

# INVESTIGATING THE “DEBT–MONEY– PRICES” TRIANGLE: IRVING FISHER’S THEORETICAL JOURNEY TOWARD THE 100% MONEY PROPOSAL

BY  
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*This paper aims to show how the 100% money proposal, which Irving Fisher came to support in 1935, connects to the rest of his work on monetary instability—in particular, to his credit cycle analysis of 1911 and his debt-deflation theory of 1932–33. Behind these respective analyses, we identify a common explanatory pattern of monetary fluctuations, the “debt–money–prices” triangle, which we use to show how Fisher’s explanations evolved over time, and how his advocacy of 100% money came as a logical conclusion.*

## I. INTRODUCTION

In his 1935 book *100% Money*, Irving Fisher offered his own particular version of the reform idea embodied in the “Chicago Plan” of 1933: that of divorcing the creation and destruction of money from the extension and contraction of bank loans by imposing a 100% reserve requirement in lawful (state-created) money behind checking deposits.<sup>1</sup> Up until his death in 1947, the Yale economist would make this “100% money” proposal (as he termed it) his centerpiece for stabilizing the dollar and mitigating booms and depressions. His relentless advocacy of the plan has been well documented in the literature—see, e.g., William R. Allen (1993), Robert W. Dimand (1993b; 2019,

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<sup>1</sup> The “Chicago Plan” for banking reform was first presented in a series of memoranda circulated in 1933 by a group of University of Chicago economists, among whom Henry C. Simons played a prominent role (see Knight et al. [1933] 1995; Simons et al. [1933] 1994; Simons [1934] 1948). On the history of this plan, see Ronnie J. Phillips (1994, 1995) and George S. Tavlas (2019, 2023, and *forthcoming*).

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ch. 5), and Ronnie J. Phillips (1995). Less has been said, however, about the place and importance of this reform idea in Fisher's analysis of monetary instability. In this respect, more attention has been paid to his credit cycle theory of 1911, or to his debt-deflation theory of 1932–33, than to his analysis of the tie between money and debt (and related 100% money proposal) of 1935.<sup>2</sup> The analytical novelty underlying the 100% plan as well as its connection to Fisher's previous analyses of monetary instability have seldom been stressed. Fisher himself, after all, placed more emphasis on the practical rather than theoretical aspects of his 1935 book, without really showing how it could connect to his previous works. Neither had he shown how his debt-deflation theory could relate, in some way, to his earlier credit cycle analysis. This paper—which strictly focuses on the theoretical aspects of Fisher's thought—proposes to draw such connections. We first argue, while recalling some recurring features of Fisher's analysis, that all his successive explanations of cyclical monetary fluctuations rested upon a common pattern, which we call the “debt–money–prices” triangle (section II). We then proceed, using this pattern, to study the evolution of his analysis through its successive stages: his early explanation of “credit cycles” developed between 1896 and 1911 (section III); his “debt-deflation theory” of great depressions presented in 1932–33 (section IV); and, finally, his “money-debt tie” analysis underlying his 100% reserve plan of 1935 (section V)—which proposal, we argue, emerged as the logical outcome of a long analytical journey.

## II. FISHER'S ANALYSIS OF MONETARY INSTABILITY: SOME CONSTANT FEATURES

Before dealing with the evolution over time of Fisher's analysis of monetary instability, several constant features of the analysis must be recalled, regarding the largely *monetary nature* of the business cycle, the *real effects* of short-run monetary instability, and the *global explanatory pattern* that he used to account for such instability.

### *An Essentially Monetary Interpretation of Booms and Depressions*

Fisher assigned fundamentally different effects to monetary factors, depending on whether the long run or the short run was considered. His reasoning was based, in both cases, on the equation of exchange,  $MV = PT$ , with  $M$  representing the volume of circulating medium;  $V$ , its velocity of circulation;  $T$ , the real volume of trade; and  $P$ , the general price level.<sup>3</sup>

<sup>2</sup> Joseph A. Schumpeter (1948, p. 220n3), for example, when reviewing “Irving Fisher's Econometrics,” specified: “We shall not consider books addressed to the general public” such as “100 Percent Money.”

<sup>3</sup> In his earlier writings (until the 1920s), Fisher reserved the use of the term “money” for generally accepted means of payment (the circulating part of which he designated by  $M$ ), using a distinct abbreviation for deposit currency ( $M'$ ) in the equation of exchange, which then read as  $MV + M'V' = PT$ . In his later writings (from the late 1920s at least), he included deposit currency in the money stock ( $M$ )—now comprising all commonly used means of payment—and simplified the equation accordingly: it became  $MV = PT$ . He used no symbol to distinguish what he called “lawful money” from “deposit currency.” Throughout this paper, unless specified otherwise, we will designate  $M$  as the total volume of circulating medium (as the later Fisher did),  $M_0$  as the volume of lawful money directly issued by the state or the central bank (whether as coins, notes, or deposits), and  $M'$  as the volume of bank deposit currency—i.e., all transferable (“checking”) deposit balances held at

Over the “long run”—i.e., insofar as static analysis comparing two states of equilibrium was concerned—Fisher viewed money as neutral: any change in  $M$ , having only temporary effects upon  $V$  and  $T$ , would ultimately lead (assuming the absence of independent changes in  $V$  and  $T$ ) to an exactly proportional change in  $P$ . That, of course, was the essence of the quantity theory of money, which Fisher ([1911] 1913) famously restated.<sup>4</sup>

However, over the “short run”—i.e., insofar as dynamic analysis of transitional or cyclical disequilibrium was concerned—Fisher regarded money as far from neutral: variations in  $M$  (and more particularly in  $M'$ ) were considered to be not only an active factor but, in most cases, the *main* disturbing factor affecting  $T$ . This was the essence of his analysis of transition periods, and of his view of the business cycle as “largely a dance of the dollar” (Fisher 1923).<sup>5</sup> In all his writings on the subject, booms and depressions of trade were closely associated with credit cycles, made of alternate inflations and deflations of deposit currency.<sup>6</sup>

Fisher’s analysis, to be sure, was not wholly monetary, especially insofar as the starting phase of the cycle was concerned. He always insisted that *any* type of factor, whether monetary or not, might cause the initial disturbance setting off a boom or depression sequence. He also explained at length how various non-monetary factors (such as changes in profits, net worth, or business confidence) combined to amplify the cyclical movement, once underway, as did changes in the velocity of circulation of money. Yet, he generally regarded these factors as of secondary importance, and considered that large changes in  $V$  were not likely to occur independently of large changes in  $M$ . The key driving force accounting for the severity of the cycle, in his analysis, always was the volume of circulating medium, and more specifically the volume of deposit currency ( $M'$ ).

