

«Note»

Equations Connecting the Break-Even Point (BEP) with Net Sales and Returns/Profits: Commonly to Macro and Micro

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Intention of this Note

This Note supplements an integrated structure of the BEP and returns or profits and, includes four basic tables and 86 figures by country and sector (Total economy = Government + PRIVATE). Evidences are clarified by these figures, commonly to the macro and micro levels. Ultimately, economic serious problems for profits and wages are solved by simultaneously introducing the integrated structure of the Break-Even Point (BEP) into the micro and macro levels.

This Note will be discussed as a supplement at *International Atlantic Economic Conference*, Savannah, on 15 Oct 2014. **Abstract** of full paper was earlier presented to this Society as follows:

Macro net sales are the sum of national disposable net income ($Y=NDI$) and external expenses by country. Micro net sales are the sum of value-added (VA) and external expenses or non-value added (non- VA) by enterprise in a country. This paper connects macro net sales with micro net sales, endogenously based on macro NDI and commonly to macro and micro. The break-even point (BEP) by enterprise is integrated with a national system of accounts (1993, 2010; SNA). Systematically and commonly, a new BEP equation is composed of three endogenous specified parameters: life-time number of employees \div number of total employees; the level of BEP; and external non-value added \div net sales. The BEP equation is formulated so as to avoid textbook's identity of $BEP=1.0000$ in corporate accounting, where profits=0, and leads to an integrated structure of the BEP and returns or profits. Key determinants of the level of BEP to

net sales are wages and external expenses. As a result, countries and enterprises each control the level of BEP, by adjusting pertinent policies for wages and external expenses, ever consistently with the SNA, where statistics data are always within a certain range of endogenous data and, consistent relationship prevails among macro and micro economies.

In short, well-known BEP concept created by Kneoppel, C. E. (1933, 1937) for corporate accounting is now reinforced and connected with a macro BEP in the macro level. As a result, external expenses recover meaningfulness, being freed from a historical fact that value added and national disposable net income ($Y=NDI$) each stress its own concept and neglect the existence of external expenses; in enterprise's accounts and in aggregated accounts of the SNA (1993, 2010).

For empirical verification or evidences, this Note and manuscript presented to IAE Conference, Savannah, use the KEWT series database 7.13, 1990–2011, instead of 8.14, 1990–2012. Note 9.15 will up-date data-set 1990–2013. Why do the author use database 7.13? Answer is important in that the method in the *EES* (i.e., “*Earth Endogenous System*” published on 15 May 2013) has two alternatives. One is that the KEWT data-set uses the rate of unemployment as the last means for the endogenous-equilibrium. The other is that the KEWT data-set uses a condition of full-employment in reality and under the endogenous-equilibrium.

The author has accumulated various experiments since the KEWT series have been published in 2007 for the first time. The author finally solved a numerical problem lying between the speed years for convergence, $1/\lambda^*$, and the diminishing returns to capital (DRC) coefficient, δ_0 . The seven endogenous parameters include these two parameters and make it possible to endogenously measure thousands of parameters and variables in the KEWT database by country. As a result, the speed years for convergence is now expressed by positive values by country and by sector (government and private sectors, just before redistribution of taxes; against just after redistribution common to the economic literature).

The KEWT databases after 8.14 will use full-employment with no inflation/deflation by year and over years. Therefore, this Note leaves the last case of the rate of unemployment $\neq 0$, for records in the future. Actually, the Cobb-Douglas production function initially holds under $\delta_0=0$ and reaches $\delta_0=\alpha$ on the time-point of convergence.

Another paper simultaneously presented to *Journal of Economic Sciences* this time directly discusses “Towards win-win relationship between the rate of return and the wage rate,” and, of course, follows the above database policy. Further, the rate of return and the wage rate are discussed in the macro and micro BEP equations. We are able to deepen relations between returns/profits, wages, fixed and variable expenses including external expenses, where new fact-findings will be more discovered by researchers co-operating each other. We are thankful to human organic systems in this world, supported by the author’s hyperbola moderation or its negative and positive principle that wholly expresses philosophy, theory, and practice, in the two dimensions.

LIST of tables and figures

By area, country, and sector (total, government, and private sectors; $T=G+PRI$) for $68=17+14+15+19+3$ (three weighted average by area, excluding Rest/Other area).

This LIST follows a finalized method using the speed years for convergence as a base. This method develops devices to realize plus-value speed years commonly to any country and under returns MAX and net investment MIN. The current year of this LIST is uniquely 2011 in KEWT database 7.13. Corresponding figures were up-dated in KEWT database 9.15 and available for comparison in August 2014.

Table 1–1 The US: Simulation of the BEP from macro to micro

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Fig. 4–2 Break-even point of KEWT database by country: 19 Rest countries

Fig. 4–3 Break-even point of KEWT database by country: 19 Rest countries

Fig. 4–4 Break-even point of KEWT database by country: 19 Rest countries

Preface in the *EES* 2nd (publishing in June; after revising, May 28, 2014)

Supplement to the *EES* 2nd: towards the *HEU* 2015 (with related references)

Table 1–1 The US: Simulation of the BEP from macro to micro

22 MACRO BEP→MICRO BEP the US 2010				X=Y/0.9 from MACRO Y/X							BEP=f(1-ν) to MICRO		
Half-Life-Time employment				0.9 0.5 0.1									
t	Y	W	f=W/Y	X	Z=X-Y	E=W+Z	e/f	ν=Z/X	BEP=f(1-ν)	e=E/X	P ₍₀₎ =X-E	P _(0.20) =P-X	
0	12822	10153	0.7919	14246	1425	11577	0.9744	0.1000	0.8798	0.8127	2669	0.18733	
1	12950	10254	0.7919	14389	1439	11693	0.9744	0.1000	0.8798	0.8127	2695	0.18733	
2	13080	10357	0.7919	14533	1453	11810	0.9744	0.1000	0.8798	0.8127	2722	0.18733	
3	13211	10461	0.7919	14678	1468	11929	0.9744	0.1000	0.8798	0.8127	2750	0.18733	
4	13343	10565	0.7919	14825	1483	12048	0.9744	0.1000	0.8798	0.8127	2777	0.18733	
5	13476	10671	0.7919	14974	1497	12169	0.9744	0.1000	0.8798	0.8127	2805	0.18733	
6	13611	10778	0.7919	15123	1512	12290	0.9744	0.1000	0.8798	0.8127	2833	0.18733	
7	13747	10886	0.7919	15275	1527	12413	0.9744	0.1000	0.8798	0.8127	2861	0.18733	
8	13885	10995	0.7919	15427	1543	12537	0.9744	0.1000	0.8798	0.8127	2890	0.18733	
9	14024	11105	0.7919	15582	1558	12663	0.9744	0.1000	0.8798	0.8127	2919	0.18733	
10	14164	11216	0.7919	15738	1574	12789	0.9744	0.1000	0.8798	0.8127	2948	0.18733	
				X=Y/0.5									
				Y/X	0.5								
t	Y	W	f=W/Y	X	Z=X-Y	E=W+Z	e/f	ν=Z/X	BEP=f(1-ν)	e=E/X	P ₍₀₎ =X-E	P _(0.20) =P-X	
0	12822	10153	0.4500	25643	12822	22974	0.5023	0.5000	0.9000	0.8959	2669	0.10407	
1	12950	10254	0.4500	25900	12950	23204	0.5023	0.5000	0.9000	0.8959	2695	0.10407	
2	13080	10357	0.4500	26159	13080	23437	0.5023	0.5000	0.9000	0.8959	2722	0.10407	
3	13211	10461	0.4500	26421	13211	23671	0.5023	0.5000	0.9000	0.8959	2750	0.10407	
4	13343	10565	0.4500	26685	13343	23908	0.5023	0.5000	0.9000	0.8959	2777	0.10407	
5	13476	10671	0.4500	26952	13476	24147	0.5023	0.5000	0.9000	0.8959	2805	0.10407	
6	13611	10778	0.4500	27222	13611	24389	0.5023	0.5000	0.9000	0.8959	2833	0.10407	
7	13747	10886	0.4500	27494	13747	24633	0.5023	0.5000	0.9000	0.8959	2861	0.10407	
8	13885	10995	0.4500	27769	13885	24879	0.5023	0.5000	0.9000	0.8959	2890	0.10407	
9	14024	11105	0.4500	28047	14024	25128	0.5023	0.5000	0.9000	0.8959	2919	0.10407	
10	14164	11216	0.4500	28328	14164	25379	0.5023	0.5000	0.9000	0.8959	2948	0.10407	
				X=Y/0.1									
				Y/X	0.1								
t	Y	W	f=W/Y	X	Z=X-Y	E=W+Z	e/f	ν=Z/X	BEP=f(1-ν)	e=E/X	P ₍₀₎ =X-E	P _(0.20) =P-X	
0	12822	10153	0.0900	128216	115394	125547	0.0919	0.9000	0.9000	0.9792	2669	0.02081	
1	12950	10254	0.0900	129500	116550	126804	0.0919	0.9000	0.9000	0.9792	2695	0.02081	
2	13080	10357	0.0900	130796	117717	128074	0.0919	0.9000	0.9000	0.9792	2722	0.02081	
3	13211	10461	0.0900	132105	118895	129356	0.0919	0.9000	0.9000	0.9792	2750	0.02081	
4	13343	10565	0.0900	133427	120085	130650	0.0919	0.9000	0.9000	0.9792	2777	0.02081	
5	13476	10671	0.0900	134762	121286	131957	0.0919	0.9000	0.9000	0.9792	2805	0.02081	
6	13611	10778	0.0900	136110	122499	133277	0.0919	0.9000	0.9000	0.9792	2833	0.02081	
7	13747	10886	0.0900	137472	123725	134611	0.0919	0.9000	0.9000	0.9792	2861	0.02081	
8	13885	10995	0.0900	138847	124962	135957	0.0919	0.9000	0.9000	0.9792	2890	0.02081	
9	14024	11105	0.0900	140235	126212	137317	0.0919	0.9000	0.9000	0.9792	2919	0.02081	
10	14164	11216	0.0900	141638	127474	138690	0.0919	0.9000	0.9000	0.9792	2948	0.02081	

