GDP^d.$$

8.2.4 "Voluntary Restriction on Exports" vs. Import Quotas

In the 1980s, Japan agreed to "voluntarily" restricting automobile exports to the US in fear of retaliatory import restriction from the US. Less universal than alternative protective trade policies.

Resulting welfare loss is similar to the more frequently resorted *import quota*, both common to *any* "Rationed Equilibrium"[27].

- Recall the *Production Equilibrium of Japan* $\left(\hat{X}_J(\pi p, q), \hat{Y}_J(\pi p, q)\right)$, as defined in **3.1.2**.

- Given *Japan's Voluntary Production Choice* (X_J^V, Y_J^V) such that $Y_J^V < \hat{Y}_J(\pi p, q)$ and $T_J(X_J^V, Y_J^V) = 0$, the associated GDP^V is computed as: $GDP^V = \pi p X_J^V + q Y_J^V$, which is *definitely* less than the free-trade GDP_J in **4.1.2**.

- Given the disposable income GDP^V, and faced by the terms of trade $\tau = \left(\frac{\pi p}{q}\right)$, *Consumption Equilibrium (Demand or Offer Curve) of Japan* $\left(D_J^{X^V}, D_J^{Y^V}\right) = \left(D_J^X(\pi p, q), D_J^Y(\pi p, q)\right)$ solves:

$$\begin{array}{c} \max\ U_J(X, Y) \\ \text{s.t. } \pi p X + q Y = GDP^V . \end{array}$$

  That is, $\left(D_J^{X^V}, D_J^{Y^V}\right)$ is the tangency point of the budget line corresponding to the income generated from $\left(X_J^V, Y_J^V\right)$ evaluated at the world price $(\pi p, q)$, and the highest attainable indifference curve.

- **Welfare Assessments**:
  - *Welfare Loss* due to the voluntary export restriction:

$$U_J\left(\underbrace{D_J^{X^V},\ D_J^{Y^V}}_{\substack{\text{Consumption under} \\ \text{Voluntary Restriction}}}\right) < U_J\left(\underbrace{D_J^X(\pi p, q), D_J^Y(\pi p, q)}_{\substack{\text{Consumption under} \\ \text{Free Trade}}}\right) .$$

  - It remains to be seen whether GDP_J, and consequently U_J are greater or smaller under the alternative policy measures, Japanese voluntary or the US retaliatory.

8.2.5 *GATT* and *WTO*

- Priority to the *price restrictions* by way of adjustments of levied tariffs, rather than the alternative *quantity restrictions* or quotas such as:
  - Japanese prohibitions of export nor import of rice before the *GATT* Uruguay Round agreement, or

[27] See eg., VARIAN, Hal R.(1987; 2014): *Intermediate Microeconomics: A Modern Approach, Ninth Ed.* New York, NY: W.W. Norton. Sect. **2.6**.

– Japanese "voluntary" restriction on exports of automobiles to the US during the US-Japan SII (Structural Impediment Initiatives) Negotiations in the 1980s.

- In order to achieve the same restricted amount of the imported grain X, $d_J^{Xt} = D_J^{Xt} - \hat{X}_J^t$ that results from the protective tariff t, by appropriately restricting the imported quantity, *Japan's Consumption Equilibrium with import quota* $\left(D_J^{XQ},\ D_J^{YQ}\right)$ is expressed as:

$$\left(D_J^{XQ},\ D_J^{YQ}\right) = \left(\underbrace{\hat{X}_J(\pi p, q)}_{\substack{\text{GDP without} \\ \text{Tariff}}} + \underbrace{d_J^{Xt}}_{\substack{\text{Import} \\ \text{Quota}}},\ \underbrace{\hat{Y}_J(\pi p, q)}_{\substack{\text{GDP without} \\ \text{Tariff}}} - \underbrace{\frac{\pi p}{q} d_J^{Xt}}_{\substack{\text{Export corresponding} \\ \text{to Import Quota}}} \right)$$

- **Basic Principles of the *GATT* (carried over to its successor *WTO* from 1995 on):**

1. *In order to achieve the identical reduction in the quantity imported, the imposing country is better off by resorting to protective tariff rather than quantity restriction.*

$$U_J\left(\underbrace{D_J^{Xt},\ D_J^{Yt}}_{\substack{\text{Consumption} \\ \text{under Tariff}}}\right) > U_J\left(\underbrace{D_J^{XQ},\ D_J^{YQ}}_{\substack{\text{Consumption} \\ \text{under Quota}}}\right)$$

   $\Longleftarrow$ With an imposition of protective tariff, it follows that the *Production Equilibrium* is dislocated to $\left(\hat{X}^t, \hat{Y}^t\right)$.

2. *"Rounds" of multilateral negotiations of cutting the protective tariffs are prone to realize "Free Trade".*

   $\Longleftarrow$ Taking into consideration the *Welfare Loss* incurred by the country imposing the protective tariff,

$$U_J\left(\underbrace{D_J^X(\pi p, q), D_J^Y(\pi p, q)}_{\substack{\text{Consumption under} \\ \text{FreeTrade}}}\right) > U_J\left(\underbrace{D_J^{Xt},\ D_J^{Yt}}_{\substack{\text{Consumption under} \\ \text{Protective Tariff}}}\right) > U_J\left(\underbrace{D_J^{XQ},\ D_J^{YQ}}_{\substack{\text{Consumption} \\ \text{under Quota}}}\right).$$

9 Monetary and Fiscal Policies

9.1 Saving Behavior

9.1.1 Why Is Japan's Saving Rate So High?: Some Hypotheses:

- *Life Cycle Hypothesis*,

  Including formation of life cycle with a *lag*, where $C_t = C(Y_{t-1})$ and $S_t(Y_{t-1}) = Y_t - C_t = Y_t - C(Y_{t-1})$. $S_t(Y_{t-1}) > S_t(Y_t)$ with $Y_t > Y_{t-1}$, i.e., in a growing economy.

  - Longevity (Life expectancy)
  - Sufficiency of social security benefits

- *Permanent Income Hypothesis*

  - Permanent vs. Temporary Incomes
  - *Bonus Hypothesis*: Bonus payment viewed as temporary income
    Saving out of bonus income > Saving out of regular wage income.

- *Real Wealth Effect* $\Longleftarrow$ Inflation rate

- *Target Saving Hypothesis*

  - Institutionalized "Lump-Sum Retirement Allowances" constitute a part of S_C or S_G before employees' retirement, and S_H after their retirement, in terms of the classifications of Savings to be introduced in the subsequent **9.1.3**.

9.1.2 Socio-Economic Factors Affecting the Saving Behavior

- Insufficient and unreliable pension system
- Availability of consumer loans
- Private burdens of higher education expenses

$\Longrightarrow$ Far-reaching horizon of individual economic planning

9.1.3 Saving-Investment Balance in the Static Context

- *Household Saving* S_H: $\nearrow \Longrightarrow \searrow$ (More recently, due to societal aging)
- *Corporate Saving* S_C: $\Longleftarrow$ Retained profits. $\searrow$ (Throughout)
- *Government Saving* S_G: *Not* the Government Surplus $(T - G)$.
  Approximately equal to T, due to the *time lag,* i.e., the *Tax Revenue* T_t is collected at the source and deposited in the Government Account of the Bank of Japan as the *Government Saving* $S_{G,\,t}$ temporarily, so that it will be spent as the *Government Expenditure* G_{t+1} in the subsequent fiscal year.
  $\searrow$ (Throughout)

– Up to the mid 1970's, Balanced Budget Clause;

– Later, greater needs for government capital formation, originally financed by the Postal Savings, and subsequently by government bonds, after the Privatization of the Postal Services and Postal Savings in 2008..

REMARK (STYLIZED FACTS *of Japanese Savings*):

1. Household Sector S_H as the largest provider of gross savings, $S_H \nearrow$ and $S_G \searrow$;
2. Household Sector S_H as the largest provider of funds that flowed into financial markets;
3. According to the GURLEY-SHAW (1955)[28] Classification,

   Indirect Financing by financial institutions (89% for 1980 - 84);

   Direct Financing through the domestic or foreign capital markets (11%);
4. **(Reversal of "Bicycle Operation" Sector from the Private Corporate Sector to the Government Sector)** Major borrowing sector, transiting from the Corporate Sector to the Public Sector, the reversal becoming more conspicuous and serious more recently after the burst of economic bubble ($\longrightarrow$ **9.1.5**, REMARK (*Adverse* KALDORIAN ...).);
5. Unchanged sectoral share of the fixed capital investments.

- *Gross* Saving-Investment Balance:

$$\begin{aligned} \text{Gross Investment} &\equiv \text{Gross Domestic Investment} + \text{Capital Inflow from Abroad} \\ &\equiv \text{Capital Depreciation} + \text{Net National Saving} \\ &\equiv \text{Gross National Saving} \\ &\equiv S_H + S_C + S_G\,. \end{aligned}$$

Or equivalently,

- *Net* Saving-Investment Balance:

$$\begin{aligned} \text{Net Investment} &\equiv \text{Gross Investment} - \text{Capital Depreciation} \\ &\equiv \text{Gross National Saving} - \text{Capital Depreciation} \\ &\equiv \text{Net National Saving} \\ &\equiv (S_H + S_C + S_G) - \text{Capital Depreciation}\,. \end{aligned}$$

[28] GURLEY, John G. and E.S. SHAW (1955): "Financial Aspects of Economic Development." *The American Economic Review*, Vol. 45, pp. 515-538.

9.1.4 Recent Sectoral Saving Behavior

Recent Saving Behavior, by Sectors (¥ Trillions, %) (Compiled from: Cabinet Office (2016): *National Economic Statistics, Definitive Ed.*)

Sectors	1994	1995	1996	1997	1998	1999	2000
Households							
$S_H^{\text{Net}} = S_H^{\text{Gross}} - \delta_H$ (*Net* Savings)	36.05	29.25	24.72	28.91	27.00	24.87	18.90
$s_H^{\text{Adjusted}} = \dfrac{S_H^{\text{Net}}}{Y_H - \delta_H}$ ("Adjusted" Saving Rate)	11.8	9.6	8.1	9.3	8.7	8.1	6.3
Non-Financial Corporates							
$S_{NC}^{\text{Net}} = S_{NC}^{\text{Gross}} - \delta_{NC}$ (*Net* Savings)	-1.17	3.11	8.51	5.25	7.40	10.93	18.36
Financial Corporates							
$S_{FC}^{\text{Net}} = S_{FC}^{\text{Gross}} - \delta_{FC}$ (*Net* Savings)	8.93	9.43	10.25	10.85	8.03	9.86	10.56
Economy-Wide							
$S^{\text{Net}} = S_H^{\text{Net}} + S_{NC}^{\text{Net}} + S_{FC}^{\text{Net}}$ (*Net* Savings)	43.81	41.79	43.48	45.01	42.43	45.66	47.82
$\delta = \delta_H + \delta_{NC} + \delta_{FC}$ (Capital Depreciations) [29]	86.77	91.55	86.96	90.37	91.02	89.69	89.02
Y^{Gross} (*Gross* Domestic Products)	495.61	504.59	515.94	521.30	510.92	506.60	510.83
$s^{\text{Adjusted}} = \dfrac{S^{\text{Gross}}}{Y^{\text{Gross}} - \delta}$ ("Adjusted" Saving Rate)	10.74	10.12	10.14	10.44	10.11	10.95	10.15

(Continued)

Sectors	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Households										
S_H^{Net}	10.41	8.31	7.50	5.02	2..69	4.32	0.96	4.29	7.40	7.05
s_H^{Adjusted}	3.5	2.8	2.6	1.7	0.9	1.5	0.3	1.5	2.6	2.5
Non-Financial Corporates										
S_{NC}^{Net}	15.06	20.03	26.22	29.63	26.11	24.20	28.52	18.86	26.07	32.22
Financial Corporates										
S_{FC}^{Net}	14.34	15.98	17.13	15.08	15.52	13.57	13.96	10.37	10.76	9.16
Economy-Wide										
S^{Net}	39.81	44.32	50.85	49.73	44.32	42.09	43.44	33.52	44.23	48.43
δ	88.34	87.25	86.05	86.12	87.09	89.48	91.71	93.16	90.99	88.11
Y^{Gross}	501.71	498.01	501.89	502.76	505.35	509.11	513.02	489.52	473.93	480.23
s^{Adjusted}	9.63	10.79	12.23	11.94	10.60	10.03	10.31	8.46	11.55	10.08

[29]

Source Data for Computation of δ (¥Trillions). (From: Cabinet Office (2016))

Sectors	1994	1995	1996	1997	1998	1999	2000
δ_H	23.75	29.51	23.63	24.19	23.77	23.20	22.88
δ_{NC}	60.66	59.68	60.96	63.70	64.69	63.93	63.65
δ_{FC}	2.36	2.36	2.37	2.48	2.56	2.56	2.49
δ	**86.77**	**91.55**	**86.96**	**90.37**	**91.02**	**89.69**	**89.02**

Sectors	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
δ_H	22.37	21.76	21.51	21.36	21.25	21.40	21.45	21.53	20.68	20.03
δ_{NC}	63.49	62.91	61.86	61.87	62.77	64.92	67.05	68.36	67.00	64.61
δ_{FC}	2.48	2.58	2.68	2.89	3.07	3.16	3.21	3.27	3.31	3.47
δ	**88.34**	**87.25**	**86.05**	**86.12**	**87.09**	**89.48**	**91.71**	**93.16**	**90.99**	**88.11**

(Continued)

Sectors	2011	2012	2013	2014
Households				
S_H^{Net}	6.19	2.88	**-3.61**	0.23
s_H^{Adjusted}	2.2	1.0	**-1.3**	0.1
Non-Financial Corporates				
S_{NC}^{Net}	28.64	28.92	30.21	27.59
Financial Corporates				
S_{FC}^{Net}	7.41	6.1164	6.14	6.91
Economy-Wide				
S^{Net}	42.24	37.91	32.74	34.73
δ	86.39	85.64	86.73	87.85
Y^{Gross}	473.90	474.47	483.11	491.40
s^{Adjusted}	10.90	9.75	8.26	8.61

[29] (Continued)

Sectors	2011	2012	2013	2014
δ_H	19.86	19.03	19.15	19.56
δ_{NC}	63.29	63.07	63.97	64.57
δ_{FC}	3.54	3.54	3.61	3.72
δ	**86.39**	**85.64**	**86.73**	**87.85**

Remark (Stylized Facts *of Japanese Savings after the Burst of Economic Bubbles*):

1. **(Ominous Sign of Declining Household Savings)** Household Sector is *no longer* the largest provider of savings, $S_H^{\text{Net}} \searrow$ and $s_H^{\text{Adjusted}} \searrow$;

   Notably, S_H^{Net} and s_H^{Adjusted} were *negative* in 2013.

2. Non-financial Corporate Sector becoming the major provider of savings, $S_{NC}^{\text{Net}} \nearrow$; while $S_{FC}^{\text{Net}} \longrightarrow$

   $\Longrightarrow$ Emergence of corporate financing via Holding Companies as an alternative to the *Direct Financing* promoted by the Financial "Big Bang."

3. The Public Sector continues to be the major borrowing sector.

More discussions on the Stylized Fact 2. in the context of growth economy will be given in the subsequent **9.1.5**, as summarized in Remark(*Adverse* Kaldorian *Saving Behavior with the Observable "Knife-Edge" Instability Property throughout the Recent Recession, and Especially Conspicuous after the 2011 East Japan Earthquake*).