Fisher also sought empirical verification for his interpretation. A series of statistical studies led him to find that the rapidity of change of the price level was highly correlated with changes in the physical volume of trade and in the volume of

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commercial banks. Considering these different sets,  $M$  would then correspond to  $MoUM'$ , and its amount be equal to the sum of  $Mo$  and  $M'$ , minus the part of  $M'$  covered by reserves ( $Mo \cap M'$ ) (see Demeulemeester 2018, p. 363).

<sup>4</sup> Comparative static analysis particularly applies to the lasting effects of *one-off* changes in the volume of money, such as exogenous changes in the monetary base. Fisher thus resorted to the quantity theory to counter the popular argument, used in particular during the Bryan presidential campaign of 1896, according to which the monetization of silver could, in addition to raising the price level, bring lasting real benefits to the economy (see Dimand 1999, p. 38).

<sup>5</sup> Dynamic analysis applies either to the transitory effects of *one-off* changes in the volume of money (such as occurring during “transition periods” between two states of equilibrium) or to the effects of *cumulative* changes in that volume (such as occurring during “credit cycles”). Fisher ([1911] 1913), however, did not really distinguish between these two cases: he typically viewed short-run monetary disturbances as both *initiated* by a one-off change in the metallic monetary base (or any other cause affecting  $P$ ), and *amplified* by cumulative changes in deposit currency. He thus treated “credit cycles” and “transition periods” as if they were one and the same thing.

<sup>6</sup> Fisher ([1933] 1934, p. 21), for example, summarized the depression phase of the cycle as follows: “The key to the business failures, and therefore the key to the depression, is the deflated price level; the key to the deflated price level is monetary deflation; the principal kind of money which deflates is our checking accounts at the banks.”

employment (Fisher 1923, 1925, 1926, 1936c). The advent of the Great Depression—which he saw as a “money famine” (1936b, p. 104)—did not alter his view on the matter.

### *The Real Effects of Monetary Instability*

Fisher was consistent not only in holding short-run monetary instability—and more particularly the cumulative variability of  $M'$ —as largely responsible for booms and depressions but also in describing *how* monetary instability would impact real activity. He argued that unexpected changes in the purchasing power of money (i.e., changes in  $P$ ), whether upward or downward, would produce three main evils. The “primary evil” of unstable money was “social injustice, a sort of subtle pocket picking,” alternately affecting the creditor and creditor-like groups, or the debtor and debtor-like groups (Fisher 1920, p. 76; see also 1928, pp. 60–61). The second evil was “social inefficiency,” that is, “irregularity in business, industry, and employment” (Fisher 1928, pp. 106, 98). This was not only because business was “always injured by uncertainty” (Fisher 1928, p. 87) but also because an unstable dollar, by playing havoc with bookkeeping values, would spell profit losses and failures (Fisher [1933] 1934, p. 74).<sup>7</sup> The third evil, resulting from the first two, was “social discontent” (Fisher 1928, p. 98), leading to class hatred and violence, while “the *real* culprit—the dollar” (Fisher 1933a, p. 66; italics in original) usually remained unsuspected because of the “money illusion”—that is, “the illusion that money is always fixed in value, that ‘a dollar is a dollar’” (Fisher 1920, p. 36). For the foregoing reasons, far from having only redistributive effects, monetary instability always led to a “net loss” to society as a whole, whether in the case of a rising or a falling price level (Fisher 1928, p. 102).<sup>8</sup> In the context of the Great Depression, Fisher (1932c, p. 32; 1933b, p. 342) also came to stress the fact that changes in  $MV$ , if particularly severe, could even affect  $T$  directly, without waiting for a change in  $P$  to do so. It is not surprising, therefore, that he always advocated a stable money policy—stabilizing, through control of its quantity, the purchasing power of money—upon which the prosperity of business and maintenance of employment depended.<sup>9</sup>

<sup>7</sup> About the deflation of 1929–33, for instance, Fisher wrote: “When the dollar became a swollen dollar, it increased *all* debts... . It measured things wrong, and measured them more wrong every day... . The dislocation was primarily a bookkeeping phenomenon. It changed the appraisals; and a changed appraisal is fatal to solvency... . After 1929, money lied in the account books; and this bookkeeping lie went on spreading, until society’s whole machinery of production and distribution was nearly wrecked” (Fisher [1933] 1934, pp. 44–45; italics in original). The fact that deflation, by increasing the real value of outstanding debts, often led to business failures had already been noted by Fisher (1911, p. 335), long before he presented his debt-deflation theory.

<sup>8</sup> “But we now find the losses exceed the gains, owing to the indirect harm of uncertainty, depression, unemployment, discontent, strikes, lock-outs, sabotage, riots, violence, Bolshevism. These can only mean a dead loss to the general public. The loss is felt whether the price level is rising or falling” (Fisher 1928, p. 103).

<sup>9</sup> Throughout his career, Fisher devoted considerable time and energy to develop price-level indexes, to enlighten the public on the advantages of a stable monetary unit, to devise practical stabilization schemes, and to call for legally mandating the monetary authority to stabilize the purchasing power of the dollar. For an overview of his efforts and contributions, see Dimand (2019).

### *A Constant Explanatory Pattern: The “Debt–Money–Prices” Triangle*

In what follows, we argue that, although Fisher’s specific explanations of short-run monetary instability would evolve over time, they had one element in common. They all rested on the cumulative interplay between three key variables: the nominal volume of loans or debts (which we will designate as  $D$ ),<sup>10</sup> the general price level ( $P$ ), and the volume of deposit currency ( $M'$ ). This interplay, which Fisher (1912, p. 363) referred to as “the circle of inflation, loans, deposits, and inflation again,” would provide the common basis for all his successive theories of monetary instability—a fact to which he never seems to have drawn attention. We propose to call this the “debt–money–prices triangle,” as illustrated in [Figure 1](#).

This interplay can be deconstructed into three specific relations of causality:

- the  $P$ -to- $D$  causality, by which an increase (a decrease) in the general price level brings about an increase (a decrease) in the nominal volume of loans, or debts—including, crucially, those having their source in commercial bank loans;
- the  $D$ -to- $M'$  causality, by which an increase (a decrease) in bank loans brings about an increase (a decrease) in the volume of deposit currency; and
- the  $M'$ -to- $P$  causality, by which an increase (a decrease) in the volume of deposit currency brings about, other things equal, an increase (a decrease) in the general price level.

