

SAE./No.75/February 2017

Studies in Applied Economics

**IS SOUTH SUDAN
HYPERINFLATING?**

Steve H. Hanke

Johns Hopkins Institute for Applied Economics,
Global Health, and Study of Business Enterprise



Is South Sudan Hyperinflating?

by Steve H. Hanke

Copyright 2017 by the author.

About the Series

The *Studies in Applied Economics* series is under the general direction of Prof. Steve H. Hanke, Co-Director of The Johns Hopkins Institute for Applied Economics, Global Health, and the Study of Business Enterprise (hanke@jhu.edu).

About the Author

Steve H. Hanke is a Professor of Applied Economics and Co-Director of the Institute for Applied Economics, Global Health, and the Study of Business Enterprise at The Johns Hopkins University in Baltimore. He is a Senior Fellow and Director of the [Troubled Currencies Project](#) at the Cato Institute in Washington, D.C., a Senior Advisor at the Renmin University of China's International Monetary Research Institute in Beijing, a Special Counselor to the Center for Financial Stability in New York, a contributing editor at *Central Banking* in London, and a contributor at Forbes. Prof. Hanke is also a member of the Charter Council of the Society of Economic Measurement and of Euromoney Country Risk's Experts Panel.

In the past, Prof. Hanke taught economics at the Colorado School of Mines and at the University of California, Berkeley. He served as a Member of the Governor's Council of Economic Advisers in Maryland in 1976-77, as a Senior Economist on President Reagan's Council of Economic Advisers in 1981-82, and as a Senior Advisor to the Joint Economic Committee of the U.S. Congress in 1984-88. Prof. Hanke served as a State Counselor to both the Republic of Lithuania in 1994-96 and the Republic of Montenegro in 1999-2003. He was also an Advisor to the Presidents of Bulgaria in 1997-2002, Venezuela in 1995-96, and Indonesia in 1998. He played an important role in establishing new currency regimes in Argentina, Estonia, Bulgaria, Bosnia-Herzegovina, Ecuador, Lithuania, and Montenegro. Prof. Hanke has also advised the governments of many other countries, including Albania, Kazakhstan, and Yugoslavia.

Prof. Hanke has been awarded honorary doctorate degrees by the Bulgarian Academy of Sciences, the Universidad San Francisco de Quito, the Free University of Tbilisi, Istanbul Kültür University, and Varna Free University in honor of his scholarship on exchange-rate regimes. He is a Distinguished Associate of the International Atlantic Economic Society, a Distinguished Professor at the Universitas Pelita Harapan in Jakarta, Indonesia, a Professor Asociado (the highest honor awarded to international experts of acknowledged competence) at the Universidad del Azuay in Cuenca, Ecuador, and a Profesor Visitante at the Universidad Peruana de Ciencias Aplicadas (the UPC's highest academic honor). In 1998, he was named one of the twenty-five most influential people in the world by *World Trade Magazine*.

Prof. Hanke is a well-known currency and commodity trader. Currently, he serves as a member of the Supervisory Board of Advanced Metallurgical Group N.V. in Amsterdam and Chairman Emeritus of the Friedberg Mercantile Group, Inc. in Toronto. During the 1990s, he served as President of Toronto Trust Argentina in Buenos Aires, the world's best-performing emerging market mutual fund in 1995.

Prof. Hanke's most recent books are *Zimbabwe: Hyperinflation to Growth* (2008) and *A Blueprint for a Safe, Sound Georgian Lari* (2010), *Juntas Monetarias para Paises en Desarrollo* (2015), and *Currency Boards for Developing Countries: A Handbook* (2015).

Prof. Hanke and his wife, Liliane, reside in Baltimore and Paris.

The popular financial press has, for some time, asserted that hyperinflation was either [just around the corner](#), or that it had already reared its ugly head in South Sudan. Reporters have inquired about my measurements and opinions on hyperinflation in South Sudan. I have demurred, indicating that the quality of the data that I possessed was too low to make a determination as to whether South Sudan's inflation rate had reached hyperinflation levels.

Thankfully, Arti Grover at the World Bank helped me overcome my data woes. The [World Bank's Market Price Surveys of South Sudan](#) contain high-quality data for the South Sudan pound-U.S. dollar rate (SSP/USD). It is collected from foreign exchange black markets (read: free markets) in 16 cities in South Sudan. The time series begins in August 2012.

