# LOVE AND DEATH: THE WEALTH OF IRVING FISHER

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## ABSTRACT

*This essay puts forward a new interpretation of Irving Fisher that integrates his scientific work with his moral crusades, and places both in the context of his times. The key to the new interpretation is Fisher's book on* The Nature of Capital and Income *(1906) where he lays out his vision of the economic process and presents his theory of income, neither one of which ever gained acceptance. The new interpretation challenges the standard view of Fisher's scientific work as an anticipation of the post war neoclassical synthesis.*

> The light of life only disappears, and its dreary night then commences, when we have none for whom to live. Then the whole creation is a void. Really to live is to live with, and through others, more than in ourselves. To do so we must do so truly. "Love, and love only, is the loan for love". . . .
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> In so far as to procure good for others, gives a real pleasure to the individual, he is released from that narrow and imperfect sphere of action, to which his mere personal interests would confine him, and the future goods which the sacrifice of present ease or enjoyment may produce, lose the greater part of their uncertainty and worthlessness. Though life may pass from him, he reckons not that his toils, his cares, his privations, will be lost, if they serve as the means of enjoyment to some whom he may leave behind (Rae 1834, 121–122).

There is no question of Irving Fisher's greatness as an economist. Quite the contrary, the evidence of critical commentary indicates that debate persists only

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as to what aspect of Fisher's wide-ranging work so qualifies him.[1] Monetarists see *The Purchasing Power of Money* (1911) as the work of a proto-Friedman, while Keynesians see *The Rate of Interest* (1907) and *Booms and Depressions* (1932) as the work of a proto-Keynes. Mathematical economists see Fisher's dissertation *Mathematical Investigations in the Theory of Value and Prices* (1892) as a foundation stone of the theory of general equilibrium subsequently developed by Arrow and Debreu. Empirical economists see *The Making of Index Numbers* (1922) as a foundation stone of the practice of modern government statistical bureaus. In this way, modern divisions within the economics profession have their counterpart in splintered historical interpretation and difficulty with seeing the work entire.

For the most part, commentary limits attention to Fisher's "scientific" work, thus drawing a discrete curtain over that side of Fisher that wanted to tell people *How to Live* (1915), the side of Fisher that promoted hygiene as well as vegetarianism, prohibition, and eugenics. The critical literature seems to agree that we can view these efforts as essentially moral crusades, and trace them to Fisher's childhood as the son of a Congregational minister, a germ source perhaps energized by Fisher's own battle against the tuberculosis that had earlier taken his father. In other words, Fisher's moral crusades can be separated from his scientific work, which means we need have no professional interest in them, scientists as we are. The only crusades that merit our attention are the (scientifically based?) economic crusade for stable money – encompassing successive enthusiasm for the compensated dollar (1920), stamp scrip (1932), and 100% money (1935) – and the somewhat more attenuated campaign for taxation of consumption rather than income (1942).

Similarly, the side of Fisher that tinkered – he invented a tent for tuberculars, a new sun dial, a 13-month calendar, a map projection, and a collapsible chair, as well as the "index visible" that made his fortune (temporarily) – tends to be put aside as reflecting at best an endearing personality quirk, and at worst the psychic need of a man who married wealth to prove himself by generating some of his own. Allen (1993), echoing the sentiments of Schumpeter (1948), speaks for the consensus in bemoaning the loss to economics that resulted from all these peripheral activities. Schumpeter summed up Fisher's scientific work as the "pillars and arches of a temple that was never built" (p. 231) on account of the busywork of the crusader, and opined that Fisher should instead have written a treatise and formed a school of disciples who would take responsibility for interpreting the master and developing his work further. Allen writes: "Had [Fisher] stuck to [his] career as a professional economist and professor, he would certainly have made an even greater contribution and his



star would be shining even more brightly in the firmament today" (Allen, 1993, 300).

Although Fisher himself always insisted on the essential unity of all his activities, it has been an operating assumption of most who came after him that Fisher's work doesn't make sense as a whole, so that we are free to pick and choose as we like. An exception is the statistician Max Sasuly, Fisher's associate for twenty years and arguably the closest thing we have to a disciple, who detected "a certain unity and order in [Fisher's] variegated activities . . . the living synthesis in the seeming agglomeration of [his] interests" (1947, p. 257). This essay builds on Sasuly to advance a new more unified interpretation.