9.1.5 Saving-Investment Balance in the Dynamic Growth Context

REMARK (KALDOR-SOLOW*'s* STYLIZED FACTS *about Steady-State Economies*):

Denote by $v = \dfrac{K}{Y}$ the *Capital-Output Ratio.*

Then, by the STYLIZED FACT 3. (*Constancy of Capital-Output Ratio*) [30]: $v =$ Constant $\implies \dot{v} = 0$ *in the steady state growth*,

$$\begin{aligned} \frac{\dot{v}}{v} = \frac{\dot{K}}{K} - \frac{\dot{Y}}{Y} &= 0\,. \\ \implies \left(\frac{\dot{K}}{Y}\right)\left(\frac{Y}{K}\right) - \frac{\dot{Y}}{Y} &= 0\,. \\ \implies s\frac{1}{v} &= g\,, \text{ where } s = \frac{\dot{K}}{Y} \text{ and } g = \frac{\dot{Y}}{Y}\,. \\ \implies \underbrace{s}_{\substack{\text{“Saving” as} \\ \text{Supply of Funds}}} &= \underbrace{gv}_{\substack{\text{“Investment” as} \\ \text{Capital Demand}}}\,. \end{aligned}$$

- *The more rapid economic growth needs to be sustained by the higher saving ratio.*
- *The more capital-intensive economic growth needs to be sustained by the higher saving ratio.*

Remaining five STYLIZED FACTS are:

1. (*Constancy of the Growth Rate of per Capita-Output*, i.e., $\left(\dfrac{\dot{Y}}{L}\right) =$ Constant);
2. (*Constancy of the Growth Rate of Capital Stock*, i.e., $\dot{K} =$ Constant);
4. (*Constancy of the Profit Rate of Capital*, i.e., $MP_K =$ Constant);
5. (*Across Countries, the Growth Rate of per Capita-Output* $\left(\dfrac{\dot{Y}}{L}\right)$ *Varies*);
6. (*Across Countries, the Higher the Capital Share of Income* $\left(\dfrac{rK}{Y}\right)$ *Is, the Higher the Ratio of Investment to Output* $\left(\dfrac{\dot{K}}{Y} = \dfrac{I}{Y} = s\right)$ *Is.*)

[30] See SOLOW, Robert M. (1970; Second Ed., 2000): *Growth Theory: An Exposition.* Clarendon, UK: Oxford University Press, **Chapter 1**, which ascribes the set of Six STYLIZED FACTS to KALDOR, Nicholas (1957): "A Model of Economic Growth," *The Economic Journal*, Vol. 67, No. 268, pp. 591-624.

A Cambridge economist KALDOR was also Hungarian by birth, and his early education started at no other than Eötvös Loránd University before he was educated in Berlin and at the London School of Economics.

Capital-Output Ratios of Japan and the US, 1970 and 1980

	Dwellings	**Non-dwellings Private**	**Non-dwellings Public**	**Non-dwellings Both**	**Total**
Japan					
(1970)	0.28	0.76	0.30	1.06	1.34
(1980)	0.56	1.10	0.58	1.67	2.23
US					
(1970)	0.76	0.82	0.52	1.34	2.10
(1980)	0.96	0.98	0.58	1.58	2.53

$$s = \sum_i \left\{ g_i v_i \middle| \, i = \text{Dwellings},\ \text{Private Non} - \text{dwellings},\ \text{Public Non} - \text{dwellings} \right\} .$$

REMARK (*Adverse* KALDORIAN *Saving Behavior with the Observable "Knife-Edge" Instability Property throughout the Recent Prolonged Recession, and Especially Conspicuous after the 2011 East Japan Earthquake*):

- **"Knife-Edge" Instability of HARROD-DOMAR Steady State Equilibrium:** Inherent to the fixed coefficient technology, *with the capital/output ratio* $v = \frac{K}{Y}$ *fixed* (HARROD (1939)[31]).

- **Neoclassical Resolution:** Salvation of the "Knife-Edge" Instability by smooth substitutability of factors of production, as represented by the *"well-behaved" production function* $Y = F(L, K)$ (SOLOW-SWAN-SAMUELSON Model (SOLOW (1956)[32]).

- KALDORIAN **Resolution:** Salvation of the "Knife-Edge" Instability by the adjustment of the *income distribution rate* θ *in the group-decomposable saving ratio* $s = (1-\theta)s_H + \theta s_C$ consisting of two groups, Households (H) and Corporates (C), whose saving ratios are s_H and s_C respectively, and their income distributions are in accordance with $(1-\theta)$ to the group H and θ to C (KALDOR (1955)[33]).

- **Anomalies of the Japanese Saving Behavior during the Recession after 1990):**

  - *Adverse* KALDORIAN: Instead of fixed sectoral saving rates, changes in s_H and s_C are dominant over the.changes in θ, the latter of which KALDOR (1955) supposed to be the major force to steer the economy back to the steady state, with the resultant economy-wide s declining contrary to what KALDOR (1955) might well have anticipated. .
  - *"Knife-Edge" Instability Property*: Despite starting with $g < g_w$, $s \longrightarrow \Longrightarrow g \longrightarrow$ throughout, and especially after the 2011 East Japan Earthquake $s\Big\downarrow \implies g\Big\downarrow$.

  This finding of saving anomalies may well vindicate the prolonged nature of the recent recession and the lack of vigor for economic recovery.

"Knife-Edge" Instability of Harrod-Domar Steady State Equilibrium:

Let g be the *actual* rate of growth. Then,

$$g = \frac{\dot{Y}}{Y} = \left(\frac{\dot{K}}{Y}\right)\left(\frac{\dot{Y}}{\dot{K}}\right) = \frac{s}{v},$$

[31] HARROD, Roy F. (1939): "An Essay in Dynamic Theory." *Economic Journal*, Vol. 49, pp. 14-33.

[32] SOLOW, Robert M. (1956): "A Contribution to the Theory of Economic Growth." *Quarterly Journal of Economics*, Vol. 70, pp. 65-94.

[33] KALDOR, Nickolas (1955): "Alternative Theories of Distribution." *Economic Journal*, Vol. 23, pp. 83-100.

where the *"marginal" capital/output ratio* $\dfrac{\dot{K}}{\dot{Y}} = \dfrac{K}{Y} \equiv v$ for the assumed fixed-coefficient technology.

Denote by the suffixes "f" and "r" those corresponding to "*full employment*" and "*ideal*" for profit maximizing entrepreneurs. Then, given the population growth rate n and the rate of technical progress τ, $g_w = \dfrac{s_f}{v_r}$ and $g_n = n + \tau$ are "*Warranted*" and "*Natural*" Rates of Growth, respectively.

For the economy to be in *full-employment steady-state equilibrium*: $g = g_w = g_n$.

"Knife-Edge" Instability: *Suppose* $g < g_w$. *Then,* $g \Big\downarrow$.
On the other hand, if $g > g_w$, *then* $g \Big\uparrow$.

Indeed, if $g < g_w$, then the actual K increases faster than K_r, and entrepreneurs will respond by cutting $\dot{K}$.
If $g > g_w$, then the economy is increasingly short of K, with the result that the actual g will rise further and further above g_w.

Neoclassical Growth Model: Denote by $k = \dfrac{K}{L}$ the per-capita capital.
When $F(L, K)$ exhibits *Constant Returns to Scale*, $y \equiv \dfrac{Y}{L} = \dfrac{F(L,K)}{L} = F(1, k) \equiv f(k)$.
Since

$$\frac{\dot{k}}{k} = \frac{\dot{K}}{K} - \frac{\dot{L}}{L} = \frac{sF(L,K)}{K} = \frac{sf(k)}{k}\,,$$

the *Steady State Equilibium* k^* solves: $\dfrac{sf(k)}{k} = n + \tau\,.$

- **Existence of k^*:** "*Well-behaved*" f (the *per capita* expression of the *Linearly Homogeneous* $F(L, K)$) satisfying $f(0) \leq 0$; $f'(0) = \infty$; $f'(\infty) = 0$; $f' > 0$ and $f'' \leq 0$
  $\Longrightarrow$ There *always* exists k^* at the intersection of

$$\begin{cases} y = s\,f(k) \\ \\ y = (n + \tau)k\,. \end{cases}$$

- **Stability of k^* (*Resolution of "Knife-Edge" Instability*):**

$$k \left\{ \begin{array}{c} > \\ = \\ < \end{array} \right\} k^* \iff f(k) \left\{ \begin{array}{c} < \\ = \\ > \end{array} \right\} n + \tau \iff \frac{\dot{k}}{k} \left\{ \begin{array}{c} < \\ = \\ > \end{array} \right\} 0\,,$$

or more visually,

$$\left(\iff k \left\{ \begin{array}{c} \downarrow \\ \rightarrow \\ \uparrow \end{array} \right\} \right)\,,$$

which establishes: *any* $k \longrightarrow k^*$.[34]

Kaldor-Type Growth Model: The basic presumption about the group-decomposable saving ratio $s = (1-\theta)s_H + \theta s_C$ is $s_H < s_C$.

The "Knife-Edge" Instability will be resolved through the changes in θ, i.e., if $g < g_w$, then by the increased scarcity of K, the *endogenous* $\theta\uparrow \implies s\uparrow \implies g\uparrow$ (For $g > g_w$, *vise versa.*).

Recent Japanese Prolonged Recession: In the preceding discussion on the Recent Sectoral Saving Behavior in **9.1.4**, the original characterization of group-decomposable saving rate due to KALDOR (1955) admits yet finer 3-group decomposition where the Corporates are further decomposed into Non-Financial Corporates (NC) and Financial Corporates (FC).

Accordingly, redefine the group-decomposable saving rate as

$$s = \sum_i \left\{ \theta_i s_i \middle| \, i = H, NC, FC \right\} \text{ with } \sum_i \left\{ \theta_i \middle| \, i = H, NC, FC \right\} = 1\,,$$

where $\theta_i = \dfrac{Y_i}{Y}$ is the income share of the group $i = H, NC, FC$.

- *Adverse* KALDORIAN (*Endogenous* s_H and s_C): Instead of changes in θ, possibly in favor of Corporates, changes in s_H and s_C have been the dominant force to drive down the economy-wide s.

[34] Alternatively, any graduate student might well be tempted to proceed with the proof *routinely* as follows, which is certainly correct:

Linear Homogeneity of $F(L,K)$ implies, by EULER'S THEOREM ON HOMOGENEOUS FUNCTIONS,

$$F(L,k) = \frac{\partial F}{\partial L}.L + \frac{\partial F}{\partial K}.K\,,$$

which, again by the homogeneity of $F(L,K)$, may be rewritten in *per capita* terms as:

$$f(k) = \frac{\partial F}{\partial L} + \frac{\partial F}{\partial K}.k\,.$$

Therefore, by recalling $\dfrac{\partial F}{\partial K} = \dfrac{\partial}{\partial K}\left\{ f\left(\dfrac{K}{L}\right).L \right\} = f'(k)\dfrac{1}{L}.L = f'(k)$,

$$\frac{\partial F}{\partial L} = f(k) - f'(k).k\,.$$

Now back to the main line of proof,

$$\begin{aligned} \frac{d}{dk}\left(\frac{\dot{k}}{k}\right) &= \frac{d}{dk}\left\{ \frac{sf(k)}{k} - (n+\tau) \right\} \\ &= \frac{s\left\{ f'(k).k - f(k) \right\}}{k^2} \\ &= \frac{s\left(-\frac{\partial F}{\partial L}\right)}{k^2} \;<\; 0\,. \qquad \blacksquare \end{aligned}$$

- *"Knife-Edge" Instability Property*: Despite starting with $g < g_w$, $s \longrightarrow \Longrightarrow g \longrightarrow$ throughout, and especially after the 2011 East Japan Earthquake $s \Big\downarrow \Longrightarrow g \Big\downarrow$.

9.1.6 Necessity of Investments in IT Infrastructures and Human Investments

1. Physical depreciations plus technological obsolescences of capital becoming larger due to the rapid innovation, especially so with IT Infrastructures.

2. With the advent of societal aging, investment should be funneled to such areas as IT Infrastructures and Human Investments, which contribute to the improved labor productivities of future generations.

More discussion will be in order in **11.5.2**.

9.1.7 Household Wealth Portfolio

Household Wealth Exclusive of Land:

Ending Balance of Japanese Households' Financial Assets, and their Ratio to GDP

Year	**Ending Balances** (Trillion ¥'s)	**Ratios to GDP** (%)
1995	1,269	253.6
2000	1,423	277.3
2005	1,502	298.4
2010	1,481	309.1

International Comparisons of Portfolio Compositions of Households' Financial Assets (2011)

Financial Assets	**Japan**	**US**	**Euro Area**
Cash, Savings	56.0%	14.5%	35.4%
Bonds	2.5	10.2	7.5
Equities	3.1	11.7	7.1
Stocks, Shares	5.6	30.9	16.1
Insurances, Pensions	28.6	8.9	30.7
Others	4.2	3.7	3.0

Household Wealth Inclusive of Land:

Household Wealth, as Multiples of Household Disposable Income, Japan and the US, 1980

Itemized Wealth	**Japan**	**US**
Land	2.90	0.33
Reproducible Assets	0.98	1.22
Financial Assets	1.99	3.06
Fixed-Claim	1.59	1.22
Equities	0.41	1.83
Corporate	0.16	0.56
Others	0.25	1.27
Total Assets	5.85	4.61
Liabilities	0.76	0.81
Net Worth	5.11	3.80

9.1.8 Comparison of Interest Rates

- "Loanable Funds Theory": Interest rate r, as determined by

$$\Longleftarrow \begin{cases} \text{Saving (Availability of Investment Funding)}: \ S(r;\, Y)\,, \\ \\ \text{Investment (Abundance of Investment Opportunities)}: \ I(r)\,. \end{cases}$$

- Influences from government policies

$$\begin{cases} \text{Monetary Policies, e.g., } S(r\downarrow;\, Y) \Big\Uparrow\,, \\ \\ \text{Fiscal Policies, e.g., } G\uparrow \Longrightarrow \text{ (via "Crowding} - \text{Out") } I(r) \Big\Downarrow\,. \end{cases}$$

Chronology of "Bank Rates": Base Discount Rate/Base Lending Rate (Bank of Japan; After Sept. 1994. Formerly, Prime Lending Rate); Federal Funds Rate (Federal Reserve Banks); Bank Rate (Bank of England); Key ECB Interest Rate (European Central Bank; Main Refinancing Operations, Fixed Rate); Base Interest Rate (People's Bank of China).

Chronology of Bank Rates
for a Selection of Countries (%)

Years	**Japan**	**US**	**UK**	**Germany France Italy**	**China**
1975	7.25	13.0	14.0	(G.) 3.50 (F.) 8.00 (I.) 6.00	
1980	7.25	13.0	14.0	(G.) 7.50 (F.) 9.50 (I.)16.50	
1985	5.00	7.50	11.31	(G.) 4.00 (F.) 9.50 (I.)15.00	
1990	6.00	6.50	13.88	(G.) 6.00 (F.) 9.25 (I.)12.50	**Apr. 1991 -** 8.64
1995	0.50	5.25	6.38	(G.) 3.00 (F.) 4.45 (I.) 9.00	12.06

Annual Chronology, after 1999

Year	Japan	US	UK	EC[35]	China
1999	0.25 (Feb.) 0.15	4.75 (June) 5.00 (Aug.) 5.25 (Nov.) 5.50	6.25 (Jan.) 6.00 (Feb.) 5.50 (Apr.) 5.25 (June) 5.00 (Sept.) 5.25 (Nov.) 5.50	3.00 (Jan. 4) 2.75 (Jan. 22) 2.00 (Apr.) 1.50 (Nov.) 2.00	6.39 (June) 5.85
2000	(Aug.) 0.25	(Feb.) 5.75 (Mar.) 6.00 (May) 6.50	(Jan.) 5.75 (Feb.) 6.00	(Feb.) 2.25 (Mar.) 2.50 (Apr.) 2.75 (June) 3.25 (Sept.) 3.50 (Oct.) 3.75	5.85
2001	(Feb.) 0.15	(Jan.) 5.50 (Mar.) 5.00 (Apr.) 4.50 (May) 4.00 (June) 3.75 (Aug.) 3.50 (Sept.) 3.00 (Oct.) 2.50 (Nov.) 2.00 (Dec.) 1.75	(Feb.) 5.75 (Apr.) 5.50 (May) 5.25 (Aug.) 5.00 (Sept.) 4.75 (Oct.) 4.50 (Nov.) 4.00	(May) 3.50 (Aug.) 3.25 (Sept.) 3.75 (Nov.) 2.25	5.85
2002	0.15	(Nov.) 1.25	4.00	(Dec.) 1.75	5.31
2003	0.15	(June) 1.00	(Feb.) 3.75 (July) 3.50 (Nov.) 3.75	(Mar.) 1.50 (June) 1.00	(Jan.) 5.31
2004	0.15	(June) 1.25 (Aug.) 1.50 (Sept.) 1.75 (Nov.) 2.00 (Dec.) 2.25	(Feb.) 4.00 (May) 4.25 (June) 4.50 (Aug.) 4.75	1.00	(Oct.) 5.58

[35] From 1999, Germany, France and Italy are consolidated into EC.

