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A Reappraisal of the Postwar Economic Growth in China

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1. Introduction

This paper provides some preliminary observations on the postwar economic growth in China. The first baseline (official) estimate of the Chinese GDP growth for 1952-1978 was given by SSB-IER(1997). The major issue of the Chinese postwar economic growth is how to correctly measure the GDP growth under the environment of seriously unreliable price data and politically biased data compilation.

The best alternative estimate for the Chinese postwar growth to overcome the above problem can be found in Maddison (1998) and its updated versions, based on Wu's industrial growth estimates and his own considerations for the non-material service sector and so on. Maddison and Wu heavily rely upon physical data and fully disaggregated input-output tables in China. This direction of research has been developed by the CIA for the USSR and the World Bank-Russia's Statistical Office for the Russian growth during the early transition as well as the author's group for estimating the Russian

postwar growth (see Rosefielde and Kuboniwa, 2003).

We believe the Maddison estimate for the postwar GDP for China is definitely true for the years around 1987: however, it should be noted that there are some possibilities of double exaggeration of the official overestimation of the Chinese postwar economic growth in Maddison's attempt.

First, as Wu-Yue(2000) correctly notes, a historical extension of Wu's estimate with the fixed one-year 1987 weight would bring about some underestimation of the Chinese postwar industrial growth for the years far from 1987.

Second, as Maddison(1998 p.163) rightly brings to our attention, a conversion of the official chain index into the time series with the fixed 1987 weight results in huge gaps between the macro growth given and the macro growth computed as the sum of the sub-sector real values. It should also be noted that a combination of the estimate with the fixed one-year weight and the chain estimates has not yet been supported by the theory.

Taking these problems into consideration, this paper provides some alternative estimates for the postwar economic growth in China. The original Japanese version of this paper was prepared in March, 2006. Here we confine ourselves to observations on the Chinese official statistics for 1952-1995 and academic contributions prior to the publication of China's *2004 Census* in 2006. Further development in our discussion based on recently updated contributions is one of our

remaining tasks.

2. Measurement of the Economic Growth of the Non-Material Service Sector

In addition to the use of Wu's estimate for the postwar industrial growth, we share a common opinion with Maddison regarding the use of employment data in estimating the GDP growth rates of the non-material service (NMS) sector.

Table 1 and Figure 1 show the author's baseline (quasi-official) chain estimate based on the official sub-sector data of the non-material service sector as well as the official data and Maddison's estimate for employment of the sector.

The chain data show that the GDP of the NMS in 1978 was 4.2 times the level in 1952 (the year average 5.7% growth for the period) and the GDP of the NMS in 1995 was 28 times the level in 1952. On the other hand, the employment of the NMS in 1978 was 3.7 times the level in 1952 (the year average 5.2% growth for the period) and the employment in 1995 was 12 times the level in 1952. We may not find a significant difference between the chain data and the employment data for 1952-1978. However, the use of the chain data after 1978 would result in a large overestimation of the NMS sector GDP.

Maddison (1978) introduced two operations in using the NMS employment data. First, he added the military employment to the

official NMS data. However, we do not have much evidence for this operation. Second, Maddison changed the official NMS employment for 1957-1963 by applying a constant average rate (4.4%) for all the years. This operation may not be consistent with his approach to the historical estimate for the agriculture and industry. So we use the official employment data for the NMS GDP.

In a rapidly growing economy like China's, we may observe rapidly increasing real wages in the state sector. This is related to the validity of the employment approach to the NMS sector. We need further consideration for this problem.

3 Alternative Estimates of the Postwar Chinese GDP

Table 2 and Figure 2 show alternative GDP estimates with the fixed 1987 weight.

First, as Maddison (1998, p.152) fairly points out, a simple conversion of the chain indexes to the indexes with the fixed 1987 weight, or a combination of chain indexes and fixed ones leads to the significant differences between the given macro data and the macro data computed by summing up the sub-sector real values.

In fact, the average macro GDP growth computed for 1952-1978 amounts to 4.8% which is much less than the given macro rate 6.1% while this problem does not arise for 1978-1995. The GDP computed for 1952-1978 implies an underestimation of the GDP.

