

# Impacts on China of America's Long Slowdown, a Loss of its 'Spirit' to Invest and the Huge Rise of Its Public Debt

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## EXECUTIVE SUMMARY

Economists commonly think about the benefits and costs of economic cooperation between two large countries, such as China and America, or the East and the West, in terms of the gains from *trade*: Each country steps up output of the good in which it has a “comparative advantage” and exports some of this output to the other country.

The *gains* from such trade are clear: China gains from the increased price it obtains for the product it exports to America and America gains from an increased price it obtains for the product it exports. As a result, national income increases in both countries.

Yet, a country's products are predominantly produced by a combination of two or more “factors of production” – labor and capital, for example. If a country's production of the imported good is *labor-intensive*, the imports may cause *wage rates* to fall; if *capital-intensive*, the *return on capital* may fall. (There can be a *reduced* return on labor or on capital though *not* on both.)

It is worth saying, however, that after China achieved what Walt Rostow dubbed “take-off into sustained growth” its economy soon became *large* relative to the countries with which it traded as measured by gross national product. As a consequence, China's *gains from trade* with America have generally *lessened*. And after America lost its high rapid growth, China was able to become *still larger* relative to America and thus gaining

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<sup>1</sup> The econometric research for this report was carried out in collaboration with Gylfi Zoega, professor of economics at the University of Iceland and part-time Professor at Birkbeck College at the University of London. I am also grateful to Professor Hian Teck Hoon, Dean of the School of Economics at Singapore Management University, for discussion.

still *less* from trade.

Now, though, there have been –most importantly in America – some forces operating through channels *other than trade* that have had important impacts on China. In this presentation, I will take up three such forces in America: First: the severe loss of productivity growth (*i.e.*, the growth rate of TFP) and resulting fall in the rate of return to investment. Second: the broad decline of the “spirit” to invest. Last: the huge increases in the size of the U.S. public debt.

### ***Impacts of Big U.S. Shocks on China 1980-2019***

- The sharp slowdown of America’s productivity growth in the early 1970s lasting for more than two decades and then resuming (after the internet boom) in the early 2000s, has had the effect in *America* of slowing the “augmentation” of labor, thus leading to a gradual rise of the capital-augmented labor ratio. In turn, this “capital deepening” in America, in reducing profit rates there, drove down long real rates of interest in America (and may have pushed share prices up in the process). That is a force operating to reduce real interest rates (and possibly raise share prices) in *China* as well and thus to increase China’s investment-output ratio. Thus America’s slowdown – in this respect at any rate – has boosted China’s development.

The logic – the “theory” – behind this *slowdown thesis* is perhaps clear enough to economic theorists. In any case, the econometric analysis undertaken here– a statistical analysis of time series – estimated that America’s TFP growth rate does indeed have a *negative* coefficient in the equation explaining China’s investment-output ratio. That finding supports the slowdown thesis – whether or not the totality of forces drove up China’s investment ratio.

- Another hypothesis is that a significant *loss* in America of the spirit that investing typically requires – a weakening of what John Maynard Keynes referred to as companies’ “animal spirits” – can be expected to have a positive impact on Chinese investment

because the pullback of investment in America widens the market share available to the Chinese. Overseas capital markets will be especially less crowded than they would otherwise have been. The logic, or “theory,” of this thesis is quite simple.

The econometric analysis here estimates that an *increase* of “animal spirits” in America – an increase of the constant term in the equation – would have a negative effect on Chinese investment, as implied by the thesis. Hence a *loss* of that spirit would indeed be *positive* for Chinese investment.

- The theory here implies that an increase of America’s public debt resulting from fiscal deficits, in adding to its total wealth, operates to contract its supply of labor, thus lowering its real wage rates. But in the long run, the increase of America’s public debt, in driving a wedge (or widening the wedge if one is already there) between wealth and capital, has the effect of driving *world* interest rates up and thus causing the capital stock to take a flatter (less steep) path in China and in the world than it would otherwise have been taken.

Evidence from the econometric model of the Chinese economy studied here finds that such a creation of wealth in America does indeed have a negative effect on investment in China.

