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Debt and Growth in a Time of Controversy

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The weight of the evidence indicates that high debt slows growth, but there is no magic threshold above which any country at any time will experience slower growth. This truth has been illustrated in the recent controversy around "Growth in a Time of Debt," an academic paper by Carmen Reinhart and Kenneth Rogoff.[1]

Reinhart, Rogoff, and Rebuttals. "Growth in a Time of Debt" has been widely cited in the policy world for its conclusion that gross debt above 90 percent of gross domestic product (GDP) is associated with lower economic growth. "Growth in a Time of Debt" argues that episodes of high debt tend to last a long time.

Thomas Herndon and two professors at the University of Massachusetts attempted to replicate "Growth in a Time of Debt" and found an Excel error and some controversial choices in using the data.[2] Some of those who disliked the paper all along are now declaring its findings "debunked."[3]

The replication by Herndon et al. was valuable, demonstrating once again the importance of peer review. They fixed the Excel formula error and showed that with newly available data, Reinhart and Rogoff's numbers could be improved, producing a less stark but no less compelling result. They did not, however, "debunk" the paper, nor did their analysis speak to the many other papers on the same topic, several of which are more rigorous than "Growth in a Time of Debt" and come to similar conclusions.

Debunking Debunked. In their paper and subsequent discussions, Reinhart and Rogoff report the average performance of low-, medium-, high-, and very-high-debt countries using two statistics: median and mean average. They emphasize the median because it is less sensitive to extremes. In the replication paper, however, Herndon et al. do not mention medians; instead, they focus only on mean averages.

The most embarrassing mistake that Reinhart and Rogoff made was to exclude five countries from calculations of mean averages. On its own, that increased the mean average growth for very-high-debt countries just one-third of one percentage point. That error is worth correcting, but it is not enough to change any of Reinhart and Rogoff's conclusions. It certainly does not "debunk" the paper, since it leaves intact the finding that the economic performance of very-high-debt countries is significantly inferior to those of other countries.

Another criticism was that Reinhart and Rogoff did not include some early post-war years of data. Reinhart and Rogoff responded that they included all the data that they had gathered and vetted at the time. Some data that they had gathered had not been vetted in time for the 2010 paper. In later work, they have included more years and adjusted their numbers accordingly.[4] Herndon et al.'s updated calculation, since it is based on a larger data sample, can improve the precision of Reinhart and Rogoff's estimates without assigning any blame.

This paper, in its entirety, can be found at
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Herndon et al. also disagree with Reinhart and Rogoff's weighting choice, which is admittedly extreme: It weighs each country equally regardless of the number of data years available. Herndon et al., however, go to the opposite extreme, weighing each year equally without accounting for the fact that national trends persist across years, and find that it diminishes the mean average difference between very-high-debt and other countries. But they do not report any difference in the median.

In the end, all of Herndon et al.'s corrections and critiques show that countries with debt above 90 percent of GDP grow on average 2.0 percent less per year than low-debt countries and 1.0 percent less per year than countries with debt levels between 60 percent and 90 percent of GDP. Those numbers are quite similar to Reinhart and Rogoff's original median differences of 2.6 percent and 1.3 percent. Qualitatively, Reinhart and Rogoff's work remains fully intact, even when their data are in hostile hands.

Correlation and Causation. Herndon et al. revive a well-known—and accurate—critique of Reinhart and Rogoff's work: It does not address causality. Does high debt cause low growth? Does low growth cause high debt? Does a third factor cause both simultaneously? Because economics cannot be tested in a laboratory, economists must use economic theory and rigorous statistical methods to discern whether a measured correlation reflects an underlying causal relationship.

Reinhart and Rogoff, and some of their interpreters, may at times have oversold "Growth in a Time of Debt."[5] On its own, that paper does not tell a causal story. It is important to recall that Reinhart and Rogoff's great contribution has been to build a 200-year database of sovereign debt and economic crises.

But other authors have taken seriously the question of causation, using lagged data and econometric techniques, most notably Manmohan Kumar and Jaejoon Woo[6] and Stephen Cecchetti, Madhusudan Mohanty, and Fabrizio Zampolli,[7] whose contributions have been discussed previously.[8] Others have attempted to find "instrumental variables," an approach that is problematic when dealing with a phenomenon as broad as GDP growth. Using one set of instruments, Cristina Checherita and Philip Rother find that there is a negative effect on growth