Table 2 also shows our estimates named hybrid(1) and hybrid(2). In the hybrid(1) the index of Wu-Yue (2000) for the industry and the official data for the others are employed with the fixed nominal sectoral proportions. In the hybrid (2) use of Wu-Yue (2000) for the industry, the official employment data for the non-material service sector and the official data for the others are made with the fixed nominal sectoral proportions.

In the hybrid(1) the average GDP growth rate for 1952-1978 accounts for 4.8% near the quasi-official rate computed. For 1978-1995 it amounts to 8.6% which is less than the quasi-official given or computed rate. This implies that our GDP estimate for 1952-1978 suffers an underestimation and thereafter it would show an overestimation.

In the hybrid(2) the average GDP growth rate for 1952-1978 also accounts for 4.8% near the quasi-official rate computed. For 1978-1995 it amounts to 8.0% which is less than the rate for the hybrid(1).

In Maddison(1998), which employs the methodology similar to our hybrid(2), the average GDP growth rate accounts for 4.4% for 1952-1978 and 7.5% for 1978-1995. Maddison's GDP estimate constitutes the lowest one. Maddison also increased the nominal GDP value of the NMS by 33.3%. This may be plausible while we do not have any statistically clear evidence for this operation in Maddison(1998).

A long run GDP estimate may heavily rely upon the selection of the base year for the fixed weight. Table 3 and Figure 3 show the case with 1970 fixed weight.

The average quasi-official GDP growth rate computed amounts to 5.4% for 1952-1978, greater than the case with the 1987 weight, and 9.4% for 1978-1995, less than the case with the 1987 weight.

In the hybrid(1) the average GDP growth rate for 1952-1978 accounts for 5.0% for 1952-1978 and 8.9% for 1978-1995.

In the hybrid(2) the average GDP growth rate also accounts for 5.0% for 1952-1978 and 8.3% for 1978-1995.

The estimates with the 1970 weight can be considered to be more (less) plausible for 1952-1978 (1978-1995) than in the case with the 1987 weight.

4. Conclusions

The basic criterion for judging possibilities of the over-or under-estimation in the case with the fixed one-year weight should be the quasi-official GDP growth rate computed as the sum of sectoral real values.

Regarding the estimates for 1952-1978 the quasi-official rate computed amounts to 4.8% or 5.4% which shows a rather strong robustness. Even in Maddison's lowest estimate, 4.4% the difference is

rather small, 0.4% point. In the case with the 1970 weight we can mention only some possibilities of overestimation in the range near 0.4% point.

For the estimates for 1952-1995 we may say there is a possibility of overestimation around the 1% point when employing hybrid methods.

As was mentioned in Wu-Yue(2000), the Wu estimate for industrial production may suffer an underestimation for 1952-1978. This implies weak possibilities of an overestimation of the GDP growth rate (at most 0.4% to 1.2% point) for the period.

Lastly, we would like to mention that all the alternative GDP estimates for the postwar China so far have not yet been supported by estimate on the expenditure side. This is also an important remaining issue for estimating the postwar GDP in China.

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Table 1 GDP and Employment of the Non-Material Service Sector for the Postwar China