Table 1–2 The US: Simulation of the BEP from macro to micro

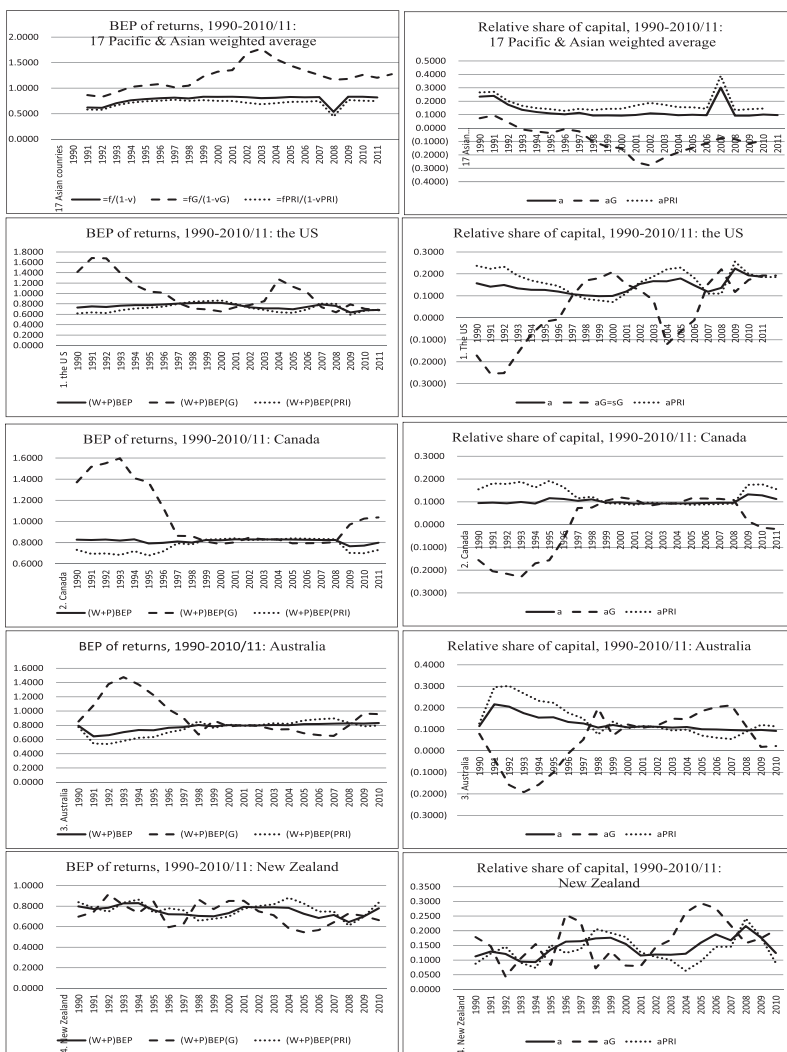
11 MACRO BEP→MICRO BEP				X=Y/0.9						BEP=f(1- ν)				to MICRO
the US 2010				from MACRO		Y/X								
Life-Time employment				0.9		0.5	0.1							
t	Y	W	f=W/Y	X	Z=X-Y	E=W+Z	e/f	$\nu=Z/X$	BEP=f(1- ν)	e=E/X	$P_{(0)}=X-E$	$P_{(0.30)}=P/X$		
0	12822	10153	0.7919	14246	1425	11577	0.9744	0.1000	0.8798	0.8127	2669	0.18733		
1	12950	10254	0.7919	14389	1439	11693	0.9744	0.1000	0.8798	0.8127	2695	0.18733		
2	13080	10357	0.7919	14533	1453	11810	0.9744	0.1000	0.8798	0.8127	2722	0.18733		
3	13211	10461	0.7919	14678	1468	11929	0.9744	0.1000	0.8798	0.8127	2750	0.18733		
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5	13476	10671	0.7919	14974	1497	12169	0.9744	0.1000	0.8798	0.8127	2805	0.18733		
6	13611	10778	0.7919	15123	1512	12290	0.9744	0.1000	0.8798	0.8127	2833	0.18733		
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10	14164	11216	0.7919	15738	1574	12789	0.9744	0.1000	0.8798	0.8127	2948	0.18733		
				X=Y/0.5										
				Y/X	0.5									
t	Y	W	f=W/Y	X	Z=X-Y	E=W+Z	e/f	$\nu=Z/X$	BEP=f(1- ν)	e=E/X	$P_{(0)}=X-E$	$P_{(0.30)}=P/X$		
0	12822	10153	0.7919	25643	12822	22974	0.8838	0.5000	1.5837	0.8959	2669	0.10407		
1	12950	10254	0.7919	25900	12950	23204	0.8838	0.5000	1.5837	0.8959	2695	0.10407		
2	13080	10357	0.7919	26159	13080	23437	0.8838	0.5000	1.5837	0.8959	2722	0.10407		
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Table 2–1 Japan: Simulation of the BEP from macro to micro

22 MACRO BEP→MICRO BEP				X=Y/0.9							BEP=f(1-ν)				
Japan 2010				from MACRO		Y/X									to MICRO
	Half-Life-Time employment			0.9		0.5	0.1								
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t	Y	W	f=W/Y	X	Z=X-Y	E=W+Z	e/f	ν=Z/X	BEP=f(1-ν)	e=E/X	P ₍₂₀₎ =X-E	P _(p,30) =P/X			
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				X=Y/0.1											
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t	Y	W	f=W/Y	X	Z=X-Y	E=W+Z	e/f	ν=Z/X	BEP=f(1-ν)	e=E/X	P ₍₂₀₎ =X-E	P _(p,30) =P/X			
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6	13611	10778	0.0900	136110	122499	133277	0.0919	0.9000	0.9000	0.9792	2833	0.02081			
7	13747	10886	0.0900	137472	123725	134611	0.0919	0.9000	0.9000	0.9792	2861	0.02081			
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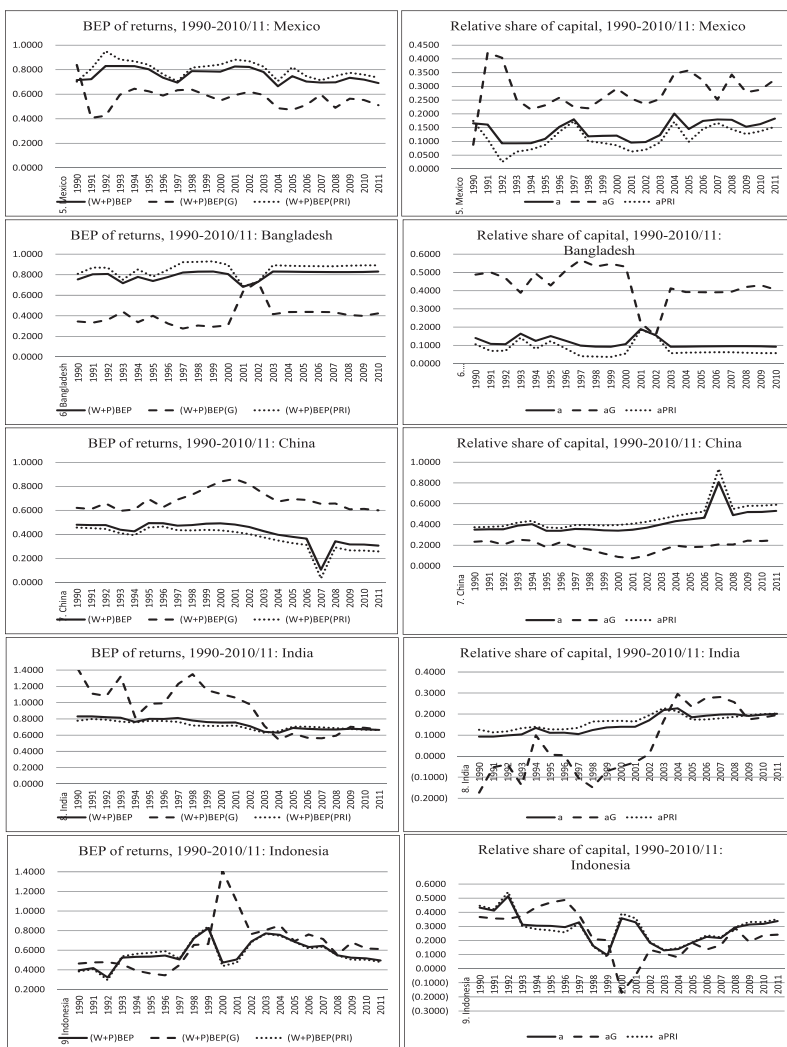
Table 2–2 Japan: Simulation of the BEP from macro to micro