Fisher’s investigations into the causes of cyclical monetary disturbances may be interpreted as a search for the main factor responsible for this vicious interplay. As we will see, he would first focus his attention on the  $P$ -to- $D$  causality ([section III](#)), before turning to the broader  $D$ -to- $M'$ -to- $P$  causality ([section IV](#)), and, finally, to the specific  $D$ -to- $M'$  causality ([section V](#)).

### III. FISHER’S EARLY ANALYSIS OF CREDIT CYCLES (1896 to 1911): FOCUSING ON THE $P$ -TO- $D$ CAUSALITY

As mentioned, in his 1911 book, *The Purchasing Power of Money*, Fisher offered a restatement of the quantity theory, according to which changes in the money stock would tend to produce proportional changes in the price level in the long run. He then restricted the use of the term “money” to designate *generally* accepted circulating media (i.e., gold coins and banknotes), and held that the volume of deposit currency ( $M'$ ) would “normally” hold a definite relation to money so defined (Fisher [1911] 1913, p. 50). Only during “transition periods” or “credit cycles,” covered in Chapter 4 of his book (see below), would this ratio be disturbed. Although Fisher did specify that “periods of transition are the rule and those of equilibrium the exception” ([1911] 1913, p. 71), he gave the impression, throughout the rest of the book, of considering that deposit currency would generally keep a proportional relation to the monetary base, so that controlling the latter was all that was needed to stabilize the

<sup>10</sup> Throughout the paper,  $D$  may designate the nominal volume of debts or the nominal volume of loans, which are, of course, two sides of the same coin. Let it be noted that Fisher himself never used any kind of symbol to designate this volume.

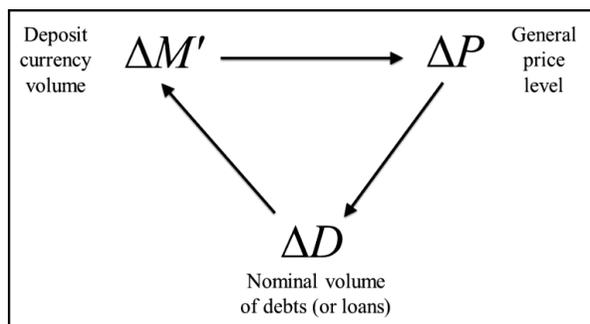


FIGURE 1. The Debt–Money–Prices Triangle

price level. His proposed remedy to monetary fluctuations—namely, his famous “compensated dollar” plan, which he first presented in 1911 (Fisher [1911] 1913, pp. 337–347)—actually consisted in periodically varying the gold content of the dollar, so as to keep its purchasing power constant; that is, “to change from a gold dollar of constant weight and varying purchasing power to a gold dollar of constant purchasing power and varying weight” (Fisher [1911] 1913, p. 233).<sup>11</sup> Such a plan, however, would have directly affected only the monetary base, which led several critics to regard it as inadequate to deal with fluctuations in deposit currency.<sup>12</sup> Many reviewers of the *Purchasing Power of Money* also criticized Fisher for overemphasizing the importance of “normal” periods, in which the deposit–reserve ratio could be considered as stable, and downplaying the fact that transition periods (or credit cycles) were actually the normal case.<sup>13</sup> These limits of Fisher’s early analysis having been stressed, the present section focuses on those of his writings of the time—especially Chapter 4 of his 1911 book—in which he did emphasize the cyclical behavior of deposit currency.

From his earlier writings on the subject up until the Great Depression, Fisher assigned a crucial role to the *P*-to-*D* causality channel when explaining short-run monetary fluctuations.<sup>14</sup> He located the starting point of credit cycles in any change in the price level (*P*), arguing that this would prompt a variation in the volume of loans (*D*). This would itself, via its effect on the volume of deposit currency (*M*’), bring a further change in *P*, and so on. This variation in *D* following from an initial variation in *P* was, in his view, the key relationship behind credit cycles, which he set himself the task of explaining.

<sup>11</sup> Only in the 1920s would Fisher come to increasingly emphasize the importance of “credit control” as a complement to “gold control.” He would nonetheless keep advocating his compensated dollar plan well into the 1930s. On Fisher’s compensated dollar, see especially Don Patinkin (1993), Jérôme de Boyer des Roches and Rebeca Gomez Betancourt (2013), and Dimand (2019, ch. 5).

<sup>12</sup> See, e.g., Allyn A. Young (in Richard T. Ely et al. 1923, p. 318) and John Maynard Keynes ([1923] 1971, p. 148), as well as, more recently, Patinkin (1993, p. 8).

<sup>13</sup> See, e.g., Keynes (1911, p. 395), David Kinley (1911, p. 595), Wesley C. Mitchell (1912, p. 163), W. G. Langworthy Taylor (1912, pp. 334–337), or Edwin B. Wilson (1913, pp. 760–763).

<sup>14</sup> For discussions of Fisher’s early analysis of credit cycles, see, for example, Dimand (1993a, 1999, 2019, chs. 3, 5) and Laidler (1991, pp. 91–95; 2013, pp. 183–187).

Fisher's first explanation of this *P-to-D* causality rested upon the particular behavior of the rate of interest. As early as 1896, he argued that an "inequality" of foresight existed between debtors and creditors, the former being more prompt to notice a change in *P*, which led to a lag in the adjustment of the nominal rate of interest (Fisher 1896, pp. 76–77). As a result, while, under a rising price level, the *nominal* rate of interest would be slow to rise, the *real* rate would actually decline (other things equal), which would unduly stimulate the demand for loans until the rate adjustment was complete—and conversely under a falling price level. This provided, in Fisher's view, an explanation for credit cycles:

What has been said bears directly on the theory of 'credit cycles'. In the view here presented periods of speculation and depression are the result of *inequality* of foresight... **[W]hen prices are rising**, borrowers are more apt to see it than lenders. Hence, while the borrower is willing to pay a higher interest than before for the same loan, lenders are willing to loan the same amount for the same interest. That is, the 'demand schedule' will rise while the 'supply schedule' remains comparatively unchanged. This will of course raise the rate of interest. But it will also cause **an increase of loans and investments**. (Fisher 1896, pp. 76–77; italics in original, bold emphasis added to highlight the *P-to-D* causality)