	GDP Baseline estimate (1952=100) (Chain index) 1	Employment Baseline estimate (mid-year) (10 thousands) 2	Employment Baseline estimate (1952=100) 3	Labor productivity 4 1/3	Maddison(1998) Employment (mid-year) (10 thousands) 5	Maddison(1998) Employment (1952=100) 6
1952	100.0	702	100.0	1.00	1,002	100.0
1953	118.4	737	104.9	1.13	1,037	103.4
1954	109.8	758	107.9	1.02	1,058	105.6
1955	121.9	775	110.3	1.10	1,075	107.3
1956	142.7	868	123.6	1.15	1,168	116.5
1957	156.6	1,020	145.2	1.08	1,320	131.6
1958	189.9	1,791	254.9	0.75	1,378	137.4
1959	220.5	2,762	393.2	0.56	1,438	143.5
1960	247.2	3,152	448.7	0.55	1,502	149.8
1961	196.5	2,490	354.5	0.55	1,568	156.4
1962	180.4	1,545	220.0	0.82	1,637	163.3
1963	188.4	1,409	200.6	0.94	1,709	170.5
1964	226.0	1,484	211.3	1.07	1,784	178.0
1965	270.3	1,578	224.7	1.20	1,878	187.4
1966	227.2	1,631	232.2	0.98	1,931	192.6
1967	236.7	1,654	235.4	1.01	1,954	194.9
1968	256.4	1,694	241.1	1.06	1,994	198.9
1969	274.5	1,710	243.5	1.13	2,010	200.5
1970	280.4	1,698	241.8	1.16	1,998	199.3
1971	304.7	1,721	245.0	1.24	2,021	201.6
1972	307.9	1,774	252.5	1.22	2,074	206.9
1973	316.9	1,807	257.2	1.23	2,107	210.2
1974	331.4	1,850	263.3	1.26	2,150	214.5
1975	349.7	1,894	269.6	1.30	2,194	218.8
1976	362.7	1,971	280.6	1.29	2,271	226.5
1977	384.2	2,205	313.9	1.22	2,505	249.9
1978	422.7	2,597	369.7	1.14	2,897	289.0
1979	453.3	2,901	413.0	1.10	3,201	319.3
1980	503.5	3,078	438.2	1.15	3,378	337.0
1981	532.2	3,149	448.4	1.19	3,449	344.1
1982	627.8	3,434	488.9	1.28	3,734	372.5
1983	716.2	3,595	511.8	1.40	3,895	388.6
1984	858.3	4,005	570.3	1.51	4,305	429.5
1985	984.8	4,502	641.0	1.54	4,802	479.0
1986	1,109.7	4,701	669.4	1.66	5,001	498.9
1987	1,290.2	4,996	711.3	1.81	5,296	528.3
1988	1,453.1	5,317	757.1	1.92	5,617	560.4
1989	1,637.4	5,684	809.3	2.02	5,984	597.0
1990	1,695.5	5,769	821.4	2.06	6,069	605.4
1991	1,862.9	6,030	858.6	2.17	6,330	631.5
1992	2,101.0	6,418	913.8	2.30	6,718	670.2
1993	2,347.5	7,061	1,005.4	2.33	7,361	734.4
1994	2,590.7	7,824	1,114.0	2.33	8,124	810.5
1995	2,799.2	8,444	1,202.2	2.33	8,744	872.3
Year average (%)						
1952~78	5.7		5.2			4.2
1978~95	11.8		7.2			6.7
1952~95	8.1		6.0			5.2

Sources: Chinese Statistical Yearbook for 1997, Maddison(1998) and author's estimation.

Notes:

1.Line 1: Estimated by the author based on the official sub-sector data of the non-material service sector.

2.Line2: Estimated based on the Chinese Statistical Yearbook for 1997 and Maddison's methodology for 1951,

3.Line 3: Derived from Line 2.

4.Lines 5 and 6 :Maddison(1998).

Table 2 A Comparison of the Baseline and the Alternative GDP Growth for the Postwar China
: the case with the fixed 1987 weight