- Last, there may be positive effects from the surge of American firms into China in order to take the opportunity to operate factories where wage rates are far lower than in America – thus pulling up wage rates in China and causing wage rates in America to slow, if not fall.

## **BACKGROUND RESEARCH**

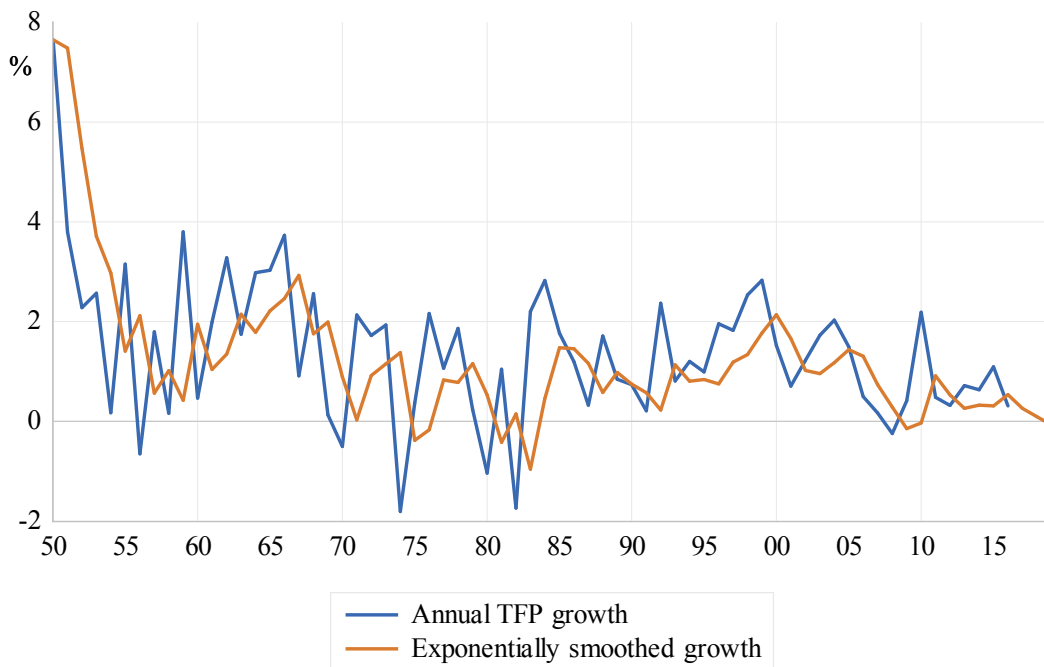
Surprisingly there has been little or no research that would support or call into question the above three hypotheses. Thanks to the collaboration of my long-time colleague in the area of econometric analysis, Prof. Gylfi Zoega, it has proved possible to find some econometric support for the above hypotheses.

### ***Slowdown of productivity growth***

The following figures show (in the blue line) the growth rate of total factor productivity growth taken from a Bank of France database<sup>2</sup> and an exponential smoothing of that series.<sup>3</sup> The smoothing serves to capture the gradual realization, or awakening, among the actors in the economy of changes in the rate of productivity growth – thus to capture learning about developments in the growth of productivity.

Note the fall in productivity growth at the end of the 1950s, the increase in the late 1960s and the decline that started around 1970s and reached a trough in the mid-1980s. There is also the recovery of productivity growth in the late 1990s and the subsequent decline. Thus, the rate of productivity growth rose in the late 1960s and the late 1990s and fell from the late 1960s to the mid-1980s and then again in the 2000s.