At that time, Fisher chose not to detail the reverse causality channel running from *D* to *P*, via *M'*, possibly because he was so convinced that he had found the main anomaly underlying credit fluctuations.<sup>15</sup> The thrust of this "inequality-of-foresight" theory was again expressed in Fisher (1907, pp. 284–287), and would lie at the heart of his explanation of credit cycles in Chapter 4 of *The Purchasing Power of Money* (Fisher [1911] 1913). In the latter work, this time, he fully described the triangular interplay between *P*, *D* and *M'*, summarizing the upswing phase as follows:

1. **Prices** rise (whatever the first cause may be; but we have chosen for illustration an increase in the amount of gold).<sup>[16]</sup>
2. The rate of interest rises, but not sufficiently.
3. Enterprisers ... encouraged by large profits, expand their **loans**.
4. **Deposit currency** (*M'*) expands relatively to money (*M*).<sup>[17]</sup>
5. **Prices** continue to rise, that is, phenomenon No. 1 is repeated. Then No. 2 is repeated, and so on.

In other words, a slight initial rise of prices sets in motion a train of events which tends to repeat itself. Rise of prices generates rise of prices, and continues to do so *as long as the*

<sup>15</sup> "Nor is this the place to treat fully the reaction on prices themselves. But it can scarcely be doubted that the mal-adjustment of interest is a central feature in the whole movement... Interest, rather than credit, appears as the chief independent variable, objectively speaking, though behind it all is imperfection of foresight" (Fisher 1896, p. 79).

<sup>16</sup> In this regard, Fisher ([1911] 1913, p. 70) further specified: "Any cause which disturbs equilibrium will suffice to set up oscillations. One of the most common of such causes is an increase in the quantity of money. Another is a shock to business confidence... A third is short crops... A fourth is invention."

<sup>17</sup> Recall that at this stage of his career, Fisher used the term *money* in the narrow sense of cash in circulation.

*interest rate lags behind its normal figure.* (Fisher [1911] 1913, p. 60; italics in original, bold emphasis added to highlight the  $P$ ,  $D$ , and  $M'$  variables)<sup>18</sup>

But, as the above passage illustrates, Fisher kept identifying the “lag in interest” occurring within the  $P$ -to- $D$  sequence as the central factor underlying the whole cycle. He had stated, after all, that “the chief object of this chapter is to show that the peculiar behavior of the rate of interest during transition periods is largely responsible for the crises and depressions in which price movements end” ([1911] 1913, p. 56). On this very point, however, his theory would meet with strong criticism, leading him to adjust his views somewhat.

Indeed, many critics of *The Purchasing Power of Money*, such as Oliver M. W. Sprague (1911, pp. 143–144), Mitchell (1912, p. 164), and Minnie Throop England (1912), saw no reason for isolating the rate of interest from other production costs (such as wages, salaries, and raw materials), the adjustment of which was just as (if not more) likely to be lagging behind changes in  $P$ —thus providing as good an explanation for the increase in profits and borrowings under a rising price level. England (1912, pp. 98–101), basing her criticism on empirical studies of her own, thus invited Fisher to modify his theory accordingly. The latter, who may have received similar criticisms beforehand,<sup>19</sup> did make such changes in his books *Elementary Principles of Economics* ([1910] 1911, 1912) and *Why Is the Dollar Shrinking?* (1914). In these works, the chapters dedicated to “transition periods,” in contrast with Chapter 4 of *The Purchasing Power of Money*, no longer presented the lag in interest as the central cause of credit cycles.<sup>20</sup> In the upswing phase, whereas sequences 1, 3, 4, and 5 remained unchanged, sequence 2 now read as follows: “(2) ‘Enterprisers’ ... get much higher prices than before, without having much greater expenses (for interest, rent, salaries, etc.), and therefore make much greater profits” (Fisher 1914, p. 77; see also 1912, p. 187).

The concluding line was amended accordingly: “Rise of prices generates rise of prices and continues to do so as long as *the enterprisers’ profits continue abnormally high*” (Fisher 1914, p. 78; italics in original; see also 1912, p. 187). Henceforth, Fisher would typically include production costs in general (such as “rent, salaries and wages—not to mention raw materials”), along with interest, as responsible for the “lagging of total expenses behind total receipt” (Fisher 1925, p. 180; see also 1920, p. 66; 1923, p. 1025; 1926, p. 787; 1932c, p. 30; 1936c, p. 496). However, he did not make such a change in the second edition of *The Purchasing Power of Money* published in 1913, for a reason he revealed in the preface;<sup>21</sup> and, on some occasions, he would again assign a primary

<sup>18</sup> Fisher ([1911] 1913) also provided a more detailed summary including the variations in  $V$  and  $V'$  (p. 68), and symmetrical descriptions of the downswing phase (pp. 63, 69).

<sup>19</sup> Unfortunately, a search of Fisher’s archives at Yale University Library has not yielded any information that allows elucidating this point.

<sup>20</sup> The first experimental edition of Fisher’s *Elementary Principles of Economics* (a textbook intended to serve as teaching material), appeared in 1910 under a different title (Fisher 1910). The chapter on transition periods was then very similar to Chapter 4 of *The Purchasing Power of Money*. It would be noticeably changed, however, in the second experimental edition, published in September 1911 (Fisher [1910] 1911)—that is, even before the criticisms of Sprague, Mitchell, and England appeared in published form—and in the final edition (Fisher 1912). That Fisher modified his description of transition periods—in some of his writings at least—does not appear to have been previously pointed out in the literature.

<sup>21</sup> “I have endeavored to avoid disturbing the plates of the first edition more than was absolutely necessary. Otherwise ... I should have liked to modify somewhat the statement of the theory of crises in Chapter IV and

importance to the maladjustment of the rate of interest (see Fisher 1914, pp. 84–86; 1923, p. 1024; 1930, pp. 43, 411–416). It is therefore difficult to assess the extent to which he really adjusted his views on this matter. In any case, after he developed his debt-deflation theory in 1932–33, Fisher would consider both the rigidity of production costs in general, and the lagging behind of interest rates in particular, as insufficient explanations, in and of themselves, of booms and depressions.<sup>22</sup> From then on, he would turn his attention to another sequence of the “debt–money–prices” triangle.