Irving Fisher wanted to use science for the betterment of the human condition. To the extent that human problems are economic, Fisher's goal required him to reconstruct economics on a scientific basis, taking the natural sciences as the model of what it means to be a science. This starting point was by no means unique to Fisher and indeed quite well within the spirit of the age in which he lived, but there was less agreement on the nature of science and on what its lessons for economics might be. Fisher's views on these matters turned out to resonate better with the world of post-WWII America than with his own times and in this sense it can be said, as it has been said, that he was a generation ahead of everyone else. But to really understand him, we need to approach him on his own terms in the context of his own time, rather than on our own terms and in retrospect.

## THE STANDARD VIEW: THE THEORY OF VALUE AND PRICES

For a modern economist, it is easiest to gain access to Fisher by starting with his dissertation (1892) which treats the problem of relative price determination in general equilibrium with maximizing consumers. For the most part the mathematical structure is familiar (leaving aside the treatment of production) so we feel that we understand him immediately. When we find much the same mathematical structure in *The Rate of Interest* (1907), albeit relegated to a mathematical appendix, we are naturally inclined to see the book as the intertemporal extension of the timeless general equilibrium model of the dissertation. Such an interpretation is made all the more compelling by Fisher's graphical presentation which is familiar from any intermediate microeconomics textbook. We find utility maximization subject to a budget constraint (p. 387), income maximization given production possibilities (p. 402), and general equilibrium of production and consumption choice (p. 409). Fisher must be like us.

From this starting point, much of the rest of Fisher's opus falls into a certain order. Most important, it is apparent already in his dissertation that Fisher is a natural quantity theorist because he sees money first and foremost as a unit of measurement. Writes Fisher: "Money is here used solely as a measure of value. It is not one of the commodities in the market. The high or low price of commodities in terms of this money is dependent entirely on the amount of it at which we agree to rate the yearly consumption of the market" (1892, 41). Ten pages later, discussing the comparative statics of the model, he drives the point home: "Increase all incomes in the same ratio. Then will all prices increase and the valuation of money decrease exactly in this ratio. There will be no change in the distribution of commodities. There is merely a depreciated standard of money" (1892, 51). Here certainly is the origin of Fisher's later *Purchasing Power of Money* (1911).[2]

Not only is Fisher a natural quantity theorist, but in the dissertation he is already thinking along the lines that will lead to his idea (and subsequent crusade) for the compensated dollar (1911, Ch. 13). Already he sees the gold standard as a primitive attempt to tie down the standard of value (1892, 58), primitive for the consequence that all prices must change whenever the relative price of gold changes. And already he sees a better way: "it is perfectly possible to have a measure of value which is not a commodity at all. Thus we might agree to call the consumption of the United States for a year $10,000,000,000, and this agreement would immediately fix a measure of value, though the new dollar need have no equality to the gold or silver dollar. It would be easy to translate between such an arbitrary standard and any commodity standard. Thus if statistics showed that the consumption measured in gold dollars was $12,000,000,000, the agreed standard is at 120 compared with gold and by measure of this factor we can reduce the prices of all commodities" (p. 41). Here certainly is the origin of Fisher's idea to stabilize prices by creating a new dollar whose value against gold would be changed depending on an index of the general price level.

So much for the static equilibrium side of Fisher, the dynamic disequilibrium side is also presaged in the dissertation. "The ideal statical condition assumed in our analysis is never satisfied in fact" (p. 103) but that is just because "the dynamical side of economics has never yet received systematic treatment" (p. 104). It is easy enough to see here the origin of Fisher's later discussion of "transition periods" (1911, Ch. 4), as well as the Fisher who saw business cycles as nothing more than the "Dance of the Dollar" (1923) caused by a lagged response of nominal interest rates to monetary inflation and deflation.



The Fisher who in 1892 wrote that "Panics show a lack of equilibrium" (p. 103) is recognizably the Fisher who proposed "The Debt-Deflation Theory of Great Depressions" (1933). From the beginning to the end, Fisher always had in mind the concept of equilibrium as reference point and central tendency of the economy, but only ever as an approximation to actual conditions. He thought monetary reform would help keep us closer to the theoretical equilibrium, since monetary fluctuation is apparently the cause of much of the disequilibrium phenomena we observe, and this explains Fisher's lifelong devotion to the cause of stable money.

