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IN OLD CHICAGO: SIMONS, FRIEDMAN AND THE DEVELOPMENT OF MONETARY-POLICY RULES

George S. Tavlas

Abstract

This paper examines the different policy rules proposed by Henry Simons, who, beginning in the mid-1930s, advocated a price-level stabilization rule, and by Milton Friedman, who, beginning in the late-1950s, advocated a rule that targeted a constant growth rate of the money supply. Although both rules shared the objective of eliminating the policy uncertainty emanating from discretion, they differed because of the different views of Simons and Friedman about the stability of secular relationships. Simons' rule relates to modern rules which emphasize the pursuit of price stability as representing optimal monetary policy.

Keywords: Milton Friedman, Henry Simons, monetary-policy rules

JEL classifications: B22, E52

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1. Introduction

Policy rules, under which the quantity of money plays a key role, were a central feature of the Chicago monetary tradition from the mid-1930s through the late-1970s.[1] The two most prominent rules were those formulated by Henry Simons and Milton Friedman.[2] Those two rules, however, were very different. Beginning in the mid-1930s, Simons (1936, 1946) proposed a rule that targeted a constant price level in the short run.[3] Specifically, under his proposal, changes in the quantity of money would act as an intermediate variable with the aim of keeping an index of commodity prices stable. Changes in the quantity of money, in turn, would be effectuated through changes in the federal government's fiscal stance; fiscal deficits would be used to increase the quantity of money and fiscal surpluses would be used to decrease the quantity of money. Beginning in the late-1950s, Friedman (1958, 1960) advocated a rule that targeted a constant rate of growth of the money supply. Under his proposal, increases in the growth of money would be generated through open-market operations conducted by the Fed. In contrast to Simons, to whom he gave generous credit for having influenced his work,[4] Friedman argued that there should be a clear separation of monetary-policy actions from fiscal-policy actions. Although Friedman's rule was the impetus for the best-known modern rule -- the Taylor rule -- the Taylor rule's focus on the pursuit of short term price stability is closer to Simons' rule than to that of Friedman.

Why did these two former leaders of the earlier Chicago tradition, both of whom formulated their policy rules on the basis of the quantity-theory framework, advocate such different rules? This issue has long been the subject of debate in the literature, but has not been resolved. In an essay on the monetary thought of Simons, Friedman (1967) conjectured that Simons formulated his price-level rule on the basis of a limited information set; a fuller information set became available only with the publication of

1. Discussions of the earlier Chicago monetary tradition include Friedman (1956a, 1972), Patinkin (1969, 1972, 1979), Laidler (1993), and Tavlas (1981, 1997, 1998). See, also, the articles dealing with that tradition collected in Leeson (2003).
2. Lucas (1977, p. 234) stated that a motivation for providing his business cycle theory was "simply an attempt to understand and make more explicit the implicit model underlying the policy proposals of Henry Simons, Milton Friedman, and other critics of activist aggregative policies."
3. Earlier, Simons had proposed a rule under which the quantity of money would be held constant (Simons, 1933). By 1936, however, he abandoned that proposal in favor of a price-level rule.
4. See Friedman (1956a, 1967, 1972).

Friedman and Schwartz's classic *Monetary History* (1963). Specifically, in their study Friedman and Schwartz showed that the Fed helped precipitate the Great Depression in the late 1920s through its tight monetary policy beginning in 1928. Simons, according to Friedman, wrote under the misleading impression that the Fed did all it could do to prevent the Depression, but that it was effectively powerless to prevent the decline in the quantity of money that occurred in the late-1920s and early-1930s in the face of a massive liquidation of loans by the banks and an increase in the demand for currency by private agents. Thus, Friedman (1967, p. 66) argued: "Had Simons known the facts as we now know them, he would, I believe, have been confirmed in his earlier persuasion as to the merits of the rule of a fixed quantity of money." [5]

Subsequently, Patinkin (1979) took issue with Friedman's conjecture about Simons' knowledge of the facts of the Great Depression. Among other things, Patinkin cited a book, *The Supply and Control of Money in the United States* (1934a), authored by Lauchlin Currie, in which that writer presented annual estimates of the money supply for the period 1921-32, the year-on-year changes of which were similar to those presented by Friedman and Schwartz (1963).[6] Moreover, in his book Currie argued along lines similar to the thesis that would subsequently be developed by Friedman and Schwartz, namely, that, throughout 1929, the Fed's policy tended not to prevent -- but rather to precipitate -- the Great Depression. Crucially, Patinkin went on to show that, in 1935, Simons reviewed Currie's book for the *Journal of Political Economy.* Thus, Patinkin (1979, p. 381) concluded: "We can safely say that when he chose his price-stabilization rule, Simons had available to him not only monetary data that revealed roughly the same changes [as the data in Friedman and Schwartz (1963)] but even an alternative interpretation of these data which in its broad lines agreed with the one that Friedman was later to give."

What, then, accounts for the different policy rules advocated by Simons and Friedman? This paper addresses this issue.[7] The remainder of the paper is comprised of six sections. Section 2 describes Simons' analytic framework and his main policy proposals. Section 3 presents Friedman's main policy views circa the late-1940s/early-

5. Friedman (1967, p. 66) was careful to point out that the fixed-quantity rule, proposed by Simons in 1933, was different from the constant growth-rate rule advocated by Friedman.
6. Friedman and Schwartz (1963) did not refer to Currie's (1934a) book.
7. See Nelson (2008) for a comparison of the monetary rules of Friedman and Taylor.

1950s, the years that marked the beginning of both his career at Chicago and his collaboration with Schwartz. At that stage of his career Friedman's policy proposals were remarkably similar to Simons', including the latter's proposal that fiscal deficits and surpluses should be used to conduct monetary policy. Why did Friedman subsequently change his view? This matter is dealt with in Section 4 where it is shown that Friedman's changed policy stance by the late 1950s reflected the implications of his empirical work, both that with Schwartz, on monetary history, and his own on the determinants and stability of the long-run demand for money. Section 5 discusses whether Simons would have changed his policy rule had he been confronted with the empirical evidence accumulated by Friedman during the 1950s; as will be shown, the answer is in the negative. That section also shows, however, that the data and interpretation of the Great Depression available to Simons, in the form of Currie's (1934a, 1934b) research, were (necessarily) of a different order than what later became available to Friedman. Section 6 discusses connections between the rules of Simons and Friedman, and modern rules. Section 7 concludes.

2. Simons, 1933-46

Simons taught at the University of Chicago from 1927 until 1946, the year of his death. He was the first Professor of Economics at the University of Chicