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The American Economic Review, Vol. 87, No. 2, Papers and Proceedings of the Hundred and Fourth Annual Meeting of the American Economic Association (May, 1997), 439-441.

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Irving Fisher: Modern Behavioral Economist

By RICHARD H. THALER *

Irving Fisher is rightly thought of as one of the pioneers of neoclassical economics. The theme of my essay is that he should also be considered a pioneer of what I will call "modern behavioral economics." I will start by defining what I mean by this term, then point to some of Fisher's contributions in this domain.

Modern behavioral economics is characterized by three features. First, rational choice is used as a starting point for developing theories of economic decision-making and market equilibria. Second, actual individual behavior is analyzed using a variety of data-collection methods. Third, these observations of human behavior, along with some lessons from other social scientists (especially psychologists) are used to explain and understand the ways in which the rational theories fail to describe the world we live in. Two of Fisher's favorite topics, time preference and money illusion, illustrate how he utilizes this approach.¹

I. Time Preference

In *The Theory of Interest* (1930) Fisher develops what is still thought of as the modern theory of intertemporal choice. The famous Fisher diagram is still an essential element of any course on microeconomics, macroeconomics, or finance. The outcome of this analysis is that at the margin everyone has the same preferences for intertemporal substitution. Fisher even sketches out what can be considered the elements of a life-cycle model,

since he stresses the role of borrowing or lending to smooth consumption over time. While it is impressive that Fisher essentially anticipates the life-cycle theory of saving, it is perhaps more impressive that he also anticipates the behavioral critique of this model (e.g., Hersh Shefrin and Thaler, 1988).

Fisher begins his theory of interest with the basic determinants of time preference or impatience (he uses the terms synonymously). He divides his discussion into two parts: the influence of economic factors (i.e., income) and what he calls "personal" factors. Fisher says that an individual's impatience depends on four characteristics of his income stream: the size, its time shape, its composition, and its risk. The role of size is quite clear: "In general, it may be said that, other things being equal, the smaller the income, the higher the preference for present over future income, that is the greater the impatience..." (Fisher, 1930 p. 72). Notice that this claim is in direct contrast to the life-cycle or permanent-income theories of saving, which postulate that all savers smooth their consumption over their lifetimes, regardless of the levels of their income. However, Fisher's analysis is a good description of the actual data. It is well established that saving rates increase sharply with permanent income, suggesting, as Fisher theorizes, that the poor are much more impatient than the middle class. Fisher is clear that the effect of income on impatience is partly rational and partly irrational. "The irrational aspect of the matter is often to relax foresight and self-control and to tempt us to 'trust the luck' of the future, if only the all-engrossing need of the present necessities can be satisfied" (Fisher, 1930 p. 73).

Foresight and self-control are two of six personal factors that Fisher identifies as determining an individual's impatience, the others being habit, expectation of life, concern for the lives of other persons (i.e., bequest motive), and fashion. Again, Fisher often explicitly stresses the irrational component of these personal factors.

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¹ Though I will argue that Fisher's work is similar to that of modern behavioral economics, it is not the case that he was a fan of contemporary psychology, particularly at the beginning of his career. In his thesis (1892 p. 5) he criticizes Francis Edgeworth for borrowing from the psychologist Gustav Fechner: "This foisting of Psychology on Economics seems inappropriate and vicious."

For example, he attributes the lack of impatience in some people to the fact that "the future is seldom considered in its true proportions. This is illustrated by the story of the farmer who would never mend his leaky roof. When it rained he could not stop the leak, and when it did not rain, there was no leak to be stopped!" (Fisher, 1930 p. 82). His discussion of self-control is very psychological. "Self-control, though distinct from foresight, is usually associated with it and has very similar effects. Foresight has to do with *thinking*; self-control with *willing*. ... Like those working men who, before prohibition, could not resist the lure of the saloon on the way home Saturday night, many persons cannot deny themselves a present indolence, even when they know what the consequences will be" (Fisher, 1930 p. 83).

The other personal factor that Fisher derides as irrational is fashion: "The most fitful of the causes at work is probably fashion. This at the present time acts, on the one hand, to stimulate men to save and become millionaires, and, on the other hand, to stimulate millionaires to live in an ostentatious manner. Fashion is one of those potent yet illusory social forces which follow the laws of imitation..." (Fisher, 1930 p. 88).