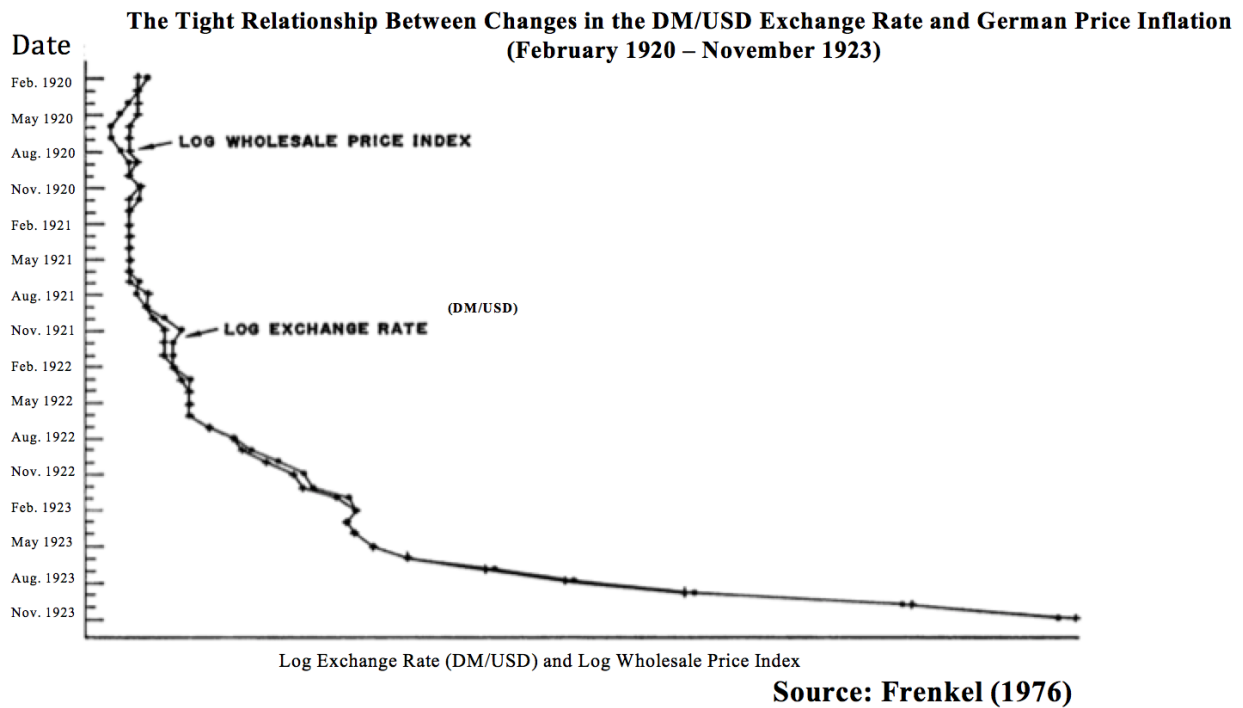
So, does South Sudan qualify to enter the [Hanke-Krus World Hyperinflation Table](#) (Hanke and Krus, 2012) as the [58th country](#) (Hanke and Bushnell, 2016) in history to have hyperinflated? To answer that question, I employ three criteria:

1. Following Phillip Cagan's (1956) classic article on hyperinflation, the economics profession adopted the following criterion: to qualify as a hyperinflation, the inflation rate must be at least 50 percent per month. I adopt this convention.
2. In addition, I specify that the 50 percent rate must persist for at least 30 consecutive days.
3. Lastly, I mandate that the inflation episode must be fully documented and that inflation estimates must be replicable.

