

## Notes

# Note: Proof of Specific Data-Consistency Connecting LONG (1960–2011) with Short (1990–2011) Data-Sets for Japan and the US, Using KEWT 7.13-6

Hideyuki Kamiryō

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## Abstract

This Abstract is the same as Abstract presented to *Papers of the Research Society of Commerce and Economics (PRSCÉ)* at the same time, except for bold letters. Specifically this Note concentrates on data-consistency proof of Japan and the US, combining *International Financial Statistics Yearbook*, IMF, with each country's SNA data. Of course, following specific case of Japan and the US, the author is able to settle data-sets by country. Yet these tries confuse readers. The author stops inserting SNA data into *International Financial Statistics Yearbook*, IMF. Nevertheless it is meaningful for readers to examine two sister Notes for comparison.

This Note focuses how to maintain ever consistency between LONG (1960–2011) data-sets and Short (1990–2011) data-sets in the series of the author's KEWT (Kamiryō Endogenous World Table) database, only for the case of Japan and the US. All the other cases are simultaneously summarized in the sister journal, *Journal of Economic Sciences*. The reason for such separation is that the case of ever consistency for Japan and the US uses not only  $25 = 10$  (for the real assets) +15 (for the financial/market assets and external others) original data taken from *International Financial Statistics Yearbook (IFSY)* but also typically precise national accounts of Japan Government Office and the Bureau of Economic Activity, the US. Earlier for many years, the author had compared the data of a system for national accounts (SNA, 1993) with the *IFSY*. The author finds that *IFSY* database is commonly available for world countries, compared with SNA database by country. Also, SNA database well maintains national taste, culture, and history, compared with IMF and the World Bank databases. It is noted that both databases, SNA and IMF, aim at recording/records and are not fitted for directly policy-oriented. The difference is just specific or commonly to the world countries.

Contrarily, the author's *Earth Endogenous System (EES, lxviii+568, May 15, 2013)* is purely policy-oriented. Recording and policy-oriented are not compatible interrupted by the market

principles. The *EES* is able to integrate recording with policy-oriented. As a result, causes and effects/results are realized at the same time, apart from one way or two-ways. Theoretical essence underlying the *EES* is: There are purely endogenous equations and these equations hold without any assumption. In the literature, equations always have some partial assumptions each as surrogate for equation. Contrarily, endogenous equations hold and perfect competition is precisely measured. And, endogenous equations even reinforce the essence of the market principles. All the values and ratios are ever consistently measured by country, sector (G and PRI, and its weight-aggregated Total) and, years and over years.

For empirical data, **this Note combines the KEWT 7.13-6 for J & US (“LONG,” 1960–2011) with the KEWT 7.13-1 (“Short,” 1990–2011) for Pacific and Asia area.**

The contents in the Excel are composed of several key blue bird devices. The author uses these key devices for further researches and finds new discoveries in the near future. After eternity, the KEWT databases hopefully are presented to IMF and the World Bank, as gifts or fortune. For key devices are connected with the author’s copyright. Copy right between two countries may be solved by specific lawyers yet, the author’s copy right has not been born without surprising support and understanding to the *EES*. In this respect, the author sincerely desires that all the copy right is succeeded by the Better Advances Press, Toronto. This is the way of the author’s spiritual life. Of course, while the author is alive, the author intends to exclusively and directly convey whatever of KEWT contents to IMF and the World Bank. This is also because the *EES* has not been born without 25 actual and external original data included in *IFSY*, IMF, over years. Furthermore, the *EES* satisfies Keynes’s spirit towards peaceful world without war and hyperinflation by utilizing an endogenous container (i.e., policy-oriented methodology). Leaders and policy-makers by country will decide the level of exercise and people by country will enjoy the results. This is because actual data remain within a certain range of endogenous data by country, sector and, years and over years.

### **Mechanics of the data-consistency between LONG and Short database**

The other Note to *PRSC*E summed up the data-consistency directly and concretely. This Note, on the contrast, pursued evidences by several aspects more widely and more deeply. Tables and figures inserted into each Note are different yet, tables and figures of two Notes, as a whole, are interrelated and tightly connected with each other, making two Notes more attractive. Also, as a whole, evidence is shown by either tables or figures, not tables and figures together at all.

Commonly clarified is the fact that it is impossible for policy-makers and leaders to give the SNA data window dressing, regardless of whether the *EES* database is used in parallel or not. Mote clearly, the original data of *IFSY*, IMF, cannot be window dressed. This is a new discovery of macro database, regardless of whether data are actual/statistics or purely endogenous. And the two sister Notes here definitely proved this discovery. The author has examined its database each year, by improving and expanding calculation methods and processes for LONG and Short data consistency.

The new fact consistently and always corresponds with the market principles. The market principle for the long-term is essentially vertical under the price-equilibrium. Nevertheless, it behaves just like God or the nature. The new discovery comes from the character of the macro-economy. Already The *EES* (12–33, *ibid.*) proved the author's neutrality of the financial/market assets to the real assets in Chapter 2. This neutrality remains a sufficient condition and the new discovery satisfies its necessary condition.

Now let the author back to this Note. Data consistency between LONG and Short database is directly examined by the capital at the total economy  $K$  and the capital at the government sector  $K_G$ . The results are shown by the following four tables and four figures.

Table 1 Japan,  $K$  consistency between LONG (1960–2011) and Short (1990–2011)

Table 2 the US,  $K$  consistency between LONG (1960–2011) and Short (1990–2011)

Table 3 Japan,  $K_G$  consistency between LONG (1960–2011) and Short (1990–2011)

Table 4 the US,  $K_G$  consistency between LONG (1960–2011) and Short (1990–2011)

Figure 1-1 Japan, related endogenous ratios under the whole consistency over years

Figure 1-2 Japan, related endogenous ratios under the whole consistency over years

Figure 2-1 the US, related endogenous ratios under the whole consistency over years

Figure 2-2 the US, related endogenous ratios under the whole consistency over years

The author used some of these tables and figures already in the *EES*. This Note renewed each data and figures from the KEWT 6.11 & 6.12 to 6.13 data-sets. Further, this Note reorganized these tables from the whole picture or version point of view. It implies what is most important and what is the priority of mechanics from the ever consistency point of view.

What do the above tables and figures indicate essentially? The  $K$  and  $K_G$  consistency is realized with compatible integration of national taste and culture and technological progress. The theory developed in a separator paper. The above two tables and two figures each show the mechanics aspect and prove that the data consistency between LONG and Short database hold. This proof implies that national taste and culture is independent of producer goods

and technological progress is independent of consumer goods. Nevertheless, the whole economy consistently holds under perfect competition. In this respect, the *EES* is not a two-sector model in the literature but a sort of one endogenous sector model.

In detail, the clue of the database consistency lying between LONG (1960–2011) and Short (1990–2011) is connected with (1) seven endogenous parameters, (2) basic endogenous equations, (3) six organic aspects, and structural hyperbolas as a base, by sector (Total, G and PRI sectors). These contents are explained at Notations by sector of the *EES* (ibid., xxxi to xlili). In a word, how do we stabilize the capital-output ratio for 51 years? It implies that first of all the clue follows ‘Law of the Conservation of the Capital-Output Ratio’ by P. A. Samuelson (1970). For stabilizing the capital-output ratio, we pay attention to how to stabilize the speed years for convergence by sector. In another words, when key ratios such as  $\beta^*$  and  $\delta_0$  are minus, we use absolute values and avoid an expression of ‘#NUM!’ at each speed years for convergence.

At the KEWT 6.12/7.13 database, the situation is always under full-employment. And, full-employment is not given but measured within the *EES*. When the rate of change in population is smooth by year and over years, we attain full-employment smoothly. When the rate of change in population has a kind of bamboo joint for a certain period of time in IMF and SNA statistics, at the joint,  $\delta_0$  often falls into minus. A minus  $\delta_0$  is a delicate result brought from actual statistics. Thus, we must be always alert at the changes in actual population over years. Full-employment is delicately connected with population in statistics. It is because full-employment is defined as the condition that the rate of change in population equals the actual growth rate of population in statistics. Note that macro technological progress advances when population decreases, as the author proved it in Chapter 15 of the *EES*.

Also, the capita-output ratio is a result of the combination of  $\Omega^* = \alpha / r^*$  derived by  $\alpha = r^* \cdot \Omega^*$ . The relative share of capital/returns to output  $Y$  and the rate of returns to capital  $K$  determine the capital-output ratio, where  $\Omega = K / Y$  and  $\Omega = \Omega^* = \Omega_0$  under Samuelson’s conservation law. It means that capital stock must be smoothly measured and as a result, the capital-output becomes smooth. The circulation argument disappears when the initial capital stock is not given but endogenously measured so that the capita-output ratio is horizontal. Therefore, the capital-output ratio is a clue for solving the database consistency. And, this is expanded by using two hyperbolic functions using  $i = I / Y$  and  $n_E = n$ . Net investment is inevitably connected with population or, sustainable growth with population endogenously.

For the mechanics of  $\delta_0$ , Chapter 8 (177–200) presents ‘two disequilibrium risks of  $\delta_0$  and the speed years, essential endogenous parameters. In particular, numerical relationship among

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$\Omega$	0.4000	0.5000	0.6852	0.8000	<b>1.0000</b>	1.2000	2.0000	10.0000	<b>11.0000</b>
LN( $\Omega$ )	(0.9163)	(0.6931)	(0.3781)	(0.2231)	0.0000	0.1823	0.6931	2.3026	2.3979
$r^* = \alpha/\Omega$	0.5000	0.4000	0.2919	0.2500	0.2000	0.1667	0.1000	0.0200	0.0182
$\beta^*$	0.3616	0.4171	<b>0.5000</b>	0.5417	<b>0.6017</b>	0.6496	0.7726	1.0000	1.0067
$B^*$	1.7655	1.3977	<b>1.0001</b>	0.8460	0.6621	0.5395	0.2943	0.0000	(0.0067)
LN( $B^*$ )	0.5684	0.3348	0.0001	(0.1673)	(0.4124)	(0.6172)	(1.2233)	(36.7368)	#NUM!
LN( $\Omega$ )/LN( $B^*$ )	(1.6119)	(2.0702)	<b>(3869.66)</b>	1.3341	<b>0.0000</b>	(0.2954)	(0.5666)	(0.0627)	#NUM!
$\delta_0$	<b>(0.612)</b>	<b>(1.070)</b>	<b>(3868.66)</b>	2.3341	<b>1.0000</b>	0.7046	0.4334	0.9373	#NUM!

capital-output ratio,  $\beta^*$ , and  $\delta_0$  is fundamental to policy-makers, as shown by BOX-8-1 (179).

The KEWT database is finally justified by Sato' Theorem 6. Sato's Theorem 6 is empirically and universally proved using the KEWT database, by shifting exogenous and market-equilibrium to endogenous and endogenous-equilibrium. 'Notes' in the *EES* sums up Ryuzo Sato's (xv, 439, 1981) two conservation laws (Theorem 6), as the final solution to Samuelson (1477–79, 1970). The *EES* (xlix, lii) raises these essences as follow:

Theorem 6 based on the Lie theory in Sato's (285, 1981):

*“Theorem 6. (Two Conservation Laws) (i) For the optimal control problem defined by (80)<sup>1)</sup>,  $\Omega_1 = \lambda Y = \text{const.}$  That is to say, the product of the implicit price  $\lambda$  and national income  $Y$  is always constant.*

*(ii)  $\Omega_2 = \lambda W = \text{const.}$  That is to say, the product of the implicit price  $\lambda$  and national wealth  $W$  is always constant.*

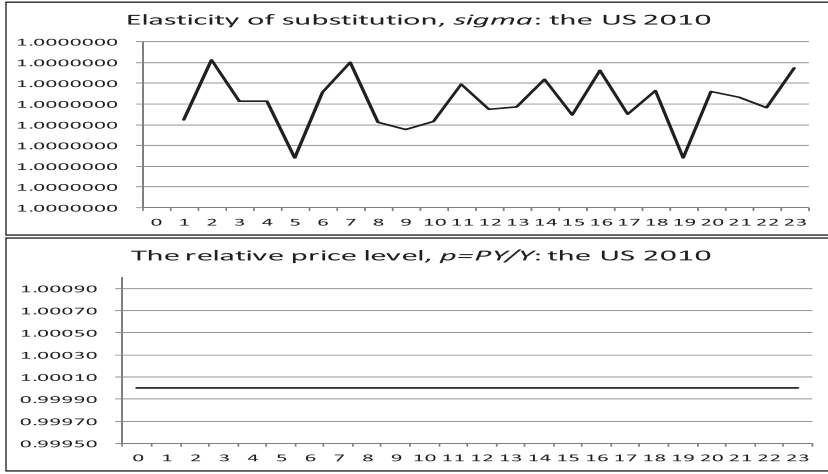
*(iii)  $\Omega_1 / \Omega_2 = Y / W = \text{const.}$  That is to say, the aggregate output-capital (wealth) ratio is always constant.*

*(iv)  $\Omega_1$  and  $\Omega_2$  are the only conservation laws globally operating in the von Neumann model of optimal growth.*

The implicit price,  $\lambda$ , defined above is now replaced by the elasticity of substitution,  $\sigma = 1.0000000$ , and the relative price level,  $p = 1.0000000$ , under constant returns to scale and at the endogenous-equilibrium, where perfect competition prevails after erasing all the assumptions in the literature (as shown at BOX N-3).

BOX N-3 Empirical proofs of specified elasticity of substitution,  $\sigma = 1.0000000$ , and the relative price level  $p = 1.0000000$ .

1) (279, Eq. 80, VII): The optimal-control problem is defined as  $\max(K_t) \int_0^T \dot{K}_t dt$  subject to  $F[K_1, K_2; \dot{K}_1, \dot{K}_2] = 0$ .



Data source: KEWT 6.12. Note: time,  $t$ , on the x axis, at the transitional path. 81 countries each show the same results by country.

Related proofs at the KEWT database are summarized in Notes (li) as follows:

Starting with endogenous Conservation Laws,  $\Omega = \Omega^* = \Omega_0$  and  $r = r^* = r_0$ ,

under  $\alpha = const.:$   $\alpha = r^* \cdot \Omega^*$ ,

- 1).  $A^* = A_0(1 + g_A^*)^{1/\lambda^*} = k^{*1-\alpha} / \Omega^*$ .  $k^* = (A^* \cdot \Omega^*)^{1/1-\alpha}$ .  $y^* = A^* k^{*\alpha}$ .
- 2).  $L^* = L_0(1 + n)^{1/\lambda^*}$ .  $K^* = k^* L^*$ .  $Y^* = A^* K^{*\alpha} L^{*(1-\alpha)}$ . Or,  $Y^* = y^* L^*$ .
- 3). Equations prevailing commonly to KEWT and its recursive programming,

$$A(t) = \frac{k(t)^{1-\alpha}}{\Omega(t)}. \quad (\text{See Note 11 on page 25, PhD thesis, Nov 2003}).$$

The speed years,  $1/\lambda^* = 1/((1-\alpha)n + (1-\delta_0)g_A^*)$ .

$$\Omega^* \frac{\beta^* \cdot i(1-\alpha)}{i(1-\beta^*)(1+n) + n(1-\alpha)}. \quad \beta^* \frac{\Omega^*(n(1-\alpha) + i(1+n))}{i(1-\alpha) + \Omega^* \cdot i(1+n)}. \quad \delta_0 = 1 + \frac{LN(\Omega^*)}{LN(B^*)} \text{ and,}$$

$$B^* = (1 - \beta^*) / \beta^*.$$

For discounting rates at  $\beta(t)$  and  $\delta_0(t)$ , the same discount rate is used by time,  $t$ :

$$r_{\beta_0-\beta^*} = \frac{LN(\beta_0) - LN(\beta^*)}{\text{speed years}}. \quad r_{\delta_0-\delta^*} = \frac{LN(\delta_0) - LN(\delta^*)}{\text{speed years}}. \quad (\text{Errors by the discount rate are}$$

negligible).

Finally, let the author compare the data consistency of Japan with that of the US. What is the difference between Japan and the UK? Implication of Figures 1-1 and 1-2 for Japan fundamentally differs from that of Figures 2-1 and 2-2 for the US. The macro-economy always tells us the truth. There is no room for compliment and deception over years. Conclusively, by item:

1. Japan has exhausted energy for the real assets completely due to accumulated deficit by year and debts over years, while the US has maintained future energy for the real assets at the sacrifice of public net investment to infrastructures.
2. The size of government is slovenly in Japan despite no war-oriented. No one is responsible for the future generations and too much short-sighted selfishness. The size of government is tight and small at the US yet the US has spent too much for world police-oriented order.
3. Both countries are endogenously against perfect competition. Under perfect competition, full-employment is natural.
4. Zero balance payment is a good prescription to the two countries. Deficits and debts do not increase naturally. The change in the exchange rate is far from the real asset robustness.
5. The author's neutrality of the financial/market assets to the real assets is the best lighthouse. Financial and market policies has no power to control the robustness of the real assets.
6. The rate of return at the real assets is zero, as proved by the author. It implies that nominal rate of return corresponds with the rate of inflation. Competition for GDP increase is meaningless.
7. Green cyclical way of business cycle is most smooth and far from repeating bubbles. Deflation is a result. 'Close to zero' nominal rate is a result. The market principles tell us ever fairly.
8. In short, the exchange rate and GDP increase are typically related and aggravate the robustness of the real assets economy by country. The 10 year market debt yield honestly expresses the worst combination of real, fiscal, financial, and market policies, from the viewpoint of the world economies in globalization, and against perfect competition as the core of the *EES*.

At the end, the author appeals the importance of the two sister Notes at this Note and sister Note simultaneously presented to the *PRSCE*. The two sister Notes are connected with each other in every respect. This Note stresses the background of the *EES* using the US and Japan, while the sister Note to the *PRSCE* the mechanics itself using France, Germany, the UK, Sweden, Spain, Italy, Greece, and Ireland.