### Total factor productivity growth in the United States

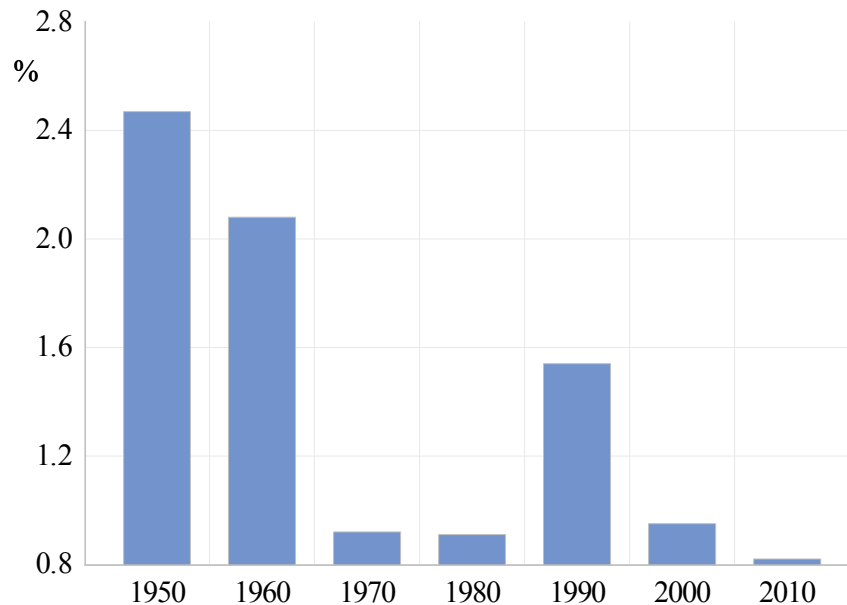


<sup>2</sup> See <http://www.longtermproductivity.com/about.html>.

<sup>3</sup> This is exponential smoothing using the Holt-Winters method. In effect, it makes the value of the smoothed series for each year be a weighted average of past values of the original series.

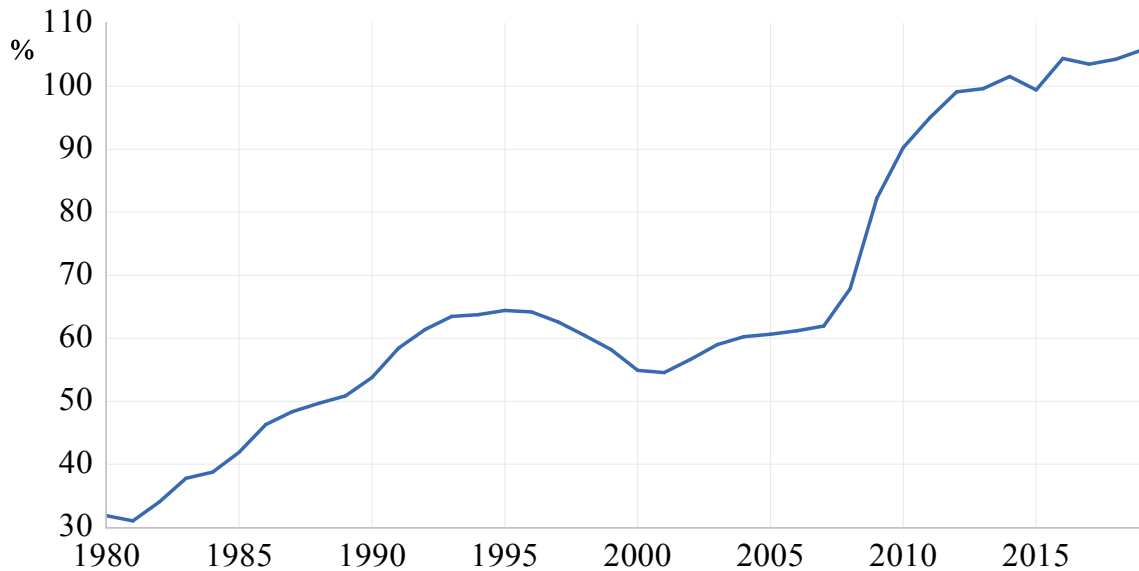
The following figure has the rate of growth of productivity in each decade starting with the 1950s (1950-1959). The average rate of growth of TFP is high in the 1950s, falls somewhat in the 1960s and then more in the 1970s and 1980s, rises in the 1990s and then falls back in the 2000s.