11 MACRO BEP→MICRO BEP				X=Y/0.9						BEP=f(1-ν)			
Japan 2010				from MACRO		Y/X							to MICRO
Life-Time employment				0.9		0.5	0.1						
t	Y	W	f=W/Y	X	Z=X·Y	E=W+Z	e/f	ν=Z/X	BEP=f(1-ν)e=E/X	P ₍₀₎ =X-E	P _(0.20) =P/X		
0	414521	374658	0.9038	460579	46058	420716	0.9895	0.1000	1.0043	0.9134	39863	0.08655	
1	419994	379605	0.9038	466660	46666	426271	0.9895	0.1000	1.0043	0.9134	40390	0.08655	
2	425626	384695	0.9038	472918	47292	431987	0.9895	0.1000	1.0043	0.9134	40931	0.08655	
3	431422	389933	0.9038	479357	47936	437869	0.9895	0.1000	1.0043	0.9134	41489	0.08655	
4	437387	395325	0.9038	485985	48599	443923	0.9895	0.1000	1.0043	0.9134	42062	0.08655	
5	443527	400874	0.9038	492808	49281	450155	0.9895	0.1000	1.0043	0.9134	42653	0.08655	
6	449848	406587	0.9038	499831	49983	456570	0.9895	0.1000	1.0043	0.9134	43261	0.08655	
7	456356	412470	0.9038	507063	50706	463176	0.9895	0.1000	1.0043	0.9134	43886	0.08655	
8	463059	418528	0.9038	514510	51451	469979	0.9895	0.1000	1.0043	0.9134	44531	0.08655	
9	469962	424767	0.9038	522180	52218	476985	0.9895	0.1000	1.0043	0.9134	45195	0.08655	
10	477073	431194	0.9038	530081	53008	484202	0.9895	0.1000	1.0043	0.9134	45879	0.08655	
				X=Y/0.5									
				Y/X		0.5							
t	Y	W	f=W/Y	X	Z=X·Y	E=W+Z	e/f	ν=Z/X	BEP=f(1-ν)e=E/X	P ₍₀₎ =X-E	P _(0.20) =P/X		
0	414521	374658	0.9038	829042	414521	789179	0.9495	0.5000	1.8077	0.9519	39863	0.04808	
1	419994	379605	0.9038	839989	419994	799599	0.9495	0.5000	1.8077	0.9519	40390	0.04808	
2	425626	384695	0.9038	851252	425626	810321	0.9495	0.5000	1.8077	0.9519	40931	0.04808	
3	431422	389933	0.9038	862843	431422	821355	0.9495	0.5000	1.8077	0.9519	41489	0.04808	
4	437387	395325	0.9038	874773	437387	832711	0.9495	0.5000	1.8077	0.9519	42062	0.04808	
5	443527	400874	0.9038	887054	443527	844401	0.9495	0.5000	1.8077	0.9519	42653	0.04808	
6	449848	406587	0.9038	899696	449848	856435	0.9495	0.5000	1.8077	0.9519	43261	0.04808	
7	456356	412470	0.9038	912713	456356	868826	0.9495	0.5000	1.8077	0.9519	43886	0.04808	
8	463059	418528	0.9038	926117	463059	881586	0.9495	0.5000	1.8077	0.9519	44531	0.04808	
9	469962	424767	0.9038	939924	469962	894729	0.9495	0.5000	1.8077	0.9519	45195	0.04808	
10	477073	431194	0.9038	954145	477073	908267	0.9495	0.5000	1.8077	0.9519	45879	0.04808	
				X=Y/0.1									
				Y/X		0.1							
t	Y	W	f=W/Y	X	Z=X·Y	E=W+Z	e/f	ν=Z/X	BEP=f(1-ν)e=E/X	P ₍₀₎ =X-E	P _(0.20) =P/X		
0	414521	374658	0.9038	4145210	3730689	4105346	0.9126	0.9000	9.0383	0.9904	39863	0.00962	
1	419994	379605	0.9038	4199943	3779948	4159553	0.9126	0.9000	9.0383	0.9904	40390	0.00962	
2	425626	384695	0.9038	4256261	3830635	4215330	0.9126	0.9000	9.0383	0.9904	40931	0.00962	
3	431422	389933	0.9038	4314211	3882796	4272729	0.9126	0.9000	9.0383	0.9904	41489	0.00962	
4	437387	395325	0.9038	4373867	3936481	4331805	0.9126	0.9000	9.0383	0.9904	42062	0.00962	
5	443527	400874	0.9038	4435268	3991741	4392615	0.9126	0.9000	9.0383	0.9904	42653	0.00962	
6	449848	406587	0.9038	4498479	4048631	4455219	0.9126	0.9000	9.0383	0.9904	43261	0.00962	
7	456356	412470	0.9038	4563564	4107207	4519677	0.9126	0.9000	9.0383	0.9904	43886	0.00962	
8	463059	418528	0.9038	4630587	4167528	4586056	0.9126	0.9000	9.0383	0.9904	44531	0.00962	
9	469962	424767	0.9038	4699618	4229656	4654423	0.9126	0.9000	9.0383	0.9904	45195	0.00962	
10	477073	431194	0.9038	4770727	4293654	4724848	0.9126	0.9000	9.0383	0.9904	45879	0.00962	



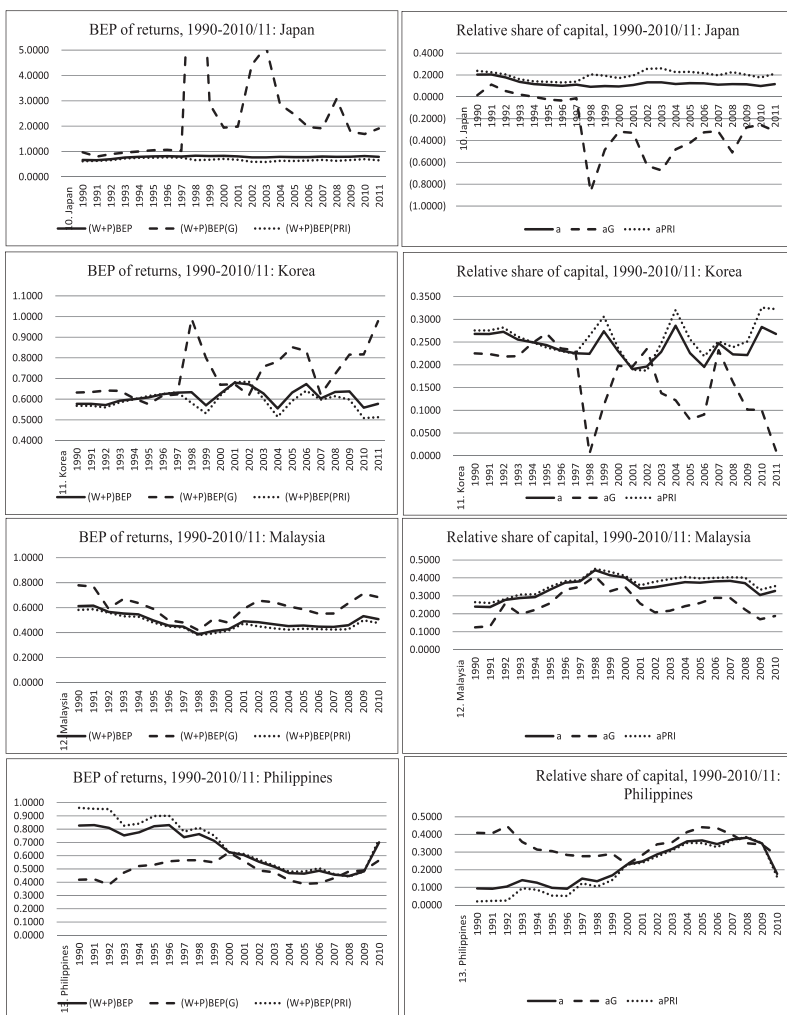
Data sources: KEWT 6.12/7.13, 1990–2010/11, whose original data taken from International Financial Statistics Yearbook, IMF.

Fig. 1–1 Break-even point of KEWT database by country: 17 Asian countries



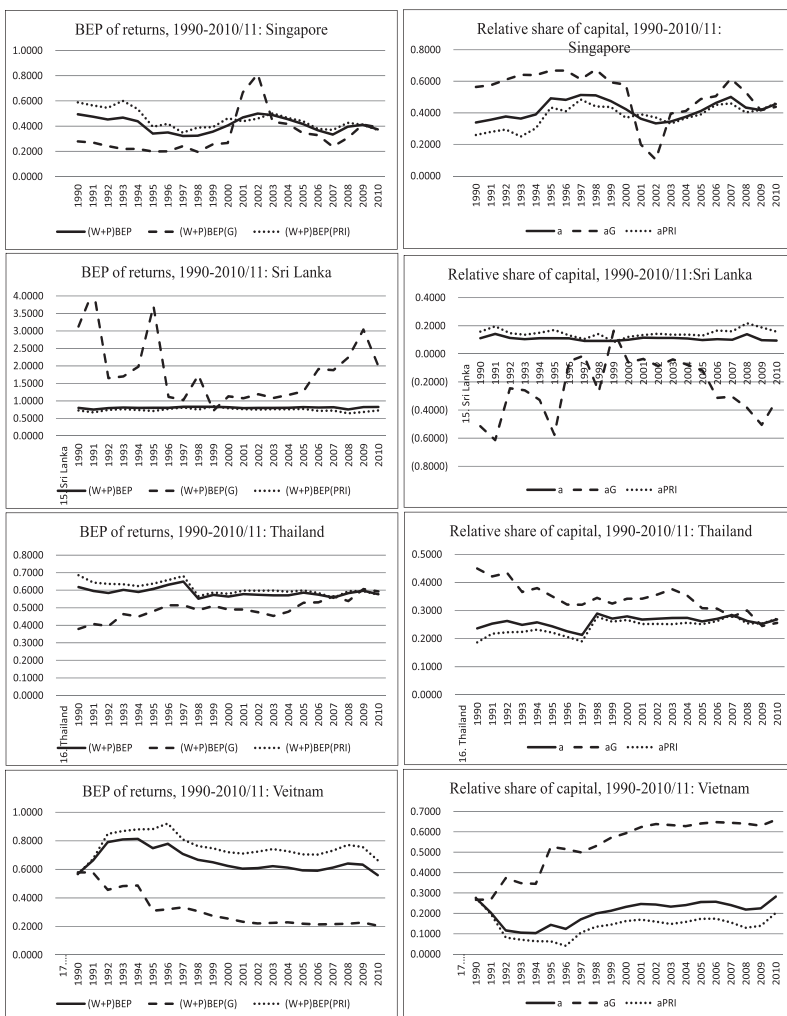
Data sources: KEWT 6.12/7.13, 1990–2010/11, whose original data taken from International Financial Statistics Yearbook, IMF.

Fig. 1–2 Break-even point of KEWT database by country: 17 Asian countries



Data sources: KEWT 6.12/7.13, 1990–2010/11, whose original data taken from International Financial Statistics Yearbook, IMF.

Fig. 1–3 Break-even point of KEWT database by country: 17 Asian countries



Data sources: KEWT 6.12/7.13, 1990–2010/11, whose original data taken from International Financial Statistics Yearbook, IMF.

Fig. 1–4 Break-even point of KEWT database by country: 17 Asian countries



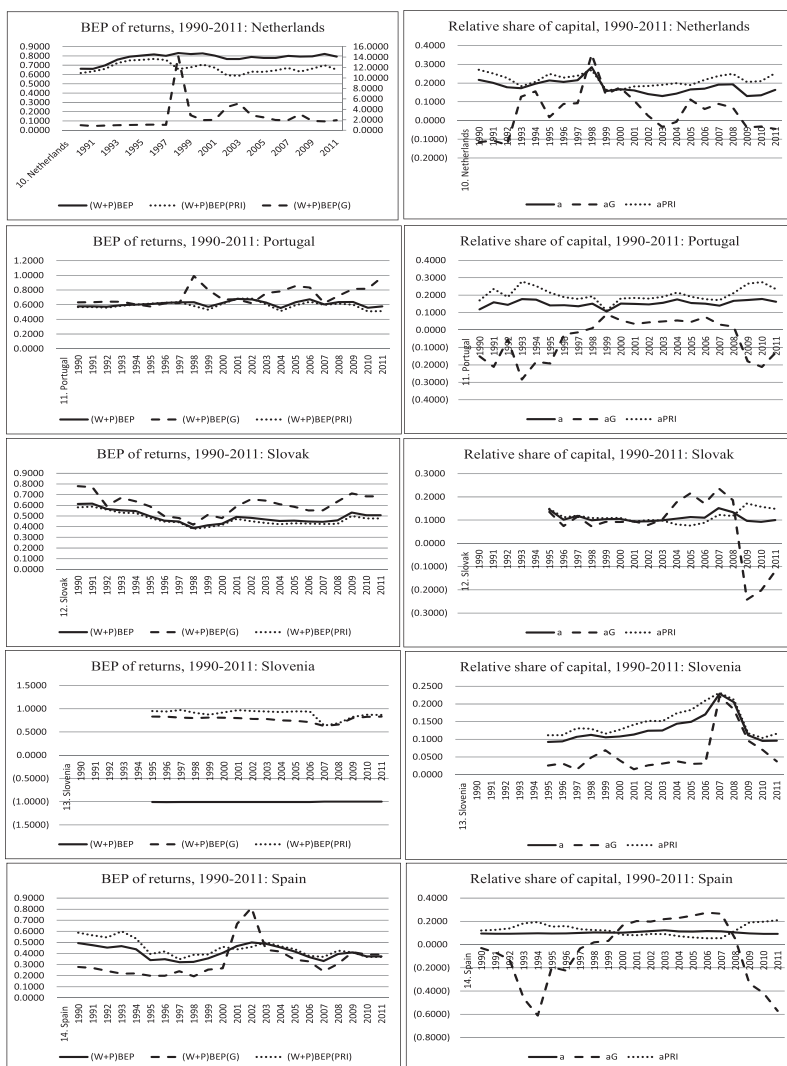
Data sources: KEWT 6.12/7.13, 1990–2010/11, whose original data taken from International Financial Statistics Yearbook, IMF.

Fig. 2-1 Break-even point of KEWT database by country: 14 Euro countries



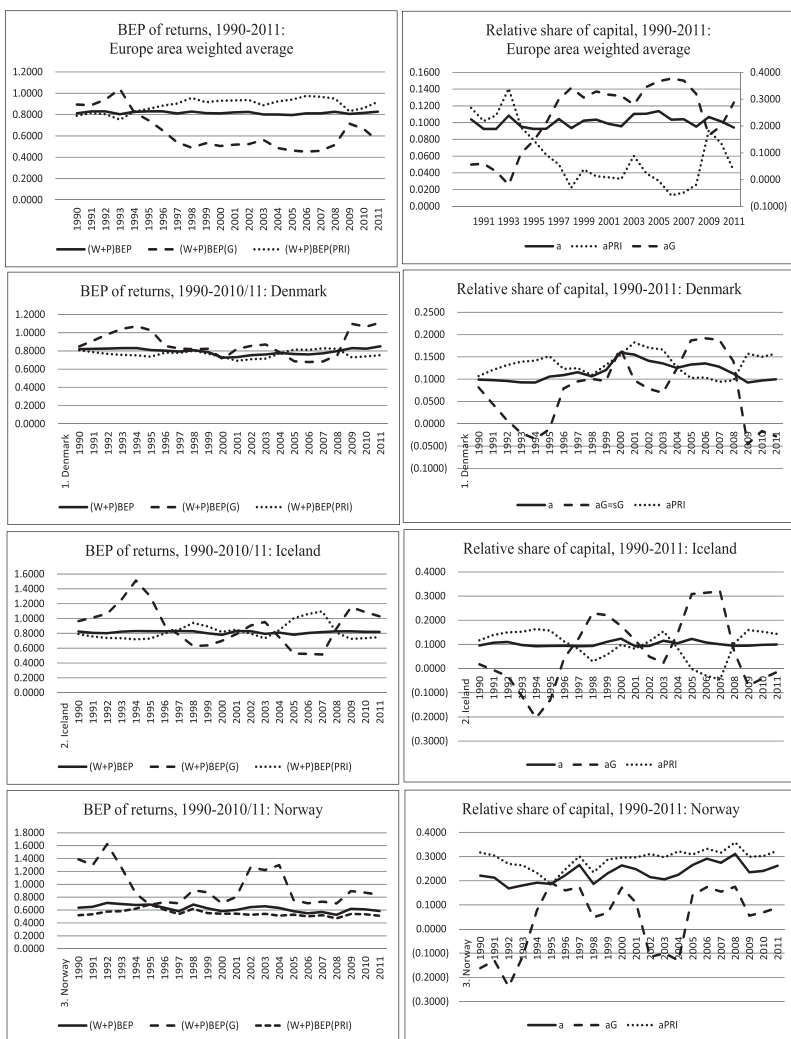
Data sources: KEWT 6.12/7.13, 1990–2010/11, whose original data taken from International Financial Statistics Yearbook, IMF.

Fig. 2–2 Break-even point of KEWT database by country: 14 Euro countries



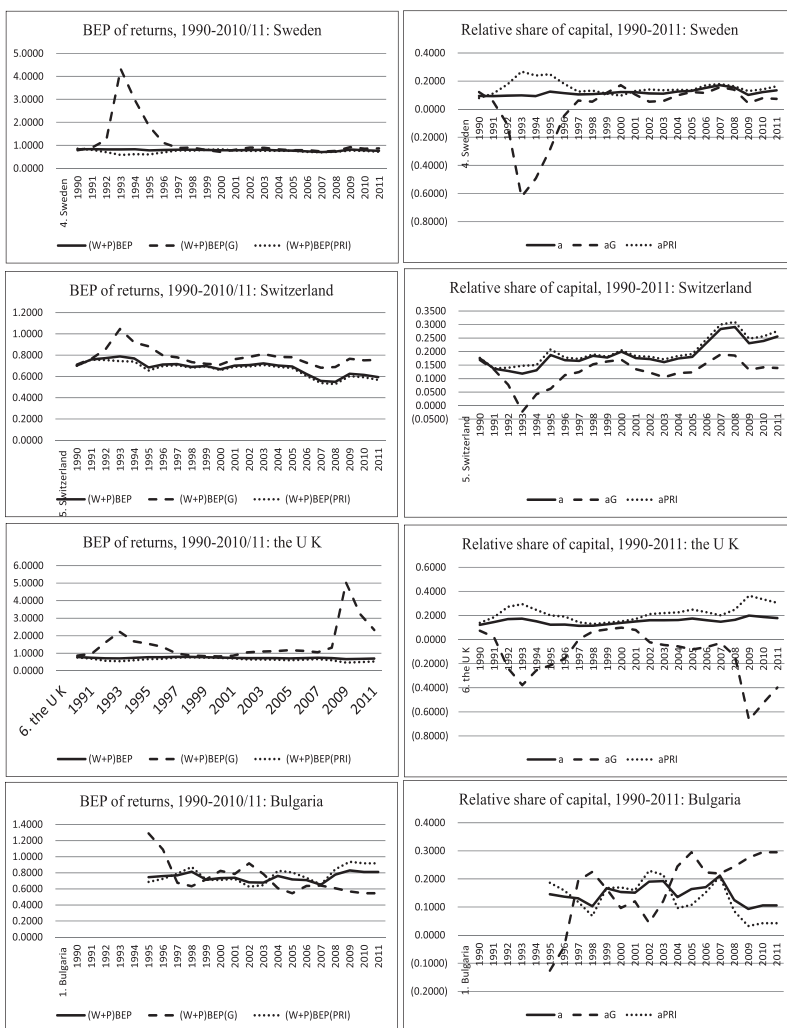
Data sources: KEWT 6.12/7.13, 1990–2010/11, whose original data taken from International Financial Statistics Yearbook, IMF.