Of course it is possible to salvage the "standard Fisherian" theory by interpreting these personal factors as determining an individual's impatience *before entering the market*. That is, an individual with a high level of impatience might borrow heavily until his marginal rate of time preference is equal to the interest rate, just as is taught in Economics 101. However, while Fisher is not explicit on this issue, I do not believe this was his intent. He always stresses that his analysis depends on the assumption of perfect foresight, and his discussion of the issues above makes it clear that he did not believe that this assumption was descriptively valid. Therefore, I think he would agree with a behavioral interpretation, namely, that the Fisher model should be considered a normative theory, a theory of how rational agents would behave and a prescriptive lesson on how to behave, but not an accurate description of how real people do behave. To catch up on where the behavioral research lies today see George Loewenstein and Jon Elster (1992).

II. Money Illusion

As far as I can tell, in his book of the same title (1928) Fisher coined the term "money illusion." By his very use of this term, Fisher anticipates the modern research on the psychology of decision-making pioneered by Daniel Kahneman and Amos Tversky. In their work they stress the role of "cognitive illusions," tricks the mind plays on us. Indeed, one of the last papers Tversky produced before his recent and untimely death, was on this topic (Eldar Shafir et al., 1997). In this paper the authors show that individuals are often confused about real and nominal values. It was precisely this confusion that prompted Fisher to write his book.

To gather data for his research on money illusion Fisher took the sensible course of talking to 24 residents of post-World War I Germany (in 1922), which was experiencing a very high rate of inflation. He describes at length one interview with a woman shopkeeper in the outskirts of Berlin. At the time he talked to her, the mark had depreciated by 98 percent in the few years since the war (prices had increased by a factor of 50), but she seemed unaware of the role of inflation in determining the prices of the goods she sold. He describes a conversation after he had purchased a shirt: "Fearing to be thought a profiteer, she said: 'That shirt I sold you will cost me just as much to replace as I am charging you.' Before I could ask her why, then, she sold it at such a low price, she continued: 'But I have made a profit on that shirt because I bought it for less'" (Fisher, 1928 p. 7). Fisher goes on to explain how the woman is a victim of the dreaded money illusion.

Fisher is very explicit about how he thinks the illusion works. He believes that people think of their local currency as fixed while other things (prices, foreign currencies, etc.) are changing. Shafir et al. (1997) offer a similar analysis. This illusion is the essence of the famous quip by Abba Eban, the Israeli diplomat, during a time of rapid inflation in Israel: "[T]hat dollar is an extremely unstable currency; one month it is worth 100 Israeli pounds the next month 200..."

Perhaps the most important implication of money illusion discussed by Fisher is the role

it plays in his discussion of the famous Fisher equation relating the nominal interest rate to the real rate plus the expected rate of inflation. Once again, Fisher's treatment of this relationship makes it clear that he did not think the Fisher equation was a good description of the world. Like his theory of savings, the equation was meant to describe how interest rates would behave in a world with what he called "foresight" (what we would now call rational expectations). What his extensive empirical work showed is that the nominal interest rate adjusted to changes in inflation only with very long lags (inventing distributed lag econometrics along the way). In one analysis of interest rates in five markets (London, New York, Berlin, Calcutta, and Tokyo), he concludes as follows: "[The results in a table show] that the real rate of interest in terms of the commodities is from seven to thirteen times as variable as the market rate of interest in terms of money. This means that men are unable or unwilling to adjust at all accurately and promptly the money interest rates to changed price levels. Negative real interest could scarcely occur if contracts were made in a composite commodity standard. The erratic behavior of real interest is evidently a trick played on the money market by the 'money illusion,'..." (1930 p. 415).

III. Conclusion

Fisher, along with Edgeworth, Vilfredo Pareto and others, helped introduce mathematics to economics. Young economists are taught these modern concepts (equations, diagrams and the like) but rarely go back and read the surrounding text. If they did they would discover that these economists, as well as many others of Fisher's generation (e.g.,

John Maynard Keynes and A. C. Pigou) were very aware of the influence of behavioral factors (such as self-control and fashion) often left out of modern economics.² It is time to stop neglecting the words and time to start updating our equations to include these behavioral factors.

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² See Loewenstein (1992) for an elaboration of this view.