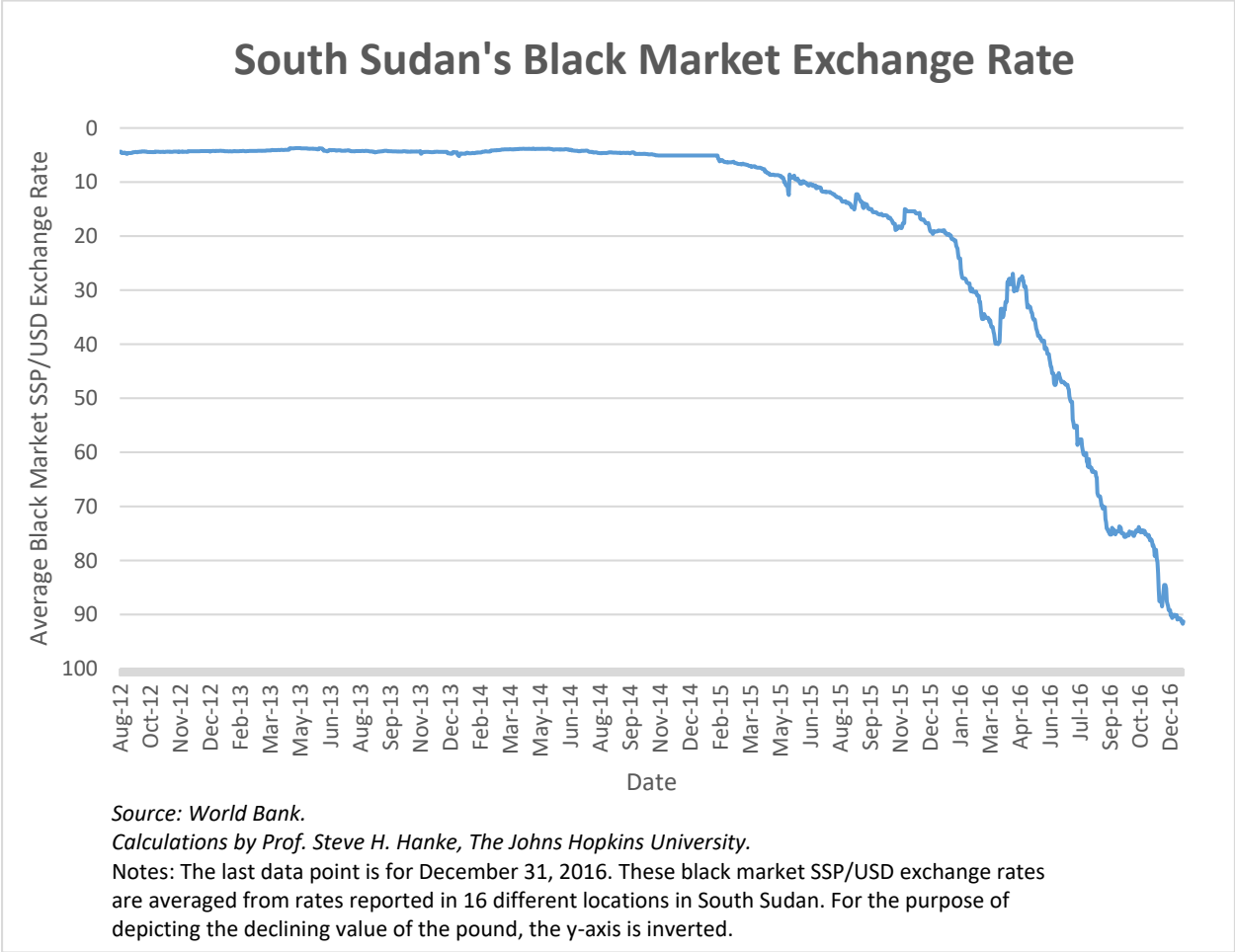
Reliable official inflation statistics for South Sudan are not available. The lack of reliable official inflation data is a "problem" that can be overcome, however. The most important price in an economy is the exchange rate between the local currency and the world's reserve currency – the U.S. dollar. As long as there is an active black market (read: free market) for currency and the black market data are available, changes in the black market exchange rate can be reliably

transformed into accurate estimates for countrywide inflation rates. The economic principle of Purchasing Power Parity (PPP) allows for this transformation and the accurate estimates of countrywide inflation rates.

Jacob Frenkel's (1976) path-breaking work on the German hyperinflation established once and for all why, at high rates of inflation, the use of PPP yields very accurate inflation estimates (Manzur, 1990). Frenkel ran six regressions of the German mark-U.S. dollar exchange rate on various German price indices (Frenkel, 1976). The results of these regressions confirm the theory of PPP and strongly support its application during hyperinflations. Indeed, Frenkel found a near one-to-one relationship between changes in exchange rate and price levels during the German hyperinflation. The chart below shows this tight linkage. McNown and Wallace (1989), as did Taylor and Taylor (2004), reinforced Frenkel's findings and confirmed that PPP held for countries that were experiencing elevated rates of inflation.