(Continued)

Year	Japan	US	UK	EC	China
2005	0.15	(Feb.) 2.50 (Mar.) 2.75 (May) 3.00 (June) 3.25 (Aug.) 3.50 (Sept.) 3.75 (Nov.) 4.00 (Dec.) 4.25	(July) 4.50	(Dec.) 1.25	5.58
2006	(July) 0.25	(Jan.) 4.50 (Mar.) 4.75 (May) 5.00 (June) 5.25	(Aug.) 4.75 (Nov.) 5.00	(Mar.) 1.50 (June) 1.75 (Aug.) 2.00 (Oct.) 2.25 (Dec.) 2.50	(Sept.) 6.12
2007	(Feb.) 0.50	(Sept.) 4.75 (Oct.) 4.50 (Dec.) 4.25	(Jan.) 5.25 (May) 5.50 (July) 5.75 (Dec.) 5.50	(Mar.) 2.75 (June) 3.00	(Mar.) 6.39 (May) 6.57 (July) 6.84 (Aug.) 7.02 (Sept.) 7.29 (Dec.) 7.47
2008	(Oct.) 0.30 (Dec.) 0-0.1	(Dec.) 0-0.25	(Feb.) 5.25 (Apr.) 5.00 (Oct.) 4.50 (Nov.) 3.00 (Dec.) 2.00	(July) 3.25 (Oct.) 3.25 (Nov.) 2.75 (Dec.) 2.00	(Sept.) 7.20 (Oct.) 6.66 (Nov.) 5.58 (Dec.) 5.31
2009	0-0.1	0-0.25	(Mar.) 0.50 (Feb.) 1.00 (Mar.) 0.50	(Jan.) 1.00 (Mar.) 0.50 (Apr.) 0.25 (May) 1.00	5.31

(Continued)

Year	Japan	US	UK	EC	China
2010	0-0.1	0-0.25	0.50	0.25	5.81 (Oct.) 5.56 (Dec.) 5.81
2011	0-0.1	0-0.25	0.50	(Apr.) 0.50 (July) 0.75 (Nov.) 0.50 (Dec.) 0.25	(Feb.) 6.06 (Apr.) 6.31 (July) 6.56
2012	0-0.1	0-0.25	0.50	(July) 0.00	(June) 6.31 (July) 6.00
2013	0-0.1	0-0.25	0.50	0.00 (Nov.) 0.25	6.00
2014	0-0.1	0-0.25	0.50	(June) **-0.10** (Sept.) **-0.20**	(Nov.) 5.60
2015	0-0.1	(Dec.) 0.50	0.50	(Dec.) **-0.30**	(Mar.) 5.35 (May) 5.10 (June) 4.85 (Aug.) 4.60 (Oct.) 4.35
2016	(Feb.) **-0.10**	0.50	0.50	(Mar.) **(-0.40)**	4.35

Recent Experiences of Negative Interest Rates Elsewhere: Repo (short for *Repurchase Agreement*) Rate (Swedish Central Bank); 3 Month LIBOR (London Interbank Offered Rate) Target Rate (Swiss National Bank); Certificate of Deposit Rate (Danish Central Bank); Central Bank Base Rate (National Bank of Hungary)

Relevant countries, other than Japan and the EC, are listed below in the ascending order from the lowest bank rate as of January 2016 (As Danish Bank Rate, the Lending Rate 0.05 is applied instead.in the ranking):

Annual Chronology of Bank Rates,
Switzerland, Sweden, Denmark and Hungary

Year	**Switzerland**	**Sweden**	**Denmark**	**Hungary**
2014	**Aug. 2011 -** 0 (Dec.) **-0.75**	**Dec. 2013 -** 0.75 (July) 0.25 (Oct.) 0	**Jan. 2013 -** **-0.10** (Apr.) 0.05 (Sept.) **-0.05**	**Dec. 2013 -** 3.00 (Jan.) 2.85 (Feb.) 2.70 (Mar.) 2.60 (Apr.) 2.50 (May) 2.40 (June) 2.30 (July) 2.10
2015	(Jan.) **-1.25**	(Feb.) **-0.10** (Mar.) **-0.25** (July) **-0.35**	(Jan.) **-0.20** (Feb.) **-0.75**	(Mar.) 1.95 (Apr.) 1.80 (May) 1.65 (June) 1.50 (July) 1.35
2016	**-1.25**	**-0.35**	(Jan.) **-0.65**	(Mar.) **-0.05**

Remark: Comparisons of timing and frequency of revisions in Bank Rates reveal the responsiveness of the Central Bank authorities in different countries.

Also, it is apparent that almost nothing further can be done to tame the economy, when the Bank Rates reach hyper-low or 0 (Such an *inoperable pitfall* used to be referred to as a "*Liquidity Trap*".).

Especially, an adoptions of *negative* Bank Rate is tantamount to losing accelerators and brakes to maneuver a national economy through difficult times, just leaving the economy to drift its own course.

9.2 Monetary Policies

9.2.1 Conventional Monetary Policies

- Control Money Supply M_2 (Deposit Money)
  - Raise (or lower) the *Reserve Requirement* on deposits
  - Raise (or lower) the *Discount Rate*

- (Until the Third Qtr. of 1991) By *Guidances at the Windows*, funnel the money supply to specific investment purposes

- (After 1975) Government Bond Market
  - Repurchase or Contingent Purchase (*gensaki*) Market
    (Flow of corporate surplus funds from fixed term deposits)

- Interest Rate Arbitrage
  - Among domestic markets
  - Between domestic and foreign markets

9.2.2 Hyper-Low or Zero Interest Rate Policy (February 1999 -)

⟶ For the actual Chronology of "Bank Rates," refer to the preceding **9.1.8**.

⟶ For the scope and the progress of the disposition of non-performing loans, refer to **Section 1.2**.

⟶ The influence of this policy on the foreign currency market will be discussed in some detail in the subsequent **10.2.6**.

9.2.3 Unconventional Monetary Policy, or "Unprecedented" Monetary Expansion (December 2012 -), Strengthened by a "Negative" Interest Rate (February 2016 -)

⟶ For the actual Chronology of "Bank Rates," refer to the preceding **9.1.8**.

REMARK (*Significance of a "Negative Interest Rate" for a "Non-Welfare State"*): Finding such "Welfare States" as Sweden, Denmark and Switzerland among countries with negative Bank Rates is *not* a consolation for Japan.

In "Non-Welfare States," where the pension system is not designed to sufficiently support the recipients' lives after retirement, personal savings are important means to supplement insufficient pension scheme.

Negative interest rates triggered by the negative Bank Rate can have such adverse effects as:

- Distorting the personal intertemporal choice and the resultant saving behavior (⟶ REMARK (*Non-Sustainability*) in the subsequent **11.3.1**.);
- Cutting off the expected income stream of interest payments to supplement insufficient pension income, thus possibly generating the need for more sufficient pension schemes, in contradiction to "Smaller" Governments;
- Resulting drops in savings causing instability in the dynamic economic growth context (⟶ **9.1.5**.).
- With an *extreme* possibility of losing confidence in central bank currencies looming on the horizon, accompanied by substitutes demands for
  - "Virtual (or Digital) Currencies" such as Bitcoins, and Local Currencies, etc., as alternative means of transactions[36], or
  - Precious Metals as alternative means for hording assets (*Already happening!*).

9.3 Segmentations of the Financial System

3 Types of Segmentations:

1. Long vs. Short Term Finance (**9.3.1**)
2. Deposit Banking vs. Trust Businesses (**9.3.2**)
3. Banking (i.e., Financial Intermediation) vs. Security Business (**9.3.3**)

Actual Financial Institutions:

- Commercial banks
  - Deposits for collecting funds ⟶ Short-term lending.

[36] **(Added on June 20, 2016:)** As of June 10, 2018, Mitsusbishi UFJ Bank, one of the mega-banks in Japan, announced its plan to issue its own Virtual Currency by the name of "MUFJ Coins" so soon as Autumn 2019. One day prior to this announcement, the same maga-bank had revealed that it might no longer honor the preassigned allotment of newly issued Government Bonds in face of the negative Bank Rate introduced by the Central Bank of Japan.

- Long-term credit banks, Trust banks
  - Financial debentures, trust account $\longrightarrow$ Long-term financing.
- Banks are forbidden to engage in the securities exchanges except for public bonds $\longrightarrow$ Securities companies.

9.3.1 Long vs. Short Term Finance

Ministry of Finance: Administrative Guidance concerning the maximum maturity on commercial banks' deposits
- Up to 3 years, "Fixed-date" time deposits.

9.3.2 Deposit Banking vs. Trust Businesses

In accordance with the distinction between short- and long-term financings
- Similar to the US, the so-called "Chinese Wall,"

9.3.3 Financial Intermediation vs. Security Business

Higher stability demanded of commercial banking
- Equities or long-term securities s.t. fluctuations in prices
- Similar to the US or UK.

- Exchange control: Regulations on international transactions $\longrightarrow$ Immunity of domestic financial markets from the foreign influences.
- After the 1927 Financial Crisis, Collateral Requirements $\longrightarrow$ Safety of transactions
  - Financial transactions, such as corporate debenture issues, bank lending, and interbank transactions, require the provision of collateral.

9.3.4 (Life) Insurance Business

2 Kinds of Insurances:

1. Term Insurance;
2. Survival Insurance: Savings Insurance, Individual Pension Insurance
   - Payment made if the insured survives a set period.

Investments of Life Insurance Companies: In addition to: Insurance premiums $\longrightarrow$ Contractual insurance payments,

1. Institutional suppliers of industrial funding;
2. Institutional investors in securities market.
   - Safe and secure investment
     $\longleftarrow$ Government bonds of Japanese and foreign governments,
     Municipal governments bonds,
     Government guaranteed bonds.

REMARK (STYLIZED FACT *about Japanese Financial Market before the "Big Bang"*):

- Dependent on professional assessments of the corporate performances
  - Reversal of *external* and *internal* financing from the corporates' view point;
  - Reversal of *indirect* and *direct* financing from from the investors' view.
- Rigid collateral requirement.

$\Longrightarrow$ Stable financial system.

9.3.5 Promotion of Transition from "Indirect" to "Direct" Financing through *Equity Financing*

(1987) Entitling Commercial Banks other than Long-Term Credit Banks to issue Corporate Bonds Convertible to Stocks $\Longrightarrow$ Improve corporates' Equity Ratios.

(1987 - 1989) Boom in Issuance of Stocks at Market Price.

(1988) Deregulation (approved in 1985) on Issuance of Corporate Stocks with an entitlement to Corporate Convertible Bonds or with a "Warrant" to purchase Stocks.

9.3.6 Financial "Big Bang" after the Burst of the Economic Bubbles

$\longrightarrow$ For a detailed discussion, refer to **Section 3.9**.

9.3.7 Postal Savings and Insurances

$\longrightarrow$ For a detailed discussion, refer to **3.9.2**.

REMARK (STYLIZED FACT *about Japanese Financial Market after the "Big Bang"*):

- Direct participation of investors
  - Shift from *internal* to *external* financing from the corporates' view point;
  - Shift from *indirect* to *direct* financing from the investors' view.

  $\longrightarrow$ This direct subjection to investors' assessments also applies to the replacement of the funding from the Postal Savings and Insurances by the issuance of Government Bonds to finance the Government Investment Account after the privatization of Japan Postal Services and Savings in 2007.
- BIS Requirements on Collaterals.

$\Longrightarrow$ Conformity with the "Global Standard" of financial system.

9.4 Fiscal Policies

Some Recent Characteristics:

- **Chronic dependence on Deficit-Financing Government Bonds**;
- Second-Best "Primary Balance" and the resultant cumulation of Consol-like Government Bonds;
- "Efficiency" considerations of Government Investments;
- Societal Aging $\longrightarrow$ Needs for Tax and Social Security Reforms;
- Central vs. Municipal Governments: Their Revenues and Expenditures.

9.4.1 A Summary of Government Expenditures/Revenues

Itemized Government Expenditures, Government Investments and Issuance of Government Bonds (In Thousand Billion ¥'s (In %))

	1947 ⋮ 1964	1965	1975	1985	1990
Social Securities		5,183(14.2)	39.282(18.5)	95,736(18.2)	116,148(17.5)
Education and Science Promotion		4,751(13.0)	25,921(12.2)	48,409(9.2)	51,128(7.7)
Government Bonds-Related		220(0.6)	10,394(4.9)	102,242(19.5)	142,885(21.6)
Veterans' Pensions		1,693(4.6)	7,558(3.5)	18,637(3.5)	18,375(2.8)
Local Government Subsidies		7,162(19.6)	44,301(20.8)	96,901(18.5)	152,750(23.0)
National Defense		3,014(8.2)	13,273(6.2)	31,,371(6.0)	41,593(6.3)
Public Projects			49,743(5.4)	63,689(12.1)	74,447(11.2)
Economic Cooperations		271(0.7)	1,926(0.9)	5,863(1.1)	7,844(1.2)
Small Business Assistance		217(0.6)	1,273(0.6)	2,162(0.4)	1,943(0.3)
Energy		- (-)	884(0.4)	6,288(1.2)	5,475(0.8)
Food Reserves		1,055(2.9)	9,086(4.3)	6,957(1.3)	3,952(0.6)
Others		5,182(14.2)	26,870(12.6)	43,245(8.2)	41,622(6.3)
Adjustments		500(1.4)	3,000(1.4)	3,500(0.6)	3,500(0.5)
Total		36,581(100)	212,888(100)	524,966(100)	662,367(100)
Issue of Government Bonds (Dependency Rate)	Balanced Budget	1,972(5.3)	52,805(25.3)	123,080(23.2)	73,120(9.2)
Deficit-Financing Bonds		-	20,905	60,050	(9,689 [37])
Outstanding Balance (Ratio to GDP)		2,000(0.6)	149,731(9.8)	1,344,314(41.1)	1,663,379(37.0)
Government Investments (Rate of Increase)		16,206(20.9)	93,100(17.5)	208,580(-1.2)	345,724(7.1)
Issue of Refunding Bonds[38]					186,532
Outstanding Balance of Municipal Bonds (R.o.I.)			140.078(63.0)	572.015(4.1)	670,459(2.2)

(Continued)

	1995	2000	2005	2010
Social Securities	139,244(19.6)	168,232(19.8)	203,807(24.7)	272,686(29.6)
Education and Science Promotion	60,764(8.5)	55,100(6.0)	57,235(6.7)	55,860(6.0)
Government Bonds-Related	132,213(18.6)	215,491(23.3)	184,422(22.4)	206,491(22.3)
Veterans' Pensions	17,266(2.4)	14,256(1.7)	10,692(1.2)	7,144(0.8)
Local Government Subsidies	132,154(18.6)	167,845(18.2)	145,709(17.6)	170,945(18.4)
National Defense	47,236(6.6)	49,358(5.8)	48,564(5.8)	47,903(5.1)
Public Projects	92,398(13.0)	94,324(11.1)	75,310(9.1)	57,730(6.2)
Economic Cooperations	10,351(1.4)	9,842(1.2)	7,404(0.8)	5,822(0.6)
Small Business Assistance	1,857(0.3)	1,949(0.2)	1,730(0.2)	1,911(0.2)
Energy	6,819(1.0)	6,352(0.7)	4,954(0.6)	8,420(0.9)
Food Reserves	2,723(0.4)	6,863(0.8)	6,755(0.8)	11,599(1.2)
Others	50,534(7.0)	1,595(0.2)	52,167(6.3)	61,968(6.7)
Adjustments	3,500(0.5)	3,500(0.4)	3,500(0.4)	3,500(0.4)
Total	709,871(100)	849,871(100)	821,829(100)	922,992(100)
Issue of Government Bonds (Dependency Rate)	212,470(24.2)	330,040(36.9)	312,690(36.6)	423,030 (44.4)
Deficit-Financing	28,511	218,660	235,070	347,000
Outstanding Balance (Ratio to GDP)	2,251,847(44.6)	3,675,547(72.0)	5,269,279(104.3)	6,363,117(132.5)
Government Investments (Rate of Increase)	402,401(2.1)	382,855(-4.6)	171,518(-16.3)	183,569(15.7)
Issue of Gov. Invest. Bonds[39]	-	-	282,494	155,000
Outstanding Balance	-	-	2,996,000	1,181,918
Issue of Refunding Bonds	253,767	532,605	1,055,195	1,026,109
Outstanding Balance of Municipal Bonds (R.o.I.)	465,011(18.1)	595,464(3.3)	1,400,516(-0.4)	1,421,255(1.7)