1. Carmen Reinhart and Kenneth Rogoff, "Growth in a Time of Debt," *American Economic Review: Papers and Proceedings*, Vol. 100 (May 2010), pp. 573–578, http://scholar.harvard.edu/files/rogoff/files/growth_in_time_debt_aer.pdf (accessed April 23, 2013).
2. Thomas Herndon, Michael Ash, and Robert Pollin, "Does High Public Debt Consistently Stifle Economic Growth? A Critique of Reinhart and Rogoff," April 15, 2013, Political Economy Research Institute, http://www.peri.umass.edu/fileadmin/pdf/working_papers/working_papers_301-350/WP322.pdf (accessed April 23, 2013).
3. Editorial, "Rogoff-Reinhart Error Is Not the Source of Global 'Austerity,'" *The Washington Post*, April 21, 2013, http://www.washingtonpost.com/opinions/rogoff-reinhart-error-is-not-the-source-of-global-austerity/2013/04/21/17b14860-a91f-11e2-b029-8fb7e977ef71_story.html (accessed April 23, 2013); Tim Walker, "Meet Carmen Reinhart and Kenneth Rogoff, the Harvard Professors Who Thought They Had Austerity Licked—and Thomas Herndon, the Student Who Proved Them Wrong," *The Independent*, April 23, 2013, http://www.independent.co.uk/news/world/americas/meet-carmen-reinhart-and-kenneth-rogoff-the-harvard-professors-who-thought-they-had-austerity-licked--and-thomas-herndon-the-student-who-proved-them-wrong-8583600.html (accessed April 23, 2013); and Mike Konczal, "GOP's Go-To Economics Study Debunked," Salon.com, April 16, 2013, http://www.salon.com/2013/04/16/gops_go_to_economics_study_debunked_partner/ (accessed April 23, 2013).
4. Carmen Reinhart and Kenneth Rogoff, "Reinhart, Rogoff Admit Excel Mistake, Rebut Other Critiques," Wall Street Journal Real Time Economics blog, April 17, 2013, http://blogs.wsj.com/economics/2013/04/17/reinhart-rogoff-admit-excel-mistake-rebut-other-critiques/ (accessed April 23, 2013).
5. In an uncharitable article, Matthew O'Brien alleges some instances. Matthew O'Brien, "Forget Excel: This Was Reinhart and Rogoff's Biggest Mistake," *The Atlantic*, April 18, 2013, http://www.theatlantic.com/business/archive/2013/04/forget-excel-this-was-reinhart-and-rogoffs-biggest-mistake/275088/ (accessed April 23, 2013).
6. Manmohan S. Kumar and Jaejoon Woo, "Public Debt and Growth," International Monetary Fund, July 2010, http://www.imf.org/external/pubs/ft/wp/2010/wp10174.pdf (accessed February 22, 2013).
7. Stephen Cecchetti, Madhusudan Mohanty, and Fabrizio Zampolli, "The Real Effects of Debt," Bank for International Settlements, September 2011, http://www.bis.org/publ/work352.pdf (accessed February 22, 2013).
8. Salim Furth, "High Debt Is a Real Drag," Heritage Foundation *Issue Brief* No. 3859, February 22, 2013, http://www.heritage.org/research/reports/2013/02/how-a-high-national-debt-impacts-the-economy.

once debt reaches approximately 100 percent of GDP.[9] Ugo Panizza and Andrea Presbitero use a different set of instruments but cannot advance the discussion.[10]

In a more recent paper, Panizza and Presbitero review the literature on this topic, citing dozens of other papers written in the past three years.[11] They conclude that with the data limitations, estimates of debt drag are bound to be imprecise. They make the excellent point that debt threshold effects should generally be different across countries—a point that Reinhart and Rogoff also made in "Growth in a Time of Debt."[12]

Does Debt Hurt Growth? "Growth in a Time of Debt" showed that very-high-debt countries grow more slowly, on average, than other countries. That finding remains valid after a vigorous and hostile critique, but that single paper was never more than a small part of the broader understanding of how debt can hurt growth.

In the United States, the question is not whether gross debt at 90 percent of GDP is acceptable. With gross U.S. debt now over 100 percent of GDP, that milestone has been passed. Rather, the question is whether the nation will continue on a path that promises to take us to debt at 200 percent of GDP within 25 years. If the U.S. continues to borrow at profligate levels to pay for routine spending, it may not be able to borrow to defend itself in an unforeseen war or to ease the pain of the next great recession.[13]

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9. Cristina Checherita and Philip Rother, "The Impact of High Government Debt on Economic Growth and Its Channels: An Empirical Investigation for the Euro Area," *European Economic Review*, Vol. 56, No. 7 (October 2012), pp. 1392–1405.

10. Ugo Panizza and Andrea Presbitero, "Public Debt and Economic Growth: Is There a Causal Effect?," Money and Finance Research Group, April 2012, http://docs.dises.univpm.it/web/quaderni/pdfmofir/Mofir065.pdf (accessed April 23, 2013). The standard errors reported in Table 2 indicate that their instrumental variable approach cannot reject a negative effect twice as severe as the directly estimated debt drag, nor could they reject a positive effect of equal magnitude.

11. Ugo Panizza and Andrea Presbitero, "Public Debt and Economic Growth in Advanced Economies: A Survey," Money and Finance Research Group, January 2013, http://docs.dises.univpm.it/web/quaderni/pdfmofir/Mofir078.pdf (accessed April 23, 2013). Panizza and Presbitero are clearly debt-drag skeptics, so the survey is generally biased against finding anything.

12. Reinhart and Rogoff find that a 60 percent debt-to-GDP ratio is a better cutoff in emerging economies and that 90 percent is a better cutoff in advanced economies. It is well known that debt tolerance differs widely even within those categories.

13. David Greenlaw, James D. Hamilton, Peter Hooper, and Frederic S. Mishkin, "Crunch Time: Fiscal Crises and the Role of Monetary Policy," U.S. Monetary Policy Forum, February 22, 2013, http://images.derstandard.at/2013/03/08/USMPF13_final.pdf (accessed April 23, 2013).