It's a nice story. It puts most of the pieces in place and, *mirabile dictu*, the picture that emerges is the postwar neoclassical synthesis! The broad church of *Fishergeschichte* turns out to be just the broad church of modern economics. True, there is no room in this story for Fisher the Crusader, but we can all celebrate Fisher the Scientist, the young mathematician who got interested in economics, saw a system amenable to analysis as if it were a physical system, and wrote in one year the dissertation that set the course of economics for the next century. Well, not all of us can celebrate, since some regret the consequent diminished role for history in the new theoretical science. Thorstein Veblen saw it happening and spoke up at the moment (Veblen 1908, 1909); Veblen's modern representatives follow suit (Mirowski 1989). But even these critics essentially agree with the consensus interpretation of what Fisher did; they just don't like it. They are the exception that proves the standard view of Fisher.

An interpretation that fits so many of the facts must be right, at least in part. But there is at least one piece of the puzzle that doesn't fit so well and that points to another line of interpretation. That piece is the first book Fisher wrote after recovering from tuberculosis, *The Nature of Capital and Income* (1906). Conventional interpretation treats the book as a kind of preliminary for *The Rate of Interest* (1907) and, since *The Rate of Interest* evidently extends the dissertation to intertemporal general equilibrium, by association *Nature of Capital and Income* is presumed to tie in with the dissertation in some way. The problem is that the tie is never explored. Indeed, the standard interpretation of *The Rate of Interest* leaves us wondering why it needs any preliminary. After all, in modern economics we pass immediately from the exchange economy to the intertemporal case, merely by relabeling the axes. If Fisher is just doing this modern trick for the very first time, why did he feel the need for any pause in between, much less a book-length pause? And, on the subject of the pause, remember that this is the book he wrote twice, since the only copy of the manuscript was lost to the thief who stole Fisher's briefcase when he put it down for a moment to make a phone call in Grand Central station (Allen, 1993, 93; Fisher, 1956, 102, 126).

Big pause, big book. *The Nature of Capital and Income* is where Fisher developed his distinct concept of income, a concept moreover that he always insisted was absolutely central to his theory of interest. Modern economics has adopted Fisher's theory of interest but remained skeptical about his concept of income, thus picking and choosing among what Fisher always insisted were inseparable components of a unity. Maybe the easiest entry point into Fisher's work is just a bit too easy. Maybe Fisher is not quite as much like us as first appears.

## A SHIFT OF FOCUS: CAPITAL, INCOME, AND TIME

Take then *The Nature of Capital and Income* as an alternative starting point for interpretation. The book appears to be a treatise on accounting, and on that score we might be inclined to discount its importance, but that is a mistake. In dealing with accounting, Fisher is dealing with the world of practical business, a world at that time (as now?) quite distant from the world of economic theory. In his dissertation he had deployed techniques and habits of thought learned from mathematical physicist Willard Gibbs in order to construct a theory of economic equilibrium, but he really didn't know very much economics yet, only what he had learned from courses with William G. Sumner ("who first inspired me with a love for economic science" according to the dedication of *Capital and Income*). The 1906 book takes an approach quite different from the dissertation, looking instead to deploy techniques and habits of thought from the world of practical business. If we read the book on its own, what comes through is nothing less than an overarching vision of the economic process,[3] and that vision is *not* what we find in standard microeconomics textbooks. It is closer to the vision we find in the musings of modern financiers such as George Soros (1987) or Henry Kaufman (2000), or of academics who made it a practice to talk with and listen to such financiers, academics such as Hyman Minsky (1986) or Fischer Black (1987).

The classical economists habitually thought of the present as determined by the past. In Adam Smith, capital is an accumulation from the careful saving of past generations, and much of modern economics still retains this old idea of the essential scarcity of capital, and of the consequent virtue attached to parsimony. A financier tends to view these matters in a different light. From a financial point of view, the present is determined by the future, or rather by our ideas about the future. Capital is less a thing than an idea about future income flows discounted back to the present. For a financier, the emphasis is thus on how new ideas, not new savings, augment and shift current capital values.



In *The Nature of Capital and Income*, Irving Fisher straddles the worlds of classical economics and practical finance by distinguishing physical capital goods (for which the past-determines-present view is correct) from the value of those goods (for which the future-determines-present view is correct).[4] Fisher has a foot in both worlds, but we can tell where his heart is since he defines income as the realized flow of services that, when capitalized, gives rise to current capital value. In his formulation, the current valuation of capital takes into account all future income expected to be generated by capital, so anything that changes expectations changes also current capital values. It follows that capital value can be augmented without any capital accumulation whatsoever, but we don't want to count such capital gains as current income since it is actually a change in (expected) future income and we don't want to double count. Furthermore, it follows that even capital accumulation (saving) we don't want to count as part of current income since it also will show up in our accounts as a change in capital value on account of the future income to which it is expected to give rise. Here too, we want to be careful not to count the same income twice.

How is this treatise on accounting a vision of the economic process? The accounts present a unified picture of the economy as a whole as nothing more than a stock of wealth moving through time, throwing off a flow of services as it goes. (Note well, *not* a static exchange economy.) In Fisher's formulation all wealth is capital, not just machines and buildings, but also land and even human beings. Indeed for Fisher human beings are the most important form of capital because the most versatile. Thus, at the highest level of abstraction, there is no distinction between the traditional categories of labor, capital, and land. All produce a stream of income (services) so all are capital, and their future income discounted back to the present is their capital value. Similarly, at the highest level of abstraction, there is no distinction between the traditional categories of wages, profit, and rent. All are incomes thrown off by capital, hence all are forms of the more general category of interest. From this point of view, Fisher's next book *The Rate of Interest* (1907) appears *not* as a theory of intertemporal price equilibrium, but rather as a theory of the rate of income flow at a moment in time. The rate of interest is not a price but a yield.

The book also appears as a theory of social welfare. The value of wealth, so broadly conceived as Fisher intends, is an operational measure of welfare since anything that increases the value of wealth must necessarily do so by increasing the flow of final services enjoyed by human beings.[5] Thus Fisher's concept of wealth gave him a concrete quantitative framework to guide his normative impulses, as will be seen presently. It also gave him, and this needs to be brought out first, a quantitative way of understanding the course of economic progress up to his own time. In this sense, *The Nature of Capital and Interest* needs to be understood as the prolegomenon to a theory of economic development that Fisher never actually wrote (hence Schumpeter's disappointment).

More insight into this latter strand of Fisher's thought can be gleaned by an appreciation of its apparent origin in John Rae's *New Principles on the Subject of Political Economy* (1834). In February 1897 Fisher published a brief note on Rae in the *Yale Review*. In November 1905 he reviewed a reissue of Rae's book that had been put together by C. W. Mixter and republished as *The Sociological Theory of Capital* (1905). The intervening years were the years of Fisher's tuberculosis, a fallow period in his intellectual life.[6] Fisher subsequently went on to dedicate *The Rate of Interest* (1907) to Rae ("To the memory of John Rae who laid the foundations upon which I have endeavored to build"). When he published a revised version of the book as *The Theory of Interest* (1930), he added Bohm-Bawerk to the dedication but he also wrote in the preface, "Every essential part of it was at least foreshadowed by John Rae in 1834" (p. ix). There is plenty of evidence that Rae influenced Fisher, but what exactly was the nature of that influence?

Rae's book is essentially a theory of economic development presented as a critique and alternative to the theory of Adam Smith. As against Smith's emphasis on accumulation through parsimony, Rae emphasizes that individuals may accumulate wealth without the nation becoming any wealthier if their wealth is merely acquired from others rather than being newly created. Thus the laissez faire recommendation to allow individuals free rein to accumulate individual wealth may not yield the desired social results. He concludes that the emphasis should rather be on invention which, though it may or may not increase individual wealth, certainly creates new wealth at the level of society as a whole. Such an emphasis, Rae goes on to argue, leaves considerable room for state intervention, by contrast to the laissez faire program that emerges from Smith's theory. In this way, Rae offered Fisher a conception of economic development that fit with his own emerging conceptions of capital and income. And he also offered Fisher what his revered teacher Sumner never did, a vision of the economic process that leaves room for its improvement.

According to Rae, the "legislator" can increase "national stock" or wealth by (1) promoting the general intelligence and morality of the society, (2) promoting invention, and (3) preventing dissipation of national wealth in luxury (Rae 1834, 362). The first is directed toward increasing the desire to accumulate, the second toward increasing the opportunity to accumulate, and the third toward making sure that accumulated wealth is not lost. Viewed in this light, Fisher's theory of interest can be understood not as a celebration of the optimality of market outcomes but rather as a framework for thinking about how to increase the flow of future services and hence current wealth. Here is Fisher in 1930: "From what has been said it is clear that, in order to estimate the possible variation in the rate of interest, we may, broadly speaking, take account of the following three groups of causes: (1) the thrift, foresight, self-control, and love of offspring which exist in the community; (2) the progress of inventions; (3) the changes in the purchasing power of money" (p. 515). This evidently parallels Rae, with the exception of the third point, but now we can understand something more about that point as well. If aggregate wealth is ever to serve as an operational welfare measure, it is important that the rod we use to measure wealth is itself stable in value. Quite apart from causing business fluctuation, monetary instability makes it hard for us to know whether a measured increase in wealth is actually an increase in aggregate welfare or only an increase in average prices.



This interpretation brings Fisher's various moral crusades into line with his scientific work. The standard interpretation suggests that Fisher's crusades were sparked by his tuberculosis, but a case can be made that it was not the tuberculosis but rather what Fisher was reading while he was recovering from the tuberculosis, namely Rae, that sparked the change. From this point of view, it appears that not just his monetary crusades but all of them stem from a scientific basis as Fisher understood it. Barber (1997) has pointed out that Fisher's crusades were all about maximizing efficiency and eliminating waste, and this seems right so far as it goes, but it doesn't go far enough. Every one of Fisher's presumed "moral" crusades can be seen as the action of Rae's "legislator" looking to increase the national stock.

Thus, to educate people about the "Rules for Healthful Living Based on Modern Science" (the subtitle of *How to Live*) – there were fifteen rules, ranging from fresh air and good food to regular bowel habits and cultivation of mental serenity – was not only or even mainly about making them better people. For someone who sees human beings as part of the stock of national wealth, as Fisher did, even a few years added to the effective working life of each person amounts to a tremendous increase of current national wealth. Similarly, Fisher's raving about eugenics, the bit of Fisher guaranteed to make a modern audience most uncomfortable, begins to come into sharper focus. When Fisher insists that "this germ plasm, which we receive and transmit, really belongs, not to us, but to the race. . . . [and] we are under the most solemn obligation to keep it up to the highest level within our power" (1915, 165), he is talking as an economist about the national stock of wealth as he understands it. Finally, Fisher the tinkerer fits too. Rae's emphasis on the importance of invention shows up not only in Fisher's scientific work (1907 Ch. 10; 1930 Ch. 16), but also in the tinkering that made him a fortune during the 1920s, and in the financial investment practices that lost him that fortune in the 1930s. By helping, as he thought, to foster invention he was only doing his own bit to maximize social welfare by increasing aggregate wealth.

Given the impact that Rae seems to have had on Fisher, it is interesting to note two areas in which Rae's teaching did not penetrate. First, science. Rae contrasts Adam Smith's axiomatic philosophical approach unfavorably to the scientific inductive empiricism of Francis Bacon, and he claims the latter method as his own (Rae, 1834, 328–333). In Rae's view, the true scientific method involves piling fact upon fact in order to find eventually the true laws of nature. We can see Fisher bowing in that direction in *Rate of Interest* when he includes three final chapters offering "inductive verification" of his own theory (Ch. 14–15) and "inductive refutation" of the monetary theory of interest (Ch. 16). But, truth told, none of the chapters really amounts to empiricism in the Baconian spirit. It all seems more like marshaling evidence to illustrate a prior theoretical conclusion. Fisher's subsequent *Report on National Vitality* (1909) comes closer to the empiricist method, but even here there is the distinct flavor of marshaling evidence for a conclusion decided on other grounds. Rae may have opened Fisher's eyes to the value of the research being done by those who were proceeding more in the Baconian spirit (for example, Wesley Clair Mitchell) but in the end the process of piling one fact on another was too slow for Fisher. He hoped to do better by adopting a more theoretically directed approach, one informed both by economic and statistical theory.[7]