Table 1 Japan, K consistency between LONG (1960–2011) and Short (1990–2011)

$(\rho/r)=1.8638*BR5^2-2.4547*BR5+1.758 \rightarrow$				$(\rho/r)=13.301*c^2-22.608*c+10.566$				theoretical wage		
$c=C/Y$	$(\rho/r)$	$\alpha=1-(\rho/r)$	$(r/w)$	$K_t=\Delta K+K_{t-1}$	$k=(\alpha/(1-\alpha))K=L:k$	$K=L:k$	$\Omega=K/Y$	$r=\alpha/\Omega$	$w=r/(r/w)$	<b>gw (1)</b>
<b>49</b>				<b>4500</b>						
0.7688	0.9724	0.2094	0.003237	7642	82	7642	0.5603	0.3738	115	
0.7424	0.9629	0.2289	0.002289	12226	130	12226	0.7449	0.3073	134	0.1628
0.7817	0.9780	0.2008	0.001480	16152	170	16152	0.8967	0.2239	151	0.1269
0.7888	0.9814	0.1963	0.001120	20957	218	20957	0.9971	0.1968	176	0.1615
0.7910	0.9825	0.1949	0.000904	25994	268	25994	1.0698	0.1822	201	0.1460
0.7600	0.9690	0.2156	0.000831	32507	331	32507	1.1266	0.1914	230	0.1442
0.7426	0.9629	0.2288	0.000728	40642	407	40642	1.1979	0.1910	262	0.1378
0.7256	0.9582	0.2427	0.000628	51439	510	51439	1.2953	0.1874	298	0.1375
0.6997	0.9529	0.2657	0.000568	64972	637	64972	1.3814	0.1924	339	0.1356
0.6788	0.9505	0.2859	0.000504	81895	794	81895	1.4684	0.1947	386	0.1398
0.6781	0.9505	0.2866	0.000412	101745	975	101745	1.5755	0.1819	442	0.1437
0.6979	0.9527	0.2674	0.000319	121040	1145	121040	1.7013	0.1572	493	0.1168
0.6927	0.9519	0.2724	0.000278	144392	1347	144392	1.7412	0.1564	563	0.1416
0.6943	0.9522	0.2708	0.000231	175025	1610	175025	1.7449	0.1552	673	0.1953
0.7173	0.9562	0.2499	0.000175	209591	1903	209591	1.7654	0.1415	808	0.2015
0.7634	0.9703	0.2132	0.000126	240420	2155	240420	1.8417	0.1158	921	0.1388
0.7661	0.9714	0.2113	0.000111	273334	2424	273334	1.8664	0.1132	1024	0.1127
0.7718	0.9737	0.2073	0.000097	307345	2699	307345	1.8929	0.1095	1130	0.1036
0.7743	0.9747	0.2057	0.000086	343929	2993	343929	1.9342	0.1063	1229	0.0875
0.7940	0.9840	0.1931	0.000072	385258	3325	385258	2.0182	0.0957	1329	0.0814
0.8567	1.0229	0.1625	0.000054	416478	3565	416478	2.0535	0.0792	1454	0.0938
0.8379	1.0097	0.1702	0.000054	450308	3827	450308	2.0350	0.0836	1561	0.0733
0.8550	1.0217	0.1632	0.000048	481935	4068	481935	2.0744	0.0787	1641	0.0515
0.8644	1.0288	0.1598	0.000044	509828	4273	509828	2.1002	0.0761	1710	0.0418
0.8510	1.0188	0.1647	0.000044	540347	4500	540347	2.0793	0.0792	1808	0.0574
0.8440	1.0139	0.1676	0.000042	572746	4740	572746	2.0701	0.0810	1906	0.0544
0.8404	1.0115	0.1691	0.000041	605653	4985	605653	2.0914	0.0808	1981	0.0392
0.8355	1.0082	0.1712	0.000039	644658	5280	644658	2.1197	0.0808	2064	0.0423
0.8220	0.9996	0.1777	0.000038	694051	5661	694051	2.1375	0.0831	2178	0.0549
0.8135	0.9945	0.1820	0.000031	890317	7231	890317	2.5549	0.0712	2315	0.0631
0.7780	0.9764	0.2032	0.000033	968326	7838	968326	2.5437	0.0799	2455	0.0606
0.7755	0.9753	0.2048	0.000030	1047779	8455	1047779	2.5922	0.0790	2594	0.0563
0.8078	0.9828	0.1781	0.000024	1110395	8939	1110395	2.7492	0.0648	2672	0.0304
0.8321	0.9634	0.1362	0.000017	1163930	9355	1163930	2.8837	0.0472	2802	0.0485
0.8474	0.9593	0.1166	0.000014	1213737	9741	1213737	2.9767	0.0392	2891	0.0316
0.8552	0.9596	0.1087	0.000012	1264029	10131	1264029	3.0620	0.0355	2949	0.0201
0.8644	0.9620	0.1014	0.000011	1313106	10510	1313106	3.1583	0.0321	2990	0.0140
0.8531	0.9593	0.1107	0.000011	1362279	10890	1362279	3.2059	0.0345	3021	0.0102
0.8901	0.9807	0.0924	0.000009	1391973	11113	1391973	3.4089	0.0271	2959	(0.0205)
0.9147	1.0150	0.0989	0.000010	1412929	11257	1412929	3.5255	0.0280	2877	(0.0275)
0.9044	0.9987	0.0945	0.000009	1440109	11455	1440109	3.4781	0.0272	2982	0.0365
0.9286	1.0417	0.1085	0.000011	1457716	11579	1457716	3.5675	0.0304	2893	(0.0298)
0.9517	1.0972	0.1326	0.000013	1462124	11600	1462124	3.6586	0.0362	2750	(0.0495)
0.9513	1.0960	0.1320	0.000013	1464746	11608	1464746	3.6779	0.0359	2740	(0.0039)
0.9387	1.0641	0.1179	0.000011	1470124	11640	1470124	3.6267	0.0325	2831	0.0335
0.9449	1.0792	0.1245	0.000012	1473572	11659	1473572	3.6296	0.0343	2812	(0.0067)
0.9446	1.0786	0.1242	0.000012	1475381	11666	1475381	3.6162	0.0344	2825	0.0046
0.9312	1.0471	0.1107	0.000011	1478064	11682	1478064	3.5572	0.0311	2920	0.0337
0.9369	1.0600	0.1161	0.000011	1486261	11744	1486261	3.6163	0.0321	2870.54	(0.0171)
0.9353	1.0563	0.1145	0.000011	1497681	11835	1497681	3.7180	0.0308	2818.57	(0.0181)
0.9136	1.0133	0.0983	0.000009	1515376	11975	1515376	3.6362	0.0270	2969.52	0.0536
0.9367	1.0595	0.1159	0.000011	1532315	12113	1532315	3.7823	0.0306	2831.39	(0.0465)
$c=C/Y$	$(\rho/r)$	$\alpha=1-(\rho/r)$	$(r/w)$	$K_t=\Delta K+K_{t-1}$	$k=(\alpha/(1-\alpha))K=L:k$	$K=L:k$	$\Omega=K/Y$	$r=\alpha/\Omega$	$w=r/(r/w)$	<b>gw (1)</b>

Data source: KEWT database 7.13-6, 1960–2011, based on original data of International Financial Statistics Yearbook, IMF



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**Table 2 the US, K consistency between LONG (1960–2011) and Short (1990–2011)**

	(rho/r)=13.301*c-2.22.608*c+10.566								theoretical wage		
	c=C/Y	(rho/r)	$\alpha=1-c/(rho/r)$	(r/w)	$K_t=\Delta K+K_{t-1}$	$k=(\alpha/(1-\alpha))K=Lk$	$\Omega=K/Y$	$r=\alpha/\Omega$	$w=r/(r/w)$	<b>gw (1)</b>	
<b>1. the US</b>					<b>1434</b>	the 1482 at BEA					
1990 <b>1960</b>	0.8762	0.9684	0.0952	0.012810	<b>1484</b>	8.22	1484	<b>3.1329</b>	0.0304	2.37	
1991 <b>1960</b>	0.8778	0.9696	0.0946	0.012514	1534	8.35	1534	3.1294	0.0302	2.42	0.0186
1992 <b>1963</b>	0.8728	0.9662	0.0966	0.012520	1594	8.54	1594	3.0231	0.0320	2.55	0.0563
<b>1963</b>	0.8730	0.9663	0.0966	0.012222	1655	8.74	1655	2.9760	0.0324	2.65	0.0398
<b>1964</b>	0.8708	0.9650	0.0976	0.012073	1719	8.96	1719	2.8783	0.0339	2.81	0.0581
<b>1965</b>	0.8648	0.9621	0.1012	0.012131	1803	9.28	1803	2.7853	0.0363	2.99	0.0660
<b>1966</b>	0.8643	0.9619	0.1015	0.011710	1897	9.65	1897	2.6758	0.0379	3.24	0.0824
<b>1967</b>	0.8774	0.9692	0.0948	0.010469	1987	10.00	1987	2.6528	0.0357	3.41	0.0532
<b>1968</b>	0.8838	0.9745	0.0931	0.009884	2084	10.38	2084	2.5448	0.0366	3.70	0.0841
<b>1969</b>	0.8841	0.9748	0.0930	0.009501	2188	10.79	2188	2.4692	0.0377	3.96	0.0715
<b>1970</b>	0.8972	0.9890	0.0928	0.009190	2282	11.13	2282	2.4425	0.0380	4.13	0.0428
<b>1971</b>	0.8937	0.9847	0.0924	0.008838	2393	11.53	2393	2.3601	0.0392	4.43	0.0720
<b>1972</b>	0.8895	0.9801	0.0924	0.008466	2525	12.03	2525	2.2659	0.0408	4.82	0.0869
<b>1973</b>	0.8736	0.9667	0.0963	0.008421	2681	12.65	2681	2.1552	0.0447	5.31	0.1013
<b>1974</b>	0.8852	0.9758	0.0928	0.007707	2839	13.28	2839	2.1039	0.0441	5.72	0.0790
<b>1975</b>	0.9013	0.9943	0.0936	0.007505	2971	13.76	2971	2.0159	0.0464	6.19	0.0805
<b>1976</b>	0.8939	0.9850	0.0925	0.007057	3148	14.44	3148	1.9169	0.0482	6.84	0.1049
<b>1977</b>	0.8891	0.9796	0.0924	0.006648	3374	15.32	3374	1.8468	0.0501	7.53	0.1015
<b>1978</b>	0.8739	0.9669	0.0961	0.006468	3661	16.45	3661	1.7732	0.0542	8.38	0.1134
<b>1979</b>	0.8688	0.9640	0.0987	0.006180	3987	17.72	3987	1.7290	0.0571	9.24	0.1017
<b>1980</b>	0.8854	0.9760	0.0928	0.005431	4289	18.84	4289	1.7094	0.0543	10.00	0.0824
<b>1981</b>	0.8742	0.9671	0.0960	0.005244	4658	20.26	4658	1.6553	0.0580	11.06	0.1066
<b>1982</b>	0.9029	0.9966	0.0940	0.004855	4963	21.37	4963	1.6951	0.0555	11.42	0.0328
<b>1983</b>	0.9113	1.0094	0.0972	0.004762	5296	22.60	5296	1.6649	0.0584	12.26	0.0729
<b>1984</b>	0.8928	0.9837	0.0924	0.004164	5778	24.45	5778	1.6333	0.0566	13.59	0.1084
<b>1985</b>	0.9057	1.0006	0.0949	0.003998	6252	26.22	6252	1.6470	0.0576	14.41	0.0605
<b>1986</b>	0.9253	1.0348	0.1058	0.004264	6681	27.76	6681	1.6831	0.0629	14.75	0.0237
<b>1987</b>	0.9281	1.0405	0.1081	0.004127	7127	29.35	7127	1.6908	0.0639	15.49	0.0499
<b>1988</b>	0.9259	1.0360	0.1063	0.003850	7572	30.90	7572	1.6680	0.0637	16.56	0.0692
<b>1989</b>	0.9218	1.0280	0.1033	0.003547	8033	32.48	8033	1.6465	0.0627	17.69	0.0684
<b>1990</b>	0.9697	1.1503	0.1570	0.005645	8250	32.98	8250	1.5960	0.0983	17.42	<b>(0.0150)</b>
<b>1991</b>	0.9590	1.1177	0.1419	0.004948	8475	33.43	8475	1.5915	0.0892	18.02	0.0346
<b>1992</b>	0.9645	1.1338	0.1494	0.005190	8693	33.84	8693	1.5468	0.0966	18.61	0.0324
<b>1993</b>	0.9527	1.0998	0.1338	0.004454	9022	34.67	9022	1.5412	0.0868	19.48	0.0471
<b>1994</b>	0.9475	1.0858	0.1275	0.004077	9438	35.83	9438	1.5233	0.0837	20.52	0.0533
<b>1995</b>	0.9471	1.0849	0.1270	0.003943	9836	36.90	9836	1.5240	0.0833	21.14	0.0299
<b>1996</b>	0.9397	1.0666	0.1190	0.003533	10305	38.21	10305	1.5066	0.0790	22.35	0.0572
<b>1997</b>	0.9276	1.0395	0.1077	0.003023	10893	39.92	10893	1.4939	0.0721	23.85	0.0672
<b>1998</b>	0.9204	1.0253	0.1023	0.002709	11622	42.09	11622	1.4990	0.0683	25.20	0.0569
<b>1999</b>	0.9144	1.0145	0.0987	0.002433	12576	45.03	12576	1.4960	0.0660	27.13	0.0763
<b>2000</b>	0.9157	1.0169	0.0995	0.002281	13680	48.43	13680	1.5172	0.0656	28.74	0.0596
<b>2001</b>	0.9403	1.0679	0.1195	0.002663	14550	50.96	14550	1.5774	0.0758	28.44	<b>(0.0105)</b>
<b>2002</b>	0.9678	1.1441	0.1541	0.003451	15231	52.80	15231	1.6235	0.0949	27.51	<b>(0.0328)</b>
<b>2003</b>	0.9764	1.1722	0.1670	0.003675	15897	54.57	15897	1.6235	0.1029	28.00	0.0178
<b>2004</b>	0.9761	1.1711	0.1665	0.003524	16673	56.70	16673	1.6064	0.1037	29.42	0.0506
<b>2005</b>	0.9840	1.1985	0.1790	0.003702	17474	58.87	17474	1.5948	0.1122	30.31	0.0303
<b>2006</b>	0.9635	1.1308	0.1480	0.002797	18603	62.10	18603	1.5730	0.0941	33.64	0.1098
<b>2007</b>	0.9392	1.0654	0.1184	0.002034	19968	66.06	19968	1.5642	0.0757	37.23	0.1068
<b>2008</b>	0.9547	1.1054	0.1363	0.002282	21097	69.17	21097	1.6222	0.0840	36.83	<b>(0.0107)</b>
<b>2009</b>	1.0108	1.3035	0.2246	0.004203	21206	68.92	21206	1.7457	0.1287	30.61	<b>(0.1688)</b>
<b>2010</b>	0.9924	1.2296	0.1929	0.003429	21631	69.69	21631	1.6846	0.1145	33.39	0.0907
<b>2011</b>	0.9890	1.2166	0.1871	0.003259	22112	70.62	22112	1.6475	0.1136	34.85	0.0436
	c=C/Y	(rho/r)	$\alpha=1-c/(rho/r)$	(r/w)	$K_t=\Delta K+K_{t-1}$	$k=(\alpha/(1-\alpha))K=Lk$	$\Omega=K/Y$	$r=\alpha/\Omega$	$w=r/(r/w)$	<b>gw (1)</b>	

Data source: KEWT database 7.13-6, 1960–2011, based on original data of International Financial Statistics Yearbook, IMF

Table 3 Japan,  $K_G$  consistency between LONG (1960–2011) and Short (1990–2011)

The government sector				The government sector								
$L_G-L(W_G/W)$	$(r/w)_G$	$K_G=\Delta K_G+K_G w_G=r_G/(r/w)$	$k_G=K_G/L_G$		$A_G$	$g_{A/G}(STOCK)$	$i_G=I_G/Y_G$	$n_G$	$\alpha_G=S_G$	$\Omega_G=K_G/Y_G$	$k_G=K_G/L_G$	
12.19		1500		9. Japan 349						HA(G)=	0.17687	
12.31	0.001696	1798	115	146	2000 1960	53.55	#DIV/0!	0.1681	0.0094	0.1986	1.0140	146
12.41	0.001578	2204	134	178	2001 1960	55.33	0.0332	0.1903	0.0092	0.2189	1.0330	178
12.84	0.000991	2662	151	207	2002 1960	73.49	0.3282	0.1956	0.0095	0.1704	1.1369	207
12.94	0.000786	3318	176	256	1963	83.31	0.1336	0.2401	0.0102	0.1677	1.2144	256
13.19	0.000603	4135	201	313	1964	96.08	0.1533	0.2586	0.0106	0.1589	1.3091	313
11.67	0.000618	5422	230	465	1965	75.38	(0.2155)	0.3718	0.0111	0.2231	1.5661	465
11.65	0.000564	7335	262	630	1966	65.58	(0.1300)	0.4620	0.0162	0.2622	1.7720	630
11.43	0.000654	10008	298	875	1967	39.84	(0.3925)	0.4986	0.0104	0.3639	1.8667	875
11.62	0.000569	13267	339	1142	1968	34.90	(0.1240)	0.5022	0.0112	0.3939	2.0441	1142
11.81	0.000571	17796	386	1507	1969	24.36	(0.3019)	0.5342	0.0119	0.4623	2.0992	1507
12.35	0.000455	22669	442	1835	1970	26.52	0.0884	0.4869	0.0113	0.4550	2.2647	1835
13.02	0.000340	27456	493	2108	1971	34.64	0.3062	0.4340	0.0130	0.4176	2.4898	2108
13.39	0.000276	34229	563	2556	1972	37.39	0.0795	0.5270	0.0141	0.4136	2.6630	2556
13.88	0.000218	42266	673	3046	1973	45.46	0.2156	0.5169	0.0142	0.3995	2.7185	3046
15.14	0.000152	50225	808	3317	1974	80.51	0.7711	0.4325	0.0133	0.3348	2.7294	3317
16.17	0.000092	63235	921	3910	1975	140.76	0.7484	0.6430	0.0128	0.2641	3.1251	3910
16.03	0.000078	78935	1024	4925	1976	134.65	(0.0434)	0.6916	0.0108	0.2768	3.4774	4925
16.14	0.000063	97776	1130	6058	1977	142.00	0.0546	0.7486	0.0097	0.2751	3.8850	6058
16.07	0.000053	120820	1229	7519	1978	136.83	(0.0365)	0.8361	0.0091	0.2833	4.3837	7519
16.16	0.000042	145240	1329	8986	1979	151.36	0.1062	0.8253	0.0084	0.2738	4.9087	8986
22.30	(0.000004)	161127	1454	7226	1980	1862.66	11.3064	0.5054	0.0081	(0.0313)	5.1254	7226
22.69	(0.000004)	166147	1561	7323	1981	2015.27	0.0819	0.1464	0.0073	(0.0323)	4.8441	7323
23.04	(0.000006)	170330	1641	7392	1982	2440.98	0.2112	0.1162	0.0070	(0.0501)	4.7301	7392
23.49	(0.000009)	169769	1710	7228	1983	2911.51	0.1928	(0.0149)	0.0070	(0.0672)	4.5119	7228
23.52	(0.000007)	172023	1808	7237	1984	2805.21	(0.0365)	0.0108	0.0065	(0.0555)	4.2256	7237
23.48	(0.000006)	167618	1906	7140	1985	2682.80	(0.0436)	(0.0603)	0.0063	(0.0433)	3.9086	7140
23.94	(0.000008)	163345	1981	6823	1986	3084.03	0.1496	(0.0952)	0.0054	(0.0564)	3.6390	6823
23.99	(0.000007)	155630	2064	6488	1987	3061.82	(0.0072)	(0.1636)	0.0049	(0.0505)	3.3015	6488
23.77	(0.000005)	142383	2178	5990	1988	2714.42	(0.1135)	(0.2632)	0.0043	(0.0286)	2.8291	5990
23.76	(0.000003)	127205	2315	5354	1989	2662.69	(0.0191)	(0.2810)	0.0042	(0.0184)	2.3551	5354
23.95	0.000002	152593	2455	6371	1990	2180	(0.1812)	0.4251	0.0034	0.0153	2.5550	6371
24.08	0.000016	184937	2594	7679	1991	1073	(0.5078)	0.4599	0.0031	0.1119	2.6295	7679
25.05	0.000007	213155	2672	8510	1992	1747	0.6279	0.3992	0.0024	0.0530	3.0157	8510
24.81	0.000002	239136	2802	9637	1993	2356	0.3489	0.3657	0.0016	0.0212	3.3663	9637
24.99	(0.000000)	263551	2891	10548	1994	2910	0.2348	0.3383	0.0014	(0.0008)	3.6518	10548
25.53	(0.000002)	286216	2949	11210	1995	3620	0.2441	0.3084	0.0014	(0.0246)	3.8952	11210
26.02	(0.000003)	307894	2990	11831	1996	3980	0.0993	0.2881	0.0014	(0.0340)	4.0915	11831
26.28	(0.000001)	326952	3021	12443	1997	3371	(0.1529)	0.2432	0.0013	(0.0130)	4.1729	12443
27.33	(0.000037)	347918	2959	12730	1998	5798509	#####	0.4844	0.0013	(0.8682)	8.0381	12730
28.74	(0.000026)	359974	2877	12525	1999	187417	(0.9677)	0.2164	0.0020	(0.4845)	6.4618	12525
28.94	(0.000018)	380051	2982	13133	2000	46678	(0.7509)	0.3069	0.0017	(0.3193)	5.8093	13133
30.99	(0.000020)	388347	2893	12533	2001	48885	0.0473	0.1230	0.0014	(0.3298)	5.7601	12533
33.20	(0.000033)	391455	2750	11791	2002	630357	11.8948	0.0556	0.0013	(0.6319)	6.9965	11791
33.34	(0.000034)	393139	2740	11791	2003	909125	0.4422	0.0309	0.0010	(0.6741)	7.2054	11791
32.46	(0.000027)	393205	2831	12113	2004	177370	(0.8049)	0.0011	0.0010	(0.4819)	6.3399	12113
32.88	(0.000025)	389954	2812	11860	2005	104968	(0.4082)	(0.0501)	0.0007	(0.4235)	6.0031	11860
32.55	(0.000021)	385842	2825	11853	2006	45329	(0.5682)	(0.0593)	0.0000	(0.3259)	5.5630	11853
31.77	(0.000020)	374395	2920	11783	2007	42072	(0.0719)	(0.1620)	0.0004	(0.3137)	5.3003	11783
32.40	(0.000030)	363626	2871	11221	2008	218880	4.2025	(0.1747)	0.0002	(0.5089)	5.8983	11221
33.29	(0.000019)	392084	2819	11779	2009	30312	(0.8615)	0.3882	0.0000	(0.2797)	5.3480	11779
32.10	(0.000016)	417713	2970	13014	2010	26890	(0.1129)	0.3379	(0.0001)	(0.2567)	5.5073	13014
34.18	(0.000018)	440532	2831	12890	2011	41489	0.5429	0.3095	(0.0003)	(0.3124)	5.9747	12890
$L_G-L(W_G/W)$	$(r/w)_G$	$K_G=\Delta K_G+K_G w_G=r_G/(r/w)$	$k_G=K_G/L_G$		$A_G$	$g_{A/G}(STOCK)$	$i_G=I_G/Y_G$	$n_G$	$\alpha_G=S_G$	$\Omega_G=K_G/Y_G$	$k_G=K_G/L_G$	