	(1987 10 ⁸ Yuan)					GDP growth index (1952=100)				
	Baseline (macro)	Baseline (sum of sub-sectors)	Hybrid (1)	Hybrid (2)	Maddison (1998)	Baseline (macro)	Baseline (sum of sub-sectors)	Hybrid (1)	Hybrid (2)	Maddison (1998)
	1	2	3	4	6	7	8	9	10	11
1952	1,083.2	1,554.6	1,679.7	1,794.3	2,180.8	100.0	100.0	100.0	100.0	100.0
1953	1,252.4	1,706.0	1,860.7	1,960.5	2,296.2	115.6	109.7	110.8	109.3	105.3
1954	1,305.2	1,752.7	1,914.7	2,034.9	2,370.5	120.5	112.7	114.0	113.4	108.7
1955	1,394.6	1,878.2	2,042.7	2,153.5	2,497.3	128.7	120.8	121.6	120.0	114.5
1956	1,604.1	2,072.4	2,283.5	2,397.5	2,745.0	148.1	133.3	135.9	133.6	125.9
1957	1,685.2	2,159.5	2,391.6	2,541.1	2,897.5	155.6	138.9	142.4	141.6	132.9
1958	2,043.4	2,429.3	2,768.6	3,149.0	3,228.7	188.6	156.3	164.8	175.5	148.1
1959	2,223.6	2,432.3	2,867.1	3,554.8	3,309.7	205.3	156.5	170.7	198.1	151.8
1960	2,216.5	2,312.4	2,787.4	3,577.5	3,200.7	204.6	148.7	165.9	199.4	146.8
1961	1,610.9	1,864.2	2,057.0	2,680.8	2,625.1	148.7	119.9	122.5	149.4	120.4
1962	1,520.5	1,819.7	1,990.6	2,296.3	2,625.1	140.4	117.1	118.5	128.0	120.4
1963	1,675.8	2,006.0	2,211.8	2,457.0	2,879.8	154.7	129.0	131.7	136.9	132.0
1964	1,981.7	2,329.4	2,568.4	2,787.3	3,228.1	182.9	149.8	152.9	155.3	148.0
1965	2,319.2	2,662.8	2,942.2	3,133.4	3,602.8	214.1	171.3	175.2	174.6	165.2
1966	2,568.1	2,895.8	3,176.9	3,447.9	3,949.3	237.1	186.3	189.1	192.2	181.1
1967	2,421.7	2,815.5	3,044.8	3,311.6	3,830.3	223.6	181.1	181.3	184.6	175.6
1968	2,322.7	2,733.0	2,962.8	3,216.7	3,746.2	214.4	175.8	176.4	179.3	171.8
1969	2,715.0	3,030.2	3,320.7	3,555.3	4,099.1	250.6	194.9	197.7	198.1	188.0
1970	3,241.7	3,478.8	3,789.5	4,011.5	4,571.8	299.3	223.8	225.6	223.6	209.6
1971	3,470.2	3,687.8	4,043.4	4,239.4	4,791.7	320.4	237.2	240.7	236.3	219.7
1972	3,600.9	3,795.7	4,158.0	4,368.7	4,932.0	332.4	244.2	247.5	243.5	226.2
1973	3,883.8	4,099.2	4,484.5	4,694.3	5,278.7	358.5	263.7	267.0	261.6	242.0
1974	3,973.5	4,206.3	4,573.7	4,778.8	5,369.2	366.8	270.6	272.3	266.3	246.2
1975	4,318.9	4,515.6	4,944.2	5,139.7	5,712.6	398.7	290.5	294.3	286.4	261.9
1976	4,248.9	4,443.7	4,890.8	5,096.0	5,657.1	392.2	285.9	291.2	284.0	259.4
1977	4,572.6	4,707.8	5,173.3	5,433.0	6,021.3	422.1	302.8	308.0	302.8	276.1
1978	5,106.2	5,202.5	5,707.8	6,054.9	6,675.6	471.4	334.7	339.8	337.4	306.1
1979	5,492.9	5,585.5	6,080.1	6,493.8	7,188.1	507.1	359.3	362.0	361.9	329.6
1980	5,923.6	5,941.7	6,293.8	6,701.3	7,466.6	546.8	382.2	374.7	373.5	342.4
1981	6,234.2	6,270.1	6,618.7	7,011.5	7,821.9	575.5	403.3	394.0	390.8	358.7
1982	6,798.8	6,856.5	7,252.5	7,613.7	8,506.0	627.6	441.1	431.8	424.3	390.0
1983	7,536.7	7,600.3	7,994.8	8,289.8	9,232.2	695.8	488.9	476.0	462.0	423.3
1984	8,680.5	8,754.9	9,071.9	9,316.2	10,326.0	801.3	563.2	540.1	519.2	473.5
1985	9,849.4	9,887.2	10,087.6	10,334.8	11,407.0	909.2	636.0	600.6	576.0	523.1
1986	10,720.7	10,744.4	10,850.1	10,995.1	12,152.1	989.7	691.2	645.9	612.8	557.2
1987	11,962.5	11,962.5	11,962.5	11,962.5	13,192.8	1,104.3	769.5	712.2	666.7	604.9
1988	13,311.9	13,269.7	13,023.8	12,911.8	14,267.5	1,228.9	853.6	775.4	719.6	654.2
1989	13,852.8	13,810.5	13,202.7	12,964.5	14,580.4	1,278.8	888.4	786.0	722.5	668.6
1990	14,384.6	14,353.3	13,435.9	13,147.8	15,046.2	1,327.9	923.3	799.9	732.7	689.9
1991	15,705.0	15,710.1	14,387.0	13,950.6	15,922.8	1,449.8	1,010.6	856.5	777.5	730.1
1992	17,941.5	18,012.6	15,970.0	15,326.5	17,436.9	1,656.3	1,158.7	950.8	854.2	799.6
1993	20,365.3	20,517.9	17,835.3	17,076.5	19,140.0	1,880.0	1,319.8	1,061.8	951.7	877.6
1994	22,941.3	23,190.4	19,966.4	19,139.0	21,042.8	2,117.8	1,491.8	1,188.7	1,066.6	964.9
1995	25,352.8	25,681.7	23,242.2	22,342.8	22,799.2	2,340.5	1,652.0	1,383.7	1,245.2	1,045.4
Year average (%)										
1952~78	6.1	4.8	4.8	4.8	4.4	6.1	4.76	4.82	4.79	4.40
1978~95	9.9	9.8	8.6	8.0	7.5	9.9	9.8	8.6	8.0	7.5
1952~95	7.6	6.7	6.3	6.0	5.6	7.6	6.7	6.3	6.0	5.6

