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A Microeconomic Assessment of Recent Japanese Fiscal and Monetary Policies: An Unconventional Japanese Economics from General (Dis-)Equilibrium Perspectives

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A Microeconomic Assessment of Recent Japanese Fiscal and Monetary Policies: An Unconventional Japanese Economics from General (Dis-)Equilibrium Perspectives*†

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Abstract

Unlike the prevalent assessments of recent fiscal and monetary policies constituting what is referred to as the *Abenomics*, with constituent fiscal and monetary policies viewed separately in their own right, the present study proposes a more comprehensive evaluation of the entire policy package from the *General (Dis-)Equilibrium* (to be abbreviated as G.E.) perspectives.

Specifically, both fiscal and monetary policies are viewed in the context of *interdependent* Real and Monetary Markets with a special emphasis on the resulting *Spill-Over Effect*, a remnant feature of the G.E. Analysis, well-recognized since the inception of Macroeconomics, and in the presence of interactions with the Foreign Currency Market. We shall also adopt the typical Microeconomic or G.E. view point on the *Sustainability* or *Supportability*, analytically speaking, of such policies, i.e., whether individual optimal choices may become consistent with the prices, especially the interest rates among others, prescribed by such policies..

In conclusion, the *interdependence* perspective points out that the Government Bond (G.B.)-financed deficit budgets have been tactfully complemented by the Unprecedented Expansive Monetary Policies of the Central Bank of Japan with a resort to monopsonic purchases of G.B.'s, and by the implementation of the Negative Interest Rate. The combination of the preceding two tactics has led to the typical case known in the standard economics textbooks as the "*Failure* of the G.B. Market," with the consequent malfunctioning of the resource-allocative price system, especially that of the interest rate in the individual intertemporal decisions on the one hand, and the concealment of governmental default risks due to the cumulated national debts on the other.

In addition to the preceding overlooked sign of warning, it is worth emphasizing that another sign of warning which should have shown up in the Foreign Currency Market due to an adverse effect of the cumulative budgetary deficit, has also been kept concealed by the intended weaker Yen, driven by the Unprecedented Expansive Monetary Policies, the effect of which is reminiscent of the notorious "Poor-thy-Neighbor" Policy.

We have also become alarmed by the recent decline in the saving ratio, especially that of households, apparently causing the *Kaldorian Instability*, which in turn explains the prolonged recession we have been experiencing during the recent "Lost Two Decades."

*An Inaugural Lecture delivered on October 15, 2016 at the Institute of East Asian Studies Symposium on "Today's Social Sciences in Practice," celebrating the 140th Anniversary of the Establishment of Nishogakusha University. I thank participants for their comments and suggestions.

†For a complete and more comprehensive treatment of the subject matter, readers are referred to: Nomura, Yoshimasa (Preliminary, 1990; Completed with Updates, April 2016; Revised, September 2016): "A Microeconomist's Monologue: Lecture Notes on Japan in the World Economy." Originally prepared for one-quarter course on "Japanese Economy" at the University of Alabama, Spring Qtr., 1990; Updated and supplemented for Intensive Course on "Japan Studies" at Eötvös Loránd University, Hungary, Spring Qtr., 2016; Revised for Economics Majors, September 2016. *Nishogakusha Economics Discussion Paper Series* **6**. Tokyo JPN: Nishogakusya University. http://www.nishogakusha-u.ac.jp/pdf/dps/dps06.pdf

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1 General Introduction

1.1 "Social Choice" vs. "Individual Choice"

- "Collective Choice": Aggregation of *Individual Values* $\longrightarrow$ *Social Choice*
  – "Consensus Formation" via Political Process ("One Person, One Vote"), vs. "Choice in the Market" ("One Dollar, One Vote") (Eg., Robbins, Lionel C. (1898-1984)).

- "Decentralization": Realization of the social choice led by individual values
  – "Incentive-Compatible", or "Sustainable": Consistence with individually optimized choice

1.2 Bases for Designs and Evaluations of Economic Policies

- **Level 0:** Instinct, intuition or even caprice for the former; Popularity, general acceptance and impression thereof ($\longleftarrow$ questionnaires, pollsters, or diffusion indices) for the latter,
- **Level 1:** Actual data on "Voting Results" or "Market Responses".
- **Level 2:** Reasoning with Economic Doctrines.