#### IV. FISHER’S DEBT-DEFLATION THEORY OF GREAT DEPRESSIONS (1932–33): SHIFTING THE FOCUS TOWARD THE *D-TO-M'-TO-P* CAUSALITY

The Great Depression of the 1930s made Fisher tackle the issue of monetary instability from a different angle. Until then, as discussed, he had held the view that credit cycles originated with a disturbance of the general price level (*P*)—“whatever the first cause may be”—from which the whole cumulative interplay between *P*, *D*, and *M'* was set off. In the boom years preceding the Great Depression, however, both the total money stock and the commodity price level had remained fairly stable, largely as a result of the countercyclical actions undertaken by the Federal Reserve System during those years (see Fisher 1934, pp. 250–251). Whatever rise in prices occurred at that time was especially concentrated in the stock market.<sup>23</sup> Possibly for this reason, Fisher’s analysis evolved. Noting that the Great Depression had originated with “a state of over-indebtedness” (Fisher 1932c, p. 25), he would thereafter take the nominal debt-volume (*D*) as the starting point of his credit cycle explanations, and focus on the *D-to-M'-to-P* sequence of the triangle.

Fisher’s new theory of booms and depressions—which, when applying it to the downswing phase, he termed the “debt-deflation theory”—was presented in a series of works, including his book *Booms and Depressions* (1932c) and an article published in the first volume of *Econometrica* (1933b).<sup>24</sup> This theory, Fisher (1932c, p. vii)

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in Chapter XI to make use of the helpful criticism of Miss Minnie Throop England, of the University of Nebraska” (Fisher [1911] 1913, p. xiii). This led William J. Barber et al. (1997, vol. 4, p. 565) and Dimand (1999, p. 48) to consider that Fisher actually never took any account of England’s criticism whatsoever. It is true that he never explicitly responded to her. But, as we have seen, he certainly did, in some of his works at least, modify his explanation of credit cycles along the very lines of her criticism.

<sup>22</sup> “Profits” and the “rate of interest” would be treated, respectively, as the “fifth” and “ninth” main oscillating factors in *Booms and Depressions* (Fisher 1932c, pp. 30, 38). As Antoine Rebeyrol (1988, p. 115) noted, Fisher now classified his “inequality-of-foresight theory” among those that, despite containing “some grain of truth,” were insufficient “to explain *big* disturbances” (Fisher 1932c, p. 62; 1933b, p. 340; italics in original).

<sup>23</sup> About the 1923 to 1929 boom, Fisher (1932c, pp. 74–75, italics in original) noted, in retrospect: “The effect of this borrowing fever was steadily and enormously to inflate the deposit currency. Corporate profits rose, and the price level in the stock market rose. These were ominous signs. . . . One warning, however, failed to put in an appearance—the *commodity price level did not rise*. The index of wholesale commodity prices, therefore, is not always an infallible index of monetary and business trends. In 1923–29, an index half-way between the level of commodity prices and the steep up-tilt of stock market prices would have been nearer the truth.”

<sup>24</sup> This theory was further presented in Fisher (1932a, pp. 347–368; 1932b, pp. 126–130; 1933a, ch. 6; [1933] 1934, ch. 3). See also Fisher ([1934] 2003) on the international transmission of booms and depressions. For

maintained in the preface of his 1932 book, sought to highlight how some “nine main factors” combined to explain business cycles. However, he quickly focused on the first three of them in particular, which he singled out in a specific chapter: the debt volume, the deposit currency volume, and the price level (pp. 8–28). We find here, once again, the “debt–money–prices” triangle— $D$ ,  $M'$ , and  $P$ . The “remaining six factors”—which included “net worth,” “profits,” “production, trade and employment,” “optimism and pessimism,” “the velocity of circulation,” and “the rate of interest” (1932c, pp. 29–43)—were presented as rather secondary factors, mostly reacting to a falling price level, and were treated, as a reviewer observed, “in a cursory manner” (Arakie 1933, p. 485). There was nothing really new in this list, as all nine factors already appeared more or less explicitly in Fisher ([1911] 1913, pp. 67–70, 335).

The novelty of Fisher’s debt-deflation theory was to be found, first of all, in its analysis of the interrelations between the three main factors,  $D$ ,  $M'$ , and  $P$ . In contrast with his former theory of credit cycles—which, as we saw, focused on the  $P$ -to- $D$  causality—he now focused on the  $D$ -to- $M'$ -to- $P$  sequence, emphasizing how a decrease in  $D$  led, through a contraction of  $M'$ , to a decrease in  $P$  (and conversely in the upswing phase):

When over-indebtedness ... is discovered ... distress selling is likely to arise... . This excessive eagerness on the selling side of a market may seem enough to explain how distress selling tends to lower the price level; but it is not the fundamental influence. (Fisher 1932c, pp. 13–14)

The really most important reason for this fall in the price level is the contraction of the currency that comes about. There is always a contraction of currency when people pay their debts to a commercial bank faster than new debts are created... . [That] is the key to the whole situation. (Fisher 1932a, p. 352; see also 1932c, p. 14)

Thus, the volume of the most important circulating medium is tied to the volume of debts, especially debts at the banks ... so that a sudden disturbance of this **debt-volume** is passed on to the **currency-volume** and consequently passed on to the **general price level**. (Fisher 1932c, p. 17; bold emphasis added to highlight the  $D$ -to- $M'$ -to- $P$  causality)

Then, with the ensuing  $P$ -to- $D$  sequence, the process would come full circle and repeat itself cumulatively, thus feeding booms and depressions.<sup>25</sup>

Above all, Fisher came to stress another new feature of his analysis—which he would later term the “Debt Paradox” (Fisher 1936a, p. 407)—pertaining to the case of particularly great booms and depressions: the “theory that when over-indebtedness is so great as to depress prices faster than liquidation, the mass effort to get out of debt sinks us more deeply into debt” (Fisher 1933b, p. 350). That is, the fall in the price level—spelling an increase in the real value of each dollar of debt outstanding—could happen faster than the decrease in the nominal debt-volume, so that the *real* debt-volume would actually increase.<sup>26</sup>

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discussions of the debt-deflation theory, see Dimand (1994; 2019, ch. 8) and the references provided by that author.

<sup>25</sup> See Fisher (1933a, pp. 78–79) for a summary statement of both the upward and downward phases.

<sup>26</sup> The opposite would occur in a great boom, starting from “a state of *under-indebtedness*” (Fisher 1932c, pp. 41–43; italics in original).