(Continued)

	2011	2012	2013	2014
Social Securities	287,079(31.1)	263,901(29.1)	291,224(31.4)	305,175(31.8)
Education and Science Promotion	65,370(7.7)	54,057(5.9)	53,687(5.7)	54,421(5.6)
Government Bonds-Related	219,653(25.8)	219,442(24.2)	222,415(24.0)	232,702(24.2)
Veterans' Pensions	6,434(0.7)	5,712(0.6)	5,044(0.5)	4,443(0.5)
Local Government Subsidies	149,304(17.6)	164,665(18.1)	162,672(17.5)	160,232(16.7)
National Defense	47,752(5.2)	47,138(5.2)	47,538(5.1)	48,848(5.1)
Public Projects	49,743(5.4)	45,734(5.0)	52,853(5.7)	59,685(6.2)
Economic Cooperations	5,298(0.6)	5,216(0.6)	5,150(0.6)	5,098(0.5)
Small Business Assistance	1,969(0.2)	1,802(0.2)	1,811(0.2)	1,853(0.2)
Energy	8,559(0.9)	8,202(0.9)	8,496(0.9)	9,642(0.1)
Food Reserves	11,587(1.3)	11,041(1.2)	10,539(1.1)	10,507(1.0)
Others	63,759(6.9)	71,653(7.9)	59,931(6.5)	61,527(6.4)
Adjustments	3,500(0.4)	3,500(0.4)	3,500(0.4)	3,500(0.4)
Total	924,116(100)	903,339(100)	926,115(100)	958,823(100)
Issue of Government Bonds (Dependency Rate)	427,980(42.5)	474,650(48.9)	408,510(40.8)	404,929(40.9)
Deficit-Financing	344,300	360,360	338,370	339,159
Outstanding Balance (Ratio to GDP)	6,698,674(141.4)	7,050,072(148.6)	7,438,676(154.0)	7,740,831(157.5)
Issue of Restoration Bonds[40]	112,500	23,033	-	10,970
Outstanding Balance	106,529	103,283	90,135	93,783
Government Investments (Rate of Increase)	149,059(-18.8)	176,000(18.1)	184,000(4.5)	162,000(-12.0)
Issue of Gov. Invest. Bonds	140,000	150,000	110,000	160,000
Outstanding Balance	1,109,122	1,092,607	1,042,104	984,958
Issue of Refunding Bonds	1,112,963	1,123,050	1,121,806	1,221,495
Outstanding Balance of Municipal Bonds (R.o.I.)	1,432,319(0.8)	1,447,052(1.0)	1,459,171(0.8)	

(Continued)

	2015
Social Securities	315,297(32.7)
Education and Science Promotion	53,613(5.6)
Government Bonds-Related	234,507(24.3)
Veterans' Pensions	3,932(0.4)
Local Government Subsidies	154,169(16.0)
National Defense	49,801(5.2)
Public Projects	59,710(6.1)
Economic Cooperations	5,064(0.5)
Small Business Assistance	1,856(0.2)
Energy	8,985(0.1)
Food Reserves	10,417(1.0)
Others	61,379(6.4)
Adjustments	3,500(0.4)
Total	963,420(100)
Issue of Government Bonds (Dependency Rate)	368,630(38.3)
Deficit-Financing	308,600
Outstanding Balance (Ratio to GDP)	8,070,911(159.8)
Issue of Restoration Bonds	28,625
Outstanding Balance	102,543
Government Investments (Rate of Increase)	146,000(-9.9)
Issue of Gov. Invest. Bonds	140,000
Outstanding Balance	984,958
Issue of Refunding Bonds	1,162,986
Outstanding Balance of Municipal Bonds (R.o.I.)	

[37] In order to complete diversion from the chronic dependence on deficit-financing bonds by the targeted 2005, "Temporary Bonds" replaced this. No deficit-financing bonds were issued till 1993.

[38] Refunding bonds used to be applicable only to "Constructive Bonds". However, after 1985, this refinancing was approved for Deficit-financing Bonds as well.

[39] No government investment bonds were issued before 2000..

[40] Intended to help restore the destructions caused by the Eastern Japan Earthquake. on March 11, 2011.

9.4.2 "Size" of the Government

"Size" of the Government as measured in terms of government expenditures.

- After 1975, greater need for public goods to improve amenities
- After 1985, with the burst of economic bubble in the late 1980's, yet greater needs for restoration of the economy
- After 2011, additional needs for restorations and recoveries from the East Japan Earthquake
- Strong concern about the hike in defense expenditure, likely to exceed 1% of GDP after 2016,

9.4.3 Social Security System in Aging Societies

- In the 70's the actual increase in eligible elderlies lagged behind the introduction of the Social Security System
  $\Longrightarrow$ Small number of elderlies satisfying eligibility requirement
  $\Longrightarrow$ Thus, sustaining the small size of the government.
  - "Separate" Social Security Account from the General Account, Bare Surplus $\longrightarrow$ Deficit financed from the G.A.
  - "Pay-as-You-Go" Social Security System (Intergenerational income transfer) $\longleftrightarrow$ "Cumulative Contributions" S.S. System
- "Deficit-Financing Bonds" vs. "Construction Bonds"
- National Debt and the Intergenerational Disparities: "Burdens on the Future Generations"

9.4.4 Tax Reform in an Aging Economy (Includes: THEORETICAL ANALYSIS (*).)

Historical Backgrounds:

- **Shoup's Recommendation on Reliance on the Direct (Income) Tax (1949):** Shoup, Carl Sumner (1902-2000)
  - Progressive Income Taxation is suitable for a recovery/growth economy $\Longrightarrow$ May yield a "Natural" increase in tax revenues
    $\longrightarrow$ After 1989, shift to Indirect (Consumption) Tax to secure tax revenues in an aging society.

Direct vs Indirect Compositions of National Tax Revenues

Japan	1934-36	1941	1955	1965	1975	1985	1990	1995	2000	2005	2010
Direct Tax	34.8%	64.1	51.4	59.2	69.3	72.8	73.7	66.1	61.3	60.3	56.3
Indirect Tax	65.2%	35.9	48.6	40.8	30.7	27.2	26.3	33.9	38.7	39.7	43.7

(2000)	US	UK	Germany	France
Direct Tax	93.3%	57.8	47.4	43.3
Indirect Tax	6.7%	42.2	52.6	56,7

Direct vs Indirect Compositions of the
Total of National and Municipal Tax Revenues

Japan	1955	1965	1975	1985	1990	1995	2000	2005	2010	2012
Direct Tax	59.7	65.1	74.1	77.6	79.3	74.4	70.0	69.5	68.7	69.3
Indirect Tax	40.3	34.9	25.9	22.4	20.7	25.6	30.0	30.5	31.3	30.7

(2012)	US	UK	Germany	France
Direct Tax	77%	57	52	54
Indirect Tax	23%	43	48	46

Tax Revenues (National and Municipal)
As % of GNP

	1965	**1983**	**1990**	**2000**	**2010**
Tax Only	14.4	19.2	27.6	23.7	21.5 %
Including Social Security Contributions	18.4	27.2	38.2	37.3	39.0 %

. Comment: Increases in revenues between 1965 and 1983 are due to the "Natural" (Unpredicted) Increases in Income Tax Revenues ($\Longleftarrow$ *Progressive* 'nature of income tax and the 'Bracket Creep"); and social security contributions.

- Japanese income taxes are "levied at the source", and pre-collected by the employers upon payment on behalf of the Internal Revenue Service, and under limited circumstances may be confirmed or consolidated individually upon taxpayers' filings.

Occupational Discrepancies
of Real Tax Burdens

Salaried Employees	9	10	Taxed at the source.
Self-Employed	6	5	Self-Filing
Farmers	4	3	Self-Filing
Politicians		1	Lots of Evasive Means!

Remark: *Occupational Disparities* are summarized by the ratios "9 : 6 : 4" (pronounced as *ku-ro-yon*), whose homonym is short for *kurobe-(dai)yon-damu* (the Fourth Reserver Dam of the Kurobe River, well-known for its hydroelectric mega-power plant), or "10 : 5 : 3" (pronounced as *toh-go-san*), homonymously to "Honorable Tohgo", the Meiji-Period Japanese Navy Admiral.

- The 1989 Tax Reform should have contributed to alleviation of these Occupational Disparities when viewed as the burdens of the total of income and consumption taxes.
- Controversial assignment in 2016 of "My Numbers" to every tax payer/pension contributor (recipient), comparable to the Social Security Numbers in the US will enable the government to grasp the individual income more accurately, thus will alleviate these Occupational Disparities.

THEORETICAL ANALYSIS (*): [41]

(*i*) *Combine the raise in consumption tax and the cut in income tax simultaneously in order to minimize the newly incurred tax burden, or to achieve the tax reform with no additional tax burden, in particular.*

(*ii*) *Despite the inevitable advent of societal aging, induce an increase in domestic investments that will contribute to increasing productivities of future generations, and to alleviating intergenerational disparities.*

(*iii*) *Augment the domestic demand to achieve moderate economic growth without causing international frictions associated with the alternative export-oriented economic growth.*

Representative Consumer (*cum* Taxpayer): Chooses the "consumption mix" (C, I) consisting of the present consumption C and the future consumption, realized through saving and investment I.

- *Time Preference*[42]: $U(C, I)$;
- Given the disposable income $Y - T$ after the income tax T is deducted, the *pre-tax* prices (p, q)[43] of (C, I), and the the rate of consumption tax t, her *budget constraint* is: $(1 + t)pC + qI \leq Y - T$;
- *Subjective Equilibrium Choice*[44] (C^*, I^*) solves:

$$\max U(C, I) \text{ s.t. } (1 + t)pC + qI \leq Y - T$$

$$\Longrightarrow \; MRS(C, I) = 1 + \rho(C, I) = \frac{p}{q}$$

A Design of Optimum Taxation: The tax reform of shift from the income taxation to the consumption taxation, as prescribed by the *Compensating Variations Principle*, realizes the following desirable properties.

(a) Raise in the consumption tax rate $\left(t\left(\uparrow\right)\right)$ coupling simultaneously with the cut in the income tax $\left(T\left(\downarrow\right)\right)$ to the extent prescribed by the *Hicksian Income Compensation*. Then, the representative consumer is free from any additional tax burden throughout the proposed tax reform.

[41] For the complete account, refer to:

NOMURA, Yoshimasa (1992): "A Heuristic Exposition of the 'Consumption Tax Controversy'." *Economic Journal of Chiba University*, Vol. 7, No. 1, 55-87.

[42] Let $\rho(C, I)$ denote the *subjective discount rate*. Then, $MRS(C, I)$ corresponding to $U(C, I)$ is equal to $1 + \rho(C, I)$.

[43] Let r be the interest rate. Then, $p = (1 + r)q$ in a *stationary state* .

[44] $\rho(C, I) = r$ for *stationary* subjective equilibrium.

(b) The proposed tax reform *always* induces an increase in investment by the *Substitution Effect*.

(c) The total value of the domestic demands $GDD = pC + qI$ evaluated by the pre-tax-reform prices are easily checked to increase after the proposed tax reform.

9.4.5 Chronic Dependence on Deficit-Financing Bonds

Financing the fiscal deficits by selling the government bonds *virtually to the central bank*

1949 - 65: Balanced budget policy

After 1965: Issuance of long-term government bonds

After 1975: "Oil Shocks" and the subsequent economic slowdowns $\Longrightarrow$

- Drop in tax revenues due to drop in corporate tax revenues
- Greater demand for public investments
- Improved Social Security System

$\Longrightarrow$ Government deficit

After 2012, purchase of Government Bonds by the central bank - in excess of newly issued amount

- "Primary Balance" $\longleftarrow$ Deficit financing government bonds are included in the General Account revenues; Also redemption and dividend costs are included in the G.A. expenditures.
  - "Primary Balance" as a "Second-Best" concession to the Balanced Budget, which stipulates balancing the government expenditures other than the G.B.-related expenses with the tax revenues, while the G.B.-related expenses are to be financed by yet equivalent issuance of deficit-financing G.B.'s.
  - Repeating issuance of finite-term G.B.'s infinitely many times, virtually making them functionally identical to "Consols".

9.4.6 Efficiency Considerations of Government Investments

2000 - : "Reforms of Budgeting Government Investments"

1. New Funding Sources of Government Investments

   Allocations of deposits to Postal Savings and premium revenues of governmental pension plans via Funding Section of the Ministry of Treasury to Government Investments subsidiaries under favorable terms than the private fundings.

   $\longrightarrow$ Securitization, i.e., funding via financial markets.

   In reality, via the following "Bypath", i.e., the Treasury Ministry intervenes by selling government-insured Government Investment Bonds collectively, instead of each government investment subsidiaries selling its own G.I. Bonds, and allocating loans to G.I. subsidiaries via "Special Account of Government Investments".

2. Closings of such Government Investment Subsidiary Agents as Petroleum Corporation, and Highway Transportation Corporation, etc.

3. Privatization of Japan Postal Services and Savings.

9.4.7 "Proper" Function of Intertemporal Exchanges (*)

[45]

Financial Market Model of 2-Period Consumption

Contingency: Distinguish the physically identical good by the date of delivery:

- **Intertemporal consumption bundle:** (C_1, C_2)
  Contingent of the date of delivery 1 and 2.
- **Income stream:** (Y_1, Y_2)
  (More generally, *Intertemporal "Production" Possibilities Curve* $T(Y_1, Y_2) = 0$)
- **Prices:** (p_1, p_2)
  The physically identical good is priced as p_1 for the delivery on the date 1, and p_2 for the delivery on the date 2.

When the market interest rate is r

- **Discounted Present Valuation (D.P.V.):** $(p_1, p_2) = \left(1,\ \frac{1}{1+r}\right)$;
- **Future Valuation (F.V):** $(p_1, p_2) = ((1+r),\ 1)$.

$\Longrightarrow$ The slope of the intertemporal budget line is: $\frac{p_1}{p_2} = (1+r)$.

Consumption Equilibrium (C_1^*, C_2^*) solves

$$\begin{aligned} &\max\ U(C_1, C_2) \\ \text{s.t.}\quad &C_1 + \left(\tfrac{1}{1+r}\right) C_2 = Y_1 + \left(\tfrac{1}{1+r}\right) Y_2 \ (\text{In } \mathbf{D.P.V.}) \\ &[or\ (1+r)C_1 + C_2 = (1+r)Y_1 + Y_2 \ (\text{In } \mathbf{F.V.})] \ . \end{aligned}$$

REMARK **("Proper" Function of Finance):** *Welfare comparison of before and after the Intertemporal Exchange implies*

$$U\left(C_1^*, C_2^*\right) > U\left(Y_1, Y_2\right) \ .$$

[45] "Proper" in the sense that *so long as* the government interventions do *not* cause the "Market Failures," much feared of the recent Government Bond Market, pointed out in **1.3**, and the subsequent **9.4.8** and **11.3**.