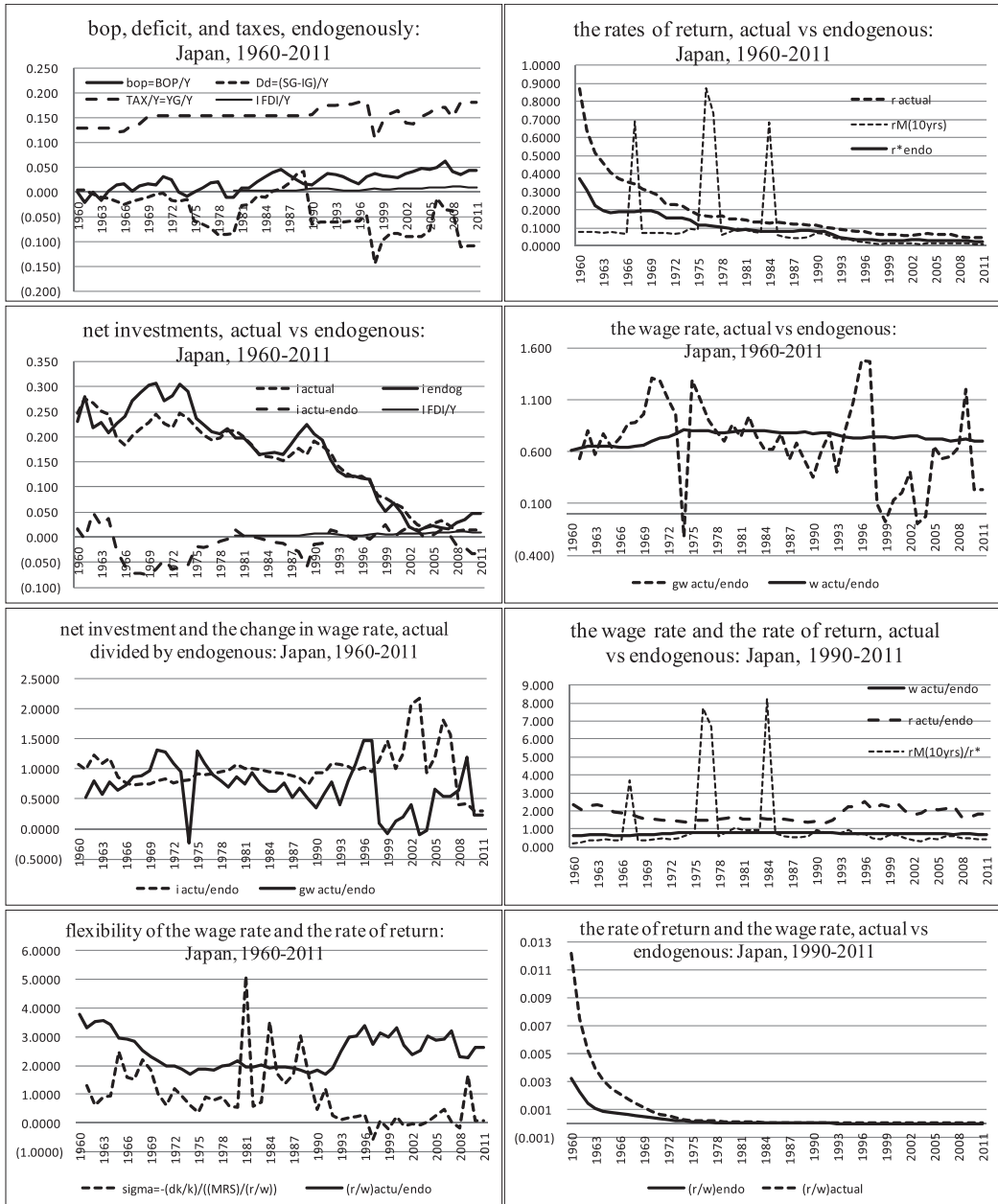
Data source: KEWT database 7.13-6, 1960–2011, based on original data of International Financial Statistics Yearbook, IMF

Note: Proof of Specific Data-Consistency Connecting LONG (1960–2011) with Short (1990–2011) Data-Sets for Japan and the US, Using KEWT 7.13-6

**Table 4 the US,  $K_G$  consistency between LONG (1960–2011) and Short (1990–2011)**

The government sector				The government sector								
$L_G=L(W_G/W)$	$(r/w)_G$	$K_G=\Delta K_G+K_G$	$w_G=r_G/(r/w)$	$k_G=K_G/L_G$		$A_G$	$g_{A(G)}(STOCK)$	$k_G=I_G/Y_G$	$n_G$	$\alpha_G=S_G$	$\Omega_G=K_G/Y_G$	$k_G=K_G/L_G$
34.59		100			1. the US						HA(G)=	0.03976
35	0.026594	106	2	3	1990 1960	2.36		0.0713	0.0150	0.0746	1.1822	3.03
36	0.017901	115	2	3	1991 1960	2.40	0.0175	0.0887	0.0167	0.0532	1.2309	3.14
38	0.010502	125	3	3	1992 1963	2.54	0.0567	0.1044	0.0155	0.0335	1.2494	3.30
39	0.008346	133	3	3	1963	2.64	0.0396	0.0733	0.0145	0.0279	1.2578	3.43
39	0.012084	144	3	4	1964	2.77	0.0514	0.0950	0.0140	0.0430	1.2659	3.72
39	0.015515	152	3	4	1965	2.94	0.0585	0.0688	0.0126	0.0575	1.2371	3.93
41	0.005632	159	3	4	1966	3.22	0.0953	0.0490	0.0116	0.0215	1.1783	3.90
44	(0.013099)	160	3	4	1967	3.47	0.0784	0.0101	0.0109	(0.0503)	1.1251	3.66
45	(0.015616)	175	4	4	1968	3.80	0.0946	0.0969	0.0101	(0.0651)	1.1263	3.91
45	0.011010	180	4	4	1969	3.90	0.0284	0.0250	0.0098	0.0422	0.9668	4.00
46	0.007864	189	4	4	1970	4.08	0.0459	0.0456	0.0117	0.0313	0.9622	4.11
46	(0.002016)	210	4	5	1971	4.45	0.0906	0.1041	0.0127	(0.0092)	1.0351	4.55
46	0.001783	235	5	5	1972	4.79	0.0755	0.1141	0.0108	0.0091	1.0563	5.14
44	0.009995	264	5	6	1973	5.08	0.0614	0.1162	0.0096	0.0563	1.0622	5.97
46	0.005148	279	6	6	1974	5.59	0.0993	0.0530	0.0092	0.0304	1.0322	6.09
48	(0.015654)	302	6	6	1975	6.83	0.2226	0.0901	0.0099	(0.1104)	1.1402	6.35
46	(0.016168)	339	7	7	1976	7.87	0.1518	0.1299	0.0096	(0.1341)	1.2135	7.31
46	(0.013412)	356	8	8	1977	8.55	0.0868	0.0570	0.0101	(0.1159)	1.1476	7.74
45	(0.007812)	390	8	9	1978	9.15	0.0693	0.0959	0.0107	(0.0728)	1.1116	8.69
45	(0.005350)	411	9	9	1979	9.85	0.0769	0.0521	0.0111	(0.0517)	1.0472	9.20
47	(0.008839)	445	10	10	1980	11.27	0.1441	0.0808	0.0119	(0.0922)	1.0432	9.55
47	(0.007918)	482	11	10	1981	12.48	0.1076	0.0769	0.0098	(0.0882)	1.0071	10.24
50	(0.011417)	539	11	11	1982	14.02	0.1234	0.1158	0.0097	(0.1414)	1.0838	10.85
50	(0.008393)	678	12	14	1983	15.20	0.0842	0.2554	0.0091	(0.1289)	1.2529	13.60
48	(0.005125)	807	14	17	1984	16.16	0.0630	0.2149	0.0087	(0.0934)	1.3414	16.67
50	(0.005500)	944	14	19	1985	18.15	0.1233	0.2131	0.0090	(0.1160)	1.4633	18.89
53	(0.006453)	1064	15	20	1986	20.14	0.1094	0.1777	0.0092	(0.1501)	1.5770	20.22
53	(0.005702)	1115	15	21	1987	20.71	0.0285	0.0715	0.0089	(0.1374)	1.5565	21.19
52	(0.004119)	1189	17	23	1988	20.84	0.0061	0.0960	0.0091	(0.1051)	1.5414	23.09
51	(0.004446)	1244	18	24	1989	23.25	0.1158	0.0680	0.0095	(0.1216)	1.5455	24.38
68	(0.007720)	1289	17	19	1990	24.67		0.0444	0.0113	(0.1720)	1.2787	19.01
63	(0.009596)	1331	18	21	1991	31.22	0.2656	0.0467	0.0134	(0.2543)	1.4705	21.13
65	(0.009520)	1377	19	21	1992	32.09	0.0280	0.0469	0.0134	(0.2523)	1.4241	21.16
58	(0.005442)	1474	19	26	1993	28.34	(0.1169)	0.1011	0.0131	(0.1618)	1.5263	25.60
56	(0.002513)	1594	21	28	1994	24.63	(0.1309)	0.1113	0.0122	(0.0767)	1.4866	28.34
54	(0.000550)	1720	21	32	1995	22.09	(0.1031)	0.1131	0.0119	(0.0179)	1.5403	31.98
52	(0.000203)	1822	22	35	1996	22.76	0.0300	0.0882	0.0117	(0.0071)	1.5671	34.77
51	0.002838	1957	24	38	1997	18.49	(0.1877)	0.1000	0.0117	0.0982	1.4508	38.36
50	0.004702	2159	25	43	1998	16.03	(0.1326)	0.1332	0.0120	0.1692	1.4278	43.32
50	0.005241	2373	27	48	1999	15.61	(0.0263)	0.1277	0.0115	0.2007	1.4115	47.90
50	0.005215	2514	29	51	2000	16.00	0.0250	0.0779	0.0115	0.2089	1.3938	50.65
54	0.003625	2661	28	50	2001	18.50	0.1561	0.0818	0.0108	0.1525	1.4793	49.65
60	(0.001883)	2681	28	45	2002	35.81	0.9354	0.0137	0.0102	(0.0925)	1.7863	44.98
63	(0.001111)	2963	28	47	2003	32.85	(0.0827)	0.1695	0.0098	(0.0554)	1.7803	47.23
63	(0.000450)	3332	29	53	2004	31.62	(0.0373)	0.2027	0.0095	(0.0243)	1.8343	52.68
65	0.002260	3917	30	60	2005	21.11	(0.3325)	0.2605	0.0094	0.1194	1.7437	60.02
62	0.002189	4496	34	72	2006	21.72	0.0288	0.2389	0.0092	0.1365	1.8545	72.24
60	0.003309	5313	37	89	2007	17.33	(0.2020)	0.2845	0.0091	0.2279	1.8499	89.19
65	0.002854	6425	37	99	2008	17.11	(0.0125)	0.3637	0.0089	0.2209	2.1022	99.38
79	0.001284	8169	31	104	2009	20.11	0.1752	0.6383	0.0089	0.1174	2.9889	103.68
74.80	0.001560	9984	33	133	2010	17.36	(0.1368)	0.6013	0.0087	0.1723	3.3087	133.48
73.10	0.001464	11891	35	163	2011	16.20	(0.0666)	0.6047	0.0087	0.1924	3.7702	162.67
$L_G=L(W_G/W)$	$(r/w)_G$	$K_G=\Delta K_G+K_G$	$w_G=r_G/(r/w)$	$k_G=K_G/L_G$	GOV GOV	$A_G$	$g_{A(G)}(STOCK)$	$k_G=I_G/Y_G$	$n_G$	$\alpha_G=S_G$	$\Omega_G=K_G/Y_G$	$k_G=K_G/L_G$

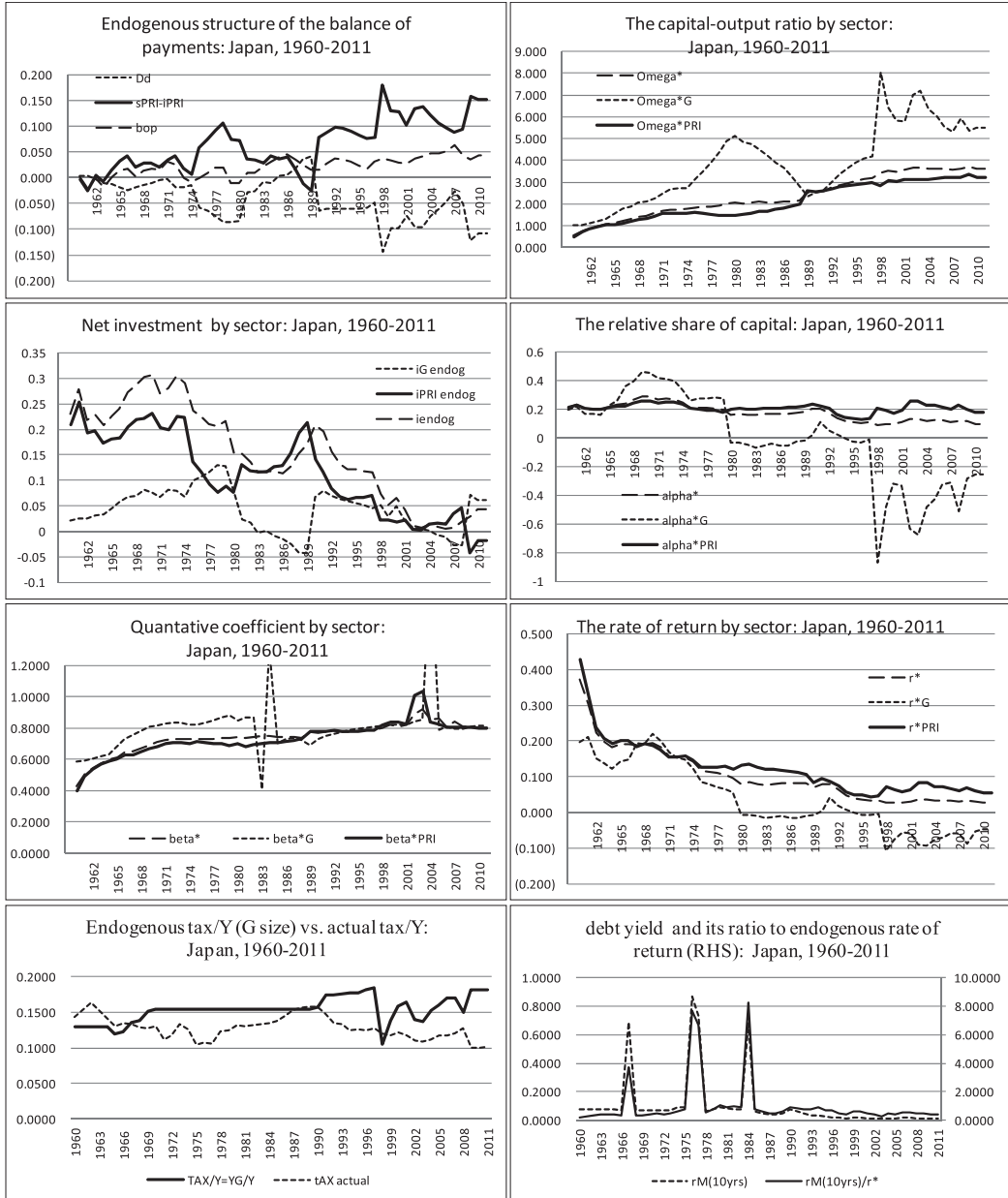
Data source: KEWT database 7.13-6, 1960–2011, based on original data of International Financial Statistics Yearbook, IMF



Data source: KEWT database 7.13-6, 1960–2011, based on original data of International Financial Statistics Yearbook, IMF

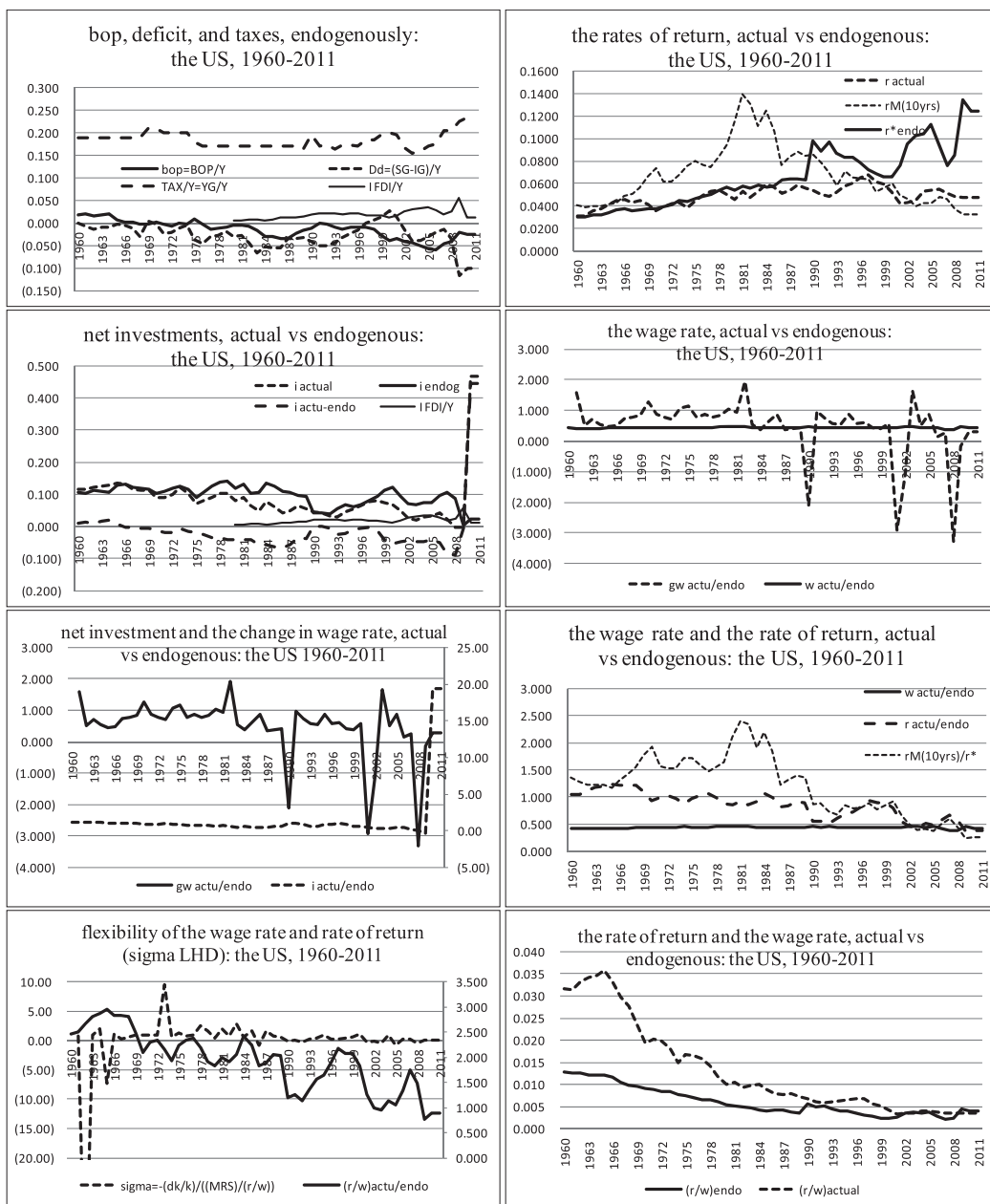
Figure 1-1 Japan, related endogenous ratios under the whole consistency over years

Note: Proof of Specific Data-Consistency Connecting LONG (1960–2011) with Short (1990–2011) Data-Sets for Japan and the US, Using KEWT 7.13-6



Data source: KEWT database 7.13-6, 1960–2011, based on original data of International Financial Statistics Yearbook, IMF

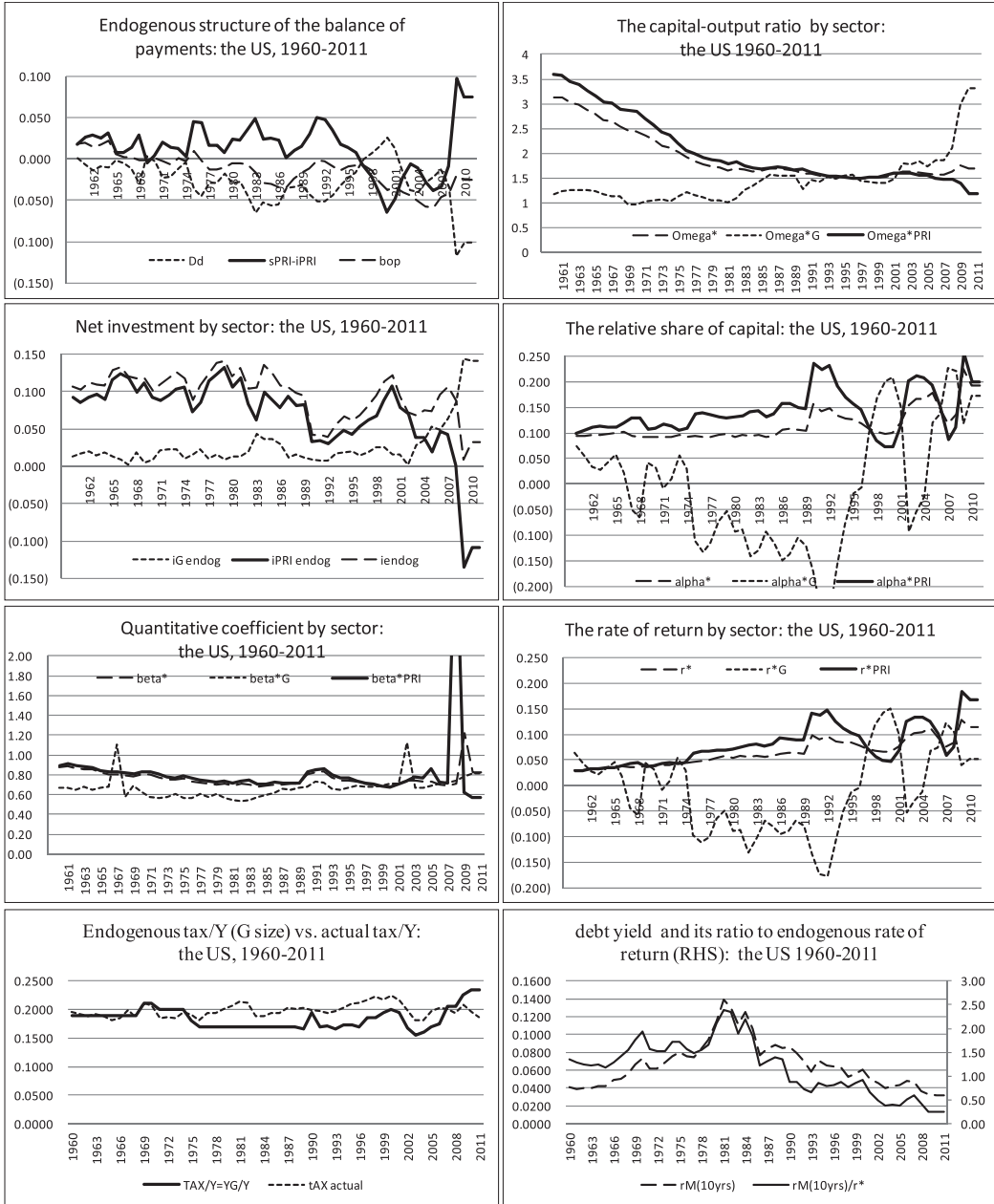
Figure 1-2 Japan, related endogenous ratios under the whole consistency over years



Data source: KEWT database 7.13-6, 1960–2011, based on original data of International Financial Statistics Yearbook, IMF

Figure 2-1 the US, related endogenous ratios under the whole consistency over years

Note: Proof of Specific Data-Consistency Connecting LONG (1960–2011) with Short (1990–2011) Data-Sets for Japan and the US, Using KEWT 7.13-6



Data source: KEWT database 7.13-6, 1960–2011, based on original data of International Financial Statistics Yearbook, IMF

Figure 2-2 the US, related endogenous ratios under the whole consistency over years

Hideyuki Kamiryo

## Lucky Connections with MIT: with hyperbola over 60 years

Hideyuki Kamiryo, Drs



MASSACHUSETTS INSTITUTE OF TECHNOLOGY

L. Rafael Reif, President

77 Massachusetts Avenue, Building 3-208  
Cambridge, Massachusetts 02139-4307 U.S.A.  
Phone 1-617-552-0148

June 4, 2013

Dr. Hideyuki Kamiryo SM '74  
5-28-5 Satsukigaoka Saeki-ku  
Hiroshima 731-5101  
JAPAN

Dear Dr. Kamiryo:

Thank you for making arrangements with Better Advances Press to forward a copy of your book to me. I was delighted to receive *Earth Endogenous System* on May 17, and I send my sincere congratulations.

We at MIT are proud of your achievements and wish you all the best in your future endeavors and in your work yet to come.

Sincerely,

L. Rafael Reif

LRR/vrd



May 15

Dear Professor Kamiryo,

I want to thank you for sending me a copy of your book, and also for the delightful grey and yellow flower painting. I certainly remember our meeting so many years ago at MIT. (I gave up that office a year or two ago, thinking that a younger person should have it. I am of course completely retired.)

I have been reading your book and looking at the painting, with

pleasure in both!

The way you combine data from KEWT with theoretical reasoning is very impressive, though not easy to follow. (The painting is more abstract!)

I hope your health is good and the future bright.

Sincerely yours

Robert S. Stein



18 Aug 2013

### Acknowledgements of Hideyuki Kamiryō

Hyperbola has connected me with invisible fortune for the last sixty years or more, gradually broader over decades. I thank the Nature and happy research life, towards benefactors, teachers, and my family.

life-work	decades	1950-59	1960-69	1970-79	1980-89	1990-99	2000-2009	2010-11	2012	2013
	born in 1930		With equations (theory) and practice always during those decades: The EES published in 15 May							
Micro-based	Accounting	O	O	O	O	O	policy-oriented will harmonize macro and micro			
	Financing			O	O	O				
	Intern'l Financing				O	O				
	Management				O	PhD in 1995#	strategies are useful to macro policy-making			
	Economics		O	O	O	O	policy-oriented will harmonize macro and micro			
Macro-based	SNA	O				O	O	O	O	O
Economics	Macroeconomics					O	PhD in 2003	O	O	O
Improving in hyperbola		O	O	O	O	Hon. PhD1994	O	O	O	O
Market data analysis			O	O	failure, consistency of the market CofC ⇒ Back up the market principles					
Index number analysis			O	O	PhD in 1984 indicates the limit of index number theory under the price-equilibrium					
All parameters: fix→change by year		O	O	O	failure to fix	almost succe	almost succe	completed	⇒new facts	
Recursive programming						O	Success in no parameter(PhD, 2003)⇒new facts			
Endogenous model & system				O	O	O	almost comp	completed	⇒new facts	
	KEWT data-sets				preliminarily, and then 1.07 in 2005		→	5.11	6.12	7.13
	By sector (G & PRI)				O	O	O	almost comp	completed	⇒new facts
	the endogenous-equilibrium, with preferences and technology				O	O	O	almost comp	completed	⇒new facts
Note: 1. The above symbol of "O" shows working continuously over years and challenging for unsolved problems and processes.										
2. Databases, SNA, BEA, OECD, UN, IMF, PWT, EUROSTAT, KLEMS, have been tested, for comparisons by decade.										
3. Statistics actual databases follow the market principles but, KEWT database universally unites market with endogenous.										
4. PhD in 1995#: "Structural Theory of Flows, Assets, Debt, and Equity in Accounting for Business Enterprises," 1990, 558p.										
Dr. Shozo Ichimura jointed its supervisors as a unique life-time teacher since we were 20 years old (see HP, Aug2013).										
5. 28 books were published including two best sellers in Tokyo but, no book published after 1991(focusing English papers).										
6. The EES shows "Earth Endogenous System," 1 <sup>st</sup> Edition, published by Better Advances Press, Toronto, on 15 May 2013.										
7. For six new discoveries/facts, see 'Four page six new facts summary, English and Japanese' stated in HP on 23 Aug 2013.										

Mr. and Mrs. Shozo Ichimura, the first given connector with me, is my life-time benefactor since Shozo was a student. Dr. Shozo knows all of Hide, as shown above research records.

Further, definitely, I have been encouraged by Stew Myers' 'Wonderland' several words on the Graduation Ceremony on 31 May 1994.2013. Now I wonder why Stew Myers said so. My answer: it must be the first connection to be connected with *Earth Endogenous System: to Answer the Current Unsolved Economic Problems* (Ixviii+568, 15 May 2013). The second connector is Yisheng Huang, Editor of Better Advances Press, and Toronto. After the second connector, invisible connectors in Wonderland suddenly began to appear. This is deep connections with MIT. And now I relish my fortunate as if I live in Utopia.

Led by invisible connections new discoveries surprisingly appear like a spring soon after the above publication. The third connector is Shizuko Ishida, who is a common wife. Her *Super Universe Integration Theory* (SUIT) enlarges scientific or mathematics world. The differences between natural sciences and social sciences become much smaller after the 21<sup>st</sup> century. Both Shizuko's and Hide's reinforce and prove each other, with no inconsistency in each philosophy and practice. Yes, theory=practice are happily strengthened by philosophy prevailing behind; from 2-dimension plane hyperbola (2DPH) to 5 and 6 dimensions in SUIT, beyond space and time. Oh, no space. We have to be silent for a moment.

Hideyuki Kamiryo

May 12, 1995

Professor Stewart C. Myers  
Sloan School of Management, MIT  
Cambridge, MA 02139, U. S. A.

Dear Stewart Myers:

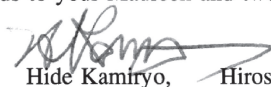
I am now very pleased to convey what I got for my long study: Ph D in Environmental Science conferred on May 28, 1994, and Ph D in Business Administration conferred on March 8, 1995, as I enclosed these copies in this letter. I owe the results to your advice at the graduation ceremony of Sloan School of Management on May 31, 1974, since you mentioned that I should concentrate on my research study using an accounting framework and saving my time given for the future.

Since then, 21 years have passed. For the last ten years, I had worked on empirical studies and the next ten years for theoretical studies, both using an accounting framework and comparing with conventional frameworks. In Japanese education system, it is rather rare to get Ph D degree for a published book, since powerful professors in Japan watch the degree. I am the first Prof. Dr. at our university since 1974 when our Graduate School of Business Administration was approved by the Ministry of Education, Tokyo (under a typical regulation system).

I began to study macro economics in order to pursue the relationships between macro and micro and the bridge between neoclassical and post-Keynesian theories; starting from Fisher, Hicks, and challenging for Harrod, Kaldor, and Pasinetti. I will have discussions with professors at the Department of Economics, the University of Auckland, N.Z. for next three years when I have no classes at HSU. The propensity to consume for an economy and the payout ratio for firms can be combined using the basic idea presented by Kaldor-Pasinetti inequality. This is my thinking at this stage. Please advise me when you feel something. I requested, from Auckland last week, your administration office to send me the certified copy of my degree of MS in management at MIT.

I am thinking of visiting MIT this fall for attending at the every three year convocation if possible, since my classmates and wives are getting older.

Warmest regards to your Maureen and two sons.



Hide Kamiryo, Hiroshima Shudo University, Japan

The above letter shows a turning point lying between 1974 and 2013, with English immature as well. Who is the connector? Yes, a tender and diligent friend of mine, Alan White, Senior Vice President. Robert Solow, Stew Myers, Alan While, and Hide live vividly in 2013, absorbing insight from Paul Samuelson minute by minute. This is a fact and I feel happy over time.

## Appendix A ‘Seven item sum-up’ as an endogenous background

### (1) Fundamentals of Macroeconomics and Macroeconomic Management

From the viewpoint of the essence of “Earth Endogenous System” (the *EES*; lxviii+568, 15 May 2013): Management is replaced by plan-do-see control by government and private decision-makers. What is the difference between fundamentals and essence? The author understands: Fundamentals are a base for holding while essence is a core of its base. Here the base is the *EES*. The core of essence is the *EES*, accordingly is ‘purely endogenous with no assumption.’ In the literature assumptions are partially required as an excuse for unformulated equations.

The author prepared for Power Point (i.e., PP-*WEAI*#87; 16 pages, 16 March 2013) to all the participants, at Session 87 of *Western Economic Association International (WEAI) Bi-Pacific Rim Conference*, Tokyo-Kyoto, Keio. Appendix B of this Note explains the related PP. Item (1) here conveys the following propaganda modestly:

1. A purely endogenous as a system.
2. No assumption under perfect competition.
3. Technological progress precisely measured.
4. Open the way towards full employment.
5. Stabilized prices and assets bubbles.
6. Theory and practice are one over years.
7. Harmony with the market principles.
8. From ill-behaved to well-behaving.

Readers will see the same phrases on the cover page of the *EES*. Editor, Yisheng Huang, the Better Advances Press, Toronto, selected these phrases among the author’s 32 phrases.

Conclusive remarks by country at the *EES* and Its KEWT Database:

(1) Sustainable growth rate by country is most robust when deficit=zero under perfect competition; (2) Purely endogenously, national taste/preferences and technological progress are independent; (3) Fiscal policy is only related to redistribution of national income; generally negative to growth (see Samuelson, 1940, 1975); (4) Deflations of CPI and assets bubbles of real assets co-exist; never misunderstood. Deflation is a whole result of unbalanced huge deficits and debts; (5) Perfect competition is precisely measured. Economy recovers, by structural reform, free markets, deregulation, tax increase, and no subsidies; (6) When a country situation is out of con-

trol by policy-makers, default is inevitable (see Reinhart); (7) For people, default is preferred to endless inflation. Difficulty by defaults recovers promptly, never undo and consecutively over years; (8) Default ends by 2/3 cutting the G spending and maintaining minimum net public investment.

## **(2) The modeling of the microeconomic as an unstable, open, and uncertain system**

From the viewpoint of the discovery of the author's 'neutrality of the financial/market assets to the real assets' in the *EES* (12–33, Chapter 2, *ibid.*):

The author's above discovery in the *EES* is defined as such state as any arbitrary management and control by policy-makers reduces to the worst against robust real assets. A government does never control ten year market debt yield even if the central bank buy debts endlessly. A government does not control the growth rate of real *GDP* but decreases real *GDP* growth. These express the extremity of the author's neutrality. The author asserts that prompt strategies executed by policy-makers in order to reinforce the real assets policies.

The modeling of the microeconomic in the literature overlooks true theory such that it is impossible for any statistician to estimate net disposable income correctly. The current theory in the literature asserts that micro is a base for macro. Of course, individual utility is a base of macro consumption. But, it is difficult for economists and statisticians to estimate individual utility, as pointed out earlier by Paul Samuelson (1937, 1939, 1940). Further, the market principles tell us results partially. The market principles cannot tell us true causes accumulated in the real assets. Uncertainty system is indispensable outcome in the literature. Unstable and open are indispensable in the global economies by country and by sector. What is the core to connect macro with micro economic?

The core is immovable consistency to connect macro with micro economic. This consistency is replaced by the proof of general data-consistency. The data-consistency is generally proved by connecting LONG (1960–2011) with Short (1990–2011) database by country, using KEWT 7.13-1, 13-2, 13-3, 13-4 for eight countries, as shown by *Papers of the Research Society of Commerce and Economics (PRSC)*, Sep 2013). The general data-consistency erases unstable and open risky anxieties even in the global economies. The general data-consistency gives us a base for how to connect macro with micro economies. A base is not micro but macro. Macro is complete but, micro must receive complicated abbreviations each for households and enterprises. The *EES* is hopefully able to clarify the contents of the abbreviations by connecting the SNA data with *International Financial Statistics Yearbook (IFS)*, IMF. This work is one of the

author's future home tasks, as already expressed in Postscript of the *EES*.

In short, we cannot solve Item (2) in the literature. The Bureau of Economic Activity (*BEA*), the US, had intended to estimate capital stock and followed D. W. Jorgenson (1963, 1966) and Jorgenson and Z. Griliches (1967). In 2007, the *BEA* stops estimating capital and instead, publishes the rate of returns within their framework. In the *EES*, one is simultaneously connected with another and so on. Overall, all of parameters and variables conceivable are connected with each other and no contradiction is found in the KEWT database measurement, by country, sector and, years and over years. This represents the essence of the *EES* and solves the current unsolved economic problems wholly as a system.

### **(3) The modeling of the microeconomic as a system containing emotional people and social groups**

From the viewpoint of Social Science (defined by Wikipedia, the free encyclopedia, 18 May 1976):

According to <http://en.wikipedia.org/wiki/Group>, group cohesiveness is shown by several pictures differently using hands of several persons. Typical is two person circles are overlap to some proportion. Also suppose several persons' two hands gather towards the origin in two dimensions. This is an expression of group society. Individuals get together cooperatively. This is defined as social cohesion or group social cohesion. The above Wikipedia lists 52 articles. The author understands that group cohesion occupies the centre of social science.

Social science differs from natural science. Natural science includes physics, element chemical, macro, micro, and nano, agriculture, plants, biology, ecology, energy, and so on. A base of natural science is: without human decisions and accordingly far from human interested motives. Avarice is typical and shows the essence of human and people. Anyone has this sort of spirit differently and qualitatively. What is the limit of science?

The *EES* (11, *ibid.*) shows BOX 1-3 for Cross-Roads Scientific Discovery (C-RSD) Diagram: positioning of natural, social, and behavioral science on a two dimensional topology. BOX 1-3 raises four classifications, natural science, social science, economic science, and behavioral science. The author severely limits the contents of the *EES* and follows Samuelson's behavior throughout life-work. Currently, the author obeys the spirit of the above C-RSD diagram. Currently, behavioral science is most far from natural science since it includes human group-oriented spirit. Some day in the 21<sup>st</sup> century, the author is hopeful in that social science overlaps natural science upon further accumulated experiences and wisdom. Evidence of overlapping is similar

to the nature of the market principles. The market principles for the long-term actually reinforce social and economic science beyond space and time. Emotional and social group-oriented are melted away and new human era comes steadily. It is through leaning by doing.

The author's friend, Wasseem Mina, has devoted to deepen social cohesion issue. He knows economic science or economics practically. Group-oriented is one of human characters since the dawn of history. Further all the animals and vegetation are group-oriented on this earth and geophysics. These living things apparently differ from human and people. The author stated 'Seven Item Sum-Up' to help develop his life-work. A common feature of group-oriented makes him to stimulate his cohesion study towards a universe direction, released from actual analysis on outcome. The *EES* is free from any sort of endless outcome lectures.

Further, group-oriented work functions commonly in macro economics, micro economics, business administration, family-life, and individuals. The author asserts that macro-economics is a base for micro-economics. Nevertheless, the author makes most use of family cooperation or collaboration as a spiritual unit. This is because the author has neglected family life for the last sixty years and now realized its impetus. Without the generous support from family members, the *EES* has not completed. This is two ways and shows the essence of dynamic balances in economic science.

#### **(4) Theoretical and empirical insights on state capacities for influencing markets**

From the viewpoint of a new discovery of 'the Real Rates to Capital, Endogenous and External = Zero' (presented to *International Atlantic Economic Association* Conference; Jan, 2014):

Item (4), starting with "State Capacity, Conflict and Development," by Timothy Besley and Torsten Persson (Sep, 2009), sums up the essence of the real (i.e., nominal less inflation/deflation) rates of return, endogenous and external, and answers the current unsolved economic problems. An endogenous Phelps golden rule clarifies the relationship between returns, profits, and economic growth.

There are several key conflicts lying between exogenous and endogenous; real assets and financial/market assets; partial/warp and whole/woof; stability and development; markets and non-markets; returns and *GDP* growth; actual and endogenous data; and government and private net investment. Researchers perceive that 'state capacity' deepened by Besley and Persson (ibid.) is one of advanced targets in the literature.

On the contrarily, the *EES* and its KEWT database solve the above key conflicts in a moment. All of these conflicts are melted away immediately. In a word, the *EES* measured by

the real assets reinforces the market principles and simultaneously balances returns and net disposable income by year, actually and endogenously. As a result, the shocks in business cycles become smooth by erasing wrong causes by country and by year.

Most typical is a fact that ‘the real rates to capital = zero’, endogenously and externally in the *EES*. This fact first indicates under the price-equilibrium that the nominal rate of interest corresponds with the rate of inflation (deflation when the sign is minus) and that the growth rate of *GDP* is meaningless, since the real rate of interest is zero, a new discovery. Second, this fact indicates under the endogenous-equilibrium that the nominal rate of returns corresponds with the endogenous rate of inflation or deflation. An endogenous Phelps golden rule determines endogenous relationship between returns and net disposable income  $Y$ , where the endogenous Phelps coefficient,  $x = r^* / g_Y^*$  and  $x = \alpha / (i \cdot \beta^*)$ . Suppose that the relative share of capital  $\alpha$  equals the rate of return at convergence in the transitional path  $r^*$ . The growth rate of net disposable income is shown by the product of net investment to  $Y$  and qualitative net investment coefficient  $\beta^*$ .

Under the price-equilibrium, the zero real rate of interest and nominal growth rate of *GDP* are compatible and, the real growth rate of *GDP* is determined by an external rate of inflation/deflation and the exogenous Phelps coefficient. Edmund Phelps (638–643, 1961) clarified his golden rule by connecting consumption  $C_t$  with power  $e^{gt}$ , although in the *EES* consumption is independent of technological progress. Phelps’ (642, *ibid.*)  $i = \alpha$  indicates  $x = 1 / \beta^*$  endogenously. His theory is close to the *EES* as a whole. Exogenous Phelps coefficient yet implies that the higher the investment the higher the growth rate is while endogenous Phelps coefficient implies the higher the rate of return the lower the rate of net investment is.

In short, state capacity captivates us with a thrill of joy.

### **(5) Maintaining Full Employment during global rebalancing**

From the viewpoint of ‘the Phillips Curve’ in the *EES* (presented to *Western Economic Association International Conference*; Jan 2015):

Full-employment in reality is guaranteed and spread everywhere in the *EES* and its KEWT database series. This viewpoint will be integrated with empirical causes and results, as shown above. Item (5) here touches a whole version shortly.

Why do many countries not attain full-employment in the global world? In the global world, enterprises look for cheaper wage rates anywhere in the world, with qualitatively different levels of workers. This is global results. Actual statistics analyses support global results. Let

the author define: A state equality between the endogenous rate of change in population and the actual growth rate of population. Then, the *EES* and its KEWT database do not hold. Or one must deny the core of purely endogenous with no assumption or the perfect competition measured in the *EES*. Actual data, however, exist within a certain range of endogenous data, by country, sector (Total, Government, and Private sectors) and, year and over years. Thus, full-employment is within policy-makers' decisions.

Why do policy-makers by country not step into hopeful decisions by year? First, regulations, laws, political culture, and group-oriented spirit refuse everlasting direction for sustainable growth and people's welfare. Second, there is no way but just learning by doing, under the current circumstance where there is no theory=practice methodology for policy-oriented model and system in the global world. No policy-maker knows simultaneous causes and results under certainty. Policy-makers always have failed in actual results while looking for correct policies and better effects. Never appears a universe lighthouse there in the global sea. Economic phenomena change in a moment. Market principles know prices by nature but express the results only. Market principles do not clarify correct causes. This is because market principles are essentially vertical by goods and services and do not know a macro price level. Price levels are externally calculated using CPI and other values and ratios. These externals are independent of theories, models, and systems.

The *EES* appears and control endogenous policies under no external and exogenous. As a result, the rate of inflation and the rate of unemployment are measured numerically. This fact answers the Phillips curve in the literature. The author has prepared for data-consistency connecting LONG (1960–2011) with Short (1990–2011) databases, each for 86 countries by sector. The closer no unemployment in statistics is the closer actual statistics data is to endogenous data.

Therefore, the author's above paper (to *Western Economic Association International Conference*) needs to show universe sum-ups corrected against wrong causes that lead to unemployment by country and by sector. Each country has its own national reasons. This is because preferences and technological progress are independent and yet, integrated as a whole by country. The author clarifies true state for preferences and technological progress in a separate paper. In short, the rate of inflation or deflation, actual/external and endogenous, is directly connected with full-employment, see Item (4) above.



**(6) Policies to promote growth and productivity in periods of macroeconomic instability and high indebtedness**

From the viewpoint of Robert E. Lucas (19–46, 1976):

The author has been directly stimulated by R. E. Lucas's (19–46, *ibid.*) since for almost forty years the author had stepped into lose-path against short-cut to the *EES*. In reality, economic policies, real, fiscal, financial, market, and social, are executed by fiscal year. These policies change by fiscal year, by country, sector and, year and over years. Questions: How to classify a bundle of policies and how to separately execute all of these budgets? How to evaluate each results and how to aggregate all of these as a whole? No, Questions are non sense. To answer Questions, econometrics methodologies have developed rapidly more than before.

Nevertheless, *discrete* data are given by fiscal year while results have been estimated, forecasted, and evaluated using *continuous* or, growth accounting, differential & integral, probability, expectation, and computer methodologies. None has invented a discrete Cobb-Douglas production function up-to-date, except for the *EES*. Without the use of the discrete Cobb-Douglas production function, none can accurately measure an endogenous rate of technological progress by country, sector and, year and over years.

Questions: How to distinguish changes in economic policies with changes in strategies & tactics? How to measure changes in economic policies and strategies & tactics respectively? Stimulated by Lucas' original doubts, the author stepped into Indian Parcheesi for a right path.

Real assets policy measures seven endogenous parameters using the *discrete* Cobb-Douglas production function. Simultaneously, seven endogenous parameters measure all the rest parameters and variables up to thousands consistently. 'Notations' of the *EES* (xxxi to xlii, *ibid.*) clarifies (1) notations by sector, (2) seven endogenous parameters, (3) basic endogenous equations, (4) six organic aspects, and (5) structural hyperbolas. Seven endogenous parameters is a base:

1. Endogenous net investment to endogenous income,  $i = I / Y$ .
2. The rate of change in Population,  $n_E = n$ .
3. The relative share of capital,  $\alpha = \Pi / Y$ , where  $\alpha = \Omega^* / r^*$ .
4. The capital-output ratio,  $\Omega^* = K / Y$ .
5. The technology coefficient (or the quantitative net investment coefficient),  $\beta^*$ , (see below).
6. The diminishing returns to capital (DRC) coefficient.  $\delta_0 = 1 + LN(\Omega^*) / LN((1 - \beta^*) / \beta^*)$ .

7. The speed years for convergence in the transitional path,  $1/\lambda^*$ , where the speed coefficient,  $\lambda^* = (1-\alpha)n + (1-\delta_0)g_A^*$ , where  $g_A^* = i(1-\beta^*)$ .

A core of seven endogenous parameters is the speed years for convergence, inverse of the speed coefficient. The endogenous rate of change in population and the endogenous rate of technological progress are measured with the relative share of capital and the diminishing returns to capital coefficient (connected with the endogenous Phelps golden rule).

As a result, growth and productivity are stably maintained. Simultaneously, macroeconomic instability and high indebtedness are solved (connected with Samuelson's earlier macro and micro utility insights). Also, increasing returns to capital, constant returns to capital, decreasing returns to capital are simultaneously solved under constant returns to scale, answering Lucas here).

### **(7) Macroeconomic policy in the presence of balance sheet overhangs**

From the viewpoint of a new discovery of Impossibility of Window-Dressing (presented to *JES* and *PRSCE*; Sep, 2013):

A new discovery is: No room for window-dressing at macro-economic, regardless of whether the price-equilibrium normally exists at a country or not. Near-east countries such as Iran, Kazakhstan, and Saudi Arabia, each show no 'ten year market debt yield.'

Window-Dressing disappears at normal circumstances. No Window-Dressing is based on the *EES* and its KEWT database. Suppose: Data itself is unstable and unreliable, due to temporal circumstances such that at the initial stage of establishing a new country, earlier stage of a country, or transitional stage. These circumstances happen before normal circumstances. Even under these temporal circumstances, Window-Dressing hardly exists in reality. Nevertheless, it is more difficult for policy-makers to examine and prove no Window-Dressing. This is because seven endogenous parameters are interrelated abnormally, positive and negative, and as a result the processes to returning back to the endogenous-equilibrium are more complicated, as numerically proved at Chapter 8 (177–200, *ibid.*) of the *EES*.

Sister Notes already presented to *PRSCE* (Sep 2013) and *JES* (Sep 2013) clarify the contents of the author's new discovery of impossibility of Window-Dressing, each generally and specifically. The sister Notes constitute the author's copy right. It means that the author's copy right is succeeded by the publisher, Better Advances Press, Toronto, after the author's eternity. Before the author's eternity, hopefully to the author's earnest desire, the contents of the Excel black boxes are exclusively delivered to the staff of IMF and the World Bank.

The author perceives that Keynes' spirit to world peaceful communities for people prevail by country in reality. This is firstly because actual statistics data are always within a certain range of endogenous data by country, sector and, year and over years. This is secondly because two extremes, positive and negative (involved in the author's hyperbolic functions each as a reduced form of endogenous equations of the *EES*), are a base for the essence of the *EES*. As a result, the origin shows moderation (impossible to touch in reality) and two asymptotes show each the limit of endogenous equilibrium in reality. Dynamic and balanced movements led by policy-makers are examined at the endogenous- equilibrium.

Appendix B Essence of the endogenous system: why does it hold with no assumption?

### Essentials of the endogenous system why does it hold with no assumption?

Using 81 countries at the KEWT Database,  
1990-2011, by Country

Hideyuki Kamiryo, 16 Mar 2013

Bi Conference WEAI, Keio University

H. Kamiryo, Purely Endogenous, 2013/5/14

### Essence of the Endogenous Ssystem

- A Purely Endogenous as a System;
- No Assumption under Perfect Competition;
- Technological Progress Precisely Measured;
- Open the Way towards Full Employment;
- Stabilized Prices and Asset Bubbles;
- Theory and Practice Are One over Years;
- Harmony with the Market Principle;
- From Ill-behaved to Well-behaving

H. Kamiryo, Purely Endogenous, 2013/5/14

### Conclusive Results by country at the Endogenous System and Its KEWT Database

- Sustainable growth rate by country is most robust when default=zero under perfect competition.
- Purely endogenous, national taste/preferences and technological progress are independent.
- Fiscal policy is only related to redistribution of national income; generally negative to growth (see Samuelson, 1940, 1975).
- Deflation at CPI and assets bubbles of real assets so-called; never misunderstood. Deflation is a whole result of unbalanced huge deficits and debts.
- Perfect competition is precisely measured. Economy recovers only by structural reform, free markets, deregulation, tax increase and no subsidies.
- When a country situation is out of control by policy-makers, default is inevitable (see Reinhart).
- For people, default is preferred to endless inflation. Difficulties under default recovers in a few years; never undo and/or consecutively over years.
- Default ends solely by 3R cutting the G spending and maintaining minimum net public investment.

H. Kamiryo, Purely Endogenous, 2013/5/14

### Typical Results by country at the Endogenous System and Its KEWT Database

- Related to the first discovery (D1), the author here stresses a definite difference between external, nominal & real, rates of interest under the price-equilibrium and the rate of return in the case of deflation due to extreme debts and under the endogenous-equilibrium.
- The endogenous system has no Fisher's (1907, 1933) concept of nominal=real+ inflation rate. Instead, under the relative price level=1.000000 holds, as defined by a 'minus' inflation rate=a deflation rate.
- The literature relying on the market principle cannot wholly explain why the real rate of interest remains constant or rise and fall for many years (see Reinhart et al, 2012). This fact must be a core to solve the current unsolved problems (cf: the cost of capital).

H. Kamiryo, Purely Endogenous, 2013/5/14

### Preferences and Technology

	Preferences	endogenously integrated with	Technology	as the best aspect to $\Omega=K/Y$
parameters fixed	$r$ and $k$	constant over years	the relative share of capital $\alpha$ , fixed	the rate of change in population $n$ , varying over years
	the rate of investment to output		$\alpha$ , at convergence in the transitional path	the rate of return, $r=\alpha\Omega$
the price-equilibrium $\Rightarrow$ the endogenous-equilibrium	$\Omega$ and $k$	varying over years	qualitative investment coefficient, $\beta$ or $1-\beta$	diminishing rate of return coefficient, $\beta_0$
	the capital-output ratio		endogenous speed years, $1/\lambda$ , yes	coefficient, $\alpha$ , between $r$ and growth rates,
	the capital-labor rate		per capita output and output, $g^* = n^* + \delta$	endogenous valuation ratio, $v^* = \beta^* / K^*$
in the transitional path over years, using recursive programming			endogenous cost of capital, $r = g^* + \delta$	
Consistency of the capital-output ratio, $\Omega$ , Samuelson 1970				
Sato's (1981) Consensus Laws to $\Omega = C_0$				

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### Differences lying behind Sato(1981) and the endogenous system

	Sato (1981)	The endogenous system
the rate of technological progress, exogenous	exogenous, as in the literature	exogenous, as in the literature
utility function	homogeneous of degree one	homogeneous of degree $< 1$ and $< 0$
	individual-oriented utility function, $u(x, y)$	macro-specific utility function, $u(x, y, z)$
	commonly in the literature	$u(x, y, z) = \beta_0 + \beta_1 x + \beta_2 y + \beta_3 z$
production function		
Cobb-Douglas type is most convenient yet,	continuous and any degree (Leontief)	limited to discrete and Cobb-Douglas
constant elasticity of substitution (CES)	sigma=constant	sigma=1.000000
increasing returns to capital-DRC	1. degree=1.0, IRC	constant returns to scale (CRS)
constant returns to scale-CRS	2. degree=1.0, DRC	diminishing returns to capital (DRC)
diminishing returns to capital-DRC	3. degree<1.0, DRC	
object	von Neumann neo classical model	integrated system applicable to neo classical and Keynesian
capital and the rate of return	separated, net investment estimated	simultaneously measured
productive measurement	expounded and estimated	flow and stock-TTP are endogenous

H. Kamiryo, Purely Endogenous, 2013/5/14

### Purpose of this resume

- This resume focuses four discoveries among others measured at author's endogenous system and its KEWT database. This section briefly explains these four discoveries step by step based on purely endogenous under no assumption and perfect competition.
- (D1) The real assets commonly have a relative price level or no absolute price level.
- (D2) The rate of technological progress purely measured, flow and stock.
- (D3) Neutrality of the financial/market assets to the real assets, justified.
- (D4) No dress up and show up allowed both at the real assets and financial/market assets.

H. Kamiryo, Purely Endogenous, 2013/5/14

### let the author itemize 25 questions on the current policy prescriptions often advocated by economists and policy researchers

- (Q1) Do deflation and asset bubbles coexist by country?
- (Q2) Are first growth and second deficit reduction realized?
- (Q3) Does money supply solve the current financial difficulties by country?
- (Q4) Does economic policies business up realize?
- (Q5) Do economic policies raise net investment at the enterprise by year?
- (Q6) Is it possible for a country to avoid assets bubbles?
- (Q7) Is it possible for a country to execute fiscal policy flexibly?
- (Q8) Is it possible for a country to execute policies to increase employment, residences and housing, and life-protection continuously?
- (Q9) Is public investment effective (related to leakage)?
- (Q10) Does tax reduction up-turn business?
- (Q11) Does subsidy business up-turn business?
- (Q12) Do fiscal multipliers increase by fiscal policy?
- (Q13) Does increasing returns to capital (IRC) realize under constant returns to scale?
- (Q14) Does positive policy mix realize recovery of steady robust growth by country?
- (Q15) Is the central bank responsible to the solution of deflation?
- (Q16) Is it possible for a country to avoid budgetary bankruptcy?
- (Q17) Is it possible for a country to control the limit to budgetary bankruptcy?
- (Q18) Is the central bank responsible to the changes in consumer price level (CPI)?
- (Q19) Is the central government responsible to the changes in consumer price level (CPI)?
- (Q20) Is it possible for the central bank to change expectation at the market?
- (Q21) Is it possible for the central government to change expectation at the market?
- (Q22) Do the inflation control and inflation target co-exist?
- (Q23) Does the market clarify cause and effect relationship by year?
- (Q24) Does the market clarify an exogenous rate of technological progress?
- (Q25) Does the market clarify the relationship between the real assets and the financial/market assets?

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Note: Proof of Specific Data-Consistency Connecting LONG (1960–2011) with Short (1990–2011) Data-Sets for Japan and the US, Using KEWT 7.13-6