In order to progress: **Level 0** $\longrightarrow$ **Level 1** $\longrightarrow$ **Level 2**, expertise on such basic economics as Microeconomics, Macroeconomics and Econometrics is inevitable.

1.3 General (Dis-)Equilibrium Perspectives

Some Perspectives:

- "*Spill-Over Effects*" to Multiple "*Interdependent*" Markets
  - Especially, that of Real and Money Markets $\Longrightarrow$ Chronic G.B.-financed deficits, being implemented by the complementary Expansive Monetary Policies
  - Interest Rates being the inverse of the price of the G.B.'s, *monopsonized* by the Bank of Japan, as well as the price of various financial assets
  - Interdependent also on the Foreign Currency Market $\Longrightarrow$ Spill-Over Effect akin to the "Poor-thy-Neighbor" Policy
- Primary Balance by repeated issuance of Consol-like Government Bonds
- Efficiency Criterion for Government Investments
- "Size" of the Government
- "*Sustainability*" of Individual Choices
  - Negative Interest Rate *does not sustain* individual intertemporal choices, i.e., *cannot support* individual "Interior Solutions."

In the subsequent analysis of the General Equilibrium nature, one should be well aware of the *impossibility of any "arbitrary" choice of the interest rate* at will of the Monetary Authority to begin with, not to mention the inapplicability of the standard "Comparative Statics" Methodology in comparison of static equilibria before and after the change in, say the interest rate, developed and extensively utilized in the Partial Equilibrium context.

1. The above noted *impossibility* is to the contrary to what the Central Bank of Japan arrogantly presumes it can in its recent shift on September 26, 2016 of the Monetary Easing from Quantitative to Interest Rate Manipulation: Maneuver the long-term interest rates down to zero, together with the *possibly yet lower* "negative" short-term Bank Rate, in lieu of the previously pursued quantitative monetary expansion.
2. Negative interest rates are prevalent among such "Welfare States" as Denmark and Sweden.
   - Since 2015, interest rates for some home mortgage loans have been negative in such deficit-ridden countries as Portugal and Spain. It is all the more unnerving if these countries might mimic the on-going Japanese monetary "malpractices," to be explicated in the subsequent analysis, and turn to negative Bank Rates to conceal the burdens of deficit-financing.

2 Summary Data of Recent 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 [1])
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[2]					186,532
Outstanding Balance of Municipal Bonds (R.o.I.)			140.078(63.0)	572.015(4.1)	670,459(2.2)

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[1] 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.

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

(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[3]	-	-	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)

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

(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[4]	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)	

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

(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.)	

2.1 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 ($\longrightarrow$ **3.7.2**, 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*));

> 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!

2.2 "Primary Balance" and "Consol-Like" Government Bonds

- "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."

2.3 Efficiency Assessment of Government Investments

2.3.1 Securitization 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.

2.3.2 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 Section **2**: 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.

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.

2.4 "*Failure* of the Government Bond Market"

2.4.1 Recent Government Bond Market: Concealed "G.B. Bubble" by the Complementary Purchase of G.B.'s by the Bank of Japan

"*Failure* of the Government Bond Market": Despite the Market Fundamentals being the following (i) and (ii), the sluggish Stock Market has prevented the G.B. price from plunging (or its inverse, the interest rate from soaring), thus failing to forewarn against fiscal overspending.

(i) **Increased Outstanding Government Bonds:** 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 same amount.

(ii) **Downward Revision of the Ranking of the Government Bonds**[5]: Market Demand for the G.B's, $D(p;q,Y)\downarrow$, causing the leftward shift of $D(p;q,Y)$.

(ii') **Excessive Popularity of the Government Bonds:** 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 by commercial banks and the Central and Postal Banks alike 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.

- 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

  $\Longleftarrow$ (i), (ii)
  - Despite the on-going pursuit of "Hyper-Low, Zero, or even Negative (since January 29, 2016) Interest Policy," 2016 which set the short-term interest rate at hyper-low, 0, or negative %, an expansion of the cumulative balance of government bonds tend to drive the long-term interest rate upward.