9.4.8 How to Pay for the Restorations from the East Japan Earthquake: Out of Tax Revenues or by Government Bonds

The tentative estimate of the restoration costs were ¥16.9 Trillion (Cabinet Office (June 24, 2011)), excluding the removal costs of the devastated Fukushima Nuclear Power Plant.

- Financial Sources for Restoration Expenses:

$$\begin{cases} \text{“Restoration Tax,”} \\ \quad \text{and/or} \\ \text{“Restoration Bonds,” which are } \textit{Constructive Bonds} \text{ in nature.} \end{cases}$$

In making the choice, the following considerations are crucial:

- Government Bonds are ingenious apparatuses for “postponing” the burdens to be incurred.
- More than 80% of the Japanese G.B. are purchased domestically. By Ricardo's Proposition on Debt Neutrality, so long as the Restoration Bonds are purchased within Japan, dividend payments before the redemption date, and the redemption payments themselves will improve Japanese future income stream.
  - In comparison with the proposed across-the-board 10% cut in Government employees' wages in violation of the Recommendations by the Government Personnel Office, payment of wages partly *in kind* so to speak, i.e. in Restoration Bonds, is more easily agreeable in labor negotiations.
  - In addition to restricting the sales of the Restoration Bonds to the domestic buyers, the allowed expenses funded by the sales of the Restoration Bonds should be delineated from the regular Government Expenditures.

9.4.9 Recent Government Bond Market

- Decline in Government Bond Prices, Summer and Autumn of 2002 and since July 2003 on: Lower market price of the government bonds $\Longleftrightarrow$ Higher interest rates
  - Despite the on-going Hyper-Low Interest Policy, or “Zero Interest Rate Policy,” which set the short-term interest rate at 0%, an expansion of the cumulative balance of government bonds drive the long-term interest rate upward.

(*i*) Market Supply of the Government Bonds $S(p;q)\Big\uparrow$ is increased by the amount of newly issued G.B's. $\Longrightarrow$ Rightward shift of $S(p;q)$ by the amount of newly issued G.B's.

(*ii*) Downward Revision of the Ranking of the Government Bonds $\Longrightarrow$ Market Demand for the G.B's. $D(p;q,Y)\Big\downarrow$, causing the leftward shift of $D(p;q,Y)$.

- Surfaced “Government Bond Bubble,” December 2002 to June 2003:

(i) Market Supply of the Government Bonds $S(p;q)\uparrow$ is increased by the amount of newly issued G.B's. $\Longrightarrow$ Rightward shift of $S(p;q)$ by the amount of newly issued G.B's.

(ii') An increase in the Market Demand for the Government Bonds $D(p;q,Y)\uparrow$ due to a sluggish Stock Market with lower stock price $q\downarrow$, thus creating an extra demand for the G.B's as substitutable asset from stocks, to the extent that dominates the negative effect on $D(p;q,Y)\downarrow$ due to the downward revision of the G.B's. ranking, as pointed out in (ii) above.

- "Sovereign Crisis" in GIIPS Countries (Greece, Italy, Ireland, Portugal and Spain), 2011 - :

Outstanding Balance of Government Bonds as Ratio to GDP (%), Selected Countries (Years)

Country (2010)	**Greece**	**Italy**	**Ireland**	**Portugal**	**Spain**
Ratio to GDP	149	126	98	103	67

(Continued)

Japan (Year)	**(2011)**	**(2012)**	**(2013)**	**(2014)**	**(2015)**
Ratio to GDP	141.4	148.6	154.0	157.5	159.8

"Punitive" Imputed Interest Rates on 10-Year Government Bonds (%), GIIPS Countries (2011)

Country	**Greece**	**Italy**	**Ireland**	**Portugal**	**Spain**
Interest Rates	35	7	14	14	7

- "Hollowing" of the Government Bond Market after December 26, 2012: Purchases of government bonds by the Central Bank of Japan on the scale of ¥80 trillion (> newly issued amount), virtually hollowed out the G.B. Market, with the ending possession balance exceeding ¥300 trillion, comprising more than 30 % of the outstanding balance as of August 2015.

  - Hidden "Government Bond Bubble" *in disguise*: "Unprecedented Monetary Release" by the Japan Central Bank $\Longrightarrow$ "Monopsonic" purchase of Government Bonds by the Bank of Japan, supporting the high G.B. prices which are otherwise destined to decline.
  - Further stimulated by the world-wide sluggish stock market as alternative portfolio assets.
  - Naturally, contractually obligatory redemptions of and dividend payments on the G.B.'s possessed by the Central Bank are likely to be the first to be suspended in case of imminent defaults. Thus, to make things even worse, high possession rates may well delay the revelation of the breach of contract to the general public.

- "*Forced* Failure of the Government Bond Market," after January 29, 2016: The G.B. Market is deprived of the function of price mechanism by the "Zero $\rightarrow$ Minus Interest Rate" instituted by the Central Bank of Japan, together with the above-noted its "Hollowing."

9.4.10 Threats from the Enlarging Cumulative Balance of Government Bonds (Includes: APPENDIX (*).)

1. Higher ratio of the expenditures on redemption and dividends payment for government bonds in the Government's General Account
   $\Longrightarrow$ "Rigidity of the Budget," closing out other government expenditure items of urgency

2. Aggravating intergenerational disparities $\Longleftarrow$ Asymmetric composition of benefit recipients and burden bearers, depending on whether government bonds are deficit-financing or constructive.

   - Issue of deficit-financing bonds are prohibited by law
     $\Longrightarrow$ The government evasively calls them "exceptional bonds," instead.

Intergenerational Disparities

Types	Generations	Benefit Recipients	Bearers of the Burden
Deficit-Financing Bonds	Present Generation	√	
	Future Generation		√
Constructive Bonds	Present Generation	√	
	Future Generation	√	√

- Restoration Bonds issued to help recover from the 2011 Eastern Japan Earthquake are classified as Constructive Bonds ($\longrightarrow$ **9.4.9**.).
- If the *lump-sum* cost of a transition from the "Pay-as-You-Go" to the "Cumulative Contributions" Systems is financed by issuance of Government Bonds in a future major reform of the ailing Social Security System ($\longrightarrow$ **9.4.4**.), then such G.B.'s may well be deemed as Constructive Bonds.

3. Lower market price of the government bonds $\Longleftrightarrow$ Higher interest rates[46]:
   - Contradictory to the Hyper-Low Interest Policy, or "Zero Interest Rate Policy" to salvage slugging economy.
   - Enlarging cumulative balance of bond issues *inevitably* drives up the long-term interest rates.
   - Despite the well-known "Ineffectiveness Postulate" of the Government Expenditure G *per se* as a policy measure in an open macroeconomic context, the issuance of debt-financing government bonds is similar to monetary policies in "effectively" influencing the international monetary equilibrium by driving up the interest rate, which in turn will raise the value of Yen[47].

[46] Refer for accurate accounts to the subsequent **APPENDIX: Non-Arbitrage Price of Government Bonds**.

[47] For the full macroeconomic adverse effect, refer to **10.3.3**.

APPENDIX: Non-Arbitrage Price of Government Bonds (*)

Eg. *Consols* or *Perpetuities*, with constant dividend payments over the infinitely many year horizon, i.e., infinite year maturity.

Suppose the long-term interest rate is constant at r, and the dividend from the consol is fixed at d over the infinite horizon. Given the time series (mathematically, time *sequence*, to be exact; or income "stream")

$$\left\{ \underbrace{d}_{\text{Paid 1 Year Later}} , \quad \underbrace{d}_{\text{Paid 2 Years Later}} , \quad \cdots , \quad \underbrace{d}_{\text{Paid } n \text{ Years Later}} , \quad \cdots \right\},$$

the *Discounted Present Value* of the above sequence is expressed as:

$$\left\{ \underbrace{\frac{d}{1+r}}_{\substack{\text{Present Value of } d \\ \text{Paid 1 Year Later}}} , \quad \underbrace{\frac{d}{(1+r)^2}}_{\substack{\text{Present Value of } d \\ \text{Paid 2 Years Later}}} , \quad \cdots , \quad \underbrace{\frac{d}{(1+r)^n}}_{\substack{\text{Present Value of } d \\ \text{Paid } n \text{ Years Later}}} , \quad \cdots \right\}.$$

A horizontal comparison of each double-row of the following TABLE is intended to help elucidate the nature of "discounting."

Consol with Dividend d vs. a Voucher of Deposits of Maturities a Year Separate Yielding the Identical Income Stream $\{d,\ d,\ \ldots\ ,\ d,\ \ldots\}$

***Present Value* of the Dividend d**	**d to Be Paid 1 Year Later**	**d to Be Paid 2 Years Later**	...	**d to Be Paid n Years Later**	...
$\dfrac{d}{1+r}$	d		...		...
Deposit 1-Year Maturity Saving in the Amount $\dfrac{d}{1+r}$	Value of the Principal and Interests Refunded at 1-Year Maturity d		...		...
$\dfrac{d}{(1+r)^2}$		d	...		...
Deposit 2-Year Maturity Saving in the Amount $\dfrac{d}{(1+r)^2}$	Value of the Principal and Interests Redeemable at the end of Year 1 $\dfrac{d}{1+r}$	Value of the Principal and Interests Refunded at 2-Year Maturity d	...		...
$\vdots$			$\vdots$		$\vdots$
$\dfrac{d}{(1+r)^n}$			...	d	...
Deposit n-Year Maturity Saving in the Amount $\dfrac{d}{(1+r)^n}$	Value of the Principal and Interests Redeemable at the end of Year 1 $\dfrac{d}{(1+r)^{n-1}}$	Value of the Principal and Interests Redeemable at the end of Year 2 $\dfrac{d}{(1+r)^{n-2}}$	...	Value of the Principal and Interests Refunded at n-Year Maturity d	...
$\vdots$			$\vdots$		$\vdots$

In order to materialize the future income stream $\left\{ \underbrace{d}_{1 \text{ Year Later}}, \underbrace{d}_{2 \text{ Years Later}}, \dots, \underbrace{d}_{n \text{ Years Later}}, \dots \right\}$, the following alternative portfolio options are conceivable[48]:

1. At the present point of time, purchase a consol and secure a flow of annual dividend d over the infinite horizon;

2. Given the annual interest rate r, purchase a voucher, "coupon book" of sort, of deposits, the first of which is 1 year maturity deposit with the face value at $\dfrac{d}{1+r}$, the second 2 year maturity deposit face-valued at $\dfrac{d}{(1+r)^2}$, $\dots$, the n-th n year maturity deposit face-valued at $\dfrac{d}{(1+r)^n}$, $\dots$, and secure the income stream

$$\left\{ \underbrace{\frac{d}{1+r} \times (1+r)}_{1 \text{ Year Later}}, \underbrace{\frac{d}{(1+r)^2} \times (1+r)^2}_{2 \text{ Years Later}}, \dots, \underbrace{\frac{d}{(1+r)^n} \times (1+r)^n}_{n \text{ Years Later}}, \dots \right\}$$

   by cashing each deposit upon maturity, to get one principal and interests payment annually into the infinite future.

In order for an investor to make an optimal portfolio choice, the above two options need to he equally lucrative, i.e., *at the same acquisition cost*: (*Option 1*) a consol and receive an infinite time sequence of annual dividend payment, on the one hand, and (*Option 2*) a voucher consisting of a 1-year maturity deposit, a 2-year deposit, $\dots$, an n-year maturity deposit, $\dots$, each with the face value of

$$\left\{ \underbrace{\frac{d}{1+r}}_{1-\text{Year Maturity}}, \underbrace{\frac{d}{(1+r)^2}}_{2-\text{Year Maturity}}, \dots, \underbrace{\frac{d}{(1+r)^n}}_{n-\text{Year Maturity}}, \dots \right\},$$

computed from the discounted present value of the time sequence of the future incomes $\left\{ \underbrace{d}_{1 \text{ Year Later}}, \underbrace{d}_{21 \text{ Years Later}}, \dots, \underbrace{d}_{n \text{ Years Later}}, \dots \right\}$, on the other.

[48] A favorite anecdote among the economics graduate students in the 1970's had it that in daily conversations with his colleagues in the Princeton coffee lounge, John VON NEUMANN (1903-1957), by then already a prominent mathematician and economist, well aware of the infinity of the maturity of consols, instead had proposed yet *3rd Option*.

That is, repeat 1 year maturity deposit, by maintaining the principal for renewal of another 1 year maturity deposit for the following year, while cashing the interest payment only, or put simply *keep the fixed fund in bank and continue to draw interests only every year*, to secure the same future income stream $\{d,\ d,\ \dots,\ d,\ \dots\}$.

To the astonishment and admiration by the fellow economists who were so much used to thinking in terms of *Option 2*, VON NEUMANN went on to conclude instantly the necessary amount of the initial principal to be $\dfrac{d}{r}$.

Note that the total acquisition cost of the voucher in *Option 2* is $\frac{d}{1+r} + \frac{d}{(1+r)^2} + \cdots + \frac{d}{(1+r)^n} + \cdots$.

In the jargon of financial engineering, the equal lucrativity requirement for optimal option in the preceding paragraph is referred to as "No Arbitrage Condition," which requires any arbitrage gain is exploited, i.e., one cannot gain by recontracting from *Option 1* to *Option 2*, or *vise versa*.

Therefore, the *(No Arbitrage) Asset Price* p of the consol is equal to the sum of the discounted present values $\left\{ \frac{d}{1+r}, \frac{d}{(1+r)^2}, \cdots, \frac{d}{(1+r)^n}, \cdots \right\}$ of the time sequence of its dividends $\{d, d, \cdots, d, \cdots\}$ [49], i.e.,

$$p = \frac{d}{1+r} + \frac{d}{(1+r)^2} + \cdots = \frac{d}{r}.$$

[49]Indeed, p may be calculated as the infinite series with the initial term $\frac{d}{1+r}$ and the common ratio $\frac{1}{1+r}$, i.e.,

$$p = \sum_{n-1}^{\infty} \left(\frac{1}{1+r}\right)^{n-1} \left(\frac{d}{1+r}\right) = \frac{\frac{d}{1+r}}{1-\frac{1}{1+r}} = \frac{d}{r}.$$

Or, on the more intuitive level,

$$(1+r)p = d + \underbrace{\frac{d}{1+r} + \frac{d}{(1+r)^2} + \cdots}_{=p},$$

so that $(1+r)p = d + p$, which in turn implies $p = \frac{d}{r}$. ■

9.4.11 Central and Municipal Governments

- Reversal between the central and municipal governments of the expenditure and revenue structures.
- The itemized expenditure of the "Local Government Subsidies" in the central government's General Budget is intended to fill in the aforementioned "reversal gap," and has been a hindrance to the financial independence of municipal governments.

Fiscal Balances of the Central and Municipal Governments
(In Thousand Million ¥'s (%)) (From: Ministry of Internal Affairs and Communications (2015): *White Papers on Municipal Governments' Finance*; Ministry of Finance (2011): "Outstanding Long-Term Debt Balances Since1970," etc.)

	Expenditures		**Tax Revenues**		
Year	**Central Government**	**Municipal Governments**	**Central Government**	**Municipal Governments**	**Outstanding Balance of Municipal Governments' Bonds** (Rate of Increase)
1975	121,569 (32.4)	253,877 (67.6)	145,043 (64.0)	81,548 (36.0)	140,078 (64.0)
1980	268,743 (37.2)	453,207 (62.8)	283,688 (64.1)	158,938 (35.9)	390,831 (13.7)
1985	347,294 (38.4)	556,356 (61.6)	391,502 (62.7)	233,165 (37.3)	572,015 (4.1)
1990	448,701 (40.4)	661,081 (59.6)	618,348 (64.9)	333,741 (35.1)	670,459 (2.2)
1995	533,115 (35.4)	974,493 (64.6)	549,630 (61.9)	336,750 (38.1)	465,011 (18.1)
2000	629,614 (39.6)	960,697 (60.4)	527,209 (59.7)	355,464 (40.3)	595,464 (3.3)
2005	612,202 (40.6)	894,242 (59.4)	522,905 (60.0)	548,044 (40.0)	1,392,840 (-0.6)
2010	661,596 (41.3)	939,243 (58.7)	437,074 (55.4)	343,163 (44.6)	1,365,399 (1.7)
2011	685,164 (41.6)	962,329 (58.4)	451,754 (56.8)	341,714 (43.2)	1,366,777 (0.8)
2012	682,810 (41.7)	954,877 (58.3)	470,492 (57.7)	344,608 (42.3)	1,370,895 (1.0)
2013	691,064 (41.7)	966,444 (58.3)	512,274 (59.1)	353,743 (40.9)	1,380,670 (0.8)

10 International Monetary Policy

10.1 Short History of International Monetary Systems

Interbank Spot Market Exchange Rate

	Annual Average in ¥ Denomination	**Fluctuations**	**Fluctuation Rates** (%)
1980	226.4	61.05	27.0
1985	238.0	63.85	26.8
1990	144.9	36.30	25.1
1995	94.1	24.95	26.5
2000	107.8	13.52	12.5
2005	110.2	19.53	17.7
2010	87.8	14.46	16.5
2011	79.8	10.01	12.6

For a more complete chronology for the entire period after the inception of the International Monetary System and more detailed with annual data after 2011, refer to a comparable Table in Section 3.2.