Nominally, of course, any liquidation must reduce debts, but really ... it may swell the unpaid balance of every debt in the country, because the dollar which has to be paid may increase in size faster than the number of dollars in the debt decreases. (Fisher 1932c, p. 25)

Then we have the great paradox which, I submit, is the chief secret of most, if not all, great depressions: *The more the debtors pay, the more they owe.* (Fisher 1933b, p. 344; italics in original)

Thus, whereas Fisher had until that time considered price-level variations as tending to be “self-corrective” (Fisher [1911] 1913, p. 70), he now argued that under certain circumstances, if left to themselves, they could become self-defeating instead.

Fisher (1932c, p. 15) further specified that, owing to their special role in the money-supply mechanism, “commercial bank debts” were “the only kind of debts directly involved” in the debt-deflation process, although other debts played an aggravating role. Yet, however much the tie between money and debt was central to his theory, he stopped short, at that time, of putting the monetary system into question. He even sometimes pushed  $M'$  into the background of his analysis, turning the spotlight on  $D$  and  $P$ :

Of these three depression tendencies, *the second (currency contraction) is important only as a connective process* between the other two—which two should be called

*The Debt Disease* (too much debt)

*The Dollar Disease* (a swelling dollar)

(Fisher 1932c, pp. 26–27; first italics added, other italics in original)

The  $D$ -to- $M'$ -to- $P$  sequence was thus sometimes treated simply as a  $D$ -to- $P$  sequence, with  $M'$  apparently accorded a secondary importance. This was especially the case in Fisher's 1933 *Econometrica* article, in which he referred to “two dominant factors, namely *over-indebtedness* to start with and *deflation* following soon after,” on the one hand, and seven “secondary variables,” into which he now relegated the “circulating media,” on the other hand (Fisher 1933b, p. 341; italics in original). This was in contrast with all of his other writings from that period (e.g., Fisher 1932a, 1932b, 1932c, 1933a, [1933] 1934), in which  $M'$  was explicitly given a central role. Could this be because, writing in an academic journal, he perhaps sought to find a receptive audience among the opponents of a monetary interpretation of business cycles?

This leads us to the question of whether Fisher's debt-deflation theory should really be regarded as monetary in nature. That this was the case was obvious to Ralph Arakie (1933, p. 485), who reviewed his 1932 book. Joseph Schumpeter (1954, p. 1122), however, although discussing it in a chapter covering the “monetary theories” of the cycle, argued that the debt-deflation theory was “in essence not monetary at all,” basing his contention on the fact that Fisher identified real factors—such as “new investment opportunities” (Fisher 1933b, p. 350)—as important debt starters.<sup>27</sup> Fisher, it is true, held that any kind of cause, whether monetary or not, could produce an initial variation in  $D$  (just like he had held, in his earlier credit cycle theory, that any kind of factor could produce the initial change in  $P$ ). He especially stressed the fact, however, that any such

<sup>27</sup> A similar interpretation was held by Mervyn King (1994, pp. 429–430), who cited Schumpeter in this respect. As a referee points out, James Tobin (1987, p. 375) also stressed the role played by “debt-financed Schumpeterian innovations” in Fisher's debt-deflation theory.

variation would then spark off cumulative variations in all three of the key variables ( $D$ ,  $M'$  and  $P$ ), and it is this *monetary* amplifying mechanism that was crucial to his analysis.<sup>28</sup> The whole interplay, moreover, could as well be started by an initial variation in  $P$ .<sup>29</sup> Although it is true that Fisher's debt-deflation theory was not entirely monetary, money (and more precisely bank money) definitely played a key role in it.

An "important corollary" of the debt-deflation theory, on which Fisher (1933b, p. 350) put strong emphasis, was that "great depressions are curable and preventable through reflation and stabilization." Indeed, the Federal Reserve System could always forestall the contraction of  $M'$  by acting on the monetary base and using "credit control" instruments, such as open market operations, the rediscount rate, or reserve requirements, in a countercyclical way (Fisher 1932c, pp. 121–131). Other measures, such as "gold control" or "velocity control," could also be used (1932c, pp. 136–141). Fisher (1932b, p. 690) therefore believed that booms and depressions could be prevented: "It can always be done, because the price level is the one thing that is easy to control."<sup>30</sup> The stability of  $P$  would still be better achieved, however, if only the cumulative interplay between  $P$ ,  $D$ , and  $M'$  could be prevented from occurring in the first place. In this respect, Fisher's analysis was soon to reach yet another stage.

## V. FISHER'S MONEY-DEBT TIE ANALYSIS AND 100% MONEY PROPOSAL (1935): FINALLY FOCUSING ON THE $D$ -TO- $M'$ CAUSALITY

With his debt-deflation theory, as we saw, Fisher had come to focus on the  $D$ -to- $M'$ -to- $P$  sequence of the "debt–money–prices" triangle. He occasionally stressed the decisive importance of the specific  $D$ -to- $M'$  causality but without, at the time, questioning the dependence of the money supply upon bank loans.<sup>31</sup> This step would finally be taken in his book *100% Money*, first published in 1935, in which he proposed "to raise reserve requirements against checking deposits from 10%, or thereabouts, to 100%" (Fisher [1935] 1945, p. xi). He explained that "the quest for non-dependence of money on loans

<sup>28</sup> See the quotations already provided in this section. It is also noteworthy that, in *Booms and Depressions*, Fisher's discussion of overindebtedness started with the very remark that "[d]ebts are tied in with the money mechanism" (1932c, p. 8). He furthermore stated: "Invention or discovery *alone* need not carry up the aggregate indebtedness very high, if the price level promptly refuses to follow up the lure of invention or discovery with the lure of profits *not due to the invention or discovery* but to credit inflation" (1932c, p. 121; italics in original).

<sup>29</sup> "In the vicious spiral, the debt factor and the inflation-deflation factor pursue each other, and either may be the starter of the pursuit" (Fisher 1932c, p. 49).

<sup>30</sup> He accordingly blamed the Federal Reserve for having failed to prevent the monetary contraction of 1929–33 (Fisher 1933b, p. 347; [1935] 1945, p. 129).