- Surfaced "Government Bond Bubble," December 2002 to June 2003

  $\Longleftarrow$ (i), (ii')

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

[5]On Jan. 27, 2011, Standard & Poor's Financial Services LLC (S&P), one of the Big Three credit-rating agencies, downgraded the Japanese Government Bonds from AA to AA- by one grade, where AA- is the top 4th of the 21 grades from AAA to D. Incidentally, Japanese G.B.s' rating AA- was below the Spanish G.B.s' AA, followed by the Irish G.B.'s which were rated A+ yet one grade below, the Portuguese G.B.'s A-, and the Greek G.B.'s BB+, to name a few countries on the brink of national bankruptcy.

On Feb. 22, 2011, Moody's Investors Service also revised the rating of Japanese G.B.s from "Stable" to "Negative."

Additional issuance of Restoration Bonds after the 3-11-2011 Eastern Japan Earthquake caused further downgrading.

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 ($\longrightarrow$ **3.4.4. Quantitatively Easing Monetary Policy: Bank of Japan as the Monopsonist in the Government Bond Market**).
- "*Forced* Failure of the Government Bond Market," after January 29, 2016 ($\longrightarrow$ **3.5.1. Hyper-Low, Zero, or Negative Interest Rate**).

2.4.2 Threats from the Enlarging Cumulative Balance of Government Bonds

- 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

- Aggravating intergenerational disparities $\Longleftarrow$ Asymmetric composition of benefit recipients and burden bearers, depending on whether government bonds are deficit-financing[6] or constructive.

[6]Deficit-financing bonds are prohibited by law $\Longrightarrow$ The government evasively calls them "exceptional bonds," instead.

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.
- 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, then such G.B.'s may well be deemed as Constructive Bonds.
- Lower market price of the government bonds $\Longleftrightarrow$ Higher interest rates[7]: In contradiction 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.

• **Adverse Effects of Debt-Financing[8]:** In contrast to the well-know "Ineffectiveness of Government Expenditures" or "Effectiveness of Monetary Policies"in the open macroeconomic context that requires $r = r_W$ for the international monetary equilibrium, Debt-Financing has adverse effects via higher interest rate, appreciation of Yen with the result of decreased Equilibrium*GDP* Y^*.

2.4.3 ANALYTICAL DIGRESSION: 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")

$$\left\{ \underbrace{d}_{\text{Paid 1 Year Later}}, \underbrace{d}_{\text{Paid 2 Years Later}}, \cdots, \underbrace{d}_{\text{Paid } n \text{ Years Later}}, \cdots \right\},$$

[7]Refer for accurate accounts to the subsequent **3.4.3 ANALYTICAL DIGRESSION: Non-Arbitrage Price of Government Bonds**.

[8]For comparisons with effects of alternative Macroeconomic counter-cyclical policy measures, refer to **3.6**. For the exact remittance mechanism of the present policy measure, refer to **3.6.2**

the *Discounted Present Value* of the above sequence is expressed as:

$$\left\{ \underbrace{\frac{d}{1+r}}_{\substack{\text{Present Value of } d \\ \text{Paid 1 Year Later}}}, \underbrace{\frac{d}{(1+r)^2}}_{\substack{\text{Present Value of } d \\ \text{Paid 2 Years Later}}}, \cdots, \underbrace{\frac{d}{(1+r)^n}}_{\substack{\text{Present Value of } d \\ \text{Paid } n \text{ Years Later}}}, \cdots \right\}.$$

A horizontal comparison of each double-row of the following TABLE is intended to help elucidate the nature of "discounting."