Second, money. Rae was an enthusiast for the Scottish system of free banking (Rae, 1834, 176–193, 397–412). He wrote: "The real advantage of the art [of banking] arises from its application of the floating loans of the society to the purposes of exchange" (p. 412). None of this sunk in. On the subject of money, Fisher stuck with Sumner's quantity theoretic explanation of prices given an inconvertible currency (Sumner, 1874, 221) and also with Sumner's consequent admiration for the British innovation of keeping the currency issue fixed in the Issue Department "entirely separated from all the vicissitudes of the banking business" (Sumner, 1896, 465). Fisher stuck with Sumner's theoretical understanding in part, one gathers, because it appeared to be consistent with his own 1892 scientific researches. He departed from Sumner not on theory but on application, favoring managed money rather than the laissez faire gold standard.



## CONCLUSION

In his 1910 textbook, Fisher wrote: "I am one of those who believe that when the usage of academic economics conflicts with the ordinary usage of business, the latter is generally the better guide" (1910, xiv). We have seen how he followed this precept in *The Nature of Capital and Income* with good results in terms of connecting up the practice of accounting with the concepts of economics. We have also seen, however, that he did not follow this guide when it came to money, where his mind was already made up by the time of his dissertation, rendering him impervious even to the suggestive comments of his hero Rae. Fisher knew about monetary theories of the rate of interest, and he knew that they emerged from the ordinary usage of business. He rejected them anyway. Fisher thereby founded modern finance on the principle that liquidity effects can be ignored for the purposes of constructing an equilibrium theory of finance, and he founded modern macroeconomics on the principle that monetary fluctuations have only temporary disequilibrium effects.

Whatever one may think of what he did, it is hard to see how Fisher could have done otherwise, given who he was and what he was trying to do. Listening to the bankers (as for example did Laurence Laughlin, the anti-quantity-theory Chicago economist) would have meant giving up the concept of income that Fisher needed for thinking about social welfare. In a thoroughgoing money flow view of the world, much of what Fisher's income concept brings into focus seems unimportant (for example, the implicit flow of services from consumer durables), and much of what Fisher's concept pushes into the background seems highly important (for example, financial flows). Fisher wanted a concept of income and capital that he could sum, because he wanted to measure aggregate or social income. For a money flow view, such summation is out of the question since it immediately nets out the phenomena that need to be front and center in the analysis. No, Fisher had to shut his ears to the practical bankers if he was ever going to make progress on his own agenda.

One consequence was that Fisher played no constructive role in the establishment of the Federal Reserve System in 1913. Another consequence was that Fisher played no constructive role in the attempts then underway by a small group of academics to develop the money flow view into a proper theory of money. I'm thinking here of Veblen (1909) but also of Young (1911) and Mitchell (1910, 1916) whose writings need to be read as responses to Fisher and attempts to articulate a positive alternative.[8] They could have used the help of a mind like Fisher's, but it was not to be.

Fisher had his own way of thinking about these matters and that, more or less, was that. He had no interest in revisiting fundamental issues that he felt he had resolved. And he couldn't help thinking that somehow his critics just weren't ready for a truly scientific approach to these questions, or didn't adequately appreciate the enormous potential benefits to mankind toward which he was working. Fisher's response to Veblen's dismissive review is a case in point, evincing equal parts puzzlement and determination to proceed: "There are doubtless many points of difference between us, but they are not in general those which Professor Veblen has mentioned. Unless unwittingly I do him injustice, his preconceptions have led him to misconceive my method and conclusions and to confuse them with methods which we both oppose" (1909, p. 516). Misconceptions there most definitely were, but on both sides and, one is bound to conclude, inevitably if somewhat tragically so.

By the time Fisher published *The Rate of Interest*, he had more or less finished his life work of theoretical construction. It was not the kind of temple Schumpeter would have liked to see, but it was a temple nonetheless, not just pillars and arches. From then on Fisher turned his attention to application, expansion, and persuasion. Schumpeter regretted the loss to economics, but Fisher himself never did. For him these activities were not peripheral. They were the whole point of his science.

