



The Role of Total Hours Worked in Japan's (Lack of) GDP Growth

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The growth of total gross domestic product (GDP) in Japan has occurred in two distinct phases. Between 1971 and 1991, Japan's GDP grew at an average annual rate of 4.4 percent, a pace much higher than the U.S. GDP growth rate of 3 percent.¹ However, between 1991 and 2011, Japan's GDP growth was 0.7 percent—much slower than the U.S. pace of 2.5 percent (see the table). In this essay, we study the extent to which the total number of hours worked can account for Japan's poor GDP growth.

Economists often decompose GDP growth into three factors: (i) hours worked, (ii) physical capital, and (iii) total factor productivity. Identifying the role of each factor in a country's growth is a first step in guiding economic policy. We find that the diverging paths of total hours worked account for most of the difference in GDP growth between Japan and the United States. One simple way of identifying this is to examine the growth rates of GDP per hour worked for each country (column (1) in the table). These rates are very similar for Japan and the United States between 1991 and 2011: 1.7 percent in Japan vs. 1.8 percent in the United States.

The first chart shows total hours worked for Japan and the United States normalized such that both series are 100 in 1971. In Japan, total hours worked grew at an annual rate of 0.5 percent from 1971 to 1991 and shrank at an annual rate of 1 percent from 1991 to 2011. During the same intervals, total hours worked in the United States grew at rates of 1.6 percent and 0.8 percent, respectively.

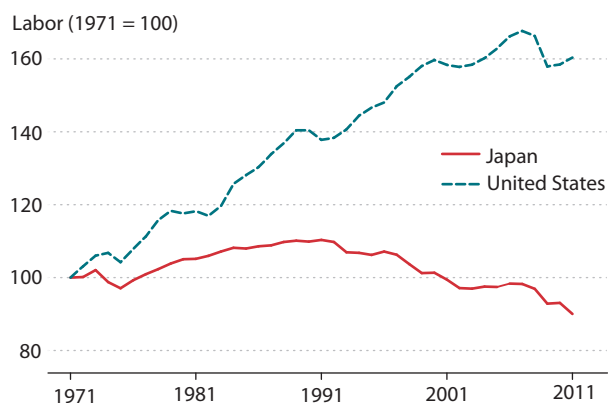
Why is there such a difference in the growth of total hours worked between Japan and the United States? In answering this question, it is useful to recall that total hours worked can be decomposed into three factors: (i) population, (ii) employment rate, and (iii) average hours worked by the employed population. The first factor is certainly important in this case: The population growth rate for Japan

