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Commodity futures contracts: Furnishing an elastic currency in the nineteenth century

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Abstract

In this paper, I show that nineteenth century US interest rates are relatively more volatile before 1874 and I propose, and demonstrate how, commodity futures trading is the likely principal proximate explanation for this change in behavior. Borrowing from Turnovsky [Econometrica 51 (1983) 1363], I model the optimizing behaviors of risk averse producers and risk neutral speculators in the absence and presence of futures contracts and I show that, so long as one party to a futures contract was risk averse, futures markets would have quelled interest rate volatility caused by variations in planting and harvesting conditions.

JEL classification: E44; G13; N11
Keywords: Federal Reserve system; Futures markets; Interest rate volatility; Seasonal cycles; US money markets

1. Introduction

Financial innovations and their effects on macroeconomic time series have fueled a substantial literature in both economics and finance over the last two decades. Two examples of these literatures are the Federal Reserve and the cessation of transitory (seasonal) fluctuations (Barsky et al., 1988; Clark, 1986; Fishe, 1991; Fishe and Wohar, 1990; Friedman and Schwartz, 1963; Holland and Toma, 1991; Kool, 1995; Mankiw and Miron, 1986; Mankiw et al., 1987; Miron, 1986, 1996), and commodity futures contracts and the stabilization of commodity spot prices (Chari et al., 1990;

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Kawai, 1983, Morgan, 1999; Morgan et al., 1994; Turnovsky, 1983; Turnovsky and Campbell, 1985; Santos, 2002).

Both of these literatures are deeply woven into the fabric of macroeconomics. In the late nineteenth and early twentieth centuries, students of seasonal fluctuations explored whether these fluctuations were relevant to the study of other, ostensibly more important, business cycles (Jevons, 1884; Kemmerer, 1910; Kuznets, 1933; Mitchell, 1927; Pigou, 1929; Burns and Mitchell, 1947; and more recently, Miron, 1996), whereas early twentieth century grain trade historians conjectured that commodity futures markets diminished spot price volatility and perhaps even stabilized aggregate fluctuations propagated by agricultural production processes (Clark, 1966; Chandler, 1977; Irwin, 1954; Rothstein, 1966). In this paper, I unite these literatures; I identify changes in the behavior of nineteenth century US money markets and demonstrate that the evolution of commodity futures trading can explain these changes.

Essentially, economists believe interest rate fluctuations, prior to 1914, were mean reverting and fueled primarily by the (seasonal) interregional cash transfers that financed the planting, harvesting and moving of the nation's crops (Davis, 1965; Friedman and Schwartz, 1963; Kemmerer, 1910). Then, in 1914, all transitory fluctuations in interest rates, including seasonality, virtually disappeared; here the literature essentially sides with Miron (1986), who argues that the Federal Reserve began to deliberately smooth interest rates, or provide an elastic currency, at that time (Barsky et al., 1988; Friedman and Schwartz, 1963; Holland and Toma, 1991; Mankiw and Miron, 1986; Mankiw et al., 1987; Miron, 1986, 1996). [1]

However, whereas I do not address the change in interest rates around 1914, my tests on extant ante- and postbellum US interest rates suggest the standard interpretation of pre-1914 interest rates pertains only to the period from 1874 onward, and that rates exhibited a different behavior prior to 1874. That is, before 1874, movements in interest rates are relatively volatile and driven primarily by real autumnal shocks; meanwhile, monthly seasonal movements are statistically insignificant. Only after 1874 do the stylized facts regarding US money markets apply. After consideration of putative alternative hypotheses for the cause of this change in behavior, I propose, and demonstrate how, commodity futures trading is the likely principal proximate explanation.

Historians of the grain trade tell us futures contracts were immensely popular by the mid-1870s thanks to a combination of storage and shipment technologies avail-

[1] Despite the popularity of Miron's (1986) hypothesis, alternative hypotheses do exist. According to Clark (1986), reductions in reserve requirements in 1914 and increases in gold imports from 1915 to 1916 increased the money supply and hence eased money market strains. Similarly, Fishe (1991) explains the disappearance of interest rate seasonals with gold flows due to increased exports with allied belligerents. Indeed, Mankiw et al. (1987) concede that the coincidence of the abandonment of the gold standard in 1914 is "not completely irrelevant" to the change in the behavior of interest rates. Meanwhile, according to Kool (1995), the change in interest rates occurred in 1917, and not 1914, because of interest rate targeting by the US and Britain for the purpose of war finance. Finally, Angelini (1992) questions the robustness of the 1914 break date and instead points to other factors including: the New York Stock Exchange's close on July 13, 1914; 1917 legislation that placed strict controls on the New York money markets; and the Aldrich–Vreeland Act.