Sources: Maddison (1998), Wu-Yue (2000) and author's estimation.

Notes:

1. Line 1: Based on the official 1987 macro value and macro chain index.
2. Line 2: Based on the sum of the sub-sector real official values.
3. Hybrid (1): Based on Wu-Yue (2000) for the industry and the official data for others.
4. Hybrid (2): Based on Wu-Yue (2000) for the industry, the official employment data for the non-material service sector and the official data for others.

**Table 3 A Comparison of the Baseline and the Alternative GDP Growth for the Postwar China
: the case with the fixed 1970 weight**

	(1970 10 ⁸ Yuan)				GDP growth index (1952=100)			
	Baseline (macro)	Baseline (sum of sub-sectors)	Hybrid(1)	Hybrid(2)	Baseline (macro)	Baseline (sum of sub-sectors)	Hybrid(1)	Hybrid(2)
	1	2	3	4	5	6	7	8
1952	752.8	911.6	976.7	992.4	100.0	100.0	100.0	100.0
1953	870.3	1,036.1	1,111.1	1,113.9	115.6	113.7	113.8	112.2
1954	907.0	1,076.3	1,151.4	1,166.2	120.5	118.1	117.9	117.5
1955	969.1	1,150.5	1,222.1	1,228.7	128.7	126.2	125.1	123.8
1956	1,114.7	1,228.4	1,305.9	1,306.7	148.1	134.8	133.7	131.7
1957	1,171.1	1,284.0	1,371.5	1,382.9	155.6	140.8	140.4	139.3
1958	1,420.0	1,498.6	1,617.4	1,718.8	188.6	164.4	165.6	173.2
1959	1,545.2	1,565.2	1,722.8	1,948.5	205.3	171.7	176.4	196.3
1960	1,540.3	1,526.6	1,701.0	1,962.4	204.6	167.5	174.2	197.7
1961	1,119.4	1,163.8	1,216.7	1,422.2	148.7	127.7	124.6	143.3
1962	1,056.6	1,118.1	1,161.6	1,233.1	140.4	122.6	118.9	124.3
1963	1,164.5	1,232.3	1,287.4	1,329.8	154.7	135.2	131.8	134.0
1964	1,377.1	1,444.7	1,499.1	1,517.0	182.9	158.5	153.5	152.9
1965	1,611.7	1,669.8	1,726.6	1,716.5	214.1	183.2	176.8	173.0
1966	1,784.6	1,828.0	1,866.0	1,906.5	237.1	200.5	191.1	192.1
1967	1,682.8	1,752.5	1,776.2	1,811.2	223.6	192.2	181.9	182.5
1968	1,614.1	1,691.3	1,726.7	1,749.1	214.4	185.5	176.8	176.2
1969	1,886.7	1,925.4	1,964.0	1,971.6	250.6	211.2	201.1	198.7
1970	2,252.7	2,252.7	2,252.7	2,252.7	299.3	247.1	230.6	227.0
1971	2,411.5	2,411.5	2,413.7	2,393.9	320.4	264.5	247.1	241.2
1972	2,502.3	2,502.3	2,496.2	2,481.8	332.4	274.5	255.6	250.1
1973	2,698.9	2,698.9	2,689.3	2,671.5	358.5	296.0	275.4	269.2
1974	2,761.2	2,761.2	2,734.0	2,709.1	366.8	302.9	279.9	273.0
1975	3,001.2	3,001.2	2,969.9	2,934.5	398.7	329.2	304.1	295.7
1976	2,952.6	2,952.6	2,938.4	2,902.7	392.2	323.9	300.9	292.5
1977	3,177.5	3,177.5	3,138.7	3,119.4	422.1	348.5	321.4	314.3
1978	3,548.4	3,548.4	3,490.5	3,496.4	471.4	389.2	357.4	352.3
1979	3,817.1	3,817.0	3,722.0	3,746.6	507.1	418.7	381.1	377.5
1980	4,116.4	4,116.4	3,862.8	3,867.4	546.8	451.5	395.5	389.7
1981	4,332.2	4,309.6	4,071.4	4,059.9	575.5	472.7	416.9	409.1
1982	4,724.6	4,600.5	4,454.0	4,395.3	627.6	504.6	456.0	442.9
1983	5,237.3	5,039.2	4,926.1	4,807.6	695.8	552.8	504.4	484.4
1984	6,032.1	5,712.4	5,605.2	5,414.0	801.3	626.6	573.9	545.5
1985	6,844.4	6,471.8	6,299.1	6,064.4	909.2	709.9	644.9	611.1
1986	7,449.9	7,303.0	6,802.6	6,477.7	989.7	801.1	696.5	652.7
1987	8,312.9	8,064.5	7,534.4	7,081.3	1,104.3	884.6	771.4	713.5
1988	9,250.6	8,950.3	8,253.5	7,693.2	1,228.9	981.8	845.1	775.2
1989	9,626.5	9,687.5	8,353.8	7,671.3	1,278.8	1,062.7	855.3	773.0
1990	9,996.1	10,094.2	8,460.7	7,735.4	1,327.9	1,107.3	866.3	779.5
1991	10,913.6	10,601.5	9,085.4	8,234.2	1,449.8	1,162.9	930.2	829.7
1992	12,467.8	11,204.5	10,126.8	9,093.3	1,656.3	1,229.1	1,036.9	916.3
1993	14,152.1	12,494.8	11,337.4	10,165.6	1,880.0	1,370.6	1,160.8	1,024.3
1994	15,942.1	14,265.5	12,731.7	11,441.8	2,117.8	1,564.8	1,303.6	1,152.9
1995	17,618.0	16,221.5	14,867.0	13,468.5	2,340.5	1,779.4	1,522.2	1,357.1
Year average (%)								
1952~78	6.1	5.4	5.0	5.0	6.1	5.4	5.0	5.0
1978~95	9.9	9.4	8.9	8.3	9.9	9.4	8.9	8.3
1952~95	7.6	6.9	6.5	6.3	7.6	6.9	6.5	6.3

Sources: Maddison (1998), Wu-Yue (2000) and author's estimation.

Notes:

1. Line 1: Based on the official 1970 macro value and macro chain index.
2. Line 2: Based on the sum of the sub-sector real official values.
3. Hybrid (1): Based on Wu-Yue (2000) for the industry and the official data for others.
4. Hybrid (2): Based on Wu-Yue (2000) for the industry, the official employment data for the non-material service sector and the official data for others.