Consol with the Dividend d vs. a Voucher of Non-Renewable Deposits with Maturities a Year Apart 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**	$\ldots$	**d to Be Paid n Years Later**	$\ldots$
$\dfrac{d}{1+r}$	d		$\ldots$		$\ldots$
Deposit 1-Year Maturity Saving in the Amount $\dfrac{d}{1+r}$	Value of the Principal and Interests Refunded at 1-Year Maturity d		$\ldots$		$\ldots$
$\dfrac{d}{(1+r)^2}$		d	$\ldots$		$\ldots$
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	$\ldots$		$\ldots$
$\vdots$			$\vdots$		$\vdots$
$\dfrac{d}{(1+r)^n}$			$\ldots$	d	$\ldots$
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 $\dfrac{d}{(1+r)^{n-2}}$	$\ldots$	Value of the Principal and Interests Refunded at n-Year Maturity d	$\ldots$
$\vdots$			$\vdots$		$\vdots$

In order to materialize the future income stream $\left\{ \underbrace{d}_{1 \text{ Year Later}},\ \underbrace{d}_{2 \text{ Years Later}},\ \ldots,\ \underbrace{d}_{n \text{ Years Later}},\ \ldots \right\}$,

the following alternative portfolio options are conceivable[9]:

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 non-renewable deposits, the first of which is 1 year maturity deposit of the face value at $\frac{d}{1+r}$, the second 2 year maturity deposit face-valued at $\frac{d}{(1+r)^2}$, ... , the n-th n year maturity deposit face-valued at $\frac{d}{(1+r)^n}$, ... , 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, ... , an n-year maturity deposit, ... , 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.

Note that the total acquisition cost of the voucher in *Option 2* is $\frac{d}{1+r} + \frac{d}{(1+r)^2} + \ \dots \ + \frac{d}{(1+r)^n} + \ \dots \ .$

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*.

[9] 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 $\frac{d}{r}$.

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 $\{d,\ d,\ \cdots,\ d,\ \cdots\}$ [10], i.e.,

$$p \ = \ \frac{d}{1+r} + \frac{d}{(1+r)^2} + \ \cdots \ = \ \frac{d}{r}\,.$$

2.4.4 Quantitatively Easing Monetary Policy: Bank of Japan as the Monopsonist in the Government Bond Market

The G.B. Market is deprived of the function of price mechanism by the "Zero → Minus Interest Rate" instituted by the Central Bank of Japan, together with the above-noted its "Hollowing."

Purchases of G.B.'s by the Bank of Japan on the scale of ¥80 trillion (> newly issued amount), virtually hollowed out the G.B. Market, with the ending possession balance of the Bank of Japanese exceeding ¥300 trillion, comprising more than 30 % of the outstanding balance as of August 2015; and the ending balance exceeding ¥400 trillion so soon as in October 2016. .

- 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.

2.5 Recent Monetary Policies

2.5.1 Hyper-Low, Zero, or Negative Interest Rate

"Market Failure of the G.B.'s," or loss of Market Mechanism thereof after Jan. 29, 2016, caused by the aforementioned forced "Hollowing" of the G.B. Market, coupled with the imposition of "0 $\longrightarrow$ Negative Interest Rate."

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[10] 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 $p = \frac{d}{r}$. ■

- "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

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

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[11]	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

[11] 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.

2.5.2 Assessment of Negative Interest Rate Policy Based on the Consistency with Microeconomic Behavior

Messing with the resource-allocative function of such prices as interest rates or exchange rates is *ad hoc*, and far from a reliable policy that stands the scrutinies of Economic Doctrines.

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."[12]

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.[13]

2.6 Effectiveness of Fiscal and Monetary Policies under the Flexible Exchange Rate System

- By the "Small Country" Hypothesis, in order for the international capital inflows and outflows to be in equilibrium, the international differential of foreign and domestic interests = 0, i.e., $r = r_W$ ..
- Pattern of policy assignment under Flexible Exchange Rate System $\longleftrightarrow$ "*Locomotive Theory*" under the Fixed Exchange Rate System with emphasis on the leading role of countries with current surpluses.

[12]The idea of "Impatience" 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 nonconvex 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,

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.

[13]Within such an institutionally imposed limit as "credit limit." Otherwise, the corresponding "budget sets" are not even *compact*.

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*.

2.6.1 Ineffectiveness of Government Expenditures (Well-Known)

1. *Domestically*, "Crowding-Out", i.e., Government Expenditures $G \left(\uparrow\right)$[14] $\Longrightarrow$ 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.[15] $\Longrightarrow$ Equilibrium GDP Y^* $(\longrightarrow)$.