Fig. 2–3 Break-even point of KEWT database by country: 14 Euro countries



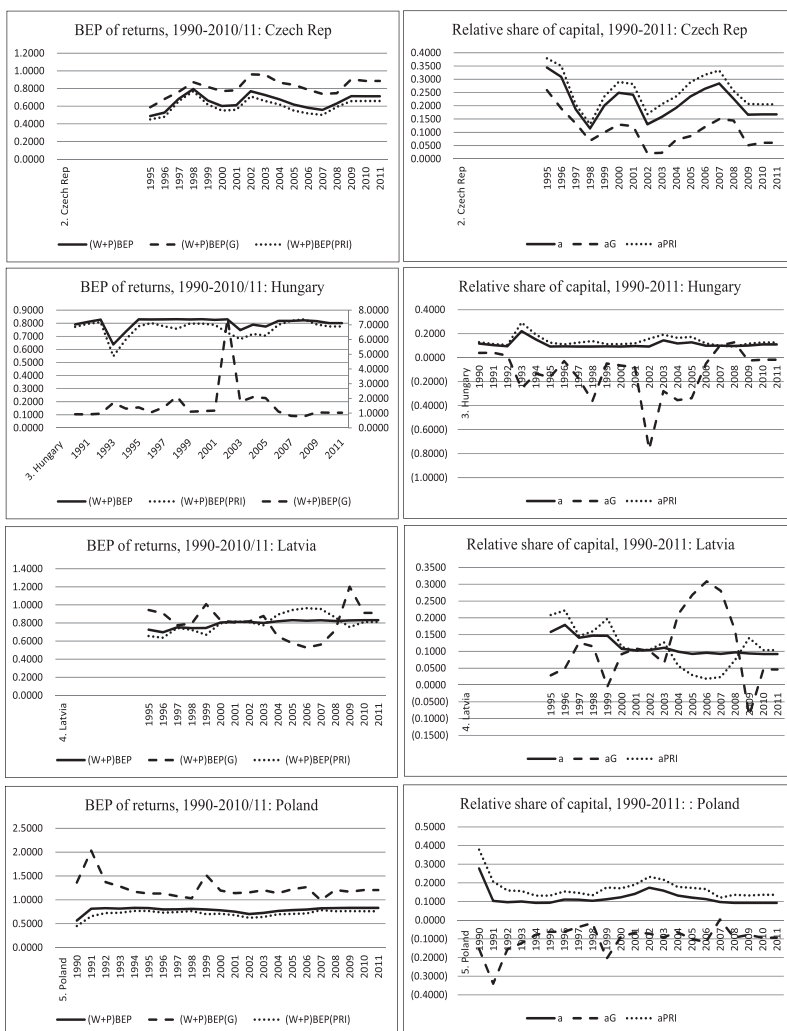
Data sources: KEWT 6.12/7.13, 1990–2010/11, whose original data taken from International Financial Statistics Yearbook, IMF.

Fig. 3–1 Break-even point of KEWT database by country: 15 European countries



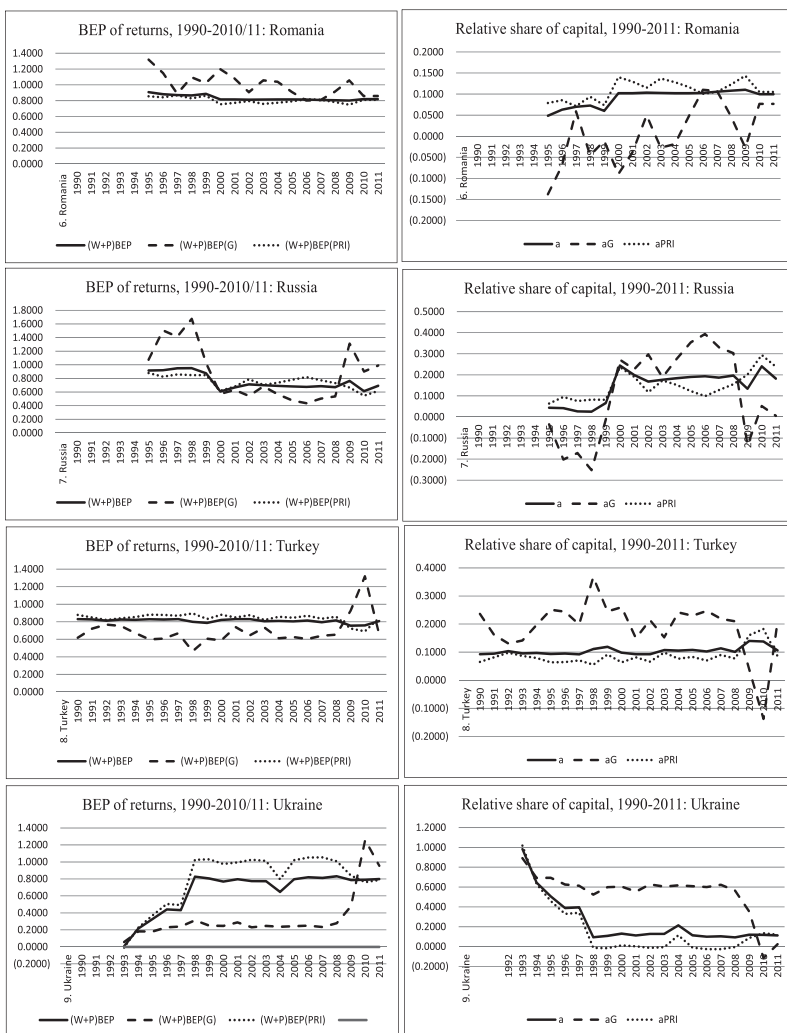
Data sources: KEWT 6.12/7.13, 1990–2010/11, whose original data taken from International Financial Statistics Yearbook, IMF.

Fig. 3–2 Break-even point of KEWT database by country: 15 European countries



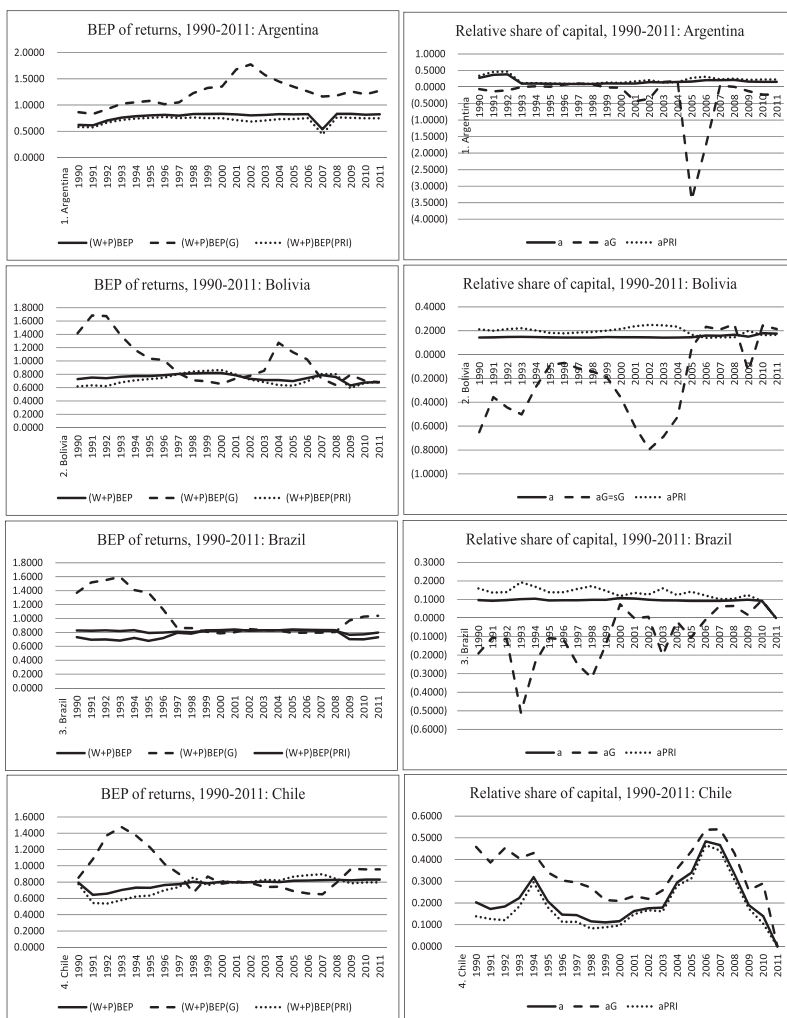
Data sources: KEWT 6.12/7.13, 1990–2010/11, whose original data taken from International Financial Statistics Yearbook, IMF.

