

CHINA'S REFORM PERIOD ECONOMIC GROWTH: HOW RELIABLE  
ARE ANGUS MADDISON'S ESTIMATES?  
RESPONSE TO ANGUS MADDISON'S REPLY

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In my article "China's Reform Period Economic Growth: How Reliable Are Angus Maddison's Estimates" (*Review of Income and Wealth*, 52(1), March 2006, pp. 85–119), I examine the validity of Maddison's (1998) alternative real growth rates for China in 1978 through 1995 (the final year of his 1998 study), and the subsequent validity of the Penn World Table data for China which rely on Maddison's adjustments to China's official data. Virtually all the difference between Maddison's alternative real growth rates and the official ones is due to four adjustments of official data by Maddison. I examine each in turn, and conclude that his adjustments do not hold up to scrutiny.

Maddison, in a reply in the same issue of the *Review of Income and Wealth* (2006, pp. 121–6), addresses my examination of one of his four adjustments, namely the adjustment to the real growth rates of other services. He does not address my assessment of his other three adjustments. My examination of his adjustment to the real growth rates of other services makes six points. Maddison comments on three of these in his reply. Maddison's 1998 study of China assumes zero labor productivity growth in "other services" (i.e. services not covered by the categories transport, communication, commerce, and catering), and uses *employment* growth in "other services" to approximate real growth in *value added*.

My six points on the real growth rates of "other services," in summary, are:

- (1) Maddison's employment data for China may double-count military personnel, lowering employment growth in "other services."
- (2) Chinese employment data are highly problematic, with a likely bias towards an underestimate of employment growth in "other services."
- (3) Comparative and transition economics suggest positive labor productivity growth in "other services" in an economy that moves out of planning, as underemployment turns into open unemployment. Exchanging currency in a Chinese bank in the mid-1990s vs. the early 1980s does not confirm zero labor productivity growth.
- (4) Maddison (1998, p. 151) justifies his assumption of zero labor productivity growth in "other services" in China with: "I have assumed, in line with the practice of many OECD countries, that there was no increase in

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[labor] productivity and used employment as an indicator of output.” My data show labor productivity growth rates of “other services” in OECD countries to be slightly positive, which suggests the absence of such a general practice. The standard deviation across countries is large, with individual countries exhibiting rates well above zero, which suggests the possibility of significant, positive labor productivity growth in “other services” for China. Across OECD countries, labor productivity growth rates of “other services” are often little different from those in transport & communication and in commerce & catering, where Maddison accepts China’s official growth rates, which suggests accepting China’s official labor productivity growth rates of “other services,” too. Finally, I argue that OECD countries are unlikely to be good comparison countries for China, an economy in transition and at a very different stage of development.

- (5) United Nations and International Labor Organization data yield similar findings as the OECD data.
- (6) A chart for the 17 transition countries for which I have data shows an unambiguous relationship between labor productivity growth in industry and in “other services.” Applying this relationship to China suggests that official labor productivity growth in “other services” is accurate if not an underestimate.

Maddison in his reply, first, addressing item (4), says that in the OECD database which I use (the OECD services database with data on employment and value added), the labor inputs are not standardized or adjusted (in my reading, they are for some but not all countries), and that with better employment data, average labor productivity growth in “other services” in nine countries (out of the 24 countries that were OECD countries in the period he covers) in the period 1973–90 was 0.06 percent per year, i.e. very close to zero.<sup>1</sup> This is similar to what I find for these nine countries in the OECD database used in my article, and it confirms that the application of zero labor productivity growth in “other services” is Maddison’s assumption rather than a general practice.<sup>2</sup>

I further doubt that the average of Denmark, France, Germany, Italy, Netherlands, Spain, Sweden, the U.K., and the U.S. in 1973–90 is an appropriate estimator for an economy in transition and at a much earlier development stage. The source that Maddison refers to, van Ark (1996), in the same table (p. 114) also provides data for 1950 (and 1960 and 1979). In the earlier period 1950–73, at an earlier development stage, average labor productivity

<sup>1</sup>Maddison’s 0.06 percent (2006, Table 5) is for “non-productive services” (with a definition in note 5 of van Ark, 1996, p. 160); China’s “nonproductive” (i.e. “other”) services *further include* business and professional services, finance, insurance, and real estate (Maddison, 1998, or Holz, 2006). I am able to reconstruct Maddison’s (2006, Table 5) values for each of the three sectors agriculture, industry, and producer & distributive services from his source (van Ark, 1996, pp. 109–15), for all countries, but not so for “other services,” where I am able to reconstruct Maddison’s values only for six countries and where my resulting average across the nine countries is 0.19 percent per year (van Ark, 1996, p. 114), not 0.06 percent (Maddison’s figure).

