Did futures markets anticipate deflation? Replicating and challenging James Hamilton's (1992) 'straw man' argument in 'Was the deflation during the great depression anticipated? Evidence from the commodity futures market.'

Rasheed Saleuddin*

* Centre for Financial History and Corpus Christi College, University of Cambridge
rkms2@cam.ac.uk

Abstract

James Hamilton (1992) uses commodities futures markets data to show that the deflation of the Great Depression years from 1929 to 1932 was not anticipated, evidence against a solely monetarist interpretation of the deepest economic contraction in history. By neglecting the historical context and market microstructure of the Interwar commodities markets, however, Hamilton has jumped to conclusions that should not stand. By contextualizing the data using the empirical and theoretical concepts developed by agricultural economist and statistician Holbrook Working and demonstrated by his "Working Curve", I mount a vigorous defense against Hamilton's "straw man" argument that the futures markets could not anticipate deflation.

James Hamilton (1992) uses commodities futures markets to show that the deflation of the Great Depression years from 1929 to 1932 was not anticipated. If this is true, the monetarist explanation for the Great Depression is less likely (Friedman & Schwartz 1963) and Keynesian (Temin 1976) or financial explanations (Bernanke 1983) look to be better alternatives. This is because the nominal interest rate behaved in such a way that monetary factors could only have been the primary cause of the Great Depression if economic actors anticipated deflation and thus understood that the low nominal rate was in fact a very high real interest rate. Unfortunately the paper is fatally flawed. This replication paper reproduces the first half of Hamilton's work in his 1992 paper (tables 1 through 3), and then introduces one important variable that dramatically alters the results. Other crucial issues related to his interpretation of Mishkin (1990), French (1986), Fama (1991), Peck (1975), Cecchetti (1992) and Working (1949) will be addressed in an upcoming paper with D'Maris Coffman.

Beginning in the middle of the 19th century, agricultural commodities such as wheat and corn began to be traded in organized "futures" markets in the Unites States and the United Kingdom, where specified quantities and grades of a crop could be contracted for at a set price in advance of their delivery. By the Interwar period, including the Great Depression, certain markets such as those for wheat and cotton became the benchmark prices off of which many cash, or "spot", and futures transactions (on other exchanges) of those commodities were agreed.

Hamilton interprets the efficient market hypothesis (Fama 1991) in such a way as to conclude early on in his paper that the futures markets did not anticipate the severe deflation of the early years of the Great Depression. This "straw man" argument, once dismissed, sets the stage for a deep exploration of anticipatory prices involving applications of the efficient market hypothesis and rational expectations (Muth 1961).

In the paper, futures prices for corn, wheat, rye, oats, lard and cotton appear to be predicting significant inflation in these commodities. For example, from Table I in Hamilton's paper (see also my replication), wheat futures appear to predict an *increase* in wheat prices of 16.3% annualized from September 1929 to September 1932, when in fact "spot" wheat prices *fell* 8% over that same period. However, this rather compelling argument is flawed in that it both misinterprets the efficient market

hypothesis as well as Holbrook Working's earlier work (e.g. 1933) on the conditions extant during the Great Depression. This result is surprising in that he was clearly aware of both topics, as they are both cited in defense of his methodology.

Hamilton has chosen as his straw man a simple comparison of the basis (that is, the difference between the cash price of a commodity and its "future" price for delivery of that commodity at a later date) and the actual price changes for the same period to claim that actors were clearly not capable of anticipating the large downward price moves of the six commodities under investigation during the early years of the Great Depression. There are many problems with this methodology, but here I only address an error in missed context. Now it turns out that the period from 1929 to 1932 was characterized by significant oversupply of many commodities (Working 1933). In years of oversupply post-harvest, such as 1907, 1916 and, importantly 1929-1932, spot prices should (and usually do) fall below the futures price until holders of inventories are rewarded in excess of the costs of carry (Kaldor 1939; Working 1949). As such, the first column in Hamilton's table I will be positive from 1929 to 1931 due to the high wheat "carryover", regardless of any deflationary expectations.

[Insert Figure I here]

I correct for the oversupply levels of 1929 to 1932 for wheat (see my replication code) and find that, for years with high carryover, assuming a 2 cent per bushel per month cost of carry (Working and Hobe 1929), wheat prices "anticipated" a <u>fall</u> of 25% (higher costs of carry) or 9% (with a very low cost of carry of 1 cent per bushel per month) versus an actual fall (again from Hamilton's (1992) table I) of 8%. Now, as a separate issue, my data (based on CBOT futures prices) shows an actual fall of 30%. Regardless of which actual own price inflation one uses, it is clear that the largest futures market, after considering inventory carryover costs of carry, did, in some way, anticipate the commodity's own price deflation. Importantly, the market for oats behaved similarly during this period (Brennan 1958).

By neglecting the historical context and market microstructure of the Interwar commodities markets, the paper in question makes initial conclusions that do not survive our cursory revisiting of the data. A simple correction using the "Working

Curve" mounts a defense against Hamilton's attack of his straw man that the futures markets could not anticipate the severe deflation of 1929-1932.

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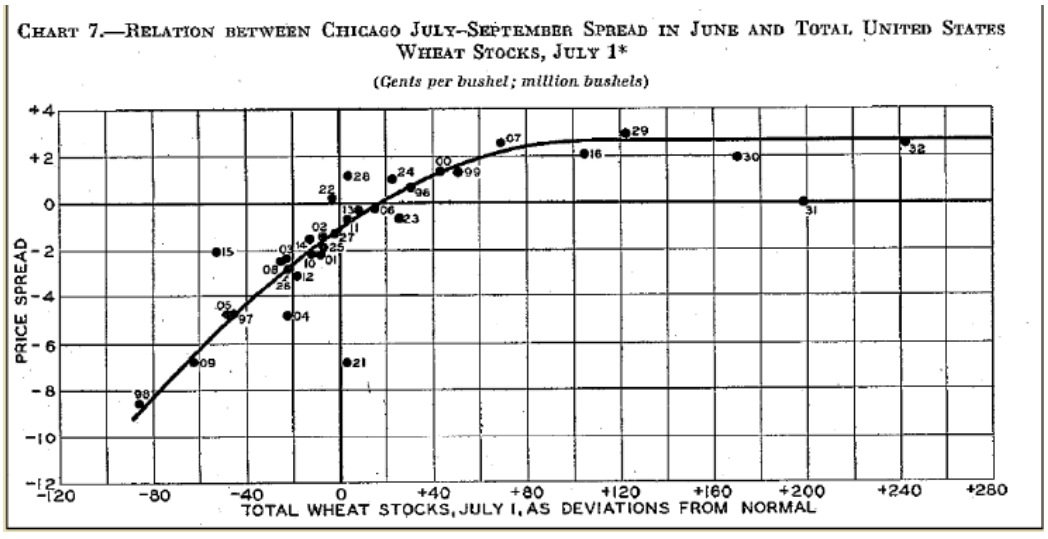
Figure I – Reproduction of Holbrook Working's (1933) Wheat Futures Analysis: The "Working Curve"



Source – Working (1933).