Fig. 3–3 Break-even point of KEWT database by country: 15 European countries



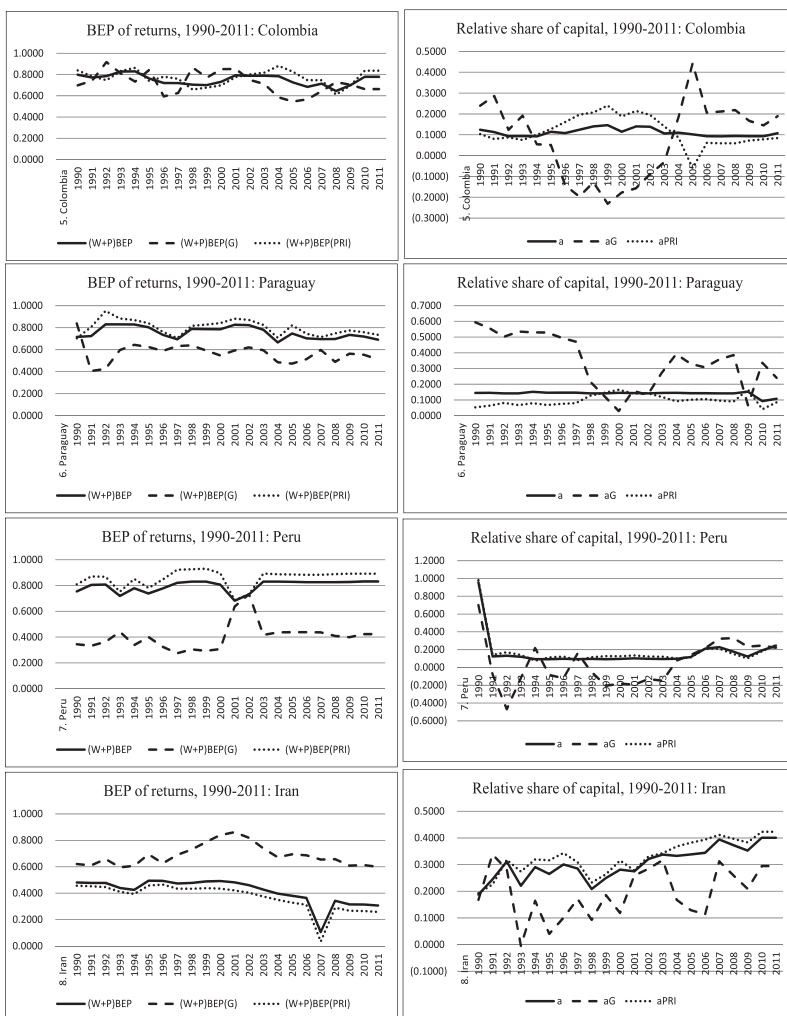
Data sources: KEWT 6.12/7.13, 1990–2010/11, whose original data taken from International Financial Statistics Yearbook, IMF.

Fig. 3-4 Break-even point of KEWT database by country: 15 European countries



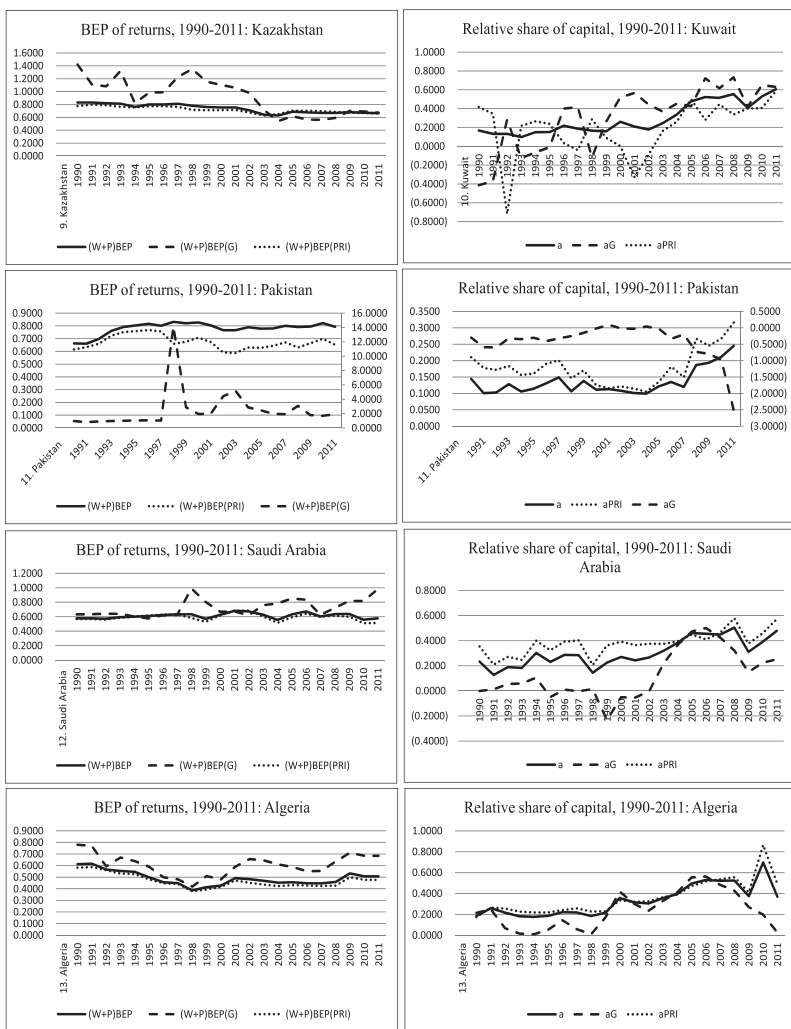
Data sources: KEWT 6.12/7.13, 1990–2010/11, whose original data taken from International Financial Statistics Yearbook, IMF.

Fig. 4–1 Break-even point of KEWT database by country: Other countries



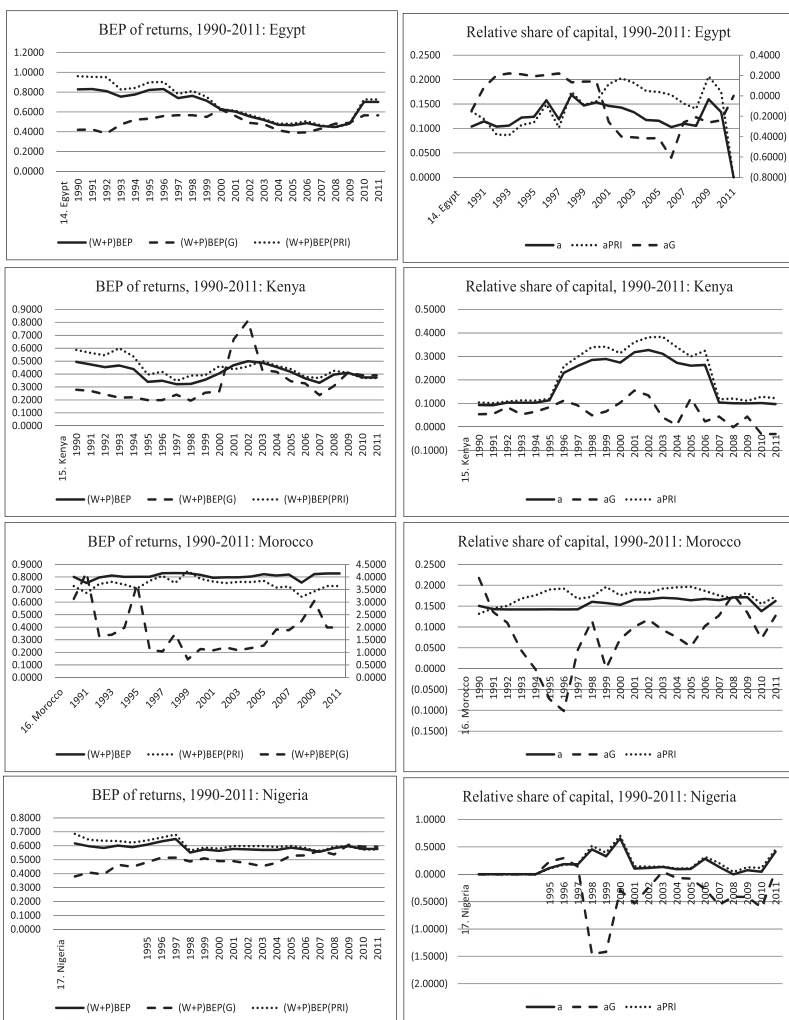
Data sources: KEWT 6.12/7.13, 1990–2010/11, whose original data taken from International Financial Statistics Yearbook, IMF.

Fig. 4-2 Break-even point of KEWT database by country: Other countries



Data sources: KEWT 6.12/7.13, 1990–2010/11, whose original data taken from International Financial Statistics Yearbook, IMF.

Fig. 4-3 Break-even point of KEWT database by country: Other countries



Data sources: KEWT 6.12/7.13, 1990–2010/11, whose original data taken from International Financial Statistics Yearbook, IMF.

Fig. 4-4 Break-even point of KEWT database by country: Other countries

Preface in the *EES* 2nd (publishing in June; after revising, May 28, 2014)

1. Why 2nd edition so soon after the 1st edition?

The 1st edition (Earth Endogenous System, here after the *EES*) was luckily published on 15 May 2013 as my monograph. Soon after the publication, I could not press down new ideas, aspects, and methods. All of these are completely consistent with the 1st edition or the *EES*, simpler, deeper, and wider. I call these 'new discoveries.' New discoveries are always within the range of scientific approach, using two-dimensions. I call the idea of two-dimension 'two-dimension plane hyperbola (2DPH).'

The *EES* is based on endogenous equations with no assumption and under perfect competition. These equations are each reduced to a hyperbola function to the ratio of net investment to national disposable net investment, $i=I/Y$, or the rate of change in population, $n_E=n$, where full employment is guaranteed.

To attract new discoveries, I divide a concept of aspects into two; measure-oriented organic aspects in the *EES* (see Notations) and nature-aspects in new discoveries. Nature-aspects are composed of six neutralities (for six nature-aspects, see Essence of Earth Endogenous System): (1) Money-neutral, (2) Consumption-neutral, (3) Relative share of capital-neutral, (4) Deficit-neutral and $RRR=0$, (5) Politics-neutral, and (6) Spirituality- neutral.

Organic aspects are measure-oriented while nature-aspects are essence-oriented; inseparable and connected each other. Nature-aspects ultimately produce three Axioms, which is much robust than hypotheses, theoretically and empirically in topology. When readers are at a loss which way to choose, please read Essence of Earth Endogenous System as a lighthouse in the sea.

