

# THE PRICE OF APPRECIATION: THE CONTINUED RELEVANCE OF FISHER'S DEBT-DEFLATION THEORY

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*With the recent crisis, the threat of deflation has returned to developed economies. In this essay, Emmet Kiberd examines Fisher's theory of debt-deflation and demonstrates its shortcomings by updating it with Japan's recent history of deflation. Despite its modern inapplicability, Emmet demonstrates Fisher's impact on modern theory including his influence on the Fed's policy in recent years.*

## Introduction

In mid-October 1929, just days before Black Tuesday and its unprecedented stock market crash, Irving Fisher made the infamous declaration that:

“Stock prices have reached what looks like a permanently high plateau”.  
(Economist, 2009)

Ever a man of strong opinions<sup>1</sup>, in the ensuing weeks Fisher lost not only his entire fortune but also his credibility and reputation in the academic community. His subsequent ideas were given little consideration as policymakers embraced the work of John Maynard Keynes, another economist whose personal stock portfolio had collapsed in the crash, albeit less publicly (Nasar, 2011). Nonetheless, Fisher, whom James Tobin (2008) describes as “the greatest economist America has produced”, was no less prolific during the Great Depression, penning his debt-deflation theory in 1933, as a succinct version of the content of his 1932 book *Booms and Depressions*. In recent years, with the return of deflation as a credible threat to advanced economies (or as a reality in the case of Japan, among others), there has been a resurgence of interest in the effects of combined debt and deflation, so that Fisher's theory is returning to prominence.

The aims of this paper are twofold: to objectively assess the relevance of the debt

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<sup>1</sup> Fisher was “an inveterate crusader” on anything and everything (Tobin, 2008), constantly promoting his beliefs in healthy living, vegetarianism and Prohibition. The darker side of his beliefs included his interest in eugenics and his adherence to a brand of medical pseudo-science that ultimately led to his daughter's death after an unnecessary medical procedure in 1919 (Nasar, 2011).

deflation theory in explaining actual deflationary slumps, and to examine the influence of Fisher's theory on later economic thought, both in academic and policymaking circles. Section 2 looks at specific deflationary episodes, with brief reference to the Great Depression and a more detailed analysis of Japan's "Lost Two Decades" and other recent deflations. In Section 3, we evaluate the development of debt deflation and the ideas contained in the theory, since its publication. The role of the theory in central bank policy is explored.

## Debt Deflation in Action

### "The Dollar Disease"

Fisher's 1932 book, *Booms and Depressions*, in which he first expounded his debt-deflation theory, represents an effort to understand the economic mire in which the United States had found itself at that time: in the previous year, one of the worst on record, US nominal GDP had contracted by 27% (Friedman and Schwartz, 1990: 301).

The debt-deflation theory is laid out as a "chain of consequences in nine links", shown below in italics (Fisher, 1933: 342): starting from a situation of widespread "over-indebtedness", debtors begin liquidating their debts through distress selling. This settlement of loans causes a contraction of deposit currency, i.e. a fall in the money supply, accompanied by a fall in the "velocity of circulation"; this, in turn, results in deflation, a fall in the price level. In the absence of central bank action to uphold the price level, the net worth of firms falls, causing bankruptcies and a similar decrease in profits. Loss-making companies act rationally by reducing output, trade and employment. These reductions and the aforementioned losses to firms precipitate a loss of confidence, which leads to further slowdown in the velocity of circulation via hoarding. All of the above factors create disturbances in interest rates: nominal rates fall, while real rates rise<sup>2</sup>. Fisher's suggested solution to break the vicious cycle of debt deflation was to reflate the price level to the point at which debt contracts had been agreed on originally<sup>3</sup>.

In spite of the theory's creation based on the Great Depression, however, evidence of debt deflation in the 1930s remains patchy. Fisher's own estimates show that while 20% of all debts had been liquidated by March, 1933, the 75% appreciation of the currency over that period left debtors with a real burden 40% larger than when they began distress sales (Fisher, 1933, p. 346). Nevertheless, he fails to provide any evidence of a self-perpetuating cycle of debt liquidation and mounting deflation. Bernanke and James (1990) cannot pin down its presence, although they postulate that it may be present

<sup>2</sup> This can be seen from another of Fisher's contributions, the Fisher equation. Since  $r = i - \pi$ , and  $i$  cannot fall below zero, under sustained deflation ( $\pi < 0$ ) the real interest rate,  $r$ , must rise.

<sup>3</sup> Of course, assuming debt contracts were continuously being created from 1929 to 1933; reflation to one arbitrary price level can never serve the best interests of every creditor and debtor. Fisher rather conveniently decides that a reflation "halfway back to 1929" would be suitable (Fisher, 2009: 125).

in the part of deflation's effect on output that is not explained by their model. They posit that the fact that around half of all non-financial borrowers (also excluding major corporations) were in default, and the inclusion of "various forms of debt adjustment and relief" in the New Deal, suggest the presence of debt deflation.

### Japan's "Great Recession"

The most frequently cited example of deflation in recent decades, Japan underwent a prolonged period of deflation from 1999 to 2005; using the GDP deflator as a measurement, its inflation rate was negative for the entire period from 1999 to 2008 (Posen, 2010: 29). The Japanese economy came into this period overburdened with nonperforming loans after a huge crash in asset prices (Ito and Mishkin, 2006: 138) and growth remained sluggish for several years. Opinions are divided as to whether debt deflation played a role in exacerbating what Koo (2009) calls "Japan's Great Recession".

Ito and Mishkin (2006: 160) formulate an interesting theoretical basis for the effects of debt deflation on financial intermediation in Japan that closely parallels the "financial accelerator" of Bernanke et al. (1996). They view falling asset prices as an erosion of borrowers' collateral, which makes both adverse selection (because the lenders' losses in case of default are higher now in real terms) and moral hazard (because the borrowers now have less to lose in the case of default) more likely. In this case, deflation, via the balance sheets of borrowers, could act as a significant obstacle to the allocation of resources in the economy to their most efficient use.

Kobayashi (2003) creates a model "to formalize debt deflation", starting with an insolvent banking system and analysing the welfare effects of various policy responses. This model tells us that unlimited liquidity support and a government guarantee on deposits, so-called "policies of temporization", lead to an equilibrium of nominal interest rates at the zero lower bound and mild deflation (similar to the situation in Japan in the early 2000s). Kobayashi blames the Japanese government for doing just this, leaving the economy to stagnate as it postponed bank recapitalisation.

In their recent paper, Fukuda and Yamada (2012) use various regression techniques to establish a significant negative relationship between inflation and the real interest rate in Japan between 1996 and the end of 2008. This suggests that deflation increased the real interest rate in Japan, presumably suppressing output in the process. Posen (2010) takes a more nuanced view, stating that while deflation has been bad for Japanese growth, making it more expensive in real terms for the government to service its debts, "it has not been a disaster".

Bordo and Filardo (2005), however, are more sceptical of deflation as a cause of economic stagnation in Japan. In their highly detailed study of deflation, they generalise that "deflation is more likely to be a symptom rather than the underlying cause of economic difficulties" and they consider banking system issues, which impacted the monetary trans-

mission mechanism, to be more important in the Japanese case.

### **Koo and the Balance-Sheet Recession**

The most complete and convincing argument made against debt deflation in the Japanese case is Richard Koo's theory of balance-sheet recessions, which he lays out in Koo (2009).

Koo's theory begins as Fisher's does, with a collapse in asset prices leaving a debt overhang in the economy, particularly on the balance sheets of companies. With their cash flows still moving as before, these firms rationally switch from an objective of profit maximisation to one of debt minimisation (Koo, 2009: 181-2). After this shift, firms become unwilling to make new investments while they still have debts to pay down, so that the banking system suffers from a lack of borrowers and real demand falls as household savings are caught in the banking system. This fall in demand and contraction of deposit money can lead to asset price deflation, which acts as a feedback loop encouraging more urgent debt reduction from firms.

There are obvious parallels between the two theories: the inclusion of the effect of further deflation on debt reduction follows Fisher's line of reasoning almost exactly. Both theories look at the effect on the macroeconomy of the balance sheet distortions that individuals are left with after an asset bubble bursts. Fisher even acknowledges, at the opening of Booms and Depressions, that firm behaviour can be crucially different in times of economic tumult:

“A Depression is a condition in which business becomes unprofitable. It might well be called The Private Profits disease.”  
(Fisher, 2009: 3)

Koo's theory feels almost like an update on Fisher's, incorporating as it does the now prominent Keynesian framework of output determined by aggregate demand, as well as the recommendation of Keynesian fiscal stimulus. Koo has the advantage of hindsight in formulating a theory that can explain crucial aspects behind both the Great Depression and the Japanese recession, benefiting from this extra data on a modern era crisis.