Growth Rates of Output and Output per Hour Worked: Japan and the United States

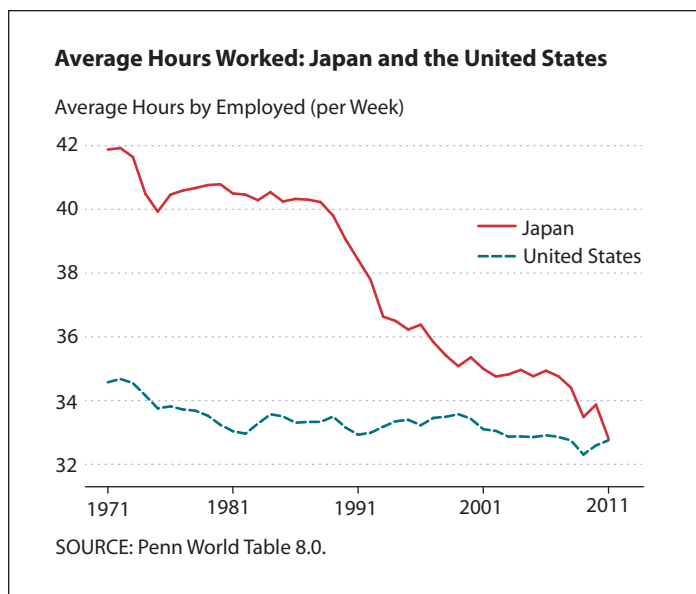
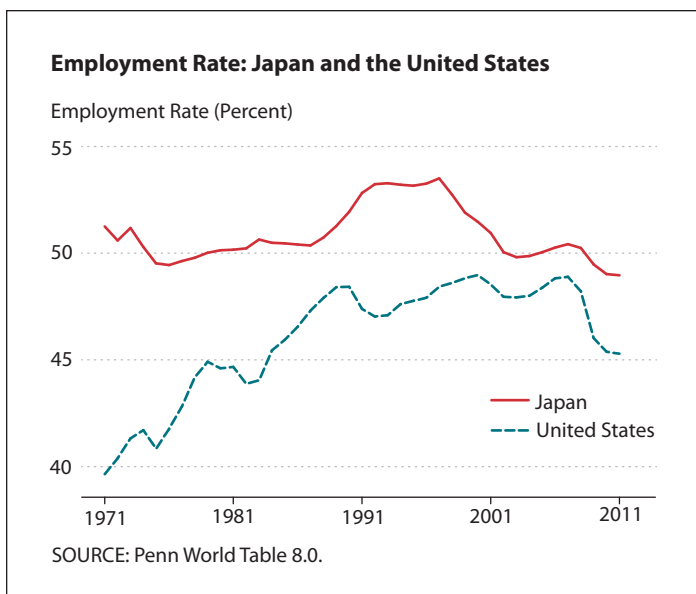
Interval	Annual growth rate (%)	
	Output (1)	Output per hour worked (2)
Japan		
1971-91	4.4	3.9
1991-2011	0.7	1.7
United States		
1971-91	3.0	1.4
1991-2011	2.6	1.8

SOURCE: Penn World Table 8.0.

Hours Worked: Japan and the United States



SOURCE: Penn World Table 8.0.



was 0.8 percent and 0.2 percent for the intervals 1971 to 1991 and 1991 to 2011, respectively, while it was around 1 percent for the United States over the entire period.

Although the differences in population growth rates are important, they do not tell the whole story. The pattern in the U.S. employment rate is very different from the one for Japan (see the second chart). In particular, employment increases from 40 percent in 1971 to a peak of almost 50 percent by 2007 for the United States, while it is relatively constant at around 50 percent for Japan. The reason for this difference is the change in the labor force participation of women: During the same time interval, it increased from 43 percent to 58 percent in United States but remained stagnant at around 48 percent in Japan.

The diverging paths of total hours worked account for most of the difference in GDP growth between Japan and the United States.

The last factor, the average weekly hours worked by the employed population, is also important in understanding the differences in total hours worked between Japan and the United States. As the third chart shows, weekly

hours worked in Japan decreased at an annual rate of close to 1 percent over the span of 40 years, while in the United States they declined only slightly.² Interestingly, Japan's weekly hours worked was initially much higher than in the United States; recently, however, the levels in the two countries have converged at about 33 hours per week per worker.

In summary, three structural factors seem to account for the difference in GDP growth between Japan and the United States in the post-1990 period: (i) the slow population growth in Japan, (ii) the employment rate, and (iii) the decline of average hours worked in Japan from a very high level to the level in the United States. It seems useful to consider these findings when Japan's experience is used to draw policy conclusions for the United States. ■

Notes

¹ The data used here are from the Penn World Table 8.0. For information regarding these data, see Feenstra, Inklaar, and Timmer (2013).

² Some episodes of this decline, such as 1988 to 1992, are explained by changes in regulations on working hours (see Hayashi and Prescott, 2002).

References

Feenstra, Robert C.; Inklaar, Robert and Timmer, Marcel P. "The Next Generation of the Penn World Table." NBER Working Paper No. 19255, National Bureau of Economic Research, 2013; <http://www.ggd.net/pwt>.
 Hayashi, Fumio and Prescott, Edward C. "The 1990s in Japan: A Lost Decade." *Review of Economic Dynamics*, January 2002, 5(1), pp. 206-35.