2.6.2 Adverse Effects of Debt-Financing

Increased cumulative budgetary deficits:

1. *Domestically*, Debt-Financing Government Bonds $\left(\uparrow\right)$ $\Longrightarrow$ Equilibrium Price of Government Bonds $\left(\downarrow\right)$ $\Longleftrightarrow$ Domestic Interest Rate $r \left(\uparrow\right)$ $\Longrightarrow$ Investment $I \left(\downarrow\right)$.
2. *Through International Interactions*[16], $r \left(\uparrow\right)$ 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*[17], 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*, i.e., $I \left(\downarrow\right)$ from 1., and $(X - M)$ $\left(\downarrow\right)$ from 3. $\Longrightarrow$ Equilibrium GDP Y^* $\left(\downarrow\right)$.

2.6.3 Effectiveness of Monetary Policies (Well-Known)

1. *Domestically*, Easing Money Supply [18] $\Longrightarrow$ Domestic Equilibrium Interest Rate $r \left(\downarrow\right)$ $\Longrightarrow$ Investment $I \left(\uparrow\right)$[19].

[14] Upward shift of the IS-Curve.

[15] 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 $(X - M)$ $\left(\downarrow\right)$.

[16] Identical to 2. in **10.3.2**.

[17] Identical to 3. in **10.3.2**.

[18] Downward shift of the LM-Curve.

[19] Upward shift of the IS-Curve.

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 $(X - M)$ $\left(\uparrow\right)$[20].

4. *In Total*, I $\left(\uparrow\right)$ in 1. is enhanced by $(X - M)$ $\left(\uparrow\right)$ in 3.[21] $\Longrightarrow$ Equilibrium GDP Y^* $\left(\uparrow\right)$.

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	$\left(\downarrow\right)$	$\left(\downarrow\right)$

[20] Upward shift of the IS-Curve.

[21] The upward shift of the IS-Curve in 1. is enhanced by yet another upward shift of the IS-Curve in 3..

2.7 Prolonged Instability due to Anomalies of the Recent Saving Behavior

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 (⟶ **3.7.2**.).

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." (⟶ **3.7.1**, especially REMARK (STYLIZED FACTS *of Japanese Savings after the Burst of Economic Bubbles*).)

2.7.1 Recent Sectoral Saving Behavior

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

Sectoral Saving Behavior

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) [22]	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

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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

[22] (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 dominant 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.

   $\Longleftarrow$ General tendency, plus particularly due to societal aging, i.e., "Dis-saving" typical of the retired generation.

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.

2.7.2 Resurgence of the "Knife-Edge Instability"

In the preceding discussion on the Recent Sectoral Saving Behavior in **3.7.1**, 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 $i = H, NC, FC$.

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

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)[23]).

- **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)[24]).

- 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)[25]).

- **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 $s\Big\downarrow \Longrightarrow g\Big\downarrow$.

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

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

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

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

3 Diagnostics for Japanese Fiscal and Monetary Policies

"Balanced Budget," to Be Identified as the Ultimate Policy Goal

- "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 ($\longrightarrow$ **3.2**).

- Direct harms attributable to dependence on the Deficit-Financing Government Bonds ($\longrightarrow$ **3.4.2**).

- Special problems arising under the Flexible Exchange Rate System:
  - Fiscal Policies no longer exert a *Counter-Cyclical Effect* ($\longrightarrow$ **3.6.1**).

    $\Longrightarrow$ Its *Income Redistributive Effect* ($\longrightarrow$ Regressive or Progressive nature of taxation, Intergenerational Income Transfers.), *Resource Allocative Effect* ($\longrightarrow$ **3.3.** Productivity Augmenting Effect of Government Investments).
  - ★ Unless the G.B. Market fails to function, Adverse Effect of Debt Financing will surface ($\longrightarrow$ **3.6.2**).