Average TFP Growth in the United States



There was a steady increase in public debt in the U.S. from 1981 to the mid-1990s, then a fall until 2001. The fall in the late 1990s coincided with the higher productivity growth shown in the figure above and the Bush tax increase in 1991. Between 2001 and 2007, the Bush tax cuts and the war in Iraq led the debt to increase from 55% of GDP in 2001 to 62% in 2007. Then the global financial crisis of 2008 caused debt to increase rapidly from 2008 to 2014, reaching 102% of GDP. *Before* Covid-19 hit the economy, the debt level had reached 106% of GDP. Now it is widely thought it could reach as high as 140% of a reduced GDP.

## Central government debt in the U.S.

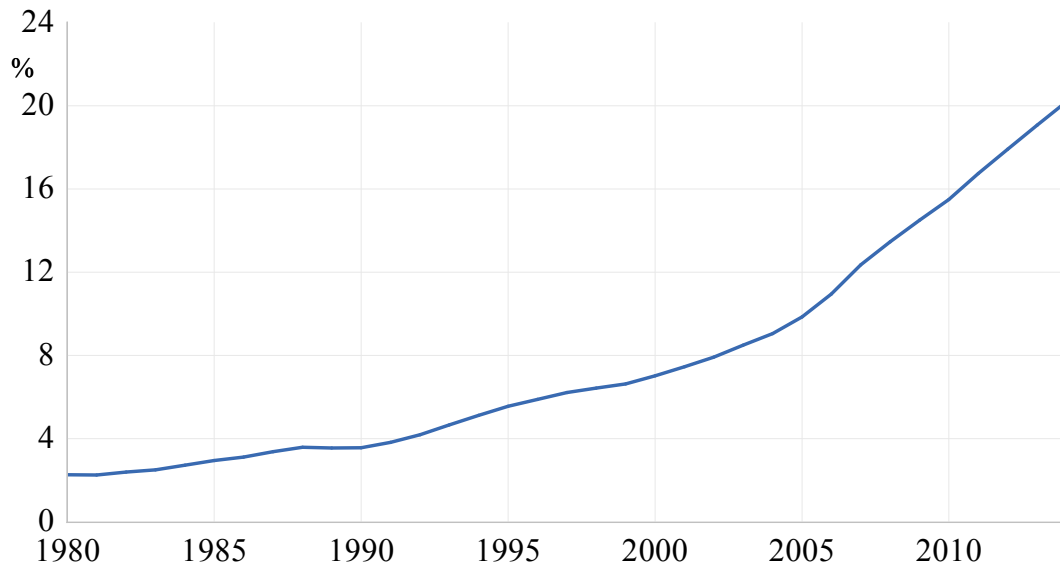


Source: FRED

The rapid rise in debt after 2008 coincided with the growth of investment in China stalling in 2010. There is of course the problem of distinguishing between the direct effect of the financial crisis on investment in China and elsewhere and the indirect effect going through debt in the United States.

Last, we consider the effects of an increase of American firms operating in China. American firms operating in China have the effect of transferring technology, which is one of many routes through which China is gradually closing the technology gap with the United States. The following figure shows the ratio of output per employed worker in China to that in the United States, which is increasing over time.