## NOTES

1. The principle biographical sources are Irving Norton Fisher (1956) and Robert Loring Allen (1993). The most influential interpretations appear to be Schumpeter's obituary essay (1948), the papers in the collection edited by Fellner (1967), and Tobin's (1985) retrospective. A sample of the most recent interpretation is collected is Loef and Monissen (1999). The interpretation offered in the present essay builds most directly on the suggestive and neglected essay of Sasuly (1947).

2. Fisher's famous distinction between nominal and real interest appears to have its origin not in the dissertation but in Fisher's later exploration of the economics of bimetallism. *Appreciation and Interest* (1896) is mainly concerned with the relationship between the rate of interest under a silver standard as opposed to a gold standard. Fisher understands both rates as the sum of an underlying "real" rate plus appreciation or depreciation of the money standard in question. Only later did he apply the same reasoning to a flat money standard in order to arrive at the familiar formula.

3. Schumpeter (1948, 223) suggests as much, but does not characterize the vision that emerges.

4. Keynes might be understood as having been engaged in the same straddle. This helps to explain the attraction that American Keynesians (e.g. Tobin, 1985) felt for Irving Fisher. And it helps to explain the attraction that young American economists, already exposed to Fisher, felt for Keynes. Note however the difference between Fisher



and Keynes on the definition of income. Also, whereas Keynes mainly used uncertainty to get time into the picture, Fisher mainly used invention, and he did so even though he was familiar with the distinction between risk and uncertainty. (Compare Fisher, 1906, Ch. 16 "The Risk Element" with Keynes' *Treatise on Probability* 1921.)

5. It is a crude measure, of course, and Fisher thought that direct utility measurement was still needed in order to take account of cross-section variation in the marginal utility of income. Fisher's 1927 article on "Measuring Marginal Utility" is an attempt to take that next step.

6. Allen (1993) dates the tuberculosis episode from diagnosis in fall 1898 to recovery of full energy in spring 1904 after the fire that destroyed Fisher's house at 460 Prospect Street.

7. Sasuly (1947) is a good starting point for understanding this later side of Fisher. In the recent collection by Loef and Monissen (1999), the essays by John Chipman on Fisher's econometrics and by Janos Barta on his index numbers are worth close attention.

8. Mehrling (1997) chronicles the line of thinking about money that springs from these origins. Note particularly the role of J. B. Canning's *Economics of Accountancy* (1929) as a formative influence on Edward Shaw, an influence later incorporated in his book with John Gurley *Money in a Theory of Finance* (1960). Canning's book also influenced Irving Fisher. In rewriting *The Rate of Interest* (1907) as *The Theory of Interest* (1930), Fisher explicitly followed Cannings' suggestion to put the flow of income at the center of the analysis, and the stock value of capital more in the background. It's not the money flow view, but it moves as much in that direction as was possible for Fisher.

## REFERENCES


Allen, R. L. (1993). *Irving Fisher, A Biography*. Cambridge, Mass.: Blackwell.

Barber, W. J. (1997). Career Highlights and Formative Influences. In: W. J. Barber (Ed.) *The Works of Irving Fisher* (pp. 3–21). London: Pickering and Chatto.

Black, F. (1987). *Business Cycles and Equilibrium*. New York: Basil Blackwell.

Canning, J. B. (1929). *The Economics of Accountancy: a critical analysis of accounting theory*. New York: Ronald Press.

Fellner, W. (Ed.) (1967). *Ten Economic Studies in the Tradition of Irving Fisher*. New York: Wiley.

Fisher, I. (1892). *Mathematical Investigations in the Theory of Value and Prices*. PhD Thesis. Transactions of the Connecticut Academy, *9* (July): 1–124.

Fisher, I. (1887). A Neglected Economist. *Yale Review*, *5*(4), (February), 457.

Fisher, I. (1896). *Appreciation and Interest*. Publication of the American Economic Association, Third Series, Vol. XI, No. 4. New York: Macmillan.

Fisher, I. (1905). Review of *The Sociological Theory of Capital* by John Rae. *Yale Review*, *14*(3), (November), 330–333.

Fisher, I. (1906). *The Nature of Capital and Income*. New York: Macmillan.

Fisher, I. (1907). *The Rate of Interest; Its Nature, Determination and Relation to Economic Phenomena*. New York: Macmillan.

Fisher, I. (1909). *Report on National Vitality, Its Wastes and Conservation*. Washington, D.C.: Government Printing Office.