<p style="text-align: center;"><b>Simultaneous mechanics of the endogenous system</b></p> <ul style="list-style-type: none"> <li>(R1) Relationship between stock and flow by factor: In terms of quantity and quality, characters of capital stock and population (stock) have the same character. The literature defines each stock just quantitatively and accordingly, corresponding flow quantitatively. As a result, it is difficult to control the rate of unemployment. Contrarily, the KEWT database realizes full-employment. Full-employment at the KEWT database indicates a fact that the rate of change in population is the same as that of workers.</li> <li>(R2) Data relationship between the macro/micro levels: The literature is based on the micro level, whose aggregation equals the macro level. The KEWT database has its own macro level uniquely.</li> <li>(R3) Relationship between the SNA data (households &amp; enterprises) and the KEWT database (the G &amp; PRI data): The former is based on an assumption of the principle of equivalent of three aspects while the latter is based on no assumption.</li> <li>(R4) Data relationship between the real assets and financial/market assets: The literature cannot express the precise relationship due to unique dependence on the market principle. For example, policy-makers admit that the results are unknown but no way but to execute prescript policies. The KEWT database entirely depends on the real assets and thus, the relationship becomes complete totally.</li> </ul> <p style="text-align: center;">2013/5/14 H. Kurogiro, Purely Endogenous 8</p>	<p style="text-align: center;"><b>15 Mechanics (1) wholly produces a bear fruit as the fourth discovery</b></p> <ul style="list-style-type: none"> <li>(M1) The KEWT database borrows original data from International Financial Statistics yearbook (IFS), IMF, 10 data from the real assets and 11 data from the financial/market data. The KEWT really does not use and converts these actual and other thousands data to endogenous data, without exception. Here I raise 10 real asset data before the IFSY since 1960, and the IFSY since 1960 + one primary stock from 1960 to 2011. Investment and depreciation, GDP and population. These actual values are each converted to endogenous values, except for good data. 10 other actual data include the exchange rate, RE, and the year data of the market, which are used for the proof of author's reality of the financial/market assets to the real assets.</li> <li>(M2) The relative price level is measured as <math>p=1/0000000</math> throughout by year, by country, sector, and year and over years. Both consumer goods and producer goods result in the same <math>p=1/0000000</math>, free from the amount price level by goods. And, the elasticity of substitution is measured as <math>\sigma=1/0000000</math> at corresponding recursive programming (RP), <math>\sigma=1/0000000</math> by year implies that no assumption and accordingly, perfect competition. Marginal productivity of capital equals the rate of return, with, and marginal productivity of labor equals the wage rate, where related assumptions in the literature are all erased. The elasticity of substitution changes by country, sector, and year and over years at the KEWT database.</li> <li>(M3) Capital stock and its rate of return are measured simultaneously with the capital-output ratio, the coefficient of diminishing returns, delta, (see Appendix), and the speed years as the inverse of lambda (see Appendix). Endogenous data, together with the rate of government and the technology coefficient, beta (see Appendix). Endogenous data determine the rate of government. As a result, several endogenous parameters are measured by country. Seven endogenous parameters justify the existence of the discrete CO-production function.</li> <li>(M4) The rate of technological progress is measured by using the rate of net investment to output and data, in the most important variable that differs from any similar technology variable in the literature. Note that <math>\sigma</math> and, As a result, the KEWT database maintains the consistency between technology flow and technology stock for total factor productivity (TFP).</li> <li>(M5) The KEWT realizes the principle of equivalent of three aspects: The literature cannot use the assumption of the people due to the purpose of the SNA. Endogenous-net national income is replaced by GDP in the literature.</li> </ul> <p style="text-align: center;">2013/5/14 H. Kurogiro, Purely Endogenous 9</p>
<p style="text-align: center;"><b>15 Mechanics (2) wholly produces a bear fruit as the fourth discovery</b></p> <ul style="list-style-type: none"> <li>(M6) The endogenous ratio of net investment to output by sector is measured: . . . and, accordingly, . . . Without, the size of government is not determined.</li> <li>(M7) Macro-utility is measured relatively and uniformly by country. Each country has its own national taste, preferences, culture, and history, under the relative macro-utility. And, this utility is precise and independently of the technology coefficient and the rate of technological progress. The literature does not wholly estimate the relationship between national taste and technology.</li> <li>(M8) The relationship between <math>\beta</math> and <math>\lambda</math> is most effective, maximum rate of return with minimum ratio of net investment. This is achieved by a corresponding hyperbolic equation as the reduced form of an endogenous equation. The endogenous equation is directly and indirectly measured. The indirect equation is . . .</li> <li>(M9) Under a fixed relative share of capital and hold. This discovery justifies Gato (1971) and Kamuro (1970) in return to their theoretical proofs. The law of conservation holds at any model and system.</li> <li>(M10) Moderate relationship of the speed years between the G and PRI sectors: The speed years by country, sector, and years and over years are measured essentially with the capital-output ratio, beta, and delta. Compared with the speed years in the literature, this discovery is revolutionary. Yet, an important is its practical policy (see-see execution), both to control dynamic behavior between the G and PRI sectors. Practice is the life of the KEWT database. Practice is tied with such mechanics as between the actual and endogenous data and, all the other mechanics.</li> </ul> <p style="text-align: center;">2013/5/14 H. Kurogiro, Purely Endogenous 10</p>	<p style="text-align: center;"><b>15 Mechanics (3) wholly produces a bear fruit as the fourth discovery</b></p> <ul style="list-style-type: none"> <li>(M11) Relationship between ex-ante prevention and ex-post prescription: Ex-ante prevention does not repeat the same with ex-ante prevention and ex-post prescription, even if ex-ante prevention is the same and magnitude. Most typical cases is asset bubbles. Further, ex-ante prevention has its early warning of asset bubbles. Ex-ante prevention is not a prescription. Ex-ante prevention is a prescription of the rate of return and the growth rate of output. Contrarily, ex-post prescription does not produce early warning indicators of asset bubbles. This is a discovery.</li> <li>(M12) The relationship between theory and practice: Data change differently over years. Theory needs discovery, which must be erasing theory. The literature is cluttered with most difficult solutions and efforts of economists. In beyond description under the mechanism. The literature is a good collection of real progressers such as (probability, expectation forecasting and, discretion, largely with mathematics. A fundamental belief, however, is: Economists do not understand the mechanism of the market.</li> <li>(M13) Relationship between politics and long strategies &amp; short tactics: Endogenous politics are far-reaching and far-reaching. The literature is cluttered with most difficult solutions and efforts of economists. In beyond description under the mechanism. The literature is a good collection of real progressers such as (probability, expectation forecasting and, discretion, largely with mathematics. A fundamental belief, however, is: Economists do not understand the mechanism of the market.</li> <li>(M14) In any way, the KEWT database and the literature are destined to be cooperative. A fundamental discovery is the endogenous data are always within a certain range of endogenous data, by country, sector, and year and over years. A problem occurs only when the endogenous system and the KEWT database do not work moderately. In the endogenous system, both work cooperatively and well-balanced. Fortunately, the KEWT database ever finds the nature and causes of real assets and financial/market assets. Contrarily, the literature has to cry "listen to the market".</li> <li>(M15) A fundamental discovery is that the rate of technological progress advances forever, no zero-sum world and peacefully towards enjoyable spirit and stable real assets. Economic change always differs by country and the KEWT database always suggests some progress over the same history. No central is required and, the public disclosure of data by government is not a requirement. No central is required and, the public disclosure of data by government is not a requirement. Basic hypothesis: equities express geometric philosophy of positive and negative. This philosophy produces a new way to solve each policy-making and priority.</li> <li>The above 15 mechanics wholly produces a bear fruit as the fourth discovery of no more drawing up the SNA data by country, endogenous, external, and endogenous data.</li> </ul> <p style="text-align: center;">2013/5/14 H. Kurogiro, Purely Endogenous 11</p>
<p style="text-align: center;"><b>Conclusions (1 Discoveries): with the outlines of the fourth discovery, no dress up and no show up</b></p> <ul style="list-style-type: none"> <li>(D1) The real assets do not express a direct price level by good and/or service, which respectively necessitates under the rice-equilibrium and with the market principle. The price level of the KEWT database is only measured relatively, where consumer goods and producer goods are, simultaneously and wholly as a system, shown by the same relative price level, <math>p</math>, and that <math>p=1/0.000000</math>.</li> <li>(D2) Purely endogenous makes policy-makers by country to measure an endogenous rate of technological progress.</li> <li>(D3) The above first discovery, simultaneously and purely endogenously, leads to the third discovery that the neutrality of the real assets to the financial/market assets holds with no assumption.</li> <li>(D4) Any policy-maker by country cannot dress up the original (before reviewed and commonly arranged) data to present to the IFSY, IMF. Each item ranges not only to real asset data (e.g., Greece for seven years before and after becoming the EU member) but also to financial/market data such as the CPI indicator (e.g., the current Argentina).</li> </ul> <p style="text-align: center;">2013/5/14 H. Kurogiro, Purely Endogenous 12</p>	<p style="text-align: center;"><b>Conclusions (2 Relations): with the outlines of the fourth discovery, no dress up and no show up</b></p> <ul style="list-style-type: none"> <li>(R1) Relationship between stock and flow by factor: In terms of quantity and quality, characters of capital stock and population (stock) have the same character. The literature defines each stock just quantitatively and accordingly, corresponding flow quantitatively. As a result, it is difficult to control the rate of unemployment. Contrarily, the KEWT database realizes full-employment. Full-employment at the KEWT database indicates a fact that the rate of change in population is the same as that of workers.</li> <li>(R2) Data relationship between the macro/micro levels: The literature is based on the micro level, whose aggregation equals the macro level. The KEWT database has its own macro level uniquely.</li> <li>(R3) Relationship between the SNA data (households &amp; enterprises) and the KEWT database (the G &amp; PRI data): The former is based on an assumption of the principle of equivalent of three aspects while the latter is based on no assumption.</li> <li>(R4) Data relationship between the real assets and financial/market assets: The literature cannot express the precise relationship due to unique dependence on the market principle. For example, policy-makers admit that the results are unknown but no way but to execute prescript policies. The KEWT database entirely depends on the real assets and thus, the relationship becomes complete totally.</li> </ul> <p style="text-align: center;">2013/5/14 H. Kurogiro, Purely Endogenous 13</p>
<p style="text-align: center;"><b>Conclusions (3 Essentials, E1 to E4): with the outlines of the fourth discovery, no dress up and no show up</b></p> <ul style="list-style-type: none"> <li>(E1) The essence of the four discoveries is total policy among others. Once baroque/rotated, any country gets involved from its economic difficulties under the gravity towards the size of government around 1/2 or 1/3. Means the expenditure must be more than 1/2 or 1/3. This is because any increase in government leads to minimum public net investment. E.g., public net investment minus or gross investment is less than depreciation as the consumption of capital. The country endogenously continues to be under deep-to-deep imbalance or disequilibrium. Upon after rejecting this prescript/prescription, the country recovers within a few years as if a different country. The most typical cases are . . .</li> <li>(E2) All the data and information are linearly related between. The market infallibly expresses the result. Anyone needs to know that against the gravity (market principle). They say do any thing only after they are clearly but, it is unrealistic. For example, the author's intention is to be a prescript/prescription of the real assets of the SNA. Who knows this reality? The endogenous system knows it itself and all the information is measured endogenously.</li> <li>(E3) As a result, any one cannot dress up to the country's real assets. People know this fact infallibly. Why? This is because any within is a result of decision-making of mind in the endogenous system. Here man being has his mind and receives the result of its decision-making, beyond space and time. This essence of discovery naturally spreads over from author's main level to micro individual enterprise level. Adam, water down, or conceivable are impossible. As a result, less increase and the country maintain sustainable growth more endogenously.</li> <li>(E4) Contrarily, the fourth discovery has two boxes, GIVEN-DATA-BOX, 10 real assets data and 15 financial/market assets data, obtained from the IFSY, IMF, and RESILIENT BOX. There is another box, called 25 IFSY to connect the above two boxes. Author's intention is a perfect description of the KEY TO THE UN and IMF. This is because, the author believes, the KEWT database was given from the Heaven, history, of the Universe, to make people enjoy without and peacefully and accordingly, peacefully among countries. This is the spirit of Keynes in 1944 when Keynes designed a version of IMF. Also, the UN has its own role in recording national accounts, which differs from policy-oriented at the KEWT database. Perfectly secure cannot establish a purely endogenous system. No one or any human can be responsible for the fact. History has its responsibility of human progress.</li> </ul> <p style="text-align: center;">2013/5/14 H. Kurogiro, Purely Endogenous 14</p>	<p style="text-align: center;"><b>Conclusions (4 Essentials, E5-1 to E5-5): with the outlines of the fourth discovery, no dress up and no show up</b></p> <ul style="list-style-type: none"> <li>(E5-1) Germany attains a budget surplus in 2012 the first time after 2007. According to IMF, Cebbu/GDP forecast in 2013 is Japan 25%, US 12%, and Germany 6%. Also, IMF shows: the unemployment rate in US is 8%, Germany 5.3%, and Japan 4.2%; GDP per capita in 2011 is Germany 54410 US \$4533, and Japan 44870; the inflation rate in 2011 is Germany 2.48 %, Japan -0.25 %, and US 3.14 %.</li> <li>(E5-2) Germany constitution really sets up the deficit rule that deficit is allowed only when the GDP growth rate is more than 2% and it is allowed when the growth rate is plus, contrary to France and 19 states, as one of 660 amendments after the end of the last war.</li> <li>(E5-3) The EU members each increased Deficit (see Agreement proposed by Germany as a debt brake. France proposed common budgeting and common bond issue within the Euro area but this proposal was not accepted by Germany, it is so).</li> <li>(E5-4) According to Ken Matsui, the current Berlin Branch Manager, in Asahi Shinbun (see end to Pod to pod), Pierre Mitterand, Mitterand, is different, modest, and cool moderate figure, going to spend time working 24 hours like auto-machine, reality-checker, and irremediably flexible. Also, Shinbun (Sensation Central, Information, suggests that leaders focus on the current asset from the current asset, not on 70 years history, evaluate to transition as historical recognition and understanding (e.g., applicable to the current Crisis, history). For example, the author's intention is to be a prescript/prescription of the real assets of the SNA. Who knows this reality? The endogenous system knows it itself and all the information is measured endogenously. The KEWT database totally and endogenously solves this distinction in reality, where endogenous technology growth and national preferences are completely independent and all wholly united, as justified at the fourth discovery.</li> <li>(E5-5) Turning to micro enterprises: Tetsufumi Arita, earlier London correspondent and current editor, of Asahi Shinbun, outlines what support German economy. The key words are fertility, gas-buying and any-one ordered. Similar and middle enterprises in Germany are most robust in the world. Their factories are in fact Germany, and Germany has high Japan, 2011, and Germany 29 %, and Germany 29 %, produced within their factories. Their market share is more than 70 % in manufacturing industries. Export share of top ten companies by country is US 36 %, Japan 5 %, and Germany 29 %, and Germany 29 %. Historically and Japan followed their craftsmanship and royalty soon after Meiji Era.</li> </ul> <p style="text-align: center;">2013/5/14 H. Kurogiro, Purely Endogenous 15</p>

### Implications (1): How to design robust economic recovery, by country and by area

- (A1) The value level is not determined by the central bank or government but by the real people globally. The price level at the zero level is only determined relatively by using the relative price theory, whose value is per 1000000 by country. This discovery is a proof of an assumption under perfect competition. Some countries do not show perfect competition but oligopoly or monopoly of some industries and a small market. This fact is expressed by the relative price theory. The speed recovery is not the same for all countries. The speed of recovery is not the same for all countries. The US has recovered from the recession. Besides, the US historically exhibits the super high level of economic growth. This discovery is a proof of an assumption under perfect competition. Besides, the US historically exhibits the super high level of economic growth.
- (A2) Deflation and asset bubble coexist at both asset and endogenous side. Clearly inflation and bubbles are common across countries. When is the reason of deflation? The top cause is a wrong deficit and debt to GDP and, consequently, over years. Among 10 countries, each is only one country that suffers from deflation. A negligible discovery is that deflation should be fixed only for the first year and its 10% after. After that, the government should not be involved. It takes only years from now to return back to the zero level. Some countries suffer from deflation. Some countries have an ability to decrease government consumption slowly, the 10% per year, off the side of deficit reduction and of asset and endogenous side.
- (A3) Deflation is a bonus because it is a bonus against a fixed rate of employment. Furthermore, deflation is much better for a country to endogenously maintain the rate of technological progress. Deflation automatically increases the rate of return but, the fact that deflation-inflation rate only comes from other inflationary policies such as no inflation and stability increase. Or, to increase the rate of return, volatility and also endogenously.
- (A4) In the short period, these two facts are reversed and interest groups tentatively earn and soon lose. All of these facts are discovered by people.
- (A5) People's consciousness determines the next generation welfare and as a result, the current people. This discovery proves "the first and last rule" in that, endogenous, designed situation at the 2007 deflation immediately proves this discovery. Some countries have been from deflation to inflation that are not related with the real world. It takes only years from now to return back to an earlier stable economy. It implies that people need to be conscious and continuously work for future stability for the long term. This is an essence of democracy of the people, for the people, and to the people.
- (A6) The endogenous discovery is that, endogenous, designed situation at the 2007 deflation immediately proves this discovery. Some countries have been from deflation to inflation that are not related with the real world. It takes only years from now to return back to an earlier stable economy. It implies that people need to be conscious and continuously work for future stability for the long term. This is an essence of democracy of the people, for the people, and to the people.
- (A7) Each country has its own policy difficulties according to its economic stage. There is no country to maintain sustainable economy without breakdown. The trend of the speed years by country clearly shows this real state of affairs. Typically controlling causes are China and India. China takes the role of leader, whose trends are government-owned. It implies that deflation is fully within a controllable range. In fact, deflation is small compared with other countries. Nevertheless, China has to be cautious. In fact, deflation is small compared with other countries. Nevertheless, China has to be cautious. In fact, deflation is small compared with other countries. Nevertheless, China has to be cautious.

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### Implications (2): How to design robust economic recovery, by country and by area

- (A1) The balance of payments (BOP) and deficit differs algebraically by country. Most countries aim at the increase of the BOP. Apparently this affects people and is in favor of value. A discovery is that stability increases in net investment of the private sector is vital more than the increase in the BOP. Rather the increase in the BOP influences negatively the increase in net investment of the private sector. A country needs a balanced growth between big enterprises and small & medium enterprises, through steady increase in net investment. Further net investment of the private sector does not increase by itself. Government consumption-increase private net investment stability. In this sense, leaders by country need to just watch the trend of the BOP and deficit by month and over years. Consumption is fully stable. The XEMT database states of maintain robust growth. People are able to perceive the qualitative level of policy-makers and leaders, by watching the trends of the BOP and deficit by month and over years.
- (A2) Are the EU and Europe area weak after 2008 when financial crisis occurred? No, not so much from the viewpoint of the endogenous system. Spain, Italy, Greece, and Ireland, each had suffered from financial crisis and had to save financial institutions stability and of unexpected skills, compared with the state of government. Great success was out of the endogenous-equilibrium but, it was never years before and after joining the Euro area and, never after 2003 (for the debt, see the fourth discovery in Conclusion).
- (A3) Assume that no financial crisis. Then, the speed years does not so much lead as of moderation. The endogenous-equilibrium is rather well-balanced except for the 2009 crisis. A problem may be after 2012. Some countries fight deficit while others release deficit, influenced by political absorption. Needless to say, sudden out of government consumption is difficult but, after sharp cutting, bright future becomes the country so that most countries to follow the direction. Note that actual data are within a certain range of endogenous data and right solution of deficit at the best policy for right recovery.
- (A4) Endogenous early warning indicators such as the endogenous valuation ratio and the endogenous Poincaré coefficient. Most EU and Europe area have each moderate level of endogenous indicators for 1990-2011 except for after 2008. And, each trend of these indicators differs by country. The market is too sensitive to the movements of short forecasting. This is because the market does not include any cause and effect relationship but only volatility. The market is too sensitive to the long years. Globalization is followed by globalization means the market shrinks and shrinks. We need to stand at the long-term side, reflecting on ourselves. This is the best way to enjoy an endogenous recovery in the Global Era. Note that national leads and specific endogenous technology march together by country. Escapes by endogenous does not show a right direction. Asset bubbles destroy future generations and no one gains in the long years of it. Endogenous early warning indicators indicate the best policy-makers and right solution of deficit at the best policy for right recovery.

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### Implications (3): How to design robust economic recovery, by country and by area

- (A7) Each country has its own policy difficulties according to its economic stage. There is no country to maintain sustainable economy without breakdown. The trend of the speed years by country clearly shows this real state of affairs. Typically controlling causes are China and India. China takes the role of leader, whose trends are government-owned. It implies that deflation is fully within a controllable range. In fact, deflation is small compared with other countries. Nevertheless, China has to be cautious. In fact, deflation is small compared with other countries. Nevertheless, China has to be cautious. In fact, deflation is small compared with other countries. Nevertheless, China has to be cautious.
- (A8) Equivalence of deficit and super-inflation. Under abnormal circumstances, a country has unrealistic experiences such as solvent/deficit and super-inflation. These experiences suggest how to compare deflation, where the market has not yet crashed. This implies that deflation is fully within a controllable range. In fact, deflation is small compared with other countries. Nevertheless, China has to be cautious. In fact, deflation is small compared with other countries. Nevertheless, China has to be cautious. In fact, deflation is small compared with other countries. Nevertheless, China has to be cautious.
- (A9) Equivalence of deficit and super-inflation. Under abnormal circumstances, a country has unrealistic experiences such as solvent/deficit and super-inflation. These experiences suggest how to compare deflation, where the market has not yet crashed. This implies that deflation is fully within a controllable range. In fact, deflation is small compared with other countries. Nevertheless, China has to be cautious. In fact, deflation is small compared with other countries. Nevertheless, China has to be cautious. In fact, deflation is small compared with other countries. Nevertheless, China has to be cautious.
- (A10) Equivalence of deficit and super-inflation. Under abnormal circumstances, a country has unrealistic experiences such as solvent/deficit and super-inflation. These experiences suggest how to compare deflation, where the market has not yet crashed. This implies that deflation is fully within a controllable range. In fact, deflation is small compared with other countries. Nevertheless, China has to be cautious. In fact, deflation is small compared with other countries. Nevertheless, China has to be cautious. In fact, deflation is small compared with other countries. Nevertheless, China has to be cautious.

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### Implications (4): How to design robust economic recovery, by country and by area

- (A7) Each country has its own policy difficulties according to its economic stage. There is no country to maintain sustainable economy without breakdown. The trend of the speed years by country clearly shows this real state of affairs. Typically controlling causes are China and India. China takes the role of leader, whose trends are government-owned. It implies that deflation is fully within a controllable range. In fact, deflation is small compared with other countries. Nevertheless, China has to be cautious. In fact, deflation is small compared with other countries. Nevertheless, China has to be cautious. In fact, deflation is small compared with other countries. Nevertheless, China has to be cautious.
- (A8) Equivalence of deficit and super-inflation. Under abnormal circumstances, a country has unrealistic experiences such as solvent/deficit and super-inflation. These experiences suggest how to compare deflation, where the market has not yet crashed. This implies that deflation is fully within a controllable range. In fact, deflation is small compared with other countries. Nevertheless, China has to be cautious. In fact, deflation is small compared with other countries. Nevertheless, China has to be cautious. In fact, deflation is small compared with other countries. Nevertheless, China has to be cautious.
- (A9) Equivalence of deficit and super-inflation. Under abnormal circumstances, a country has unrealistic experiences such as solvent/deficit and super-inflation. These experiences suggest how to compare deflation, where the market has not yet crashed. This implies that deflation is fully within a controllable range. In fact, deflation is small compared with other countries. Nevertheless, China has to be cautious. In fact, deflation is small compared with other countries. Nevertheless, China has to be cautious. In fact, deflation is small compared with other countries. Nevertheless, China has to be cautious.
- (A10) Equivalence of deficit and super-inflation. Under abnormal circumstances, a country has unrealistic experiences such as solvent/deficit and super-inflation. These experiences suggest how to compare deflation, where the market has not yet crashed. This implies that deflation is fully within a controllable range. In fact, deflation is small compared with other countries. Nevertheless, China has to be cautious. In fact, deflation is small compared with other countries. Nevertheless, China has to be cautious. In fact, deflation is small compared with other countries. Nevertheless, China has to be cautious.

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### From parts to endogenous organic system

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### 1. Endogenous methodology cooperates with econometrics in the literature

For comparisons of statistics and endogenous data, econometrics is useful.

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### 2. A shift of paradigm of causes and effects/results: vertical versus wholly

All the variables and seven endogenous parameters are consistent with each other. Seven endogenous parameters are consistent with all the equations each other.

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### Mechanical obstacle at developing stages: by country and by year

	c	0.400	0.500	0.600	0.800	1.000	1.500	2.000	3.000	4.000	5.000	6.000	8.000	1.000	1.500
LN(2)		0.6931	0.6931	0.6931	0.6931	0.6931	0.6931	0.6931	0.6931	0.6931	0.6931	0.6931	0.6931	0.6931	0.6931
ln*		0.400	0.500	0.600	0.800	1.000	1.500	2.000	3.000	4.000	5.000	6.000	8.000	1.000	1.500
ln**		1.500	1.800	0.607	0.200	1.500	1.800	0.607	0.200	1.500	1.800	0.607	0.200	1.500	1.800
LN(3)		0.405	0.800	0.405	1.303	0.405	0.800	0.405	1.303	0.405	0.800	0.405	1.303	0.405	0.800
LN(4)		0.295	0.400	1.200	0.800	0.400	0.400	1.200	0.800	0.400	0.400	1.200	0.800	0.400	0.400
ln(5)		1.200	0.295	2.219	1.610	1.610	0.295	2.219	1.610	1.610	0.295	2.219	1.610	1.610	0.295
LN(6)		1.500	1.800	0.607	0.200	0.607	0.200	0.607	0.200	0.607	0.200	0.607	0.200	0.607	0.200
LN(7)		0.6931	0.6931	0.6931	0.6931	0.6931	0.6931	0.6931	0.6931	0.6931	0.6931	0.6931	0.6931	0.6931	0.6931
ln(8)		1.200	0.295	2.219	1.610	1.610	0.295	2.219	1.610	1.610	0.295	2.219	1.610	1.610	0.295

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**Aspect 1 shows a base for endogenous situation from the viewpoint of costs of capital**

Aspect 1 endogenously measures the rate of return and cost of capital (as the rate of return less the growth rate), for nominal-real+ inflation in equilibrium.

Nine items: The horizontal asymptote of  $r^*(t)$ ,  $HA_{r^*(t)}$ ; The endogenous inflation rate,  $r^* - HA_{r^*(t)}$ ; The valuation ratio,  $v = \frac{r^*}{r^* - g^*}$ ; The real and nominal costs of capital by sector,  $CC_{REAL}^*$ ,  $CC_{REAL(t)}^*$ ,  $CC_{REAL(PH)}^*$ ,  $CC_{NOMINAL}^*$ ,  $CC_{NOMINAL(t)}^*$ ,  $CC_{NOMINAL(PH)}^*$ .

Equations of the real growth rate:  $g^*_{REAL} = g^* - HA_{g^*}$ , where  $HA_{g^*} = HA_{r^*(t)} \times i \cdot \beta^* / \alpha$  and  $i \cdot \beta^* / \alpha$  is the Petersburg coefficient.