To obtain the free market exchange rates required for the application of PPP, I use black market exchange rates. Black market rates are efficient processors of information when political and economic circumstances make the official exchange rate unreliable or irrelevant (Arbetman and Kugler 1997). The course of the South Sudan pound-U.S. dollar (SSP/USD) black market rate is shown in the chart below. The value of the pound against the dollar has collapsed. PPP suggests that South Sudan is experiencing a dramatic inflation surge.



PPP can be employed to accurately transform changes in the pound’s black market exchange rate into accurate estimates of South Sudan’s inflation. One form is Absolute PPP. It states that the price of a standard market basket of goods, when measured in a common currency, is the same in all countries because of international arbitrage (Manzur 1993). Formally, this can

be written as: $S=P/P^*$, where S is the spot market exchange rate, P is the price of the basket in domestic currency, and P* is the price of the basket in foreign currency. With Absolute PPP, the Law of One Price holds. That is, all goods sell at the same price when converted into a common currency. But, three major factors can cause the Law of One Price not to hold in the short run. They are: transportation costs and barriers to trade; different speeds of adjustment in the foreign exchange market and goods markets; and differences in the composition of “market baskets” (Mahdavi and Zhou 1994).

The shortcomings of Absolute PPP can be overcome with the use of a second form of PPP: Relative PPP. It accounts for the factors that can cause deviations from Absolute PPP and adjusts for transaction costs and barriers to trade (Manzur 1993). Relative PPP relates the percentage change in the exchange rate between two currencies to the inflation rate differential between two countries. It holds, even if Absolute PPP does not (Mahdavi and Zhou 1994). Relative PPP can be written as: $S' = P' - P^{*}$, where S' is the percentage change in the spot market exchange rate, P' is the percentage change in the price of the basket in domestic currency, and P*' is the percentage change in the price of the basket in foreign currency (Manzur 1993).

I apply Relative PPP to calculate inflation in South Sudan. Let

P_A = the South Sudan price level in pounds,

P_B = the United States price level in U.S. dollars, and

$S_{A/B}$ = the exchange rate (pounds/ U.S. dollar).

Then, PPP in the absolute form states that:

$$\frac{P_A}{P_B} = S_{A/B}.$$

The Absolute PPP can be converted to Relative PPP:

$$\frac{1 + \frac{\Delta P_A}{P_A}}{1 + \frac{\Delta P_B}{P_B}} = 1 + \frac{\Delta S_{A/B}}{S_{A/B}}$$

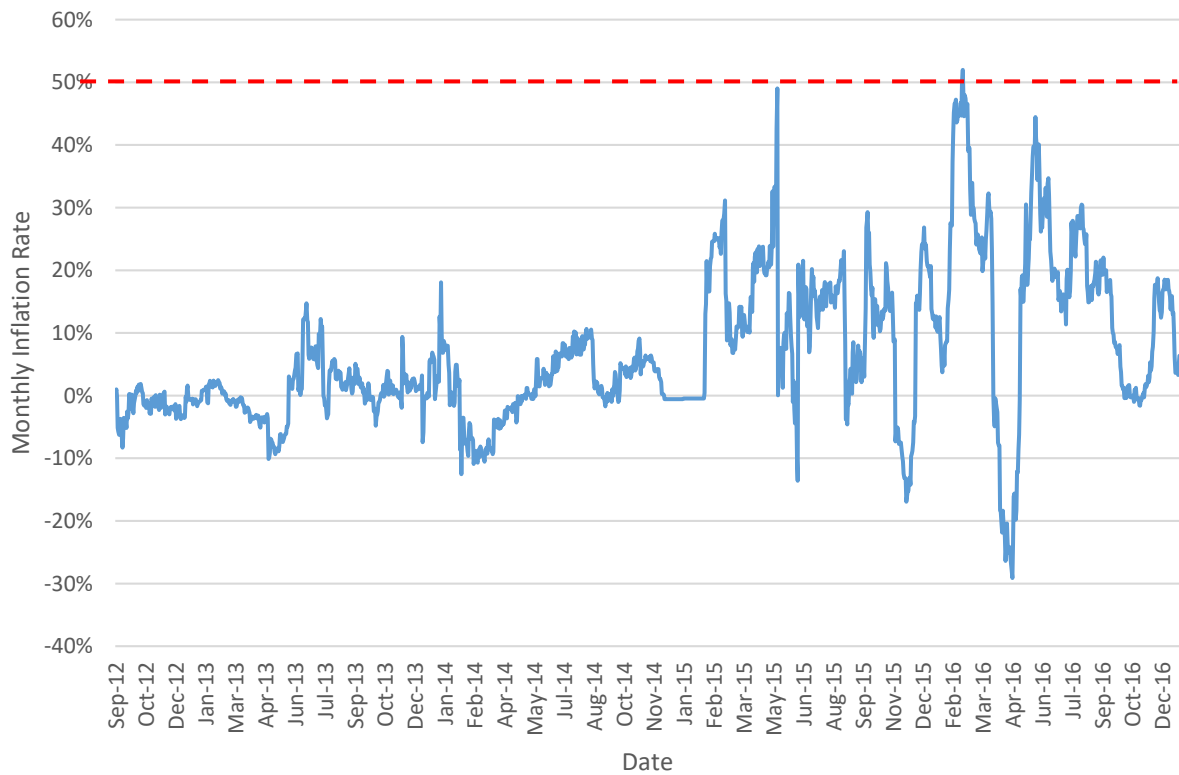
These terms can then be rearranged to obtain the following relationship:

$$\frac{\Delta P_A}{P_A} = \left[\left(1 + \frac{\Delta P_B}{P_B} \right) \left(1 + \frac{\Delta S_{A/B}}{S_{A/B}} \right) \right] - 1.$$

Thus, if the U.S. inflation rate and the change in the exchange rate between the pound and the dollar are known over the given time period, the inflation rate in South Sudan can be calculated. In order to make the calculations, I use the Consumer Price Index for All Urban Consumers: All Items. This index is reported by the U.S. Bureau of Labor Statistics, and the black market exchange rate for the pound against the dollar is from the World Bank's data.

The following chart shows that the monthly inflation rate in South Sudan has been elevated, particularly in the 2015-2016 period. However, the monthly rate only exceeded 50 percent on two days: February 15, 2016 and February 16, 2016. South Sudan failed to ever sustain a monthly inflation rate above 50 percent for 30 consecutive days over the study period. In consequence, South Sudan did not, contrary to many reports in the financial press, experience hyperinflation.

South Sudan's Monthly Inflation Rate



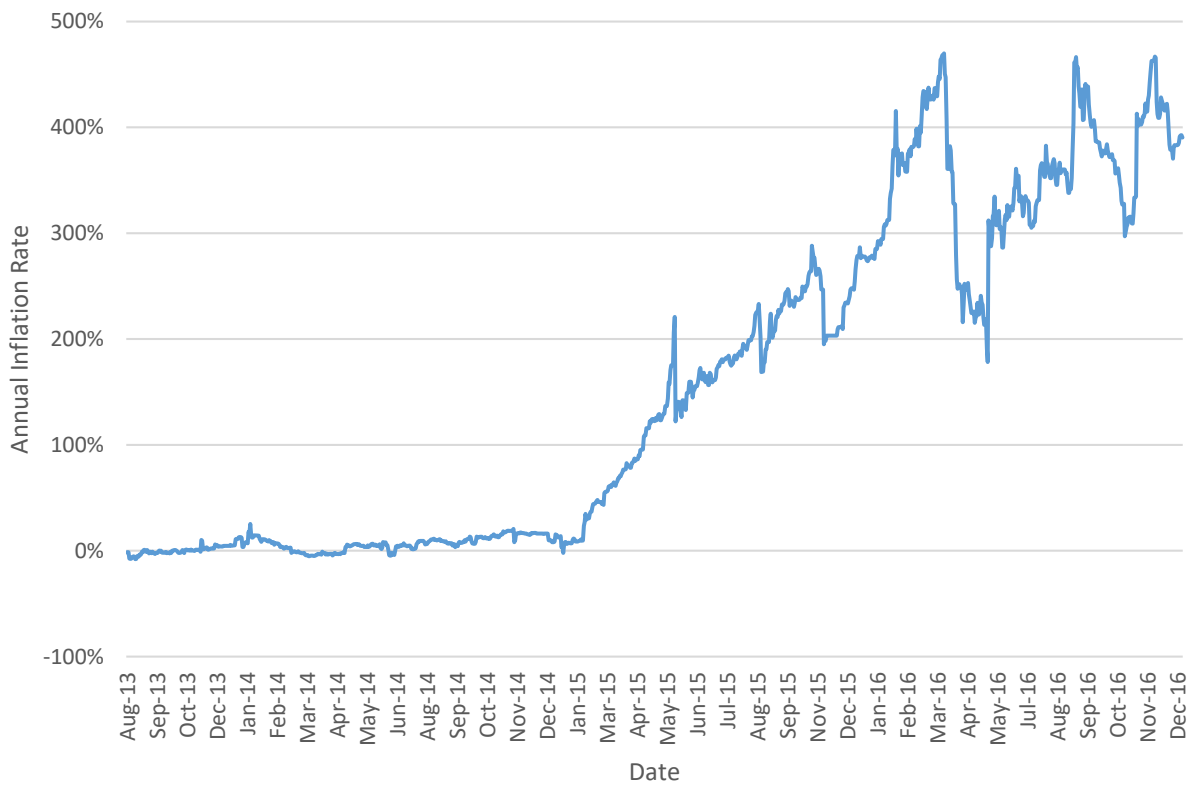
Source: U.S. Bureau of Labor Statistics and World Bank.

