Attachment 10

Bank of Japan Monetary Intermediation Cost

Direct Issuance (Seigniorage) Monetary Intermediation

M1[1] Money Stock Basis Assumed

Initial Conditions

Initial conditions would be to take GDP of economy in base year and divide it by itself and call the result 100 and the same for the money stock, take the chosen money stock indicator and divide it by itself and call it 100. Then, one possible way to allocate the productivity increase of the economy back to the economy itself in the most direct, efficient and least costly way would be for any increases in the money stock to be directly issued by the government as interest/Labor Dividend pro rata to the accounts held at the new 100% cash depositories. If the economy grows at a 2% rate then 2% seigniorage interest would be credited to the demand deposit accounts. In recessionary cycles, if any, no interest/Labor Dividend would be paid. In that sense these 100% reserve checking accounts would appear to earn interest/Labor Dividends and be the same as today's fractional reserve checking accounts that are paying effectively no interest in recessionary periods and some interest in expansionary periods. There would be no need for deposit insurance because the depository would have 100% cash and demand deposits - it would not be possible for such a depository to not have 100% funds on hand to cover any withdrawal situation including up to 100%. Commercial Banks would no longer take demand deposits but could take CDs and make time matched funding loans and lend their own capital and continue to offer other financial services without government insurance.

Formula If economy declines, no Labor Dividend until fully recovered to avoid inflation.

$$[\%\ \text{Change } MS_N]\ [\text{Labor Dividend (LD)}]\ [\text{Seigniorage}] = \frac{[MS_N - MS_{N-1}]}{[MS_{N-1}]} = \frac{\text{Money Stock}_0 \times GDP_N}{\text{Money Stock}_{N-1} \times GDP_0} - 1$$

Provided $[GDP_N]$ greater than any previous $[GDP_X]$ in the series 0 to N-1, if not then $[\%\ \text{Change } MS_N] = 0\%$

Where

MS =Money Stock/Supply
GDP =Gross Domestic Product, measure of economic performance
N = Year, (period between measurements used)
LD =Labor Dividend [Seigniorage/interest]

Economic (GDP) Performance

Year/Period (N)	0	1	2	3	4	5	6	7	8	9	10
Year	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
GDP[2] (End of Year ¥ Billions)	¥529,076.6	¥530,997.3	¥509,465.8	¥492,070.4	¥499,281.0	¥494,017.2	¥494,478.0	¥507,246.0	¥518,468.5	¥533,904.4	¥539,254.3
Economy GDP (Begin GDP_{N-1})		100.000	100.363	96.293	93.006	94.368	93.373	93.461	95.874	97.995	100.912
Economy GDP (End GDP_N/GDP_0)	100.000	100.363	96.293	93.006	94.368	93.373	93.461	95.874	97.995	100.912	101.924
% GDP Change (GDP_N/GDP_{N-1} -1)		**0.363%**	**-4.055%**	**-3.414%**	**1.465%**	**-1.054%**	**0.093%**	**2.582%**	**2.212%**	**2.977%**	**1.002%**
% Change Cumulative (GDP_N/GDP_0 -1)	0.000%	0.363%	-3.707%	-6.994%	-5.632%	-6.627%	-6.539%	-4.126%	-2.005%	0.912%	1.924%

Money Stock Growth

Year/Period (N)	0	1	2	3	4	5	6	7	8	9	10
Money Stock (Begin 1/1)		100.000	100.363	100.363	100.363	100.363	100.363	100.363	100.363	100.363	100.912
% Change (Period N from GDP% N-1)		0.363%	-4.055%	-3.414%	1.465%	-1.054%	0.093%	2.582%	2.212%	2.977%	1.002%
% Change Cumulative (∑ MS from 0)		0.363%	-3.707%	-6.994%	-5.632%	-6.627%	-6.539%	-4.126%	-2.005%	0.912%	1.924%
Labor Dividend (Year N)[3]		**0.363%**	**0.000%**	**0.000%**	**0.000%**	**0.000%**	**0.000%**	**0.000%**	**0.000%**	**0.547%**	**1.002%**
Money Stock (End)	100.000	100.363	100.363	100.363	100.363	100.363	100.363	100.363	100.363	100.912	101.924
Labor Div Cumulative (MS_N/MS_0 - 1)	0.000%	0.363%	0.363%	0.363%	0.363%	0.363%	0.363%	0.363%	0.363%	0.912%	1.924%
Money Stock (LD Model) (Begin)		$483,207.6	$484,961.8	$484,961.8	$484,961.8	$484,961.8	$484,961.8	$484,961.8	$484,961.8	$484,961.8	$487,616.8
Labor Dividend (Year/Period N)		**$1,754.2**	**$0.0**	**$0.0**	**$0.0**	**$0.0**	**$0.0**	**$0.0**	**$0.0**	**$2,655.1**	**$4,886.1**
Money Stock (LD Model) (End)	$483,207.6	$484,961.8	$484,961.8	$484,961.8	$484,961.8	$484,961.8	$484,961.8	$484,961.8	$484,961.8	$487,616.8	$492,502.9
Money Stock (M1 Actual)	¥483,207.6	¥482,837.3	¥480,386.7	¥482,867.0	¥492,396.0	¥515,772.0	¥534,532.8	¥560,220.8	¥586,543.9	¥616,483.1	¥659,839.4
Variance (with LD Model)	Over / (Under)	-0.4%	-0.9%	-0.4%	1.5%	6.4%	10.2%	15.5%	20.9%	26.4%	34.0%

Money Stock (LD Model)/GDP Ratio	100.0%	100.0%	104.2%	107.9%	106.4%	107.5%	107.4%	104.7%	102.4%	100.0%	100.0%
Variance (Over +/ Under -)	0.0%	0.0%	4.2%	7.9%	6.4%	7.5%	7.4%	4.7%	2.4%	0.0%	0.0%

Notes/Sources

1-M1 Money Stock data Annual Calendar (Not Seasonally Adjusted) from Federal Reserve Bank of St. Louis at
https://fred.stlouisfed.org/series/MANMM101JPA189S Last Update: 10/17/2017

2-GDP data from Cabinet Office, Government of Japan, Time Series Data, Annual Nominal, Fiscal Year GDP at
http://www.esri.cao.go.jp/en/sna/sokuhou/sokuhou_top.html Download Date: 1/12/2018

3-Also known as Seigniorage. It is percent (%) increase in money stock for period N, provided the economy has total net positive growth above all previously paid Labor Dividends. Seigniorage money supply expansions would be paid like interest, direct deposited into depository account holders accounts on a pro rata basis.