<sup>2</sup>The OECD services database, used in my article, does not provide data covering the same time period for all countries; disregarding time period differences, the average for the nine countries covered by Maddison is 0.23 percent.

growth in “other services” in these nine countries is 1.51 percent per year. The degree to which *average* labor productivity growth in “other services” of the nine countries constitutes a good estimator of labor productivity growth in *any single one* of the nine countries differs from country to country. Spain, the least developed country among the nine (but not a transition economy), in 1950–73 experienced labor productivity growth in “other services” of 4.66 percent per year (van Ark, 1996, p. 114), just above China’s official rate in the reform period 1978–95.<sup>3</sup>

Maddison, second, in my reading says that the ILO employment data (in (5)) are unlikely to be consistently defined over time and across countries, and “there is also a problem in knowing whether the sectoral breakdowns used by the ILO and the UN are compatible” (p. 125). In a lengthy footnote 19 in my article I examine the implications of inconsistent measurement of employment data for the conclusions that I draw in the paper; only a very particular, *systematic* bias in *growth rates* across countries would possibly make a difference.

Maddison, third, suspects that the labor productivity growth rates of “other services” of Kazakhstan, Slovakia, and the Ukraine (or possibly all transition countries?) are “subject to much greater mismeasurement than China’s” (p. 125). The three countries are outliers in the chart in my article (Figure 1, p. 101) and are not needed for my point (6) to hold, namely that China’s official labor productivity growth in “other services” is perfectly justified by the labor productivity growth patterns of other transition countries.

In his reply, Maddison makes numerous additional comments that, in my reading, are meant as a *general justification* for adjusting Chinese growth rates.<sup>4</sup> Reasons can be found to adjust China’s 1978–95 growth rates upward as well as downward. I have discussed some, briefly, in Holz (2002, 2003, 2005).<sup>5</sup> In my article examining Maddison’s reform period growth estimates for China I have, beyond arguing/showing that the *operational methods* chosen by Maddison for making adjustments do not hold up to scrutiny, in my view also shown that the

<sup>3</sup>In the period 1973–90, Spain’s labor productivity growth rate in “other services” was 1.35 percent per year (Maddison, 2006, Table 5, “non-productive services,” or van Ark, 1996, p. 114), compared to the nine-country average of 0.19 percent (or 0.06 percent in Maddison’s presentation). In both the first and second period, labor productivity growth in the primary sector in Spain is higher than in China in the reform period, and in the secondary sector and in the “productive” tertiary sector about two-thirds that of China (with the complication that “productive” vs. “non-productive” services in Maddison, 2006, or van Ark, 1996, are not compatible with China’s classification, as mentioned in note 1). For China’s values, see my article (Holz, 2006).

<sup>4</sup>It is not immediately clear to me why what Maddison presents as “reasons for adjusting official figures” (p. 121) are *reasons* for making *adjustments*. The deflator issue of item (2) of his list, to me, appears worthy of further examination. Item (3) seems to hinge on using his 1990 value as a benchmark, where my article questions his data. I don’t question the use of PPP figures (his item 4), nor adjustments of national data for the sake of international comparability (item 1). In the latter instance, Maddison needs to apply the assumption of zero labor productivity growth in “other services” to all countries at all times and use the product method in agriculture and industry for all countries; a quick check for the U.S. since 1950 suggests this is not the case for Maddison’s historical cross-country series available on his homepage.

<sup>5</sup>Maddison (2006, p. 123) writes: “Holz makes no reference to other studies which confirm my view that it is useful to test the validity of official statistics by careful and transparent construction of alternative measures.” I share his view on testing, and in Holz (2003) examine a range of evidence presented in the literature that claims to show that official data on industrial value added and GDP are wrong (and find the evidence not compelling).

*specific* reasons advanced by Maddison (1998) to justify his adjustments are problematic.<sup>6</sup>

Two short items remain. First, at the end of the conclusions of my article, going beyond Maddison's adjustments to Chinese data, I write in one sentence that I subscribe to a substantial margin of error in China's official growth rates but not an aggregate systematic bias, and provide a subjective estimate of the margin of error. Maddison replies that I do so "without a shred of evidence." I omitted to refer to my earlier publication on Chinese statistics in the *Review of Income and Wealth* (Holz, 2004, pp. 402–5).

Second, Maddison's (1998) real growth rates for industry are taken from calculations of Harry Wu in 1997, with an average annual rate of 8.56 percent between 1978 and 1995. Wu (2002) revised this value upward to 9.85 percent; in my article, I argue/show that these estimates are not a reliable alternative to China's official data, and Maddison in his reply does not address my assessment of Wu's calculation method. Maddison (2006, p. 124) writes: "He [Wu] has since [since Wu (2002), with no later reference provided] updated his estimates to 2002, and they show a growth rate of 9.2 percent a year for 1978–2002 . . . I have used his latest results in updating my estimates." On March 6, 2006, after publication of Maddison's reply, I accessed Maddison's historical data, "World Population, GDP and Per Capita GDP, 1–2001 AD (copyright Angus Maddison)" on his homepage. China's real GDP figures (and thereby its real GDP growth) of 1978 and 1995 are identical to his original values (Maddison, 1998, Table C.4 on p. 158). There can have been no update of his historical data.<sup>7</sup>

#### POSTSCRIPT

After I submitted this response, it has turned out that Maddison's latest series of GDP and population, called World Population, GDP and Per Capita GDP, 1–2003 AD, on his website (<http://www.ggdc.net/Maddison/>) were updated as of April 27, 2006. This includes adjusted series for China. A double-check with the GDP data in Geary-Khamis dollars in Maddison (1998, Table C.4) for the years 1978, 1987, 1990, and 1995, shows that the newly released values of 1978, 1987, and 1990 are unchanged, while the 1995 value is 7.7% higher.

<sup>6</sup>Maddison also quotes a passage in OECD (2000, pp. 16–17) as saying that Maddison's estimates constitute a lower bound and the official growth estimates an upper bound. He attributes this passage to two officials of China's National Bureau of Statistics. I wonder if this passage does not, in fact, refer to the early period (1950s) of the People's Republic of China. Furthermore, one of these two officials, as head of the national income accounts division, in the economic census 2005 oversaw an official 16.8 percent *upward* revision to China's original official nominal 2004 GDP and an upward revision of average annual real growth in 1993–2004 from 9.0 percent to 9.5 percent (with, in 1993, 1994, and 1995, a 0.5, 0.5, and 0.4 percentage point upward revision).

<sup>7</sup>In Maddison's (1998) Table C.4, these are the GDP level values converted to "international" (Geary-Khamis) dollars," provided for the years 1978, 1987, 1990, and 1995. These values are identical to the values for these years on Maddison's homepage (<http://www.ggdc.net/maddison/>), where the values are labeled "GDP levels: PIB, 1990 International Geary-Khamis dollars." The historical data come with a note, "For updates of the GDP and per capita GDP figures beyond 2001, readers may find it helpful to refer to the GGDC database (<http://www.ggdc.net/>)." In the (most recent) January 2006 version of the "Total Economy Database," China's values of 1978–90 are identical to those in Maddison's historical series, and those of 1991–95 are revised upward by 0.8 percent, 10.3 percent, 1.5 percent, 1.5 percent, and 7.7 percent. Wu's (2002) results would require updating the values of 1978–90, too. Furthermore, the 1991–95 time pattern of the revisions to *GDP* in the GGDC (Groningen Growth & Development Centre) series vs. Maddison's historical series does not match the time pattern of the revisions to *industrial value added* in Wu (2002, p. 202) vs. Maddison (1998, p. 157).

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