Calculations by Prof. Steve H. Hanke, The Johns Hopkins University.

Notes: The last data point is for December 31, 2016. These monthly inflation rates are implied from the black market SSP/USD exchange rate.

In closing, and for those who are more accustomed to using annual inflation rates, the chart below contains South Sudan's annual (year-over-year) inflation rates. At the end of 2016, the annual inflation rate was 390 percent.

South Sudan's Annual Inflation Rate



Source: U.S. Bureau of Labor Statistics and World Bank.

Calculations by Prof. Steve H. Hanke, The Johns Hopkins University.

Notes: The last data point is for December 31, 2016. These annual inflation rates are implied from the black market SSP/USD exchange rate.

Works Cited

- Arbetman, Marina, and Jacek Kugler. *Political Capacity and Economic Behavior*. Boulder, CO, Westview Press, 1997.
- Cagan, Phillip. "The Monetary Dynamics of Hyperinflation." *Studies in the Quantity Theory of Money*, Edited by Milton Friedman, University of Chicago Press, Chicago, 1956.
- Frenkel, Jacob. "A Monetary Approach to the Exchange Rate: Doctrinal Aspects and Empirical Evidence." *The Scandinavian Journal of Economics*, vol. 78, no. 2, 1976, pp. 200–224.
- Hanke, Steve H., and Charles Bushnell. "Venezuela Enters the Record Book – The 57th Entry in the Hanke-Krus World Hyperinflation Table." *Johns Hopkins Institute for Applied Economics, Global Health, and the Study of Business Enterprise. Studies in Applied Economics*. no. 69, 2016.
- Hanke, Steve H., and Nicholas Krus. "World Hyperinflations." *Routledge Handbook of Major Events in Economic History*, Edited by Robert Whaples and Randall Parker. London, Routledge, 2013.
- Mahdavi, Saeid, and Su Zhou. "Purchasing Power Parity in High-Inflation Countries: Further Evidence." *Journal of Macroeconomics*, vol. 16, no. 3, 1994, pp. 403–422.
- Manzur, Meher. "An International Comparison of Prices and Exchange Rates: a New Test of Purchasing Power Parity." *Journal of International Money and Finance*, vol. 9, no. 1, 1990, pp. 75–91.
- Manzur, Meher. *Exchange Rates, Prices, and World Trade: New Methods, Evidence, and Implications*. London, Routledge, 1993.

McNown, Robert, and Myles Wallace. "National Price Levels, Purchasing Power Parity, and Cointegration: a Test of Four High Inflation Economies." *Journal of International Money and Finance*, vol. 8, no. 4, 1989, pp. 533–545.

Taylor, Alan M., and Mark P. Taylor. "The Purchasing Power Parity Debate." *The Journal of Economic Perspectives*, vol. 18, no. 4, 2004, pp. 135–158.