A Summary Account of International Monetary Systems after the WW II:

- (1942 – [In Preparation]) 1944 – *Bretton Woods Regime*: Fixed Exchange Rate System, implemented by a newly established *International Monetary Fund, IMF*. Redeemability of Dollars as the Key Currency for Gold.

- 1971 "Nixon Shock": Dollars are no longer redeemable for gold. ($\Longleftarrow$ Vietnam War) .

- 1973 *Smithsonian Regime*: Restoration of Current Balance Equilibrium by Flexible Exchange Rate.

- 1973/78 *First/Second Oil Shock*.

- 1980's: Freer International Movement of Capital $\Longrightarrow$ Restoration of Current-cum-Capital Balance Equilibrium by Flexible Exchange Rate.

- 1985 *Plaza Agreement* $\Longrightarrow$ No cap on the appreciating ¥;
  - Domestically, *prolonged* hyper-low government interest rate for fear of resulting economic recession.
  - Indeed, too long to cause economic bubbles.

The Burst of Economic Bubbles and After (1990 -):

- Critical timing that the foreign currency markets judge the sufficiency of the progress made in the "Disposition of Non-performing Loans $\Longleftrightarrow$ Recovery from Recession."
  - With a resort to coordinated interventions in foreign currency markets by dumping ¥'s, the exchange rate of ¥ is barely suppressed from soring.
    Notably, with an expiration of effects from the market intervention on June 22, 1999, the appreciation of ¥ immediately followed on July 18, 1999.
  - Speculative money such as *Hedge Funds* is invested or divested according to:

$$\left\{\begin{array}{l} \text{Speculative Sales of Over} - \text{Valued Currency (Divest \$ from the market)} \\ \quad \text{Eg. Currency Crisis in Thailand in 1997;} \\ \quad\quad \text{or} \\ \text{Speculative Purchases of Under} - \text{Valued Currency (As Characterized by the} \\ \quad \text{Cumulative CurrentSurpluses) (Invest \$ in the market)} \\ \quad \Longrightarrow \text{ Chronic appreciation of ¥ against \$.} \end{array}\right.$$

  - Threat of termination of Hyper Low, or 0 Interest Rate Policy
    ($\Longleftarrow$ Decline in Government Bond prices due to conspicuous increase in outstanding balance of G.B's.
    $\Longleftrightarrow$ Higher (Long-Term) Interest Rate)

- (July 28, 2000) World-wide plummeting price of IT-related stocks, triggered by the plunge in the NASDAQ market.
  - Orchestrated sales of Japanese stocks by foreign investors (¥ 2T. net sales in 2000, coupled with the net sales of similar scale of mutually held stocks by domestic financial institutions); and .
    Redirection of the funds to the purchases of \$'s.
    $\Longrightarrow$ Simultaneous cheap ¥ and cheap Japanese stocks.

- (Fall 2000 -) Lagged revelations of effects from higher petroleum price, after the US and Europe

- (Nov. 2001 -) Delays in the Disposition of Non-performing Loans

- (Dec. 2002 - June 2003) Sluggish Stock Market and the Government Bond Bubble

- (Jan. - Oct. 2003) Market interventions
- (2003) Half-way or Completion-in-sight of the Disposition of Non-performing Loans
- (2008) Lehman Shock
- (2011 -) European Currency Crisis
- (2015 -) World-wide glut in crude oil due to the Shale Oil Drilling in the US $\Longrightarrow$ Low petroleum price

10.2 A Flow Model Approximation of the Determination of Flexible Exchange Rates (*)

10.2.1 Scope and Applicability of the Present Flow Model

- **Scope:** The present determination model of exchange rates under the flexible exchange system will be improved so that it encompasses not only the *Current Balance* but also the *(Long-Run) Capital Balance*, increasingly more notable as liberations of international capital markets progress. The exchange rate will be analyzed as an equilibrium of the composite of the two markets.
- **Applicability:** The present model adapts the standard "Flow Model" in the US textbook treatments in terms of the quantities transacted of Dollars, which will be converted to those of Yens.
  - The present model, although quite simplified, has a potential of enabling one to directly assess the (non-)effectiveness of the recent monetary policies as well as analyzing what is happening to ¥ in the ever internationally integrated capital markets.

10.2.2 Flow Model of Determination of the Exchange Rate

Analyze the Foreign Exchange Market in terms of interactions of the *quantity demanded for Yen* and the *quantity supplied of Yen*, both in relation to the *exchange rate in Dollar denomination*.

Exchange Rate in Yen Denomination vs. Dollar Denomination:

- Denote by π, e.g., $\pi = 120, 100, 85, \ \ldots$, the Exchange Rate *in Yen Denomination*, which has always been in use in Japan, and also widely in use nowadays even in the U.S. This summarized the relationship: $\$1.00 = ¥\pi$.

  Its inverse $\left(\frac{1}{\pi}\right)$ is called as the Exchange Rate *in Dollar Denomination*, and stands for $¥1.00 = \$\left(\frac{1}{\pi}\right)$.

- Since the higher value of ¥ corresponds to a greater value of $\left(\frac{1}{\pi}\right)$, the Exchange Rate *in Dollar Denomination* $\left(\frac{1}{\pi}\right)$ is better suited to express the *va;ue* of ¥.

Demand and Supply of Yen:

- **Demand for Yen:** Summary of the *Quantities Bought of Yen/Sold of Dollar* ($D = D_1 + D_2$), consisting of
  - $D_1\left(\frac{1}{\pi}\right)$ in the *Current Balance* which comes from the need for Yen to settle the payment from abroad for Japanese exports,

  and
  - $D_2\left(r_{US} - r_J\right)$ in the *(Long-Term) Capital Balance*, i.d., the *Capital Inflow* in response to the *Domestic-Foreign Interest Rate Differentials* ($r_{US} - r_J < 0$), which corresponds to the need for Yen in order for foreigners to invest in Japan.
- **Supply of Yen:** Summary of the *Quantities Sold of Yen/Bought of Dollar* ($S = S_1 + S_2$), consisting of
  - $S_1\left(\frac{1}{\pi}\right)$ in the *Current Balance* which comes from the need for Dollars to settle the payment from Japan for Japanese imports,

  and
  - $S_2\left(r_{US} - r_J\right)$ in the *(Long-Term) Capital Balance*, i.d., the *Capital Outflow* in response to the *Domestic-Foreign Interest Rate Differentials* ($r_{US} - r_J > 0$), which corresponds to the need for Dollars in order for the Japanese to invest abroad.

Equilibrium Exchange Rate:

1. **Original Smithsoninan Regime in the 1970's:** The equilibrium exchange rate in dollar denomination $\frac{1}{\pi^*}$ is the one that restores the equilibrium in *Current Balance*, i.e., such that $D_1\left(\frac{1}{\pi^*}\right) = S_1\left(\frac{1}{\pi^*}\right)$.

2. **With the Liberations of International Capital Flows after the 1980's:** The equilibrium exchange rate in dollar denomination $\frac{1}{\pi^{**}}$ is the one that restores the equilibrium in *Current and (Long-run) Capital Balances*, i.e., such that

$$D_1\left(\frac{1}{\pi^{**}}\right) + D_2\left(r_{US} - r_J\right) = S_1\left(\frac{1}{\pi^{**}}\right) + S_2\left(r_{US} - r_J\right) .$$

10.2.3 Equilibrating the Current Balance via Flexible Exchange Rate

Current Balances D_1, S_1: When the Current Surpluses persist due to devalued ¥,

- Exports from Japan increase $\Longrightarrow$ $D_1\left(\frac{1}{\pi}\right)$ $\Longrightarrow$ $D\,(\longrightarrow)$ shifts to the right,

while

- Japanese imports decrease $\Longrightarrow$ $S_1\left(\frac{1}{\pi}\right)$ $\Longrightarrow$ $S\,(\longleftarrow)$ shifts leftward.

Consequently, the undervalued ¥ is rectified $\left(\frac{1}{\pi}\right)\left(\uparrow\right)$.

Once the exchange rate is adjusted to a higher value of ¥, the Current Surplus

$$\left\{D_1\left(\frac{1}{\pi}\right) - S_1\left(\frac{1}{\pi}\right)\right\}\left(\downarrow\right)$$

will decrease.

Eventually, in normal cases where the so-called *Marshall-Lerner Condition* is met, the Current Market Equilibrium is known to be restored through the adjustment of flexible exchange rate.

> Remark: The preceding treatment is in the vein of *Microeconomic Analysis* focusing on the Current Market, and the role of resource allocation by the price therein, i.e., $\left\{D_1\left(\frac{1}{\pi}\right) - S_1\left(\frac{1}{\pi}\right)\right\}$ demand and supply of ¥ in relation to the exchange rate, being the price.
>
> In contrast, *Macroeconomic Analysis* underestimates the resource allocative role of the Flexible Exchange Rate, in belief of the price rigidity. Instead, Macroeconomics emphasizes on the Domestic-Demand-oriented increase in Y by the *Principle of Effective Demand*, which in turn increases *Import* $M(Y)$, thus reducing the Current Account Surplus.

10.2.4 "J-Curve Effect"

It takes time for a policy change to realize intended effect, sometimes even after a period of adverse effect.

- Notable in the SII Negotiations in the 1980's in response to the appreciation of ¥.
  Despite the stronger ¥, initially for some length of period,
  - **Lag in import substitution**, i.e., slow substitution of domestic products for cheaper imports
  - **Cheaper imported raw materials** $\Longrightarrow$ Lowered production costs of exports $\Longrightarrow$ Improved terms of trade.

  $\Longrightarrow$ Current Surplus $\uparrow$.

- More recently, despite the successful efforts by the Bank of Japan to devalue ¥, which remained strong since the Lehman Shock in 2008, the Current Balance has not improved.

  - **Structural change of export industries**, i.e., Japanese exporters have already moved their production sites to overseas, closer to the final consumption, in response to strong ¥ during the past decade.

10.2.5 Effects of Changes in Foreign-Domestic Differentials of Interest Rates on (Long-Term) Capital Balances

(Long-Term) Capital Balances D_2, S_2: In the conspicuous presence of Foreign-Domestic Interest Rate Differentials $(r_{US} - r_J)$, the capital will be enticed to flow into the country with the higher interest rate.

- Under the Flexible Exchange Rate System, any international financial transaction is *not* free from fluctuations in exchange rates. Therefore, in actuality, the Foreign-Domestic Interest Rate Differentials need to be modified as the *expected value*

$$(r_{US} - r_J) + \frac{\pi^e - \pi}{\pi}$$

  to take into account the potential *gain* or *loss* $\frac{\pi^e - \pi}{\pi}$ due to the subsequent fluctuation for which the investor will form an expectation in terms of *expected* exchange rate π^e on the maturity date of her investment.

  - *Expected gain* if $\pi^e > \pi$, i.e., ¥ is expected to be devalued, or to become cheaper,
  - *Expected loss* if $\pi^e < \pi$, i.e., ¥ is expected to be appreciated, or to become more expensive..

- *Net Investment to Overseas* $(S_2 - D_2)$ is the *Private Balance* $(S - I)$ in the *Macroeconomic National (or Domestic) Income Accounting*, the residual of available domestic investment fund S in excess of the domestic investment opportunities I, and corresponds to the out-flow of capital.

  Remark: Awkwardly enough, by the *rationale* of "Global Standard", Japan's Current Surplus $(D_1 - S_1)$, in the disguise of the Capital Outflow to the US $(D_2 - S_2)$, has been financing the Private Balance Deficit $(S_{US} - I_{US})$ and the Budget Deficit $(T_{US} - G_{US})$ of the US.

  This dependency became most notable after 2008 when Japan salvaged the ever worsening budget deficit of the US due to the military expenses associated with the Iraqui War.

10.2.6 Some Implications of the Comparative Statics of the Flow Model

Coordinated Intervention in Foreign Currency Markets: In order for the coordinated intervention to be sustainable (until the effect shows up),

(i) The means of intervention is the currency issued by the central bank of the *leader* country that takes the initiative in the intervention,

and

(ii) The leader country benefits from the intervention, i.e., may gain from her own devalued currency.

- *Sustainable*: In order to rectify the strong ¥, coordinated intervention by central banks to deposit ¥'s in their possession (frequently resorted to in the 1980's, but put to an end by the Plaza Agreement in 1985) $\Longrightarrow$ Rightward shift of S.
- *Unsustainable*: In order to appreciate the ¥exchange rate, coordinated intervention by central banks to deposit \$'s in their possession (After 1990's, when Japan endeavored to dispose of non-performing loans generated during the economic bubble) $\Longrightarrow$ Rightward Shift of D.

Unprecedented Monetary Easing Policies of Japan Central Bank to Devalue Yen: [50] After 2012.

Inflow of ¥ into the foreign currency market $\left(S_2\left(\uparrow\right)\right)$ that surpasses the *import-decreasing effect of cheaper* ¥ $\left(S_1\left(\downarrow\right)\right)$

$\Longrightarrow$ Rightward shift of $\left(S\left(\uparrow\right)\right)$, which dominates the *export-augmenting effect of cheaper* ¥ $\left(D_1\left(\uparrow\right)\right)$

$\Longrightarrow$ Yet cheaper ¥ $\left(\frac{1}{\pi}\left(\downarrow\right)\right)$.

Fluctuating Market Evaluations of Other Currencies as Substitutable Assets:

- "Emergency Demand for Dollars" $\Longrightarrow$ (¥ being a substitute for \$) Leftward shift of D_2 $\Longrightarrow$ Cheaper ¥
- Distrust in \$'s immediately after *Lehmann Shock* in 2008 $\Longrightarrow$ (¥ being a substitute for \$) Rightward shift of D_2 $\Longrightarrow$ Stronger ¥.
- Recent revelations of enormous government deficits in some of the EC countries $\Longrightarrow$ Distrust in €'s $\Longrightarrow$ (¥ being a substitute for €) Rightward shift of D_2 $\Longrightarrow$ Stronger ¥.

The effectiveness of the above *demand shifters* depends on the degree of openness of goods or capital markets, speculative nature of the capital market, and/or political factors. One such explication is known as *Marshall-Lerner Condition* referred to in the preceding **10.2.3**.

[50] In the Introductory account of the present Lecture Notes (**Section 1.3**, p.10), I pointed out the similarity of the effect of this policy on the foreign currency markets to those associated with the "Poor-thy-Neighbor" or "Beggar-my-Neighbor" policies. As of March 2016, this problematic nature is being duly under accusation by the Democratic Presidential Candidate.

10.3 Evaluations of Government Policies under Flexible Exchange Rate System (*)

Evaluate the effectiveness of each policy measure in restoring the full employment in the *open* macro-economy, with the additional requirement $r = r_W$ for *international monetary equilibrium*..