- Debt-Financing implemented by complementary Monetary Policies:
  - Hidden "Government Bonds Bubble" ($\longrightarrow$ **3.4.1**).
  - ★ *Forced* "Market Failure" of the *Isolated* Government Bond Market in order to conceal the revelation of budgetary deficits: *Failure of the Signaling Function inherent to the interest rates as prices to alert against the threats of fiscal crisis.*

    $\Longleftarrow$ The Government Bond Market is intended to be *isolated* by the Monopsony of the Central Bank of Japan ($\longrightarrow$ **3.4.4**); In order to enforce a "Negative Interest Rate" therein. ($\longrightarrow$ **3.4.5**).
  - The G.B. Market *not quite isolated!*

    $\Longrightarrow$ Through the *General Equilibrium* interactions, the entire market system, including the Money Market, has been distorted, permitting incessant cumulations of budgetary deficits.
  - ★ *Negative interest rates are inconsistent with individual intertemporal optimizations* ($\longrightarrow$ **3.5.2**).
  - ★ **"Non-Subordination" of Monetary Policies to Fiscal Policies** ($\longrightarrow$**3.4.4**) .

- Prolonged Recession accompanied by changes in saving behaviors (The "Knife Edge" Instability revisited $\longrightarrow$ **3.7**).

4 METHODOLOGICAL DIGRESSION: Two Specializations of General (Dis-)Equilibrium Analysis - Microeconomic Analysis of Partial or Related Market Equilibrium, and Aggregate Macroeconomic Analysis with or without Unemployment

"History of Economic Analyses after 1881 *in Action*:"

- **Prototype: General (Dis-)Equilibrium Analysis**
  Milestone references are:

  EDGEWORTH, Francis Ysidro (1881; Reprinted 1967): *Mathematical Psychics: An Essay on the Application of Mathematics to the Moral Sciences.* Repr. of 1881 Ed. London, UK: G. Kegan Paul; New York. NY: Augustus M. Kelley. Also in: EDGEWORTH (Ed. by Peter NEWMAN) (2003): *F.Y. Edgeworth's Mathematical Psychics and Further Papers on Political Economy.* Oxford: Oxford University Press.

  WALRAS, Léon (1926; Translated 1954): *Elements of Pure Economics, or the Theory of Social Wealth.* Trans. from the 1926 Definitive French Edition by William Jaffé. London: George Allen and Unwin for the American Economic Association and the Royal Economic Society.

  The definitive mathematical rendition to the above is given in:

  DEBREU, Gérard (1959; Reissued 1971): *Theory of Value: An Axiomatic Analysis of Economic Equilibrium.* A Cowles Foundation Monograph 17. Fourth Printing. New York, NY: John Wiley & Sons; New Haven, CT: Yale University Press.

- **Special Case I: Microeconomic Analysis of Partial or Related Market Equilibrium**
  Refer to any standard Microeconomics textbooks incorporating treatments developed in the classics:

  MARSHALL, Alfred (1890; Ninth (Variorum) Ed. 1961): *Principles of Economics, Ninth (Variorum) Ed. Vol. 1: Text; Vol 2: Notes.* With Annotations by C.W. Guillebaud. London: Macmillan for the Royal Economic Society.

  HICKS, John R. (1939; Second Ed., 1946): *Value and Capital: An Inquiry into Some Fundamental Principles of Economic Theory, Second Ed.* Oxford: Clarendon Press.

- **Special Case II: Neoclassical Aggregate Macroeconomic Analysis of Full-Employment Equilibrium**
  "Neoclassical Synthesis" (⟵ SAMUELSON, Paul A. (1938; Various Eds., thereafter): *Economics: An Introductory Analysis.* New York, N.Y.: McGraw-Hill.)

  - Applicable once the unemployment is resolved with a resort to appropriate fiscal/monetary policies.
  - Resource allocation mechanism of the price system is restored.

- **Special Case III: Keynesian Aggregate Macroeconomic Analysis of Under-Employment Equilibrium**
  Refer to any standard Macroeconomics textbooks in the tradition of:

  KEYNES, John Maynard (1936; Collected Writings Ed., 1973; Repr., 1998): *The General Theory of Employment, Interest and Money.* The Collected Writings of John Maynard Keynes, Vol. 11. London: Macmillan and New York, NY: Cambridge University Press for The Royal Economic Society.

Summary Table A: Microeconomics (Price Theory)

General (Dis-) 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: MACROECONOMICS (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* $\left\{ \bar{L} - (L_C^* + L_I^*) \right\}$.