Koo's balanced critical assessment of Fisher's debt-deflation theory not only elucidates the difference between the two, but exposes a couple of flaws in the older model. Firstly, Koo distinguishes between deflation in Fisher's theory (a key propagation mechanism without which the economic slump would be far milder) and in his own theory (where deflation “is very much a result, and not a cause, of recession” (Koo, 2009: 181)). This point is supported by Bordo and Filardo's (2005) finding that historical episodes of deflation can be classified as good (precipitated by high productivity growth and coinciding with economic growth), bad (a result of the economy seizing up) and, rarely, ugly (severe deflation negatively impacting on growth, as in the 1930s). Since Fisher's model requires

deflation to be at the centre of the propagation mechanism, it could only be applied to the ‘ugly’ class of deflationary episode.

This is confirmed by Koo’s further analysis of Fisher’s propagation mechanism and the model’s unstable equilibrium so colourfully described in the original Econometrica article as a boat that, when rocking, tends eventually to capsize. For the deflationary spiral to take effect, the rate of deflation must exceed the rate of debt liquidation. However, we are told that markets are subject to distress selling. It is reasonable to expect debts to decrease by more than 10% per annum in a fire sale; in this case a historically exceptional rate of deflation would be required to precipitate a downward slide. In a world where the Gold Standard no longer applies, this kind of future eventuality is unlikely: monetary policy would have to be utterly inept to create such severe deflation.

In support of the latter point, the consensus of research into the only other recent episode of sustained deflation in a developed economy, that of Hong Kong from 1999 to 2005, is that the debt-deflation theory did not apply (Bordo and Filardo, 2005; Fukuda and Yamada, 2012). This deflation resulted from the interaction of external, regional shocks and Hong Kong’s maintaining a dollar peg on its currency.

## Fisher’s Legacy

Irving Fisher undoubtedly left us with a wealth of knowledge, opinion and innovation, from a mathematical formulation of the equation of exchange to a hydraulic price-determination computer constructed for his 1892 doctoral dissertation (Dimand, 1995). The legacy of the debt-deflation model lies not in applicability, but in its influence on later economic thought.

First and foremost, it was a pivotal step in the progression of Monetarist thought. As one of the earliest proponents of a monetary cause of the Great Depression, Fisher charted a path that would soon be followed by the underappreciated Clark Warburton and more famously by Friedman and Schwartz in their landmark 1963 book (Cargill, 1979).

Secondly, he drew attention to the relevance of micro-level balance sheets to the macroeconomy, laying the groundwork for a rich strand of literature in the 1980s and ‘90s. This literature grew from Bernanke’s (1983) paper introducing the idea of disruptions in the flow of credit aggravating the macroeconomic outcomes of the Great Depression. This idea was later formalised as the “financial accelerator” (Bernanke et al., 1996), a concept vital to our understanding of how asset bubbles form: procyclical asset price inflation leaves borrowers with more collateral in good times, meaning they can increase their leverage and investment. This feeds back into asset prices in a positive feedback loop.

Finally, a subtler but no less important legacy of the debt-deflation theory is its

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<sup>4</sup> Eggertsson and Krugman (2012) is an interesting, recent effort to incorporate much of this balance sheet theory into a New Keynesian macro model.

influence on monetary policy, at the Federal Reserve and elsewhere. This came primarily through Ben Bernanke, first as Governor and then as Chairman of the Federal Reserve. In a famous speech (Bernanke, 2002) he raised the spectre of deflation that was haunting the US and laid out the Fed's willingness to strongly fight deflation. This stance was cemented by the expansionary policy of the following year, which some think responsible for the ensuing mortgage bubble and crash. Bernanke (2010) later defended these decisions, citing the need at the time to avoid ending up in deflation with near-zero interest rates. It is likely that Bernanke's work on the subject of deflation made him more deflation-averse than the average central banker. Tcherneva (2010) also posits that Bernanke's study of Japan's prolonged deflation heavily informed his policy actions in late-2008 and 2009.

## References

- Bernanke, B. (1983). 'Non-Monetary Effects of the Financial Crisis in the Propagation of the Great Depression'. *American Economic Review*, 73(3): 257-76.
- Bernanke, B. (2002, November 21st). *Deflation: Making Sure "It" Doesn't Happen Here*. Remarks by Governor Ben S. Bernanke before the National Economists Club, Washington, D.C.
- Bernanke, B. (2010, January 3rd). *Monetary Policy and the Housing Bubble*. Speech at the Annual Meeting of the American Economic Association, Atlanta, Georgia.
- Bernanke, B. and James, H. (1990). 'The Gold Standard, Deflation, and Financial Crisis in the Great Depression: An International Comparison'. *NBER Working Papers* 3488.
- Bernanke, B., Gertler, M. and Gilchrist, S. (1996). 'The financial accelerator and flight to quality'. *Review of Economics and Statistics*, 78: 1-15.
- Bordo, M. and Filardo, A. (2005). 'Deflation in a Historical Perspective'. *Bank for International Settlements Working Papers No 186*.
- Cargill, T. (1979). 'Clark Warburton and the Development of Monetarism since the Great Depression'. *History of Political Economy*, 11(3): 425-449.
- Cargill, T. (2001). 'Monetary Policy, Deflation, and Economic History: Lessons for the Bank of Japan'. *Monetary and Economic Studies*, 19(S1): 113-34.
- Dimand, R. (1995). 'Irving Fisher: A Biography' (Book). *Review of Social Economy*, 53(2): 290-4.
- Economist. (2009). 'Out of Keynes's Shadow'. *The Economist*, Feb 12th 2009.
- Eggertsson, G. and Krugman, P. (2012). 'Debt, Deleveraging, and the Liquidity Trap: A Fisher-Minsky-Koo Approach'. *The Quarterly Journal of Economics*, 127(3): 1469-1513.
- Fisher, I. (1933). 'The Debt-Deflation Theory of Great Depressions'. *Econometrica*, 1: 337-57.

Fisher, I. (2009). *Booms and Depressions: Some First Principles*. Retrieved January 4th, 2013, from <http://fraser.stlouisfed.org/>: [https://fraser.stlouisfed.org/docs/publications/books/booms\\_fisher.pdf](https://fraser.stlouisfed.org/docs/publications/books/booms_fisher.pdf)

Friedman, M. and Schwartz, A. J. (1990). *A Monetary History of the United States, 1867-1960* (8th ed.). Princeton, NJ: Princeton University Press.

Fukuda, S. and Yamada, J. (2012). *Why Did Large-scale Deflation Occur? What Did It Bring About?: From Hong Kong's Experiences in the First Half of the 2000s*. Public Policy Review, Policy Research Institute, Ministry of Finance Japan, 8(1): 93-122.

Ito, T. and Mishkin, F. (2006). 'Two Decades of Japanese Monetary Policy and the Deflation Problem'. In Ito and Rose, A., *Monetary Policy under Very Low Inflation in the Pacific Rim, NBER-EASE*, Volume 15 (pp. 131-201). Chicago: University of Chicago Press.

Kobayashi, K. (2003). 'Debt Deflation and Bank Recapitalization'. *Discussion Papers 03007*, Research Institute of Economy, Trade and Industry (RIETI).

Koo, R. (2009). *The Holy Grail of Macroeconomics: Lessons from Japan's Great Recession*. Singapore: John Wiley & Sons.

Nasar, S. (2011). 'Fisher, the Crash and an 'Economics of the Whole''. In S. Nasar, *Grand Pursuit: The Story of Economic Genius*. New York: Simon & Schuster.

Patinkin, D. (1995). 'Irving Fisher: A biography'. *Journal of Economic Literature*, 33(3): 1324-8.

Posen, A. (2010). *The Realities and Relevance of Japan's Great Recession*. STICERD Public Lecture, London School of Economics.

Tcherneva, P. (2010). *Bernanke's Paradox: Can He Reconcile His Position on the Federal Budget with His Recent Charge to Prevent Deflation?* Levy Economics Institute Working Paper No. 636.

Tobin, J. (2008). Fisher, Irving (1867-1947). (Durlauf, S. & Blume, L., Eds.) *The New Palgrave Dictionary of Economics*, Second Edition.