10.3.1 Effectiveness of Monetary Policies

1. *Domestically*, Easing Money Supply [51] $\Longrightarrow$ Domestic Equilibrium Interest Rate r $\left(\downarrow\right)$ $\Longrightarrow$ Investment I $\left(\uparrow\right)$[52].
2. *Through International Interactions*, r $\left(\downarrow\right)$ in 1. $\Longrightarrow$ Domestic-Foreign Interest Rate Differential $r < r_W$ $\Longrightarrow$ Outflow of Capital $\Longrightarrow$ Exchange Rate of Yen $\left(\downarrow\right)$ $\Longrightarrow$ 3. ,
3. *Back Domestically*, Exchange Rate of Yen $\left(\downarrow\right)$ in 2. $\Longrightarrow$ Export X $\left(\uparrow\right)$ cum Import I $\left(\downarrow\right)$ $\Longrightarrow$ Current Balance $(X - M)$ $\left(\uparrow\right)$[53].
4. *In Total*, I $\left(\uparrow\right)$ in 1. is enhanced by $(X - M)$ $\left(\uparrow\right)$ in 3.[54] $\Longrightarrow$ Equilibrium GDP Y^* $\left(\uparrow\right)$.

10.3.2 Ineffectiveness of Government Expenditures

1. *Domestically*, "Crowding-Out", i.e., Government Expenditures G $\left(\uparrow\right)$[55] $\Longrightarrow$ Domestic Equilibrium Interest Rate r $\left(\uparrow\right)$ $\Longrightarrow$ Investment I $\left(\downarrow\right)$.
2. *Through International Interactions*, r $\left(\uparrow\right)$ in 1. $\Longrightarrow$ Domestic-Foreign Interest Rate Differential $r > r_W$ $\Longrightarrow$ Inflow of Capital $\Longrightarrow$ Exchange Rate of Yen $\left(\uparrow\right)$ $\Longrightarrow$ 3.,
3. *Back Domestically*, Exchange Rate of Yen $\left(\uparrow\right)$ in 2. $\Longrightarrow$ Export X $\left(\downarrow\right)$ cum Import I $\left(\uparrow\right)$ $\Longrightarrow$ Current Balance $(X - M)$ $\left(\downarrow\right)$.
4. *In Total*, the initial G $\left(\uparrow\right)$ is canceled by the subsequent I $\left(\downarrow\right)$ from 1., and $(X - M)$ $\left(\downarrow\right)$ from 3.[56] $\Longrightarrow$ Equilibrium GDP Y^* $(\longrightarrow)$.

---

[51] Downward shift of the LM-Curve.
[52] Upward shift of the IS-Curve.
[53] Upward shift of the IS-Curve.
[54] The upward shift of the IS-Curve in 1. is enhanced by yet another upward shift of the IS-Curve in 3..
[55] Upward shift of the IS-Curve.
[56] The original upward shift of the IS-Curve due to G $\left(\uparrow\right)$ is canceled by the downward shifts upon I $\left(\downarrow\right)$ and $(X - M)$ $\left(\downarrow\right)$.

10.3.3 Adverse Effects of Debt-Financing

1. *Domestically*, Debt-Financing Government Bonds $\left(\uparrow\right) \implies$ Equilibrium Price of Government Bonds $\left(\downarrow\right) \iff$ Domestic Interest Rate r $\left(\uparrow\right) \implies$ Investment I $\left(\downarrow\right)$.
2. *Through International Interactions*[57], r $\left(\uparrow\right)$ in 1. $\implies$ Domestic-Foreign Interest Rate Differential $r > r_W \implies$ Inflow of Capital $\implies$ Exchange Rate of Yen $\left(\uparrow\right)$ $\implies$ 3.,
3. *Back Domestically*[58], Exchange Rate of Yen $\left(\uparrow\right)$ in 2. $\implies$ Export X $\left(\downarrow\right)$ cum Import I $\left(\uparrow\right) \implies$ Current Balance $(X - M)$ $\left(\downarrow\right)$.
4. *In Total*, i.e., I $\left(\downarrow\right)$ from 1., and $(X - M)$ $\left(\downarrow\right)$ from 3. $\implies$ Equilibrium GDP Y^* $\left(\downarrow\right)$.

10.3.4 Ineffectiveness of Protective Trade Policies:

1. *Direct Intervention in Import Markets:* Import Quota by Way of Tariff Barrier (Protective Tariff) and/or Non-Tariff Barriers $\implies$ Import M $\left(\downarrow\right)$[59]. $\implies$ Domestic Interest Rate r $\left(\downarrow\right) \implies$ Investment I $\left(\uparrow\right)$.
2. *Through International Interactions*[60], r $\left(\downarrow\right)$ in 1. $\implies$ Domestic-Foreign Interest Rate Differential $r < r_W \implies$ Outflow of Capital $\implies$ Exchange Rate of Yen $\left(\downarrow\right)$ $\implies$ 3.,
3. *Back Domestically*[61], Exchange Rate of Yen $\left(\downarrow\right)$ in 2. $\implies$ Export X $\left(\uparrow\right)$ cum Import I $\left(\downarrow\right) \implies$ Current Balance $(X - M)$ $\left(\uparrow\right)$.
4. *In Total*, the initial M $\left(\downarrow\right)$ and the consequent I $\left(\uparrow\right)$ in 1. are canceled by $(X - M)$ $\left(\uparrow\right) \implies$ Equilibrium GDP Y^* $(\longrightarrow)$.

[57] Identical to 2. in **10.3.2**.
[58] Identical to 3. in **10.3.2**.
[59] Downward shift of the IS-Curve.
[60] Similar in nature, but opposite in direction to 2. in **10.3.2**.
[61] Similar in nature, but opposite in direction to 3. in **10.3.2**.

Summary Table of Macroeconomic
Effectiveness of Different Policy Measures

Policy Measures	(A) Domestic Effect	Effect on Exchange Rate	(B) Repercussion Effect on $(X - M)$	(A) + (B) Total, or Net Effect on Y^*
9.3.1 Easing Money Supply	$r \left(\downarrow\right) \Longrightarrow I \left(\uparrow\right)$	Weaker Yen	$\left(\uparrow\right)$	$\left(\uparrow\right)$
9.3.2 Government Expenditures	**(A.1)** $G \left(\uparrow\right)$; **(A.2)** $r \left(\uparrow\right) \Longrightarrow I \left(\downarrow\right)$	Stronger Yen	$\left(\downarrow\right)$	$(\longrightarrow)$
9.3.3 Deficit-Financing Bonds	$r \left(\uparrow\right) \Longrightarrow I \left(\downarrow\right)$	Stronger Yen	$\left(\downarrow\right)$	$\left(\downarrow\right)$
9.3.4 Protective Trade Policies	**(A.1)** $M \left(\downarrow\right)$; **(A.2)** $r \left(\downarrow\right) \Longrightarrow I \left(\uparrow\right)$	Weaker Yen	$\left(\uparrow\right)$	$(\longrightarrow)$

11 Concluding Remarks

11.1 In Appreciation of "The Economic Consequences of the Peace"

Japan has enjoyed "The Economic Consequences of the Peace" *literally* since the end of the WW II, and should certainly be committed to pursue this goal in the future.

The short-run benefits are reflected in the savings of military expenses:

Military Expenses, Multiples of GDP,
Selected Countries ($ Billions, %)
(Source: International Institute for
Strategic Studies (2016): *The Military Balance.*)

Country	**Expenditure**	**Ratio to GDP**
U.S.	597.5	3.3
China	145.8	1.2
U.K.	56.2	2.0
Russia	51.6	4.1
India	47.9	1.8
Japan	41.4	1.0
Germany	36.6	1.1
S.Korea	33.4	2.4
France	32.0	1.9

However, the benefits of the peace is farther-reaching than just the above. Indeed, the resulting benefits in the longer perspectives are so comprehensive as to include the followings.

REMARK (*"The Economic Consequences of the Peace" in Today's Japan*):

Among others,

- Japan has managed to nurture attitudes to plan ahead with far-reaching horizons in sight
  - High saving = high investment, Better completion of Higher Education, etc.
- Thanks to the long-lasting peace, it has been possible to concentrate on civil capital formation, both physical and human at relatively small defense costs.

11.2 Scope of Macroeconomic Controls: Quantity Control vs. Price Control

- Macroeconomic Instrumental Variables:

$$\begin{cases} \text{Quantities}: \ C, I, G, T, X \text{ (Real)}; \ M \text{ (Money Supply)}, \ \text{etc.}, \\ \qquad \text{or} \\ \text{Prices}: \ p, r \text{ (Intertemporal)}, \pi \text{ (Exchange Rate)}, \ \text{etc.} \end{cases}$$

  - The present administration tries to control such price variables as: (negative) interest rate, inflation rate, exchange rate, and wage rate, among others.

- *Viable* Domain of Price Variables:
  Macroeconomic activities of *any* economy are built on the collection of individual microeconomic choices, which are summarized as interrelated causative relationships from the prices.

  Therefore, in order to take advantage of the *Resource Allocative Role of the Price Mechanism*, the prices should not be distorted to the extent that *some* individuals can no longer carry out her optimization. The case in point is the *negative* interest rate.

- *Awakening from the Euphoria of Apathy to Cumulating National Debt*, or the Need to Resurrect the Price Mechanism in the Government Bond Market:

  From the onset in **Section 1.3**, I have repeatedly emphasized on the imperative need for the government to restore the balanced budget.

  As I pointed out in **1.3** and **9.4.8**, policies pursued by the Central Bank of Japan could not possibly replace the imperative requirement of the balanced budget *of some sort*, and have merely caused the "Market Failure" of the G.B. Market, which needs to be rectified and restored in the first place. .

11.3 Consistency with the Basic Economics Doctrines

In conclusion, messing with the allocative mechanism of prices, including the interest rate and foreign exchange rate, is *ad hoc*, and cannot be a reliable policy measure that will stand the test of the economics doctrine.

11.3.1 Consistency with Microeconomic Behavior

Assessment of Negative Interest Rate Policy: *Negative* "Bank Rate" initiated on January 29, 2016 has distorted the commercial interest rate system at large of different term structures.

- *Any* interest rate is more or less "pegged" to the prime lending rate.
  - "Prime Lending Rate" on the overnight loans by commercial banks from the Central Bank, constitutes the cost the commercial banks incur for borrowing overnight from the Bank of Japan to finance the loans to corporate investments, housing loans, and other consumers' loans, etc.

> REMARK (*Non-Sustainability*): Negative interest rate *cannot be a supporting price* for any private corporate or individual loan markets, and distorts choices in such markets, since it is inconsistent with individual "Impatience."[62]
>
> Consequently, with an introduction of negative interest rates, each agent can at best hope for satisficing oneself with *suboptimal choices at corner points*, e.g., borrow the maximum possible amount and/or length.

[62] The idea is originally due to:

FISHER, Irving (1930): *The Theory of Interest, As Determined by Impatience to Spend Income and Opportunity to Invest It.* New York, NY: Macmillan.

A seminal paper:

BROWN, Donald J. and Lucinda M. LEWIS (1981): "Myopic Economic Agents." *Econometrica* **49**, 359-368.

gave a modern topological characterization of "Impatience", consistent with the existence of general equilibria with infinitely many contingent commodities, i.e., the emergence of as many markets for as many commodities, and the allocative functioning of the prices thereof.

Their characterization of infinite-dimensional "Myopic Topologies" in which the *continuous preferences* exhibit the behavioral property of Impatience has enabled subsequent researchers to tackle such diverse economic situations as intertemporal allocations, uncertainty, commodity differentiation, and economic locations comprehensively in "*Large-Square* (or $(Large)^2$) *Economies*", i.e., with infinitely many agents and infinitely many (contingent) commodities, and to generalize the Equilibrium Existence and Welfare Economics to such economies. .

For the exact role of "Myopic Topologies" in the General Equilibrium Analysis of "Large-Square Economies", refer to:

NOMURA, Yoshimasa (1993): "An Elementary Approach to Approximate Equilibria with Infinitely Many Commodities." *Journal of Economic Theory* **60**, 378-409,

which also managed to elucidate under such generalities as permitting nonconvex preferences and noncnvex commodity space, the *Relative Size Requirement* that there should be *sufficiently* more agents than the number of commodities.

More recently, John GEANAKOPLOS, *et al.* have emphasized on the importance of collateral rates (*margin* or *leverage*, equivalently), in times of crisis and in the presence of default possibility, over the interest rate. They have investigated the effectiveness and the welfare assessments of the collateral equilibria in the context of general equilibrium of incomplete markets, and have gone so far as to propose that the central banks attend to the economy-wide leverage and leave the interest rate alone.

For a comprehensive survey of this strand of researches, refer to the expository article:

GEANAKOPLOS, John (2010): "The Leverage Cycle." In: ACEMOGLU, Daron, Kenneth ROGOFF and Michael WOODFORD (Eds.) (2010): *NBER Macroeconomics Annual 2009* **24**. Chicago, IL: University of Chicago Press for the National Bureau of Economic Research. 1-65,

Assessment of Targeted Inflationary Rate Policy: Same as the preceding Assessment of of Negative Interest Rate Policy.

Assessment of Unprecedented Monetary Easing Policy of Foreign Exchange Rate: Including the effect of "induced" lowered exchange rate of ¥ similar to "Poor-thy-Neighbor" or "Beggar-my-Neighbor" Policy. For some detailed discussions, refer to **Section 1.3**, p. 10, and **10.2.6**, p. 127, together with the FOOTNOTE 49 of the present Lecture Notes.

Assessment of Government Interference with Management-Labor Union Negotiation of Wages: *Not sustainable*, as vindicated by the experiences over the last couple of years.

11.3.2 General Equilibrium Structure of the Interrelated Financial Markets

- Ever enlarged scope of "marketization" of finance: The system of interest rates are to be determined respectively in the interrelated markets of financial assets of different term structure.
  - Interest rates for corporate investments, housing loans, and other consumers' loans, each of different term structures.
  - *Imputed* interest rates from the bond prices, including government bonds, as seen in **9.4.9, APPENDIX**.

11.3.3 Additional Macroeconomic Inconsistence

In addition to the aforementioned alarming microeconomic concerns, the following apparent macroeconomic contradictions are sure to make one feel all the more uneasy with the recent monetary policies:

- "True" Social Cost of Hyper-low, 0 and Negative Interest Rates: Lowered interest rates are harmful to savers who would otherwise supplement insufficient pension incomes with interest incomes. Because of their foregone interest incomes, relatively well-prepared retirees naturally call for a more robust and reliable social security system which is certainly more costly to the society.

- No remarkable increase in investments expected, i.e. insensitivity of investments to cuts in interest rate

  $\Longleftarrow$ Corporates are in the position to finance their investments on their own out of the savings of their encompassing Holding Companies ($\longleftarrow$ REMARK of **9.1.4**, Stylyzed Fact 2.).

---

which is further expanded with the updates in:

GEANAKOPLOS, John (2014): "The Leverage Cycle, Default, and Foreclosure." In: BAUDUCCO, Sofía, Lawrence CHRISTIANO and Claudio RADDATZ (Eds.) (2014): *Macroeconomic and Financial Stability: Challenges for Monetary Policy*. Santiago, Chile: Central Bank of Chile. 161-213.

11.4 Long-Term Perspectives

REMARK **(Achievement of "Balanced Budget" as the Prerequisite for any *Viable* Sequence of Economic Policies):**

- "Primary Balance" is not an ultimate social goal but a mere second-best half-way milestone to the true "Balanced Budget".
  - With an accomplishment of the "Primary Balance", there will still remain a burden of outstanding Consol-like Government Bonds ($\longrightarrow$ **9.4.5**).

- Direct harms attributable to dependence on the Deficit-Financing Government Bonds ($\longrightarrow$ **9.4.10**).

- Special problems arising under the Flexible Exchange Rate System:
  - Fiscal Policies no longer exert a *Counter-Cyclical Effect* ($\longrightarrow$ **10.3.2**).

    $\Longrightarrow$ Adoption of particular fiscal policy should be based on the evaluation of
    (a) its *Income Redistributive Effect* ($\longrightarrow$ **9.4.4** (Regressive or Progressive nature of taxation in "Tax Reform" from Direct to Indirect Taxation); **9.4.3** (Intergenerational Income Transfers in "Pay-as-You-Go" Social Security System),

    and/or

    (b) *Resource Allocative Effect* ($\longrightarrow$ **9.4.6** (Productivity Augmenting Effect of Investments of Government Investments).
  - Adverse effect of Debt-Financing ($\longrightarrow$ **10.3.3**).