Fig. 1 GDP and Employment in Chinese Non-Material Service (NMS) Sector (1952=100) : 1952~1995

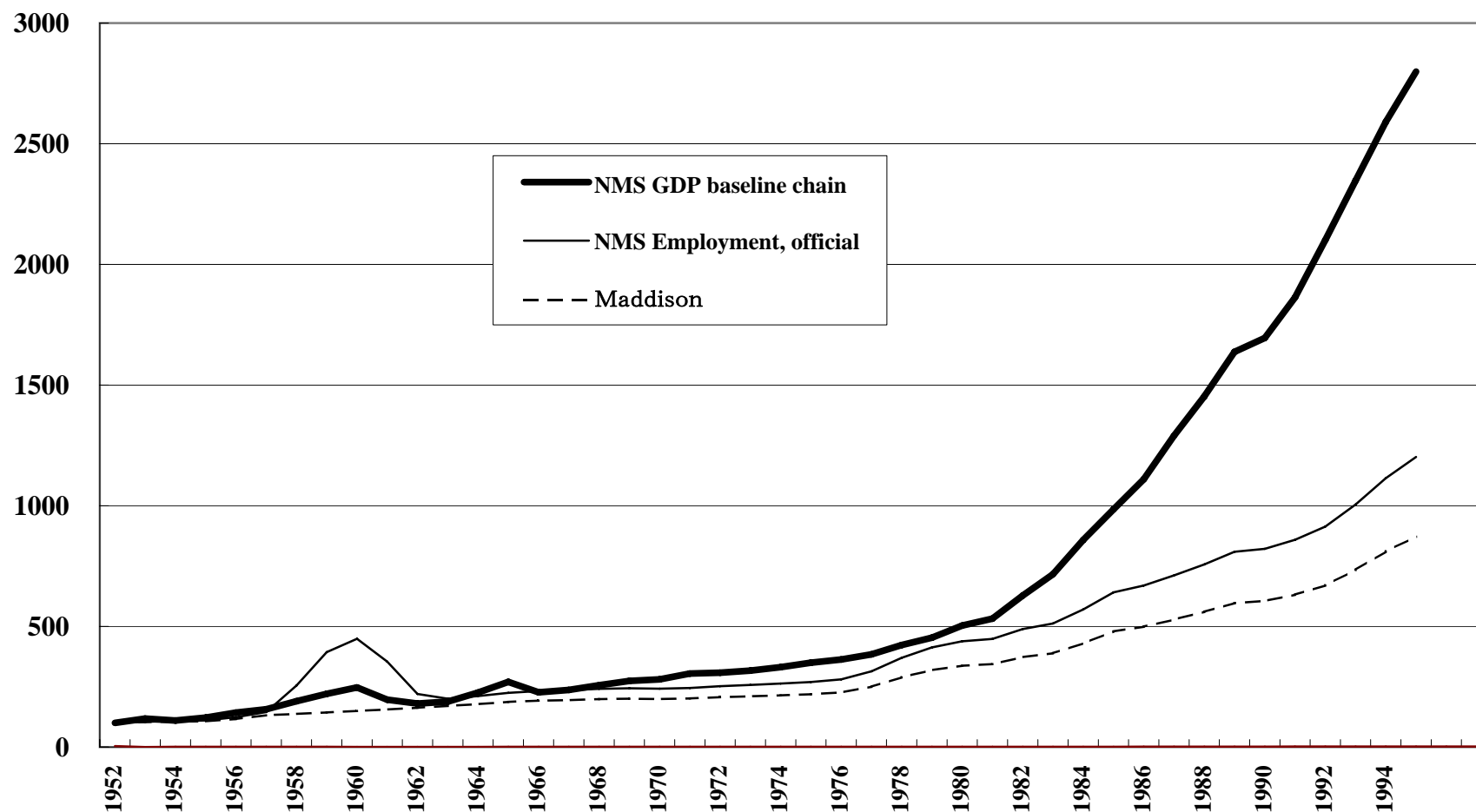