## Ratio of Chinese to U.S. output per employed worker

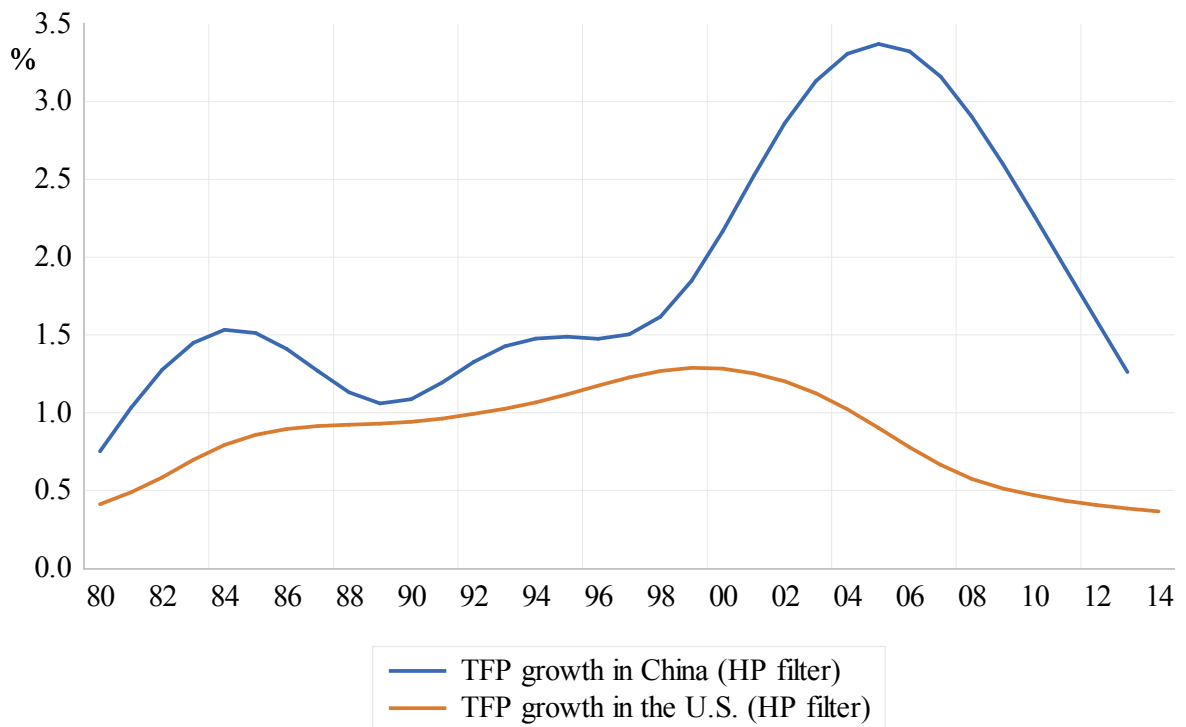


Source: Penn World Tables.

The rising output per employed worker in China stems from both high investment as well as rapid productivity growth.

The figure below shows the Hodrick-Prescott smoothing of the time series of the rate of TFP growth in China and the U.S. since 1980.

## TFP growth in China and the U.S (HP smoothed)



Source: Penn World Tables

The fact that TFP growth in China is faster than in the U.S. means that the technology gap with the U.S. is shrinking over time. It is noteworthy that TFP growth in China accelerated in the early 2000s when the gap was much smaller than in the 1990s. This could be explained by China's increased ability to learn from the rest of the world due to the many Chinese students returning from studies in the West, a surge of American and other Western countries' operation of factories in China or increased rate of indigenous innovations.

### ***Multiple regressions***

In Table 1 we report the results of a multiple linear regression where the dependent variable is the investment ratio for China (ratio of gross capital formation to Chinese



GDP taken from the Penn World Table) in percentages. The objective is to assess to what extent the U.S. economy impacts China through the channels described above.

Table 1. Investment equation for China  
(Investment and public debt relative to U.S. GDP)

Dependent variable: Investment-output ratio in China		
Period: 1980-2014		
	Coefficient	t-ratio
Constant term	38.52	1.62
TFP growth in U.S. (%)	-2.05*	2.15
Investment-output ratio U.S. (%)	-1.68	1.57
Public debt/GDP in U.S. (%)	0.27*	2.51
Standard & Poor 500 (real)	2.62*	2.82
R-squared	0.84	
F-statistic	40.6	

\* Indicates significance at the 5% level.

The first explanatory variable is the rate of TFP growth in the U.S., measured in percentages.<sup>4</sup> We apply adaptive smoothing techniques that make our TFP growth series respond gradually to actual TFP developments.<sup>5</sup> The estimated coefficient is statistically significant with a value equal to -2.05, which implies that a 1% slowdown in productivity growth in the U.S. (as from 2% to 1% per annum) goes together with an increase in the ratio of gross capital formation in China to GDP in China of 2%.