- Adverse effects of Debt-Financing on Monetary Policies:

  "Government Bonds Bubble" ($\longrightarrow$ **9.4.9**).

  $\longrightarrow$ *Forced* "Market Failure" of the *Isolated* Government Bond Market.

  $\Longleftarrow$ The Government Bond Market is *isolated* by the Monopsony of the Central Bank of Japan ($\longrightarrow$ **9.4.9**.),

  In order to enforce a "Negative Interest Rate" therein ($\longrightarrow$ **9.1.8**).
  - *Not quite isolated!* $\Longrightarrow$ Through the *General Equilibrium* interactions, the entire market system has been distorted.

- Prolonged Recession accompanied by changes in saving behaviors (The "Knife Edge" Instability revisited $\longrightarrow$ **9.1.5**).

11.4.1 Recognition of the Long-Term Social Goal and the Surrounding Constraints

- Long-Term Social Goal $\longleftrightarrow$ Short-term remedial tactics to overcome the recession after the burst of economic bubble in 1990:
  - "Small" Government, and the Private Incentives
  - "Consumer Sovereignty"
  - Domestic-Demand-oriented sustainable economic growth
- Surrounding Constraints:
  - Aging, coupled with lowered fertility
  - Competition from the rapidly growing Asian countries

11.4.2 Intertemporal Optimization vs. a Sequence of Temporary Optimizations

In each year $t = 1, \ \dots \ T$, consider the Government Expenditure G_t financed by the Tax Revenue $T(Y_{t-1})$ carried over from the previous year, and the newly issued Government Bond B_t.

Sequence of Temporary Optimizations: Given an issuance of Government Bonds B_t ,

$$\begin{array}{cc} & \max_{(Y_t, G_t)} u_t(C(Y_t), \, G_t) \\ \text{s.t.} & \underbrace{G_t - T(Y_{t-1}) = B_t}_{\text{Government Budget Constraint}} . \end{array}$$

In order to carry out Temporary Optimization by containing the setting to a single period, assume away the lag of taxation, i.e., the Tax Revenue is simply $T(Y_t)$, instead of the more realistic $T(Y_{t-1})$.

Given a *steady-state growth path* $Y_t = (1+g)Y_{t-1} = (1+g)^{t-1}\bar{Y}$, the preceding specification reduces the **Temporary Optimization Problem** to:

$$\begin{array}{ccc} & & \max_{G_t} u_t(C(Y_t), \, G_t) \\ (^*) & \text{s.t.} & G_t - T(Y_t) = B_t \, ; \\ & & Y_t = (1+g)^{t-1}\bar{Y} \, . \end{array}$$

Under a sufficient set of regularity conditions, $G_t^*(B_t)$ solves $(^*)$.

Intertemporal Optimizations: Given a "stream" of issuance of Government Bonds $\{B_t\}$.

$$\begin{array}{cc} & \max_{\{Y_t\}, \{G_t\}} W(\{u_t(C(Y_t), \, G_t)\}) \\ \text{s.t.} & G_t - T(Y_t) = B_t \ (\forall t = 1, \ \dots \ , T) \, ; \end{array}$$

Given the *steady-state growth path* $Y_t = (1+g)^{t-1}\bar{Y}$, , the preceding specification reduces the **Intertemporal Optimization Problem** to:

$$
\begin{array}{cc}
 & \max_{\{G_t\}} W(\{u_t(C(Y_t),\, G_t)\}) \\
(^{**}) \quad \text{s.t.} & G_t - T(Y_t) = B_t \ (\forall t = 1,\ \ldots\ , T)\,; \\
 & Y_t = (1+g)^{t-1}\bar{Y}\,.
\end{array}
$$

Under a sufficient set of regularity conditions, $G_t^{**}(\{B_t\})$ solves $(^{**})$.

By the comparison of $(^{*})$, $(^{**})$, and the solutions therein $G_t^{*}(B_t)$, $G_t^{**}(\{B_t\})$, the following PROPOSITION is immediate.

PROPOSITION (**Superiority of the Long-Run Plan over a Sequence of Short-Run Plans**)[63]**:** *The "Intertemporal Substitutability of Consumption" implies: For any stream of issuance of Government Bonds* $\{B_t\}$*,*

$$
W(\{u_t(C((1+g)^{t-1}\bar{Y}),\, G_t^{**}(\{B_t\}))\}) \ \geq\ W(\{u_t(C(1+g)^{t-1}\bar{Y}),\, G_t^{*}(B_t))\})\,.
$$

However, the real issue remains to be solved as to the *choice* of $\{B_t\}$, in consideration of the "*Intergenerational Equity.*"

REMARK (*Repetition of Either of Two Bitter Experiences of the Private Sector Needs to Be Avoided by a Responsible Government*):

1. Staggering "Bicycle Operation" before the onset of the rapid economic growth period (See **Section 7.1**.),

2. Disposition of Non-Performing Loans, 1990 - 2003? at the ultimate expense of Households'-*cum*- savers' opportunity to earn interest incomes during the disposition period, and thereafter (**Section 1.3**).

   - In the case of Government Debts, the ultimate bearers of by-far the greater would-be burdens, the *Outstanding Balance of Government Bonds* $\sum_{s\leq t} B_s^{\text{Net}}$ will be no other than the taxpayers, mainly Households, where $\sum_{s\leq t} B_s^{\text{Net}} = \sum_{s\leq t}(B_s - R_s)$, with R_t being the Redemption of the Outstanding Government Bonds in Year t.

$\Longrightarrow$ In the choice of $\{B_t\}$, with the resultant Outstanding Balance $\sum_{s\leq t} B_s^{\text{Net}}$, the government *should not* count on the sufficiency of approximately ¥1,400 Trillions, as noted in **9.1.7**, ENDING BALANCE OF JAPANESE HOUSEHOLDS' FINANCIAL ASSETS, AND THEIR RATIO TO GDP, *as if a "Collateral" to the Outstanding Debt* $\sum_{s\leq t} B_s^{\text{Net}}$.

[63]This is an immediate adaptation of "PROPER" FUNCTION OF FINANCE in the preceding **9.4.6**.

11.5 From "Globalizations" to "Universalizations" of the Japanese Economy

11.5.1 Western (or US, in Particular) vs. Japanese Economic Prototypes

- Overcome the diffidences prevalent after the burst of economic bubbles
  - Diffidence in the Japanese Prototype of economic competition.
  - Quick adaptation to the US-led "Globalization".
- Identify factors that contributed to the Japanese success, and resurrect emphases on these contributing factors in the current context:
  - "High Saving = High Investment" $\Longrightarrow$ Investing from physical capital to human capital and/or IT infrastructure-related capital
  - Technical Progress $\Longrightarrow$ "Innovation"

> REMARK (*Overcoming the "Knife-Edge" Instability*): Whether one likes it or not, Japanese economy has recently been transformed to satisfy the KALDORIAN presumption, $s_C > S_H$. As pointed out in **9.1.5**, it is imperative to regain resilience to recessions by confronting $g < g_w$ with an increased s.

11.5.2 How to Make the Most of Dwindling Labor Force

We are now in the position to address the scrutinized expenditures of what little government budget permissible under the balanced budget *of different degrees of stringencies* to alternative social needs.

- **Recognition of Labor Force in "Efficiency Units"**
  - Analyze Labor Force not in Population Unit, but in Efficiency Unit

$$\begin{cases} e^{nt}N & \text{Labor Force in Population Unit;} \\ e^{(n+\tau)t}N & \text{Labor Force in Efficiency Unit .} \end{cases}$$

    where τ denotes the *rate of (Harrod-neutral[64]) technical progress*, which needs to be raised to dominate and overcompensate for the decline in n.

    That is, *treat one worker as if embodying* $(1+\tau)$ *times of the "natural" productivity.*

[64] Refer to **3.4.3**.

– Identify major factors influencing τ as:

$$\begin{cases} \text{Human Investment;} \\ \\ \text{IT Infrastructures}\,, \end{cases}$$

and exploit the preceding fiction of "efficiency units" in practice.

Two of realization measures of the above, among others, are in order:

- **Higher Education:** One of the Japanese strengths identified in **Section 6.6**.
  - Corporate investments mainly on physical capitals
    $\Longrightarrow$ Generated the rapid economic growth in the 1970s.
  - Also before mid-1980s, when life-time employment was prevalent, corporates invested partly on human capitals as well by sending their employees to higher educational institutions, especially the graduate schools in the US in the hopes that their dispatched employees return the benefits of gained higher productivities.
  - After 1990s, despite its nature of private investments on human capital, Higher Education, being such a big private expenditure item, needs to be supplemented by strong societal commitments, such as Government Financial Assistances to students, and Tax Incentives that induce bequests to Colleges and Universities
    $\Longrightarrow$ Human capital formation, together with improved IT infrastructures, to raise the productivities of the future generations

- **Specialization in Differentiated *Knowledge-Intensive* Commodities**
  - (Storage of) Knowledge as *Non-Physical* Capital Stock, similar to Human Capital.
  - *A Redefinition of Differentiated Commodities with "High-Income Elasticity"* (As developed in **7.1.2** for designing export promotions, and in **7.1.3** for the future of Japanese agriculture.) as *Knowledge-Intensive* Commodities, i.e.,

    $$\begin{cases} \text{High} - \text{tech goods,} \\ \qquad \text{and/or} \\ \text{Craft works with high "craftsmanship" and/or "tradition" contents,} \end{cases}$$

    being the two extremes, and their amalgamations.
  - Promotions of production and consumption of the above newly defined "High-Income Elasticity" Goods need societal support and commitment, in another form of human investment and enlightenment of consumers as to the differentiating qualities, such as safety and durability of the products.

Reading List

Textbook and Collected Papers

The Textbook

Balassa, Bela[65] and Marcus Noland (1988): *Japan in the World Economy.* Washington, D.C.: Institute for International Economics. ISBN: 0 88132 041 2.

Table of Subject-to-Chapter Correspondence

Subjects	Balassa and Noland (1988)
4	Chs. 1, 2 and 3
9	Chs. 4 and 5
10	Chs. 6, 7 and 8

General Introductions

Ito, Takatoshi (1992): *The Japanese Economy.* Cambridge, MA: The MIT Press. ISBN: 0 262 09029 5.

Mitsuhashi, Tadahiro, Shigeo Uchida and Yoshiki Ikeda (2015): *Introduction to the New Japanese Economy*, New (26^{th}) Edition of *Introductory Japanese Economics.* Economics Seminar Series (1985, Updated Annually) (In Japanese). Tokyo, JPN: Nikkei Publishing. ISBN: 978 4 532 13457 0.

Collected Papers

Aoki, Masahiko (Ed.) (1984): *The Economic Analysis of the Japanese Firm.* North-Holland.

Hutchison, Michael M. and Westermann, Frank (Eds.) (2006): *Japan's Great Stagnation: Financial and Monetary Policy Lessons for Advanced Economies.* CESifo Seminar Series. Cambridge, MA: The MIT Press.

[65]See Christ, Carl F. (1991): "In Memoriam: Bela Balassa (1928-1991)." *Journal of Comparative Economics* **15**, 577-581.

Inoguchi, Kuniko and Daniel I. Okimoto (Eds.) (1988): *The Political Economy of Japan, Vol. 2: The Changing International Context.* Stanford, CA: Stanford University Press.

Komiya, Ryuhtaroh, Masahiro Okuno and Kohtaroh Suzumura (Eds.) (1988): *Industrial Policy of Japan.* Academic Press.

Satoh, Ryuhzoh and Takashi Negishi (Eds.) (1989): *Developments in Japanese Economics.* Academic Press.

Suzuki, Yoshio (Ed.) (1987): *The Japanese Financial System.* Oxford University Press.

Yamamura, Kohzoh and Yasukichi Yasuba (Eds.) (1987): *The Political Economy of Japan, Vol. 1: The Domestic Transformation.* Stanford, CA: Stanford University Press.

Comparative Advantage

Balassa, Bela and Marcus Noland (1989): "The Changing Comparative Advantage of Japan and the United States." *Journal of the Japanese and International Economies*, **3**. 174-188.

Jorgenson, Dale W., Masahiro Kuroda and Mieko Nishimizu (1987): "Japan-U.S. Industry-Level Productivity Comparisons, 1960-1979." *Journal of the Japanese and International Economies*, **1**. 1-30.

Japanese Corporates

Aoki, Masahiko (1984): "Aspects of the Japanese Firm." In: Aoki (Ed.) (1984). 3-43.

Aoki, Masahiko (1988): *Information, Incentives, and Bargaining in the Japanese Economy.* Cambridge University Press.

Leibenstein, Harvey (1984): "The Japanese Management System: An X-Efficiency-Game Theory Analysis." In: Aoki (Ed.) (1984). 331-357.

Leibenstein, Harvey (1987; 2008): "X-Efficiency Theory." In: Eatwell, John, Murray Milgate and Peter Newman (Eds.) (1987): *The New Palgrave: A Dictionary of Economics.* Vol. 4. 934-935. Revised as: "X-Efficiency." In: Durlauf, Steven N. and Lawrence E. Blume (Eds.) (2008): *The New Palgrave Dictionary of Economics, Second Edition.* Vol. 8. 794-795.

Labor Market

Koike, Kazuo (1987): "Human Resource Development and Labor-Management Relations." In: Yamamura and Yasuba (Eds.) (1987). 289-330.

Tachibanaki, Toshiaki (1984): "Labor Mobility and Job Tenure." In: Aoki (Ed.) (1984). 77-102.

Taira, K. (1989): "Labor Market Segmentation, Human Resource Utilization, and Economic Development: The Case of Japan." In: Satoh, Ryuhzoh and Takashi Negishi Eds.) (1989). 181-195.

Industrial Policy

Itoh, Motoshige, K. Kiyono, Masahiro Okuno and Kohtaroh Suzumura (1988a): "Industrial Policy as a Corrective to Market Failure." In: Komiya, Okuno and Suzumura (Eds.) (1988). 233-253.

Itoh, Motoshige, K. Kiyono, Masahiro Okuno and Kohtaroh Suzumura (1988b): "Industry Promotion and Trade." In: Komiya, Okuno and Suzumura (Eds.) (1988). 257-278.

Monetary and Fiscal Policies

Hayashi, Fumio and Edward .C. Prescott (2002). "The 1990s in Japan: the Lost Decade." *Rev. Econ. Dynam.*, **5 (1)**. 206-235.

Horioka, Charles Yuji (1989): "Why Is Japan's Saving Rate So High?" In: Satoh and Negishi (Eds.) (1989). 145-178.

Hutchison, Michael M., Takatoshi Ito, Frank Westermann (2006): "The Great Japanese Stagnation: Lessons for Industrial Countries." In: Hutchison and Westermann (Eds.) (2006). 1-32.

Ishikawa, Tsuneo and Kazuo Ueda (1984): "The Bonus Payment System and Japanese Personal Savings." In: Aoki (Ed.) (1984). 133-192.

Kaizuka, Keimei (1989): "A Comparative Study on Financial Development." In: Satoh Negishi (Eds.) (1989). 197-216.

Nakatani, Iwao (1984): "The Economic Role of Financial Corporate Grouping." In: Aoki (Ed.) (1984). 227-258.

Suzuki, Yoshio (1987): Chapters in Suzuki (Ed.) (1987).

International Monetary Policy

Bernstein, E.M. (1990): "How Japan Can Reduce Its Huge Trade Surplus." *Letters, The New York Times*, February 14.

Hamada, Kohichi and H.T. Patrick (1988): "Japan and the International Monetary Regime." In: Inoguchi and Okimoto (Eds.) (1988). 108-137.

Mori, T. (1990): "How U.S. Can Cut Trade Imbalance with Japan." *Letters, The New York Times*, February 7.

Silk, Leonard (1990): "Trade Pressures on the Japanese." *Economic Scene, The New York Times*, January 12.