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**Aspect 2 shows a base for endogenous situation from the viewpoint of endogenous equilibrium**

Nine items: The speed of years by sector,  $1/\lambda^*$ ,  $1/\lambda^*_e$ ,  $1/\lambda^*_{PH}$ , where speed years is  $\lambda^* = (1 - a)n + (1 - \delta_0)g^*_k$ ;

The actual and endogenous ratios of net investment to output, and the difference,  $i_{actual}$ ,  $i_{Endogenous}$ ,  $i_{actual} - endog$ ;

Deficit, the balance of payments, and the difference,  $\Delta d$ ,  $S_{PH} - i_{PH}$ ,  $bop = BOP/Y$ .

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**Aspect 3 shows a base for endogenous situation from the viewpoint of the endogenous NAIRU**

Nine items: The actual growth rate of population, its rate of change in equilibrium, and The difference, by sector,  $n$ ,  $n_{EG} - n$ ,  $n_{EPH} - n$ ;  $n_{EG} - n_e$ ,  $n_{EPH} - n_{PH}$ ;

The actual rate of unemployment,  $Unem\ rate(actual)$ ;

The rate of change in CPI (consumers' price index),  $g_{CPI}(actual)$ ;

A compound rate of inflation to test the quality of CPI,  $Infla\ rate_{COMPOUND} = r_{DEBT} - (r^* - HA_{r^*(t)})$ , where  $r^* - HA_{r^*(t)}$  is the endogenous rate of inflation.

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**Aspect 4 A base for endogenous situation: technology-oriented robustness and economic stage**

Aspect 4 wholly ties up technology, robustness and economic stage.

Ten items: The horizontal asymptote of  $\beta^*(t)$  by sector,  $HA_{\beta^*(t)}$ ,  $HA_{\beta^*(t)_e}$ ,  $HA_{\beta^*(t)_{PH}}$ ;

The horizontal asymptote of  $\beta^*(t)$  by sector,  $HA_{\beta^*(t)}$ ,  $HA_{\beta^*(t)_e}$ , and  $HA_{\beta^*(t)_{PH}}$ ;

The Width of  $\beta^*(t)$  by sector,  $Width_{\beta^*(t)}$ ,  $Width_{\beta^*(t)_e}$ , and  $Width_{\beta^*(t)_{PH}}$ ;

The Width divided by the HA,  $Width_{\beta^*(t)}/HA_{\beta^*(t)}$ .

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**Aspect 5 A base for endogenous situation: the balance between growth and returns**

Ten items: The relative share of capital,  $\alpha$ ;

The diminishing returns to capital (DRC) coefficient,  $\delta_0$ ;

The qualitative net investment coefficient,  $\beta^*$ ;

The capital-output ratio,  $\Omega = \Omega_0 = \Omega^*$ ;

The rate of technological progress,  $g^*_k = i(1 - \beta^*)$ ;

The Petersburg endogenous coefficient,  $\alpha/i \cdot \beta^*$ , where  $r^* = g^*_k \left( \frac{\alpha}{i \cdot \beta^*} \right)$ ;

The rate of return by sector,  $r^*$ ,  $r^*_e$ ,  $r^*_{PH}$ ;

Sustainable diminishing level,  $\delta_0/\alpha$ .

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**Aspect 6 Balance between the real assets and financial/market assets (i.e., neutrality of real assets)**

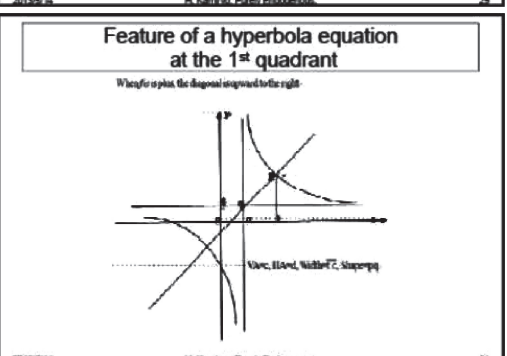
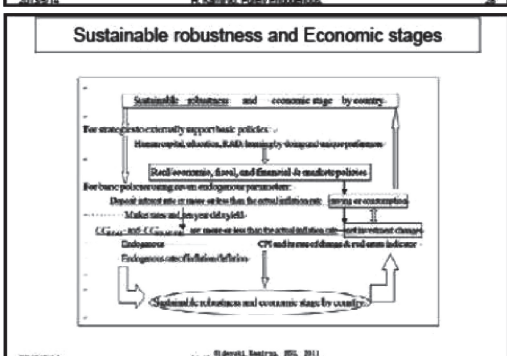
Ten items: The money-neutral indicators,  $m_1 = M2/K$ ,  $m = M2/Y$ ,  $m_B = M2/\Pi$ ;

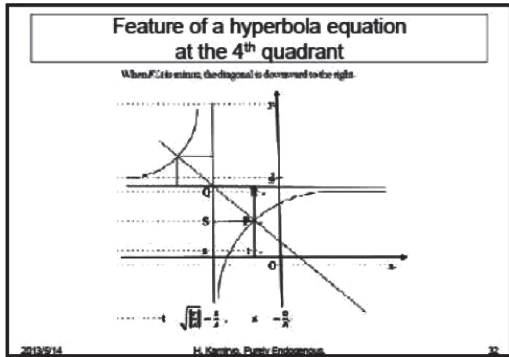
The difference between the market rate and endogenous rate,  $r_{DEBT} - r^*$ ,  $r_{DEBT}/r^*$ ;

The exchange rate-neutral indicators are composed of the following five;

- (1) The exchange rate to the US (item 'ae', in JFSY, IMF) divided by the relative growth rate of per capita output,  $e_{(US)}/g^*_k$ , where  $g^*_k = g^*_k/g^*_{(US)}$ ;
- (2)  $r_{DEBT} - r^*$ ;
- (3)  $e^*_{(US)} = e_{(US)}(r^* - r^*_{(US)})$ ;
- (4)  $e_{(US)}/e^*_{(US)} = e_{(US)}/(e_{(US)}(r^* - r^*_{(US)}))$ ;
- (5)  $e_{(US)}/y^{**}$ , where  $y^{**} = y^*/y^*_{(US)}$ .

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- ### Seven Endogenous Parameters
- (1) Endogenous net investment to endogenous income,  $i = I/Y$ .
  - (2) The rate of change in population,  $n_T = n$ .
  - (3) The relative share of capital,  $\alpha = \Omega/Y$ , where  $\alpha = \Omega^*/r^*$ .
  - (4) The capital-output ratio,  $\Omega^* = K/Y$ .
  - (5) The technology coefficient (or the quantitative net investment coefficient),  $\beta^*$ , (see below).
  - (6) The coefficient of diminishing returns,  $\delta_1 = 1 + \Delta N(\beta^*)/\Delta N(1 - \beta^*)/\beta^*$ .
  - (7) The speed years for convergence in the transitional path,  $1/\lambda'$ , where the speed coefficient  $\lambda' = (1 - \alpha)n + (1 - \delta_1)g_1$ , where  $g_1 = i/(1 - \beta^*)$ .
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### Fortunate publication born by all of you

- Earth Endogenous System, Better Advances Press, Toronto; 640p., ISBN 978-0-99188-0-3, May 15, 2013

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## Appendix C Preface in Japanese

### 1. なぜ「純粋に内生」なのか？

本モノグラフは、国ごとの、低インフレ下での完全雇用を実現するための「純粋に内生」システムの方法論を提示したものである。理論には、前提が必要である。実践は、前提を必要としない。「純粋に内生」は、前提を必要としない。内生システムは、理論＝実行の、政策を志向した枠組みや考え方を指す。内生システムは、国という単位でも、それを受けての部門（最終的に、政府、私企業、家計の3つ）という単位でも、税金再配分直前の政府部門と民間部門という単位でも、ともども、つねに相互に整合して有機的であり、かつ循環的である。

このモノグラフは、言うまでもなく、過去からの歴史的文献の上に成立している。過去の研究業績の蓄積がなければ、本書は存在し得なかった（巻末の参考文献リストを参照のこと）。このモノグラフは、解決が非常に困難なマクロ経済学上の問題について、個別に真の因果関係を明らかにし、実践的な解決策を与えている。それは、幾百にも絡まった糸が突如として解けるかのおりである。

前提を置かない背景には、2つの重要な考え方がある。1つは、Meade (1962) が考えた9つの前提が非線形方程式によって置き換えられた時点で、すべての前提が不必要となったこと。もう1つは、財とサービス毎に垂直的にしか表されない価格水準の均衡が内生均衡に置き換えられた時点で、すべての前提が不必要となったこと。さまざまな均衡があり、視点を変えた均衡水準の測定尺度は、相互に整合して存在する。基本的には、均衡水準の測定尺度は、国、部門ごとに、収束まで何年かかるかの速度で測定される。実物資産は集計資本（有高）によって成り立つ。

また、技術進歩は、金融／市場資産（有高）からではなく、実物資産とその増減によってのみ創出される。市場原理は、政策機能として働く実物資産の結果を反映するに止まる。実物資産、金融／市場資産ともに、同時並行的に進行するが、主体性は、実物資産にある。金融／市場資産は、貨幣・マネーを直接的に扱うが、かっこ実物資産の裏返しに止まる。これらの事実は、著者が文献上はじめて発見した、「内生実物資産に対する、金融／市場資産の中立性」とそれを支える実証的論証に基づいている（概要は第2章、以降各章参照）。

不均衡に陥る前に、市場原理として表に出る価格均衡は、均衡に戻るように瞬時に自動調整される。こうして、経済が破綻しない限り、常に価格均衡が保たれる。調整後において、滑らかでない状況をみせる場合、人々はそれを衝撃（ショック）と呼び、衝撃の形成する景気変動を好まない。この衝撃波は景気後退と呼ばれ、人々はこれを克服したいと思う。少な

くとも数年に一度は、景気循環の過程で衝撃が生じる。しかしながら、衝撃の真の原因は、価格均衡モデルでは、タテ割りのため、すべてを包含的に説明できない。

反面、著者は衝撃を前向きに受け止める。というのは、衝撃の最中に、真の原因が内生的に特定され、排除・改善されるからである。衝撃とは、不均衡を避けるための、神からの贈物なのである。まことに多面的な景気循環論のなかには、実物資産に基づく実物景気循環論も存在する。この実物景気循環論は、正しい方向であるが、タテ割り価格の影響を強く受けて、今でも部分的な枠組みを脱却しきっていない。内生システム／モノグラフは、景気循環波が上述の金融・市場資産中立性の下にあることを理論的・实际的に（1960–2010/11データベースを適用して）論証したのである。

## 2. グローバリゼーション下での技術と選好

一国の経済全体は、民間部門と政府部門で構成される。民間部門は、国際競争の直接的影響下にある。マクロにおいて、グローバリゼーションは、技術、国民的嗜好、選好、文化、歴史を飲み込むという人がある。内生システムは、このような脅し文句を完全に否定するものである。グローバリゼーションとマクロの技術ならびに選好は、内生システムの下では両立するものである。技術進歩は、純粋に内生的であり、まずもって、2つの要素で決定される。1つは、質的な純投資技術係数、ベータであり、もうひとつは純投資率である。しかも、マクロの選好とは、常に整合し、一貫するものである。

マクロの選好は、ミクロにおける個人に対する伝統的効用関数から離れて、マクロレベルでの効用－消費関数に基づき、国民的嗜好、選好、文化、歴史の集合体として経済全体で内生測定される。1990年から2010年の実証結果をみても、81か国がそれぞれ、国・政府・民間部門で、グローバリゼーションとマクロの技術ならびに選好との共存的關係を示している。これは、内生システムの天恵の特徴である。このような融合・融和は、内生双曲線式を支える哲学でもある。

要約すると、グローバリゼーションは、国民的個性を弱体化せず、むしろ温存して、経済の持続性を保証する。東洋文化・文明と西洋文化・文明とは、今世紀、すでに融和される時代に入っているという認識が重要である。マクロにおける技術と選好は、国の経済政策により、実り豊かな成果を企業や家計に生み出すのである。国の経済政策の成否とその原因＝結果は、部門間ならびに実際・内生データ間の動的バランスを、長期的視野からどのように年毎に維持するかにかかる。

文化・文明の融和は、異なる文明が互いに争うことなく、平和的に協調し合えることを示唆している。実際のデータが内生データのある範囲内にあるので（論証済み）、長期的視野が

定着する。政策を支える戦略がグリーンな環境循環経路を支える主柱になりさえすれば、家計はまず子孫生存への安心を与えられ、企業はアニマル精神を発揮でき、給与や解雇に対して、いいわけや口実を決して言えない。短期的な規制で、長期的な展望が右往左往して、曇ることはない。

### 3. 科学的発見と哲学，自然・社会・行動科学

本モノグラフは、各章において、意図的に哲学的説明を避けた。モノグラフとは、科学的または数学的に厳密に立証していくものである。この厳密性ゆえ、著者は、第一章冒頭で科学的発見について自分なりの定義を示した。これは、第一章の図1-3に示されている。図1-3では「科学的発見の分類ダイアグラム」を示し、自然科学，社会科学，行動科学を2つの次元のトポロジーで整理した。数学においては、部分的論証が全体的論証と矛盾しないことが知られており、なおかつ数学は経験的論証を要しない。

研究論文における哲学は、イマヌエル・カント（1724–1804）まで遡ることができる。彼の哲学の特徴は、「大衆への啓蒙」にある。正義は啓蒙と関連し、自然の機構は、永遠平和という果実を保証する。この世界において、地球、人類、文明それぞれが普遍的かつ協調的に存在する。東洋文明は今、西洋文明と同一化の過程にあるものの、それぞれの個性が残る十分な余地がある。グリーン経済学は、上述の哲学を前提とするものである。資源は、国家によって公平に分配される。国家間、また先進国と発展途上国の間でも然りである。理論は実践によって達成される。達成とは、完全な場合に限って、成立する。

未解決の経済の諸問題への解決策の水準は、一般の人々、政策立案者、リーダーの実行段階での水準により決まる。実行段階での水準は、哲学に根差すものである。一般の人々、政策立案者、リーダーは自身の哲学のレベルを超えて、幸福な生活を謳歌することはできない。だからこそ、時間がかかるのである。内生システムの方法論は、単なる受け皿のままである。内生システムという受け皿では、いかなる実行水準も受容可能である。

自然科学は、人間の精神を超越し、発展中の社会科学のはるか先を行っている。社会科学は、自然科学の後塵を拝しているが、これは、貪欲な金銭志向の精神の影響を多少なりとも受けているからである。前の話に戻るが、内生システムは「科学的発見の分類ダイアグラム」によると、科学的発見の領域に留まるものである。それゆえ、本モノグラフで著者は、行動科学と行動経済学に挑戦するものではない。著者は、自然科学と社会科学がいつか1つとなる時代が到来すると信じている。絶対不変の原理または自然しかこの世には存在しないからだ。

自然志向の兆候については、第10章で述べた。光は、性質を持たず、量も持たない。電子

もまた同様である。電子が螺旋状に回転して中性子と結合し、質と量を持つ状態に戻る。この事実は、石田静子氏による「籐または竹の身近かなモデル」を使って物理的に証明されている。第10章において、女史が生涯をかけて整理したモデルの全体像を紹介し、6次元と5次元の関係を説明した。女史の1次元から6次元までの自然科学の真髓と整合する著者のシステム整序化は、「不連続データ」と「連続コブ・ダグラス型生産関数」との数式化が取り持った。

つまり、規模に関する収穫不変下での「不連続な」コブ・ダグラス型生産関数数式化に隠された7つの内生変数を発見し、すべての国・部門・年毎に共通的に測定できたために、石田静子氏による自然科学の真髓と繋がったのである。結果として、基本方程式（表記法の項目を参照）が公式化され、実践に移される。基本方程式は、それぞれ双曲線式に約分される。これらの双曲線式は、ピタゴラスの直角三角形と合致し（黄金比と $\sqrt{2}$ を含む2等辺三角形シルバー比の重なり）、物質的6次元（ゆらぎや遊びの1次元プラスが不可欠）と精神的5次元との統合を含意できる。しかも、物質的6次元のなかにあっても、これらの双曲線式は、2次元に表現され、over space and time と整合している。

#### 4. 内生均衡を補強する特別な手段としての双曲線式

もっとも重要な双曲線式について説明しよう。内生双曲線式のヨコ軸に純投資率を当てると、内生均衡の最適範囲は、第1象限に示されるように、財政赤字が許容範囲にある場合には、タテ軸に測定されるように、適切なインフレーションを伴うことになる。純投資に対する収益率の双曲線式は、最低限の純投資による最大限の収益率を目標として、その水準を実現する。このような内生双曲線式は、放物線式（次元の特定は不要）を使ったサミュエルソン（1972）の利潤最大化の結果と整合する。しかしながら、純投資に対する収益率の双曲線式は、日本のように財政赤字が手に負えない事態となった場合、第4象限へと移り、巨額の財政赤字と国の債務蓄積によりデフレーションは、不可避となり、成長力はゼロ近くに貼りつくことを正確に測定する。ラインハート（2010）の殆どすべての国が経験した、過去800年にわたる実際の財政破綻を、内生システムがここに論証したのである。

著者は、2次元の双曲線式を用いることにより、地勢的哲学を設定した。地勢的哲学は、伏羲の陰陽道原理と整合性のある考え方である（以下第6項参照）。双曲線式の垂直的・水平的漸近線は、測定不能の限界を示し、この限界は、陰陽道原理の極を示すものである。測定不能の限界は、ゼロ点に近接している。来年中には、大容量の真空設備を用いてその存在が証明されるであろう物理学会のナノ・ゼロ点域よりはるかに小さい、石田静子女史のナノ・ゼロ点域に対応する。

## 5. 新古典派ケインズ経済学者であるハーコート教授と本書の全16章をいかに読むか

本モノグラフには、読者の便宜を図るため、全体像と道案内を随所で示している。本モノグラフは全16章で構成され、第1章から第10章の各章は、各側面の全体的統合を企図せず、各側面を個別に分析している。一方、第11章から第16章の各章では、システムとして全体的な立場から、内生的モデルの成果の統合を図っている。読者は、第14章、第15章、第16章において知的興奮を感じるに違いない。というのも、著者は、現在の未解決の問題に対する解答の核心を訴え、部分ではなく、全体的にまとめて、測定しているからである。これらの章で示される結論は、常識、統計、計量経済学のいままでの研究業績を覆すことになる。具体例を挙げると、人口増加率が小さくなると、国レベルで見た技術進歩率は通説とは逆に高くなるということが論証されている（第15章参照）。

双曲線式は、関連項目でも使用される。第14章においては、純投資における変化に関して、また第15章では、人口の変化に関して、それぞれ完全かつ網羅的説明が行われる。移行過程を説明する再帰的プログラミングが第16章の中心となる。著者は、第14章と第15章において、新古典派の研究業績を整理し、F. P. ラムゼイ（1928）とジョルゲンソン（1963）を引用している。また、著者は、ネオ・ケインズ主義、ニュー・ケインズ主義のたどった研究を第16章で整理し、巨星ハーコート（1972）のグラフを7つ引用して、国別に比較した。現在引退してオーストラリアに戻ったハーコート先生に、1996以来、はじめて喜ばれている。

## 6. 著者の人生に関する事柄

ここで、過去60年にわたる著者の個人史を紹介したい。著者はこの生涯で7つの大学と関係してきた。長年に渡り、それぞれは点に過ぎなかったが、今日、それらはつながり、いずれ近い将来に各点が全体として1つにまとまるであろうことを著者は確信している。奇妙に聞こえるかもしれないが、著者は、50年以上にわたり、双曲線と人生を共にしてきた。若い頃、企業の生産性分析に使ったのがきっかけである。その後、双曲線の特徴は、ミクロからマクロレベルへと徐々に変化していった。著者の研究は、当時日本で第5位の銀行であった東海銀行に在籍していた時の、各社の財務諸表分析に端を発している。著者は、銀行を退職するまでの30年間、海外での実践的経験を土台にして、企業会計に焦点を当て、地元企業から国際企業にシフトする企業金融の研究に注力してきた。

1974年にマサチューセッツ工科大学のスローン経営大学院を修了、主指導者はスチュワート・マイヤーズ教授で、卒業式の日にかこう助言してくださった。「研究を継続し、独自の理論

枠組みとモデル生み出すように」と。著者はこう尋ねた。「それにはどれくらいの時間がかかるでしょうか」と。先生はこう続けた。「最低30年はかかる」、「独自のモデルを構築してみてはどうか」、「既存の理論枠組みに深く浸り切っていない、一人前とは言えない。我々はいかなる（理論的）制約からも自由であるが、容易に既存の理論枠組みを捨て去ることはできない」と。1980年4月、著者は九州産業大学経営学部で初めて教職に就いた。これは、山口大学（旧制）卒業生の三戸公先生と文部省（実業界から研究者へと転身したのは日本初であった）の早急な推薦によるものであった。その後、1986年、博士課程指導教員として広島修道大学に移った。