Fig. 2 Chinese Postwar GDP (fixed 1987 weight) : 1952~1995

1952=100

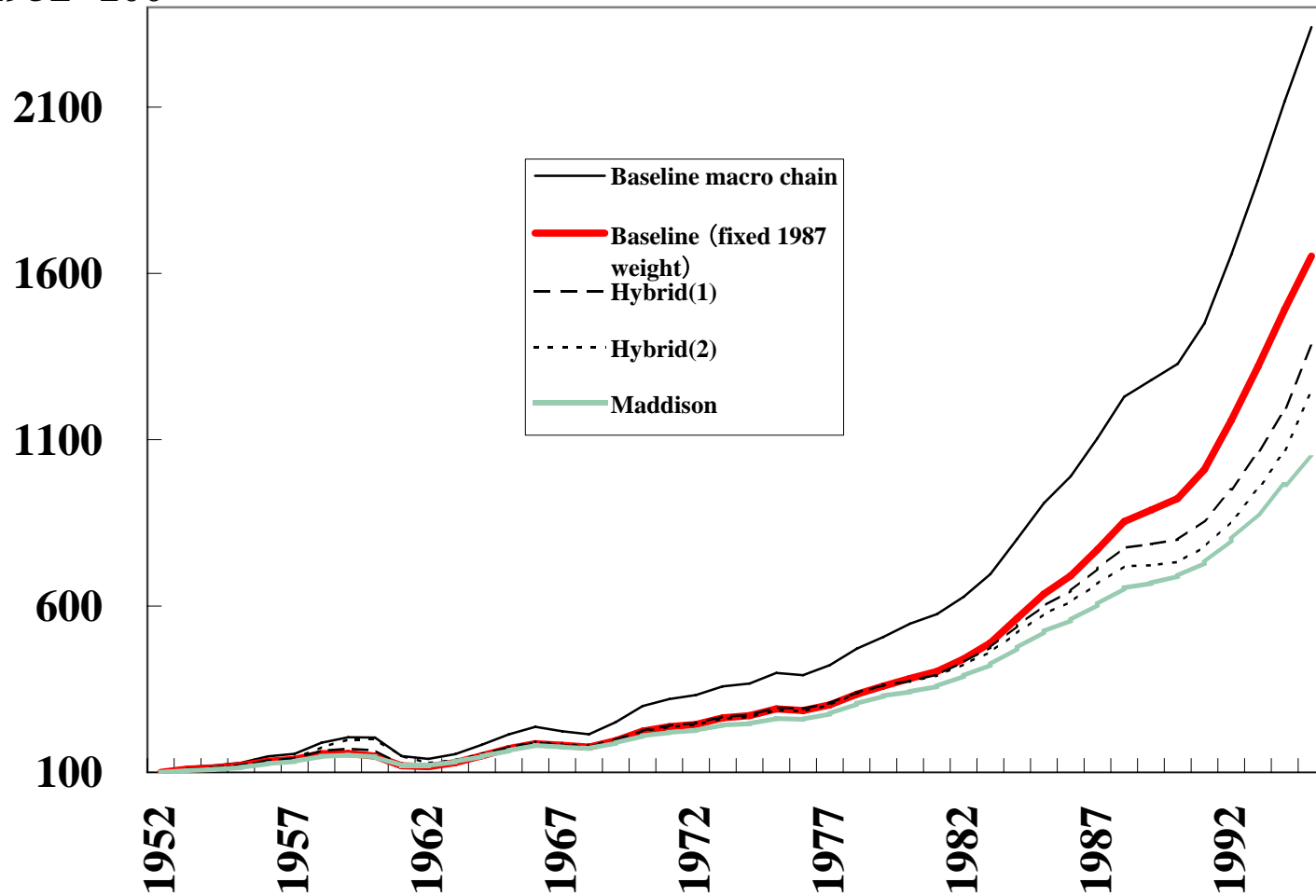


Fig. .3 Chinese Postwar GDP (fixed 1970 waight)