2. Consistency with the 1st edition

The contents of the 1st edition have been deepened by the 2nd edition with no

discrepancy. Preface of the 1st edition remains vividly alive as it is. The 1st Preface (Pp. lvii-lxvii) has the following items:

1. Why 'purely endogenous'?
2. Technology and preferences under globalization
3. Scientific discoveries and philosophy and, natural, social, and behavior sciences
4. Hyperbola as a specific tool that reinforces endogenous equations
5. How to read 16 chapters along with Neo-classical and Keynesian, Harcourt
6. Particulars to my life
7. Wonderful connections with Samuelson, Sato, and Solow
8. To answer Krugman's anxiety towards the EU countries
9. Essence of system and model: A message to economics and econometrics
10. Explanation to the first appearance to Monograph
11. For patent to forecasting economic growth
12. Acknowledgements

I do not intend to repeat the above statements but further I want to record the above statements for the future generations. Acknowledgements of the 2nd edition will be stated at the end, after thankfully understanding the 1st Acknowledgements.

3. From the past to the future

The *EES* does not change in its stance and remains within actual data and scientific world. This policy was stated in Chapter 1, comparing it with natural science, social science, and behavior science. The 2nd edition obeys and respects this policy like Father.

However, Son grows spiritually in order. Here conclusively I sum up developing circumstances behind the family. The *EES* has three poles everlastingly. These were in the Earth in the 1st edition and now these have stood above the lands. These poles are historically based on geometry and topology. I believe, readers

will accept these poles geometrically. My geometry apparently differs from geometry as pure mathematics and swallows pure geometry. Fact is that my geometry integrates geometry into universe geometry and harmonizes any sort of geometry. The following three topological poles exist in my two-dimension plane (2DPH):

Pole 1: One circle and one hyperbola with one equilateral triangle of 1, 1, and the square root of 2. As a result, I could express the essence of hyperbola for the first time. This is the starting pole and called Pole 1. Pole 1 clarifies the essence of the silver ratio. Incidentally, the silver ratio has been the core of Japanese civilization and agriculture race culture at least for the last thousand years in Japan Islands. Note that geometry in math has naturally spread combinations of various sorts of circles, triangles and polygonal, and ellipses/ovals.

The uniqueness of Pole 1 is proved by a fact that one hyperbola each is a reduced form of fundamental endogenous equations with no assumption.

Pole 2: Proof of an identical area/size/square measure of the Silver ratio to the Golden ratio. This proof would never be born without the birth of Pole 1. Poles 1 and 2 were presented to Clay Mathematics Institute, Cambridge, 14 Sep 2013, to leave two discoveries for next generations, with Shizuko Ishida (Iyonoishi, in Japan). Here I stay in scientific and two-dimension world so that for Iyonoishi, see Chapter 10 in the 2nd edition.

Pole 3: Pole 3 is related to the unity of Euclid and non-Euclid geometry. Why does the *EES* in two-dimensions necessitate Pole 3? Pole 3 reinforces everlasting philosophy of hyperbola endowed with negative and positive asymptotes (vertical and horizontal). One hyperbola produces the essence of the *EES* and *KWET*, with three Axioms and six Nature-aspects. It is impossible for one to strictly approach the origin of the x and y axes in a plane. An asymptote expresses negative or positive but it is again impossible to approach. The asymptote has a power to convert negative to positive and vice versa. This philosophy corresponds with oriental philosophy in Confucianism. Why is

philosophy of hyperbola required for the *EES* and KEWT?

Actual statistics data are always within a certain range of endogenous data, as proved in KEWT. Leaders and policy-makers seriously decide economic policies everyday while the same results never happen, by country, by sector, and year and over years. When the worst appears one becomes shocked but it is the beginning of turn-over. Endogenously, turn-over has been proved by country if economic policies decrease real causes continuously. Therefore, hyperbola philosophy is alive with theoretical background.

Finally, how is the relationship between Euclid and non-Euclid geometry¹⁾ solved? This relationship is only solved when six-dimension real world is united with five-dimension imaginary world. One per cent is out of this world. Five-dimension imaginary world is true and must be approved as scientific. I call enlarged world New-scientific. I stress here that Shizuko Ishida (Iyonoishi) has proved this fact, family-like proved in physics, element chemistry, and word culture, as her life-work.

4. Brief summary of KEWT database series

I had used as original data in world databases such as the UN, OECD, Eurostat, ILO, IMF, and the World Bank, in the 1980s and 1990s. By various reasons, I decided to use statistics data solely from *International Financial Statistics Yearbook*, IMF. Since then, I have published KEWT (Kamiryo Endogenous World Table) database series by year and over years, gradually increasing the number of countries.

1) Earlier historically, Roberto Bonola (authorized English translation with additional appendices by H. S. Carslaw; with an introduction by Federigo Enriques) published *Non-Euclidean Geometry: a Critical and Historical Study of its Development*. (1912, Austin, Texas: Open Court). The first appearances to non-Euclid were Lobatschewsky, N. I. (1856), Nicolaus Lobatschewsky. (1887), and Nicholaus Lobatschewsky (1897) (see Essence of Earth Endogenous System).

For readers' convenience, I state here the transition of the records:

KEWT 1.07, the number of countries is 9 countries; 2.08, 32 countries; 3.09, 61 countries; 4.10, 63 countries; 5.11, 63 countries; 6.12, 81 countries; and now 7.13, 86 countries. Today, I have tested dozen countries without adding these countries into formal database series. I set Axiom 2 of window dressing of accounting is impossible (for three Axioms, see Essence of Earth Endogenous System). Once database is fixed, this is absolutely true. However, many African countries do not supply true data to *IFSY* particularly when countries are newly established. When data are arranged artificially or with help of statisticians who use statistics tools broadly, it takes many hours for me to find endogenous data accurately. For this reason, I observe these country data separately from official data.

5. Readers with the 2nd edition

The 2nd edition was, of course, presented to readers, after revising. I must convey my mind for revising to readers here. This is not my excuse but my sincere anxiety. After the 1st edition, I got several new ideas and discoveries. These discoveries (clear but, from my spirit of moderation, 'finding' I prefer to discoveries) are consistent with the 1st edition. There is no change in the contents. Rather, even in the 2nd edition, I realized that the 1st edition must be preserved longer, as my fortunate publication.

Then, what are the differences between the 1st and 2nd editions? Also what are new findings in the 2nd edition? In a word, new findings hold, shorter and simpler, using geometric topology in two-dimension plane, where a hyperbola is formulated as the reduced function of corresponding endogenous equation in the 1st edition.

For example, suppose that the nominal growth rate of output (i.e., national disposable net income, Y) is equal to the rate of inflation/deflation, as a concrete expression of new finding. A concrete expression may be a result in the *EES* but,

this result equals its cause simultaneously. So that in the *EES*, results=causes prevail everywhere.

Thus, new findings present the essence of the *EES* and, composed of six nature-neutrals: Money-neutral, consumption-neutral to technology, the relative share of capital-neutral to macro-inequality, deficit-neutral, politics-neutral, and spirituality-neutral. Concrete expressions present the results=causes of the essence and, are composed of the real rate of return=0 ($RRR=0$), the nominal growth rate of output=the rate of inflation/deflation, a Phelps coefficient, a Phillips line, and the valuation ratio.

Concrete expressions are measured two ways in the *EES*: (1) Accurately by measuring endogenous equation and (2) measuring by using hyperbola function in the two-dimensions. In the case of new findings, the author adds (3) 'simply by indicating the corresponding ratio' in the same two-dimensions to the above (1) and (2). The corresponding ratio in (3) at once indicates the cross-point of hyperbolic curve and its horizontal asymptote.

Therefore, the differences between the 1st and 2nd editions are attributed to the existence of the above (3). The existence of the above (3), however, is united with topological philosophy or the negative and positive philosophy, where the origin indicates moderation and vertical and horizontal asymptotes is related to optimum critical position. Two dimensions are naturally connected with six dimensions or the real world we live in. Further, six dimensions are connected with five dimensions in another world. However, the 2nd edition stays at the same two-dimension and, the author finds and proves new findings and concrete expressions much more simply than in the 1st edition. As a result, the author inserted the above (3) into related chapters, shortly and simply, and avoiding small confusions.

The author is fortunate to be able to open and publish the truth and essence of the *EES*, always helped by readers, teachers, benefactors, colleagues, and staff, internationally. As a result, the author has repeatedly met invaluable opportunities

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to confirm the first appearances for the author's topological new findings.

6. Acknowledgements

I have learned a lot at eight universities, as shown by my memorial drawings below. Chances in Japan, America, Canada, New Zealand, Australia, England, Sweden, and Netherlands, have come to me, negatively and positively, just like our human life. Also, several academic societies/associations have supported me, short and long years. My motto is learning by doing, and confirming by eyes, ears, hands, and legs, walking and running. I have learned; most important is communications, from individuals, families, societies, district, mountains, fields, and seas.

It is honestly few years for me to show my real thankfulness to my family. I am ashamed of the sacrifice of my family. We have each role in our life. We have peaceful mind commonly. My role is to convey a robust container to economic policies.

One of my fortunes is that the above container is next to the market principles. Yes, the market principles never are controlled by human mind arbitrarily. The market principles are next to God. I perceive this fact day and night, together with all of you; teachers, friends, readers, researchers, people, companies, and the literature accumulated historically. We are connected with each other spiritually

My trip to the US in Oct 2013 had two targets: one is to confirm facts that my new findings are the first appearance in the literature and, the other is to read through the original and the first appearance books and papers and, get parts of these originals, focusing on graphs and equations and, following the copy-right law. These originals have been usually stored in separated and specified places and in some cases, allowed to look at within four hours. Among others, I thank university libraries of U of Penn, Georgetown, CUA, and U of Hawaii, with excitement and delightedness. Two weeks in April 2014, I could attend *IAE* Conference, Madrid, and *RES* Annual Meeting, Univ. of Manchester, where I was fortunate to

find some papers using hyperbolic topology but the method remains within the framework of the literature. In this way, I have pursuing 'the first appearances,' together with 'purely endogenous,' throughout my life-work.