There is then the effect of changes in the U.S. investment to GDP ratio discussed above. A significant *loss* in America of the spirit that investing typically requires can be

4. Taken from a Bank of France database, see <http://www.longtermproductivity.com/about.html>.

5 The smoothing method applied uses adaptive forecasting to capture slow learning about productivity growth developments. Exponential smoothing methods adjust the weights applied to past observations of TFP growth based on forecast errors. See Bruce L. Bowerman and Richard O'Connell (2004), *Forecasting, Time Series, and Regressions*, Cengage Learning. We use the Hold-Winters method that generates forecast with a linear trend.

expected to have a positive impact on Chinese investment because the pullback of investment in America widens the market share available to the Chinese. The estimated coefficient is less significant. Its value implies that a 1% fall in the U.S. investment to GDP ratio goes together with an increase in the investment ratio in China of 1.7%.

We then add public debt (central government debt) in the US as a ratio to GDP measured in percentages. The coefficient has a value of 0.27, which implies that an increase in the U.S. debt ratio of 10% will increase investment in China by 2.7%. The sign of the coefficient goes counter to the hypothesis proposed in the earlier section of this note. But see the paragraph below for a further discussion.

Finally, the real S&P 500 index (deflated by the CPI) has a robust and statistically significant coefficient. The index has a value of 6.2 in 2005 and 8.2 in 2014 so that the implied effect on the investment ratio in China is 5.2%.

A better way of measuring the effect of U.S. investment and public debt on China is to measure them relative to China's GDP. The results are in Table 2.

**Table 2. Investment equation for China  
(Investment and public debt relative to Chinese GDP)**

Dependent variable: Investment-output ratio in China				
Period: 1980-2014				
	(1)	(2)	(3)	(4)
Constant term	55.39* (43.12)	57.72* (44.63)	59.91* (33.17)	54.34* (20.69)
Investment in U.S./output in China (%)	-0.51* (22.30)	-0.52* (26.03)	-0.49* (17.70)	-0.44* (14.92)
TFP growth in U.S. (%)		-1.55* (3.50)	-1.12* (2.24)	-1.70* (3.39)
Public debt in U.S./GDP in China (%)			-0.03* (1.69)	-0.03 (1.39)
Standard & Poor 500 (real)				0.67* (2.72)
R-squared	0.94	0.96	0.96	0.97
F-statistic	497.33	339.60	240.53	219.52

\* Indicates significance at the 5% level.

We first include the investment-output ratio in column (1) of the table, then add TFP growth in column (2), then public debt in column (3) and finally the S&P 500 in column (4). The estimated coefficient of the investment variable implies that a 1% fall in U.S. investment as a ratio to Chinese GDP makes the investment-output ratio in China rise by 0.5%; a fall in TFP growth in the U.S. by 1% makes the investment-output ratio in China rise by 1.7%; a rise of public debt of 10% in the U.S. makes the investment-output ratio *fall* by 0.3%; and the observed rise in the S&P 500 from 2005 to 2014 makes the investment-output ratio in China go up by 1.3%.

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\* Edmund Phelps, the 2006 Nobel Laureate in economics, is director of Columbia's Center on Capitalism and Society, now in its 20th year. His career began at the RAND Corp. in 1959-60 and Cowles Foundation, Yale, in 1960-61.

Among his 20 or so books, he is the author of *Fiscal Neutrality toward Economic Growth* (1965), *Golden Rules of Economic Growth* (1966), coauthor and editor of *Microeconomic Foundations of Employment and Inflation Theory* (1970), author of *Inflation Policy and Unemployment Theory* (1972), author of *Political Economy: An Introductory Text* (1985), principal author of *Structural Slumps* (1994), author of *Seven Schools of Economic Thought* (1990), author of *Rewarding Work* (1997, 2007), editor of *Designing Inclusion* (2003), co-editor with H-W Sinn of *Perspectives on the Performance of the Continental Economies* (2011), author of *Mass Flourishing* (2013) and principal author of *Dynamism: The Values that Drive Innovation, Job Satisfaction and Economic Growth*, (2020) with Raicho Bojilov, Hian Teck Hoon and Gylfi Zoega.