<sup>31</sup> Some passages of his 1932–33 writings, however, seemed to anticipate his later endorsement of the 100% money idea. Fisher (1933a, p. 78; italics in original), for instance, held that "[t]he leading role in these recent cases [of booms and depressions] has been played by credit currency, which (as few people are aware) constitutes nine-tenths of the circulating medium of the United States... . Credit currency develops an evil tendency of its own—a tendency which is fortunately denied to other forms of money. This tendency of credit currency (once it starts moving) is to *perpetuate its own motion in a sort of vicious circle, or rather a vicious spiral*—upward or downward as the case may be."

was what started the present writer on the 100% system” ([1935] 1945, p. 58).<sup>32</sup> From the Chicago Plan memoranda of 1933, Fisher ([1935] 1945, p. xiii) claimed to have obtained “many of the ideas” embodied in his own proposal. He had embraced this reform idea by the end of 1933, and was already campaigning for it in early 1934, as William Allen (1993, pp. 707–708) recounts.

The existing mixed monetary system, made up of both lawful and bank-created money, was now held directly responsible for the severe contraction of  $M'$  (from twenty-three to fifteen billion dollars, Fisher specified) between 1929 and 1933: “This destruction of check-book money was not something natural and inevitable; it was due to a faulty system” (Fisher [1935] 1945, p. 7). Under this “10% system,” as Fisher called it, “some nine-tenths of the depositors’ deposits can be made out of their own promises, with the help of the bank” ([1935] 1945, p. 41). The resulting “constant trombone of expansion and contraction” of deposits subject to check, “tied, as they now are, to bank loans,” was, according to him, “the chief cause of both booms and depressions” (Fisher 1935, p. 522; [1935] 1945, p. xviii). He now insisted that the  $D$ -to- $M'$ -to- $P$  causality—which, as we saw, was central to his debt-deflation theory—was made possible only by this  $D$ -to- $M'$  connection:

We ought to know that one of the chief reasons why changes in business bring about changes in the price level is the 10% system. This causes the banks, by means of business debts, to keep everlastingly tinkering with our currency and so causes unnatural inflations and unnatural deflations. . . . But, take away the 10% system and you take away these unfortunate associations between business and the price level. (Fisher [1935] 1945, p. 181)<sup>33</sup>

As a solution, the 100% money proposal sought to “make money independent of loans; that is, to divorce the process of creating and destroying money from the business of banking” (Fisher [1935] 1945, p. xvii). To this effect, a sharp distinction between two kinds of deposits would be drawn. On the one hand, *checking deposits* ( $M'$ ), serving as means of payment, could no longer be created or destroyed through bank loans. They would have to be fully covered by reserves in lawful money ( $Mo$ ), the volume of which would be regulated by a legally mandated Currency Commission, independent of the government.<sup>34</sup> On the other hand, *savings deposits*, fulfilling an investment function,

<sup>32</sup> As Fisher (1935, p. 534) recalled: “I was stimulated to it partly by [Congressman] Goldsborough asking me if it was not possible to get up a system by which the money of this country could be created and controlled without somebody having to go into debt to create it. And then I discovered that a memorandum on the subject had been prepared at the University of Chicago by a half dozen economists there.”

<sup>33</sup> See Fisher ([1935] 1945, p. 181) for a fuller statement of how the 10% system, by allowing the  $D$ -to- $M'$ -to- $P$  interplay to take place, brings about “a vicious circle in which business expansion and price expansion act each to boost the other” in a boom, and conversely in a depression. He insisted that individual bankers had no responsibility in this respect: “The public is quite wrong when, in the depression, they blame the individual bankers. It is the banking system—the 10% system—which is at fault. *Under this system, the bankers cannot help destroying money when it should be created, namely in a depression; while in a boom they create money when it should be destroyed*” (Fisher [1935] 1945, p. 78; italics in original).

<sup>34</sup> We would thus have  $Mo \cap M' = M'$ , and  $M = Mo \cup M' = Mo$ . The Currency Commission would create (destroy) money mainly by purchasing (selling) government bonds—newly issued if need be—according to a policy criterion to be adopted by Congress. Fisher, not surprisingly, favored the criterion of a stable purchasing power of the dollar. He would endow the Currency Commission with some operational discretion, so as to enable it to take action proactively whenever the price level threatened to vary (see Fisher [1935]

would be freely used by the banks to finance loans and investments (and thus remain only fractionally covered by reserves) but would not be allowed to serve as means of payment.<sup>35</sup> The banking business would therefore involve the handling of only pre-existing money, while the monetary authority alone could expand or contract the medium of exchange. In this way, the “mistaken tie between money and debt” (Fisher [1935] 1945, p. 177) would be severed, and the  $D$ -to- $M'$  causality ended—thus preventing the whole “debt–money–prices” cumulative interplay from occurring.

Henceforth, the volume of circulating medium ( $M$ ) would no longer directly vary with bank loans and investments. To be sure, an increase in the real volume of trade ( $T$ ), insofar as it exerted a downward pressure on  $P$ , would prompt the Currency Commission to increase  $M$ , supposing a price-level stabilization policy to be followed.<sup>36</sup> But such changes would no longer be cumulative—thus providing, in Fisher’s view, the conditions for a true elastic currency:

The 100% system, with a Currency Commission, provides for expansion and contraction *in proportion to the national need*—that is precisely the meaning of a steady price level. On the other hand, under the 10% system, the business-expansion and debt-expansion are *not* in proportion, nor are the two contractions in proportion. Booms and depressions prove the contrary. It is quite true that money should expand and contract as business expands and contracts. That is the main concern of this book. But we need a more genuine matching of money and business than the debt-deposit tie-up can ever give us. (Fisher [1935] 1945, p. 177; italics in original)

The velocity of circulation of money ( $V$ ), of course, might still vary. Fisher, however, held that the changes in  $V$  typically followed, rather than led, the changes in  $M$ . As he explained:

[Under the 100% system], the velocity of circulation might still be subject to various untoward disturbances. For instance, after a period of over-indebtedness and speculation, there might still be a stampede of distress selling and therefore increased hoarding; that is, there might be a slowing of velocity. The effect of this on the price level, however, would be much smaller than if the volume of circulation were also affected; and even the velocity effect on the price level could probably be offset by a suitable increase in volume. (Fisher [1935] 1945, p. 102)

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1945, ch. 6). He further argued that such a monetary system would allow reducing the national debt ([1935] 1945, pp. 206–208).

<sup>35</sup> On this point, a key difference with the Chicago Plan must be noted. Simons et al. ([1933] 1994, pp. 46–47), indeed, considered that savings deposits, *even if not subject to check* (and therefore not affecting  $M$ ), would still exacerbate the changes in  $V$ —to which changes, in contrast to Fisher, they assigned a leading role. For this reason, in addition to 100% reserves on checking accounts, the Chicagoans would prohibit the use of savings deposits and replace lending banks with investment trusts. On these differences of approach, see Demeulemeester (2018, 2022).

<sup>36</sup> Stabilizing the price level, as we saw, was Fisher’s favored policy criterion. As he observed: “The monetary authority . . . should therefore be authorized and directed, on the slightest signal of deflation, as registered by an index number, to issue more new money” (Fisher 1937a, p. 294). In this case, then, although the whole mass of means of payment would be directly supplied by the monetary authority, its volume would remain dictated by the level of economic activity. In this regard, again, Fisher’s views differed somewhat from those of the Chicago Plan authors (especially Simons), who tended to favor an automatic policy rule such as fixing the total quantity of money (see Tavlas 2015, 2021).

Fisher linked his new monetary analysis to his debt-deflation theory, providing, in Chapter 7 of *100% Money*, an updated summary of his 1933 *Econometrica* article. This time, he gave the “money-debt tie” more emphasis, noting that “an underlying cause (or pre-condition) of great booms and depressions is the 10% system itself” (Fisher [1935] 1945, p. 120).<sup>37</sup> Should the “debt–money–prices” interplay be prevented from occurring, he argued, overindebtedness would be much less likely to develop in the first place: “Moreover, under the 100% system, the depression could never get so big a start since the preceding boom and over-indebtedness would not be so great. This does not mean that, under the 100% system, there would be no booms and depressions whatever. It means simply that they would be vastly less severe” (Fisher [1935] 1945, p. 134).

Yet another argument made by Fisher was that, by separating the issuing from the lending of money, the 100% scheme would allow market conditions to prevail on the loan market, as the issuing authority would no longer need to manipulate interest rates in order to encourage (or discourage) the creation of money through bank loans:

It should also be noted that, even when the price level is, for a time, successfully stabilized under the 10% system, the very effort to accomplish this by manipulating the rates of interest ... necessarily requires some distortion of the rate of interest from normal, that is, from the rate which the mere supply and demand of loans would have produced. This is because, when the Federal Reserve Banks raise or lower the rate of interest for the purpose of preventing inflation or deflation, such raising or lowering necessarily interferes somewhat with the natural money market... . Under the 100% system ... [i]nterest rates would seek their level in a natural way. (Fisher [1935] 1945, pp. 139–140)

Fisher was here referring to the countercyclical policy carried out by the Fed in the 1920s, under the leadership of Federal Reserve Bank of New York’s Governor Benjamin Strong—which, although it was successful in stabilizing the commodity price level, did so at the expense of interest rate distortions: “[It] is a dangerous thing to do, to interfere with the natural rate of interest, and it was largely because the rate of interest was abnormally low in 1925 that you had the speculation on the stock exchange, which had a great deal to do with this depression” (Fisher, 1937c, p. 288; see also [1935] 1945, pp. 139–140). Only under a 100% system, Fisher now held, was it possible to have both a stable price level and freely market-determined interest rates.

This money-debt tie analysis, underpinning the 100% money proposal, marked the last stage of Fisher’s evolving theories of monetary instability. The Yale economist would continue to advocate his 100% plan, and try to get it enacted into law, for the rest of his life.<sup>38</sup>

<sup>37</sup> Also, whereas the 1933 article held that “all the fluctuations listed come about through a fall of prices” (Fisher 1933b, p. 344), it was now stated that “practically all the events listed occur through a contraction of check-book money” (Fisher [1935] 1945, p. 123).

<sup>38</sup> As Allen (1993, p. 715) noted: “His prodigious efforts continued almost to the moment of his death on April 29, 1947—while in a terminal stay in a hospital, he wrote a long letter to President Harry S Truman on March 27 urging ‘a law which will sever the tie that now binds bank loans to the volume of checkbook money.’”

## VI. CONCLUSION

Throughout his career, Irving Fisher argued that, in the short run, variations in the value of the monetary unit would be a cause of social injustice, social inefficiency, and social discontent, resulting in a net loss to society as a whole. In this connection, he closely associated booms and depressions of trade with inflations and deflations of deposit currency, and interpreted the Great Depression as a “money famine.” He thus consistently called for preserving the purchasing power of money through active management of its quantity. When it came to analyzing the causes of monetary fluctuations, however, he would put forward different explanations over time, without clearly connecting them. Schumpeter (1948, p. 231) said of Fisher’s major contributions to economics that they belonged to “an imposing structure that the architect never presented as a tectonic unit,” and one can surely apply the same statement to his works on monetary instability.<sup>39</sup> Yet, as this paper has shown, a clear connection can be identified between Fisher’s early analysis of credit cycles of 1911, his debt-deflation theory of 1932–33, and his money-debt tie analysis of 1935. All of them emphasized the cumulative interactions among three key variables: the nominal volume of loans (or debts), the volume of deposit currency, and the general price level. The 100% reserve plan sought in essence to sever the tie between money and debt, so as to put an end to this vicious triangular interplay. Viewed in this light, Fisher’s advocacy of 100% money may be read as a logical outcome of his long-evolving analysis of monetary instability. This is worth stressing, given how much confusion has surrounded this reform idea. Already in his time, Fisher (1937b, p. 296) had to recall that its primary objective was not “to safeguard the depositors, and so to guard against panics”—as Ralph G. Hawtrey (1936, p. 388) and many others had wrongly understood—but “the cessation of inflation and deflation of our circulating medium, and so the mitigation of booms and depressions.” He apparently felt this point was not sufficiently highlighted in his works. Shortly before his death, when leaving instructions for an ultimate revision of *100% Money* (which would never see the light of day), Fisher insisted: “I also would like to have the book emphasize, wherever it is possible to bring it in, the most important point of all, namely, that the 100% plan would cut the fateful tie now binding our money supply to the volume of bank loans and investments.”<sup>40</sup>

## COMPETING INTERESTS

The author declares no competing interests exist.

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<sup>39</sup> Dimand (1993b, p. 72) also observed that “the pieces of Fisher’s monetary analysis might well appear to be a jumble of disconnected ideas and slogans. Instead of presenting a single central message to the discipline, Fisher presented too many messages, so that the profession missed the connections between some of them and failed to absorb some.”

<sup>40</sup> Fisher, letter to Allan K. Deeds, March 19, 1947 (in box 16, Irving Fisher Papers, Manuscripts and Archives, Yale University Library).

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