Lastly, let me convey the pith of the endogenous-equilibrium under the market principles, although I may repeat some of the following three paragraphs.

I found two everlasting facts when I up-dated KEWT database series just before publishing the 2nd edition: (1) For the period between the initial (1990) and current (2012) years; if we could easily measure a constant capital-output ratio each by sector, the endogenous equilibrium is most robust, where $K=K_G+K_{PRI}$. (2) Values of net investment by sector must be always plus and as much as smaller. Really some countries are each easily attain the above results while others not easily and taking many hours; results are reversed suddenly, sharply, and repeatedly. Readers are, however, able to confirm the reproducibility and duplicability in any country; scientific mathematically and geometrically (in the two dimensions).

How can policy-makers by country effectively and efficiently get out of unstable taking-time measurements as if ant lion?' Most important: Real-assets policies should be politics-neutral and spirituality-neutral. Through learning by doing, I understand that policy-makers' efforts of unstable countries is beyond description day and night. In fact, any country has passed the same maze processes promptly to cope with endogenous-shocks. We are fortunate to realize that even the current instance any country attains whole equilibrium purely endogenously. This is the hyperbola principle which numerically expresses endogenous philosophy. For example, minus apparent results such as deflation globally balances plus unbelievable results for people such as consumer good prices. A system of national accounts expresses by year but, the same as individuals. The wage rate decreases but CPI decreases in parallel. More important is how to minimize net investment and raise the rate of technological progress. Anyone should not claim or blame but accept a natural fact that the market principles are always much more pure to

God than human greedy behavior and decision-making.

The endogenous-equilibrium by country is expressed directly by the speed years for convergence and indirectly by key parameters and variables. However, endogenous situation holds regardless of the levels of these values. In other words, seven endogenous parameters as a clue of the *EES* remain always unchanged even some of these value up and down unstably. And, seven endogenous parameters remains always unchanged under actual statistics data, under endogenous data, and under external data. When combinations of seven endogenous parameters are unbalanced, actual situation reflects unbalanced combinations. The market principles are vertical by goods and services so that the *EES* integrates and reinforces the indispensable weak points wholly.

The speed years for convergence are tested by KEWT databases and its transitional path using recursive programming. Up-dated database 8.14, 1960/90–2012 by sector, is much simpler and much more generalized than the previous 7.13. Despite, the results of seven endogenous parameters remain unchanged, by the above decisive reason. The 2nd edition wholly uses up-dated tables for chapters 4, 5, 6, 8, 11, 12, and 16, including some figures. Chapters 7, 13, 14, and 15, however, use the same data as before, based on the above decisive reason.

Last but not least important, let me show my sincere thanks to Prof. Robert Solow. The rate of technological progress in Solow R. (1956, 1957), is a magnetic key that I could luckily obtain to disentangle the knotted threads in economics.

What is more, one copy of *EES* (1st Ed) was mailed to Prof. Solow when the book was printed and bound in April in advance. In late May, I was ecstatic to get a card full of inspiring words from Prof. Solow. Prof. Solow also says “As alike as peas in a pod” on the cover of the card. His card is one of my most precious gifts in this recent decade, I believe.

May 15

Dear Professor Kamiryo,

I want to Thank you for sending me a copy of your book, and also for the delightful gray 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 paintings, with

pleasure in both!

The way you combine data from K&W 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 J. Aumann



7. Three axioms vs. necessary and sufficient conditions

Finally, and right before the *EES* 2nd Ed. is turned over to the printing shop, I fortunately read an article published by Royal Economic Society on the *Newsletter* 165 (14–15 April 2014) as a new arrival at my home address. The article “Can

economics be evidence-based?" by Michael Joffe stimulated my fresh idea related to three axioms in the *EES* vs. their necessary and sufficient conditions.

1. Different from the literature, the *EES* has causes=results scientifically under the two dimensional plane (and, beyond space and time).
2. As a result, necessary conditions=sufficient conditions. This is completely justified by a severe fact such that no assumption as a surrogate exists among thousand equations.
3. The essence of the *EES* is firstly expressed by **Axiom 1** solving problems lying in the capital-output ratio.
4. Accordingly, Axiom 1 is most strong among three Axioms. And, **Axioms 2** and **3** are relatively weaker than Axiom 1 in each level. Of course, three are united systematically.
5. In short, the *EES* shows a theory having no defect in logic. The KEWT database series shows a practice. Therefore, evidences are perfectly proved and tested in the *EES* and the KEWT database series.

Towards



Supplement to the *EES* 2nd: towards the *HEU* 2015

This supplement is a short bridge between the *EES* (“*Earth Endogenous System: To Answer the Current Unsolved Economic Problems*,” 2014, 2nd edition) and the *HEU* (“*Hyperbola Economics: Towards A Utopia Economy in Reality*,” 2015). This remains a short memo for future essays by respect.

Surprising intuitions of J. A. Schumpeter (1939)

J. A. Schumpeter (“*Business Cycles*,” 1095 pages for I and II, 1939) is full of the first appearances or original fact-findings, although of course the evidence was not possible at that time. It is after 1945 when statistics data based on A System of National Accounts (the SNA, 1993, 2010) and econometrics apart from economic theories have been steadily prepared for data evidences by economists and decision-makers.

Schumpeter’s fifteen chapters are fundamentally relied on the real assets under the market principles by goods and services. This fact is clarified by a number of figures selectively shown in 1095 pages. Schumpeter (483–905, *ibid.*) shows selected figures in Chapters 9 to 14. These chapters are limited to physical quantities and employment; expenditure, wages, customers’ balances, although he had to take in some influential figures for households and enterprises, and the stock market in Chapters 10. In Chapters 7 to 13, Schumpeter (483–905, *ibid.*) does not illustrate figures for the rate of interest, the central market and the stock exchange, and 1919–1929, except for some fundamentals. The author realized this fact after reading repeatedly. Schumpeter must have intentionally avoided figures available in the literature.

The title of business cycles tells us much more than the meanings of printing by

page. Economic activities are, in any respect, deeply involved in business cycles. Economic activities are expressed freely by the real assets, the financial assets, and externals, exogenous and externally given in statistics data. Economic activities are expected to be totally integrated and wholly united, which is Schumpeter's implication throughout of 1095 pages.

The *EES* has some chapters related to business cycles such as Chapter 6, 14, and also some others. The author intends to write one chapter in the *HEU*. This chapter must be a kernel and also a bridge lying between the *EES* and the *HEU*. Accountant would say that this chapter is finish of financial statements.

Concretely, Schumpeter's (171-, 303-, 397-, *ibid.*) Kondratieff wave was backed up using fiscal policy and deficit, for the US, Germany, and the UK (England) in three historical waves. The author must thoroughly show pertinent figures for his evidence. Also, Schumpeter (449–451, *ibid.*) discusses the price level introducing the index numbers by industry. My PhD (1984), Lincoln Agriculture College, NZ, summed up the index numbers by crop industry but I did not cite Schumpeter's intuitions and equations but cited R. G. D. Allen's (548 pages, 1938; 1939 Reprinted) "*Mathematical Analysis for Economists*." In any way, I have perceived, taking time, that business cycles by industry does not complete well endlessly. Now I understand a true reason is the difference between the market principles (plural) and the market principle (single) wholly and totally at the macro level.

There is no proof and evidence for 'seven year' Juglars in the literature (here, Juglar's wave is 'Juglars'). Is 'seven year' is true? Conclusively, the speed years clarifies 'seven year' is not a fact (preliminarily, see Chapters 6 and 14 in the *EES*).

Why Marx falls into unsolved trap

There is no direct comment of Karl Marx (1934 Russia) in the *EES*. His theory is wrong in (1) the rate of technological progress is exogenous/external and further

always 'constant' and, in (2) the relation between the profits and wages is only partial without simultaneously introducing consumption and saving. Exogenously, Ernest Mandel (367–383, In the *New Palgrave A Dictionary of Economics*, Vol. 3, K to P, 2008, 2nd edition²⁾) excellently commented on Marx's 'surplus-value' as a strong base.

Mandel (379, *ibid.*) shows an equation of the rate of profit, $\frac{s/v}{(c+v)/(v)} + 1 = s/c + v$, where c is the value of constant capital, v is the value of variable capital (wages of productive workers), and s is surplus-value. The essence of 'surplus-value' is connected with three classes in society. Mandel (376, *ibid.*) expresses as follows (stressing with the author's underline):

Surplus product can take a money form, like money-rent in the final phases of feudalism, and capitalist profits. Surplus-value is essentially just that: the money form of the social surplus product or, what amounts to the same, the money product of surplus labour. It has therefore a common root with all other forms of surplus product: unpaid labour.

The *EES* is essentially based on quality=quantity=money= 1.0000, where money is, in a sense, commonly to Marx and Mandel. Nevertheless, Marx fails in perpetuating an economic circulation by country, due to vertical but indispensable characteristics of the market principles by goods and services. As a result, it is natural for Marx's theory not to find any solution.

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2) English edition was first published as "*Foundations of a Critique of Political Economy*" (1939), according to Selected works in this Dictionary.

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Towards Euler, Leonhard in Postscript, page 525, the *EES*, 1st Ed.



Euler's (1707–1783) portrait happily drawn by Hide, the author, 22–25 June 2004, MASR2004, Russian Academy of Sciences Conference, St. Petersburg.

The author overlapped *Petersburg* Paradox with St. *Petersburg*, Comparing *random probability* in the literature with the author's *no probability* aspect.

Hide, on 30 July 2014, adding in