著者は、2003年11月にニュージーランドのオークランド大学より経済学博士号を授与された。英系国立のシステムでは、居住者であることは博士号取得の資格要件ではない。結果として、8年を要し、その間日本で講義を続けることができた。ドバシス博士、シャープ博士、フル博士が著者の指導教員であった。著者は、方程式がない状態で、再帰的プログラミングの実験を行わなければならなかった（この実験で著者は、微分・積分を直接的に使用せずに、佐藤隆三先生による1981年のリー理論を経験的に証明することになった）。

これより前の1986年、著者はクライストチャーチにあるカンタベリー大学リンカーン応用科学大学院より修士号を授与されている（最近、現在のリンカーン大学 URL によれば、1984 PhD for agricultural economics 取得の記載あり、メールにて、March 2013 大学当局に PhD 取得の再確認済。当時の環境では、risk-aversion な国立大学の在り方として、当然な対応であったと理解）。ここでは、4年をかけて、R. G. D. アレンによる、指数の理論と実際（1975）に基づき、指数の理論と実際の利用について実験を行った。著者は、過去20年に及ぶ、オーストラリア、カナダ、日本、ニュージーランド、イギリス、米国の国および農産物ごとの農業統計を使用した。各国政府の方々の支援も受けた。当時、著者は、指数の方法論が経済学の最終兵器として経験的に十分でない点を認識していたが、その根拠の1つは、反転試験の際に不可欠である一貫性の欠如という点であった。それ以降、著者の研究の焦点は、産業・企業というマイクロレベルから、単一のマクロレベルへと移っていく。

内生システムは、理論とその実践で構成される。つまり、国および部門ごとの上領内生的世界体系データ・セット、データベースである。内生システムは、2012年1月、1990年から2010年までの81カ国の部門ごとの KEWT6.12として完成した。最初の KEWT は2007年1月にまとめた KEWT1.07 であり、1960年から2005年までの9カ国に関するものである。KEWT1.07 の発表に先立ち、著者は数年にわたり繰り返し実験を行い、そのデータを OECD、国連、IMF 統計、国ごとの国民経済計算（SNA）の統計の計算結果と比較検討した。国民経済計算（SNA）は、記録自体が目的であるが、そこでは、国全体の経済は、家計や企業へと移行しつつある。KEWT データベースは、記録を目的とすることはできない。

KEWT データベースは、政策の plan-do-see を、また統計データの内生的データへの変換を目的とする。

KEWT1.07 発表後、著者は、部門ごとに、KEWT2.08, 3.09, 4.10, 5.11で内生均衡の適切な範囲を測定する方法を考案した。著者は KEWT5.11 において、均衡回復の最後の手段として、失業率を使用した。KEWT6.12 では、完全雇用の下での内生システムという結論を出した。これらの実験で、著者は、指数に関するダイワートの研究（2001, 2009, 2011）は別として、指数の使用を避けたのである。

著者が大学の規定で2002年に71歳で退職するまで、王建雄と大下英蔵の2名が博士号を取得した。建雄は著者を父と呼び、中庸という哲学を共有し、同じ心を持っている。中庸が何より大事である、と。中庸とは、陰陽道に基づく思想で、その起源である「伏羲」は、数千年前に古代中国で生まれた。私が所属する広島修道大学の建学の精神は、老子を起源とする中庸である。広島修道大学は、388年前に設立された17の藩校の1つを起源とする。著者は、建雄が能力を伸ばし、中国政府、上海市、北京市と信頼関係を築いていることを知り、嬉しく思っている。彼が中国に帰国した際、著者は、中国政府の要人に対し、（中国共産党の）同士として認めてもらうよう再度手紙を出した。中国語で Flower を表す「華」、日本語で Peace を表す「和」は、Harmony「融合」に通じる。国を越えた地球の真の融合を心願。

2012年1月に KEWT5.11 を6.12に更新してからというもの、著者は、エイプリルフールの日を除けば、3月か4月中には、内生システムの考えをまとめようと決意していた。上海の建雄が2012年6月に広島にやってきた。我々は景気循環について前向きに議論した。その後、モノグラフをまとめ始めた。建雄の問いに答えるため、著者は、第15章の終りに「王建雄への注釈」というモノグラフを加えたのである。あわせて、米国、日本、中国での実践に向けた手順、すぐに何をすべきか（あとがき）も加えた。

KEWT データベースは、その政策目標が政策支援の戦略を背後に温存するという点で、文献上の政策の目標とは区別される。王建雄は、グリーン戦略の実現具体化に取り組んでいる。これは著者のライフスタイルにも合致するものである。年を追うごとに、著者は、政策を戦略につなげる必要性を体得的に感じるようになった。というのも、関連する戦略と戦術が、関与する国の人々の真の利益を増すことにつながるデータを年毎に確認できるためである。

著者は、循環農法を「なずなの会」のオーナーである赤峰勝人氏（大分県佐伯市）、自然農法を、そのパイオニアである林幸美氏（ブラジル）、城雄二氏（広島大学在職から請われて静岡県茶畑耕作不能地に移住）から学んだ。たまたま、島根県飯南町一帯に根づいた無農薬農園と広域日本海側の自然に回帰する山里・棚田地域を、地元の有力議員である石原敏郎氏の案内で訪問したのが、契機である。著者は、なずなの会の広島代表森山照子氏と身近かな向田昭則氏からも、循環農法の本質についての実際を学び、戦術の在り方を習得した。自然

の作物を育てて成年になった年代は、自らの舌が一生そのやさしい味を決して忘れないという事実が幸いした。そのような自然の力に心底から感謝している。

また、中川裕二大学講師・圭子夫妻と長男は、デザインのグリーン化にかけた建築設計技師であり、長女は、ソプラニスト、原爆ピアノを愛するボランティアである。中川家族全員は「後世に平和の尊厳を伝える語り部」としての元幼稚園園長（原爆被害者）の宇根利枝氏を、94歳の他界後まで、日・夜、心から支え続けた。スチーブ原爆資料館長に協力し、平和に向けての音楽ボランティア活動に徹し、縁のあるドイツを中心に、心やさしい中庸の国際交流を実行・実践してきた。著者は、そのような語り部をできるようにと思っている。

## 7. サミュエルソン、佐藤、ソローとの素晴らしいご縁

日本にはこんな金言がある。「実現しなければ、誰もわからない」。我々は、生涯を通じて、毎年ベストを尽くす。そして、ある日、ある事柄が別の事柄と結び付く。

サミュエルソンが存命中、サミュエルソン委員会は、何年も電子メールを送ってきて、ペーパー提出を求め、著者を支えてくれた。1973年から1974年にかけて、ピーター・ダイヤモンドが1年間ロンドン大学に滞在した際、著者と家族は、ピーターの自宅に滞在するという幸運に恵まれた。著者と妻、そして二人の幼い娘は、1973年から1974年にかけて、ケンブリッジのオールストンにあるピーターの自宅で生活した。二人の娘はチャールズ川に面するモース・スクールに通った。私たち家族は、1973年秋、サミュエルソン夫妻をピーター宅に招き、手作りの和食を楽しんだ。著者は、ピーター宅のリビングで3枚の伝統的日本画を描いた。ピーター宅のリビングには、長くて高い壁があり、天井まで書棚として使えるよう設計されていた。著者は40年前の場面を今日でもはっきり覚えている。著者の家族が和食を準備するのを待つ間、サミュエルソンはじっくりと本を見つめ、何冊かを手にして頁をめくりつつ、彼の妻と私に話しかけていた光景だ。ピーター・ダイヤモンドが2010年にノーベル賞を受賞した際、サミュエルソンの言葉にある「ピーターこそ一世紀に誕生する唯一の天才」の真のすがたを得心した。

内生システムは、2012年1月にとにかく（完全ではないが）完成した。遅すぎるように思えるが、少なくとも過去数年間にわたって、サミュエルソンから得た刺激、洞察を毎朝感じていた。サミュエルソンの存命中に、KEWT（Kamiryo Endogenous World Table）データベースが完成していたならば、サミュエルソンが自身の幾多の発見を証明するための提案をしてくれたに違いない。

とりわけ、資本係数の不変性は、KEWTが一切の前提を持たないことの基礎をなす。サミュエルソンが唱える不変性は、KEWTを根拠づけるものである。この不変性（という概



念)は、リー理論に依拠した佐藤隆三(1981)により最終的に完成した。佐藤によるリー理論は、KEWTにより証明され、注釈の頁で別に要約を行っており、序文の前の注記の箇所に掲載している。読者は、この注記にこだわらずに、一切の前提なしで全16章を通読できる。しかしながら、最も重要なのは、当モノグラフに含まれるサミュエルソンと佐藤の注釈である。というのも、佐藤のリー理論がなければ、KEWTの普遍的証明は不可能だからである。

「ご縁」はまだ続く。1990年代初頭にソロー・モデルを出発点に、KEWTの形成を夢想した当時、ソローによる外生的技術進歩率を「純粹に内生」という方向に置き換える高揚感もあった。ソロー(1956)のモデルがなければ、どうしても、内生システムは誕生しなかった。当時、著者は、ソローの経験的結果に若干の疑義を感じ、ソローの論文と著書を読むことに専念していた。疑義を解く鍵は、資本の相対的分配率と収益率にあった。これら2つの比率は、既存研究では測定不能であり、資本・産出比率の別の一面を突くものである。新古典派経済学においては、市場原理のもと、収益率に代わる指標として利子率を用いるのが普通である。

著者は、疑問を感じたため、株式資本とその収益率を測定することに注力した。ジョルゲンソン(1963)の見方は、画期的であったが、一方向的に資本のフローしか見ていなかった。我々に必要なのは、フロー(投資)とストック(有価)の間に隠された一貫性である。すなわち、資本、生産性、そしてなによりも技術進歩に使えるモデルである。ソロー教授から著者への手紙(1998年5月9日付)をご覧いただきたい。この手紙は、著者の質問へのこれ以上ない返答であった。また、資本・産出比率を使用する上で、著者はどれだけ励まされたことか。サミュエルソンとソローは、スローン経営大学院の旧研究棟の4階で隣同士であった。著者はお二方の共著論文を繰り返し読んでいます。

本モノグラフは、関連する章で、その共著論文に内生システムに基づいた答えを出している。KEWTは、IMFの統計を基にしている。実際データは常に内生データの一定の範囲に含まれている。既存研究と内生システム論は、融合の賜物である(以下の11節を参照)。経済学における自己分散(auto variance)(1977)の結果は、適切な範囲内での均衡に基づく内生システムの研究に取り組むことにつながる。

## 8. EU諸国に関するクルーグマンの懸念に答えるために

著者は、2012年6月11日付、7月1日付のニューヨークタイムズ紙に掲載されたクルーグマンの論説を読んだ。クルーグマンはこう述べている。政府の資金・税金は、金融機関救済に使われ、失業率改善には使われていない、と。また、スペインのバブル経済は、EUの主要銀行により資金供給されているが、この事実は発表されていない。この2つは、実際には

両方とも真である。著者は、実際のデータが内生的データに近づくようになれば、各国で完全雇用が常に保証されると主張するものである。近づかない理由は、普遍的理論が存在しないこともあって、実物資産（有価証券、資本）の真の姿が消えてしまっているからである。

新たな発見事象は以下の通りである。1) マクロにおける一人当たり給与の不均衡拡大阻止は、成長率の大小とは無関係である。資本やレターン（利潤）の相対的分配率の水準そのものは、産出成長率および一人当たり産出高の水準とは無関係であるためである。2) 人口変化率は、成長水準とは負の相関にある。3) 最大のレターン（利潤）は、最小の純投資とともに得られる。レターンと純投資の関係を示す双曲線式から決められ、測定される。著者は、糸口を見つけたのである。

その糸口とは、サミュエルソン（1942）による科学的発見であり、財政赤字が継続的にゼロのときに、一人当たり産出高の成長率が最も高い状態が何年も続くということである。著者は、1990年から2010年までの75カ国のデータを使い、サミュエルソンの理論（1937, 1940, 1942, 1975）を経験的に証明した。さらに、この論証は、クルーグマンが提起したEU地域への上記疑問に明確な解答を与えるものである。すなわち、実物資産に関して、政府消費の削減額が、政府による純投資額を越えてはるかに大きい場合ほど、各国の一人当たり成長率は持続的水準を回復するのである。

## 9. システムとモデルの本質：経済学と計量経済学へのメッセージ

いかなるシステムも垂直的ではなく、経済または社会において全体的であるべきである、ということがシステムの本質である。言い換えると、市場原理が垂直に保たれる場合、市場原理は完全には機能しない。同様に、経済モデルにより経済システムの再構築に着手する場合、モデルとシステムの両方が全体として確立されるようにするべきである。研究者による現在の再構築に向けた方向性には、著者も励まされる思いであるが、部分的かつ垂直的な状態が続いている。我々は、学術研究者が着実に間口を拡げて、学際研究の前面に出ることを期待している。最後に示すたとえば、内生システムでなければならない。

著者は、経済学および計量経済学が進展し、文献上の結論が内生システムの結論と同一となる、という主張を残しておかなければならない。その本質は同じであるが、既存の研究と内生システム論の間には明確な違いがある。既存研究は、あらゆる均衡を定式化できるものではなく、前提を置くことによって、一部を置き換えているのである。したがって、トポロジーは、説明に過ぎない。微分、弾力性、成長会計、確率、相関分析がいつまでも続く。内生システムは、7つの内生的変数からスタートする。内生システムは、望む限りの内生均衡を定式化し、一切の前提を置かず、継続的な方法論も必要としない。トポロジーは、様相ご

との双曲線グラフに置きかえられる。既存研究と内生システム論の明確な違いとは、要するに、何年にもわたり正確に測定が可能か否かという点にある。

このトポロジーの考え方は、*Economic Journal* 第37号47-61頁に掲載の A. C. ラムゼイ (1927) の「租税理論によせて」で初めて紹介されたものである。研究者の知恵は年々着実に蓄積され、学問として結実しつつある。先人が積み重ねた業績に刺激を受け、過去の文献を再検討することが重要であることを知った。我々は、今の時代に生きていることを幸せに感じている。

本モノグラフのこの部分に記録しておかなければならない幸運な出会いがある。点が線、そして、面から多面体に、縁により繋がっていく過程を示す幸運な事実として、記録しておきたい。まず、2人のコンピュータ・ソフトウェア専門家との出会いである。

1方目は大阪教育大学附属高校の友田勝久氏である。友田氏は、有志とともに、ライフワークとして数学教育用グラフ描画ソフトを教育現場への利用可能性を求めて開発してきた。友田氏は、開発済の双曲線描画一般ソフトウェアを、著者からの、国および政府・民間部門ごとの研究に適用できるように再設計のデザイン提案を応諾し、特別仕様を開発して、その使用を末永く許諾してくれた。

もう1方は、学生時代に数学を専攻した永井英次氏である。永井氏は金沢市の澁谷工業で部長と子会社の役員を務めている。永井氏は、会社の情報システム部門に長く籍を置いてきたので、理論と工学実践とを融合した貴重な経験者である。永井氏は、著者からの依頼を受け入れ、澁谷社長の許可を得てくれた。ヒックス (1950) による文献初出の  $\sin$  式に内生数値を入れて、グラフ描画できるようなソフトウェアの開発を、短い工数でなんなくやってのけた。その描画特別仕様ソフトウェアは、マクロ経済において、難問中の難問である「景気循環分析」を一般化できた。

そして何よりも、数学に独学の気ままな著者は、縁の深い幸運に恵まれて今日に至っている。澁谷社長の同期生である古田孝臣名誉教授・理学博士は、1974年以来、著者の素朴な質問には、その都度、質疑とともに、わかりやすく解説してくれた。数学は部分でも真であること、また、数学に実践的証明の不要であることを、妥協を許さない数学界の第一人者を通して、骨身にしみて理解できたのである。「生粋の数学者はコンサルタントにはなれない」という名言も、忘れることができない。

## 10. 本モノグラフへの初掲論文について

チャンスは限られた時にしかやって来ない。著者の研究の初掲誌について明確にしておく必要がある。初掲誌については、各章の参考文献とは別に、個別参考文献の箇所を参照され

たい。著者が自身のホームページ上の履歴書で説明している通り、本モノグラフは、一定の視点からの分析から始まっている。第1章から第10章までの、それぞれの視点は、1990年から2000年に公表した原稿や論文から選んだものである。そして、第11章から第16章において、それぞれの視点を統合している。

著者の考えは、自分で「原稿または論文に基づく」と呼ぶ、多くの実験に由来している。各章の要点を述べるのに必要なのは、過去の論文と比較すると、ページ数にして3分の1か4分の1である。読みづらい文章を削り、頭の中の考えを短く正確に表現するよう努めた。

著者の英語力は、ネイティブとは当然比較にならない。日本語の言語地理学的位置づけは、最後の第4分類であり、動詞が後に来て、主語がない場合もままある。著者は、欧米の読者の理解が進むように、日本語独特のスタイルから抜け出そうとした。著者は英語力向上の必要性を日々感じて、毎日3-5分は、その日の研究を要約して、声を出して独り会話するという。

## 11. 経済成長予測に関する特許について

著者は、2010年1月22日付で、「経済成長の予測プログラミング」で特許(#4441748)を取得した(2002年3月29日付の日本、米国、中国への申請#2002-094100に基づくものである)。著者は、広島三原特許事務所の三原靖雄所長の10年間にわたる無償の努力にも非常に感謝している。著者は、この特許が国際機関に認められ、平和の時代の役に立つことを切に願っている。モノグラフはお返しである。著者は、青い鳥がみなさんの家庭に飛来することを心から祈っている。

この特許は、7つの内生的変数のうち、人口増減率・アルファ・ベータしか使用しないことに注意を要するが、その他の変数ともある程度まで整合性がある。著者は、三原特許事務所のスタッフである、急逝の野間空氏と今も親交を続けている小倉仁亮氏から頂いたアドバイスに大いに感謝している。野間空氏は、あと1つと言っている。その1つとは、デルタ( $\delta_0$ )であるが、その最終解は、データベースの年毎の更新・改善を通してついに確定した。完全雇用の確認作業と軌を一にしている。

著者は、いま悩んでいる。いつKEWTデータベースの全容を、IMFが快諾して受け入れ、世界平和と庶民のために、生かしてくださるかという時期がわからないためである。また、KEWTデータベースの全容の核心に位置するデルタ( $\delta_0$ )を特許として残すべきかである。

## 12. 謝 辞

著者がこのモノグラフを執筆できたのは、大学図書館、学术交流センター、情報センターのヘルプデスクのスタッフの方々の支援を受けたからである。なかでも、増田直也氏と北川豊氏である。時政昂、藤本利躬の両教授は、著者の唐突な質問にまで、今日まで親切に対応してくださっている。

本モノグラフに収録の論稿の大部分は、2000年前後からの『経済科学研究』および『修道商学』に掲載のペーパーに少しずつ蓄積・改善されてきた思考と方法に基づいている。印刷・校正段階に迷惑をかけてきた増田達夫氏と岡本元次氏に深く感謝している。

同時に、今日の私があるのは、金沢にある澁谷工業の澁谷亮治会長と澁谷弘利社長のおかげである。澁谷兄弟からは、著者が名古屋中小企業投資育成株式会社に勤めた1963年以来、励ましの言葉をいただき続けている。また、渡辺英勝社長、開甲子久、河村孝志の各氏からの多くの局面に対応した長いご厚情もここに記しておかねばならない。

また、広島には東洋高圧という **only one** の会社があり、著者は毎月、最先端の技術について教えていただいている。同社の野口賢二郎会長、野口啄史社長と著者は広島での友人である。また、大先輩の林春樹氏、加藤省吾氏と池田達也氏、そして修経会代々の代表のみなさんが著者の面倒をみてくださっている。

著者は、2012年9月12日に M. ピーター・ファン・デル・ホエック氏より以下の電子メールを受け取った。論文の転載申請への返事である。

親愛なるヒデへ：貴殿が私に連絡してきたのは、貴殿が **FEI** 誌に発表した論文を出版予定のモノグラフの一部として収録することへの許可を求めるからだと理解しています。もしそうであるならば、*FEI (Forum for Economists International, Amsterdam)* の出版物の著作権保護は著者を保護するためのものであります。各著者は、自分の文章を自分の思い通りにする自由があります。したがって、*FEI* の出版物を出版予定のモノグラフに入れようが（コピーしようが、貴殿にその意志があれば）、それは自由です。お役に立てば幸いです。ピーター

統計数字、論文の使用許可への謝辞は各章で述べている。著者は、各研究者、学術団体、学術誌および出版社に感謝申し上げる。以下のリスト（略）は、内容、出版社、転載許可を

Hideyuki Kamiryo

得た日付である。著者は、一人一人お名前を挙げるのは控えるが、関連の方々から頂いた寛大な電子メールに深く感謝している。謝辞は各章を参照されたい。

(澁谷工業株式会社；遠藤温翻訳・上領英之による監修と追加補正) on 15 May 2013