Fisher, I. (1909). Capital and Interest. *Political Science Quarterly, 24*(3), (September), 504–516.

Fisher, I. (1910). *Elementary Principles of Economics*. New York: Macmillan.

Fisher, I. (1911). *The Purchasing Power of Money; Its Determination and Relation to Credit, Interest and Crises*. New York: Macmillan.

Fisher, I. (1915). *How to Live; Rules for Healthful Living Based on Modern Science* (with Eugene Lyman Fisk). New York: Funk and Wagnalls.

Fisher, I. (1920). *Stabilizing the Dollar*. New York: Macmillan.

Fisher, I. (1922). *The Making of Index Numbers*. Boston: Houghton Mifflin.

Fisher, I. (1923). The business cycle largely a 'dance of the dollar'. *Journal of the American Statistical Association, 18*, 1024–1028.

Fisher, I. (1927). A statistical method for measuring marginal utility and testing the justice of a progressive income tax. In: J. H. Hollander (Ed.), *Economic Essays, Contributed in Honor of John Bates Clark* (pp. 157–193). New York: Macmillan.

Fisher, I. (1930). *The Theory of Interest, as determined by impatience to spend income and opportunity to invest it*. New York: Macmillan.

Fisher, I. (1932). *Stamp Scrip*. New York: Adelphi.

Fisher, I. (1932). *Booms and Depressions: some first principles*. New York: Adelphi.

Fisher, I. (1933). The Debt-Deflation Theory of Great Depressions. *Econometrica, 1*, 337–357.

Fisher, I. (1935). *100% Money*. New York: Adelphi.

Fisher, I. (1942). *Constructive Income Taxation*. New York: Harper.

Fisher, I. N. (1956). *My Father, Irving Fisher*. New York: Comet Press.

Gurley, J. G., & Shaw, E. S. (1960). *Money in a Theory of Finance*. Washington, D. C.: Brookings Institution.

Kaufman, H. (2000). *On Money and Markets*. New York: McGraw Hill.

Keynes, J. M. (1921). *A Treatise on Probability*. London: Macmillan.

Loef, H.-E., & Monissen, H.G. (Eds) (1999). *The Economics of Irving Fisher, Reviewing the Scientific Work of a Great Economist*. Northampton, Mass.: Edward Elgar.

Mehrling, P. (1997). *The Money Interest and the Public Interest, American Monetary Thought, 1920–1970*. Cambridge, Mass.: Harvard University Press.

Minsky, H. (1986). *Stabilizing an Unstable Economy*. New Haven: Yale University Press.

Mitchell, W. C. (1910). The rationality of economic activity. *Journal of Political Economy, 18*(2–3), (February, March), 97–113, 197–216.

Mitchell, W. C. (1916). The role of money in economic theory. *American Economic Review, 6*(1), supplement (March), 140–161.

Mirowski, P. (1989). *More Heat Than Light: Economics as social physics, physics as nature's economics*. Cambridge, England: Cambridge University Press.

Rae, J. (1834). *Statement of Some New Principles on the Subject of Political Economy, exposing the fallacies of the system of free trade*. Boston: Hilliard, G.

Sasuly, M. (1947). Irving Fisher and Social Science. *Econometrica, 15*(4), (October), 255–278.

Schumpeter, J. A. (1948). Irving Fisher's Econometrics. *Econometrica, 16*, 219–231.

Soros, G. (1987). *The alchemy of finance: reading the mind of the market*. New York: Simon and Schuster.

Sumner, W. G. (1874). *A History of American Currency*. New York: H. Holt.

Sumner, W. G. (1896). A History of Banking in the United States. New York: *Journal of Commerce and Commercial Bulletin*.



Tobin, J. (1985). Neoclassical Theory in America: J. B. Clark and Irving Fisher. *American Economic Review, 75*(6), (December), 28–38.

Veblen, T. (1908). Fisher's Capital and Income. *Political Science Quarterly, 23*(1), (March), 112–128.

Veblen, T. (1909). Fisher's Rate of Interest. *Political Science Quarterly, 24*(2), (June), 296–303.

Young, A. A. (1911). Some limitations of the value concept. *Quarterly Journal of Economics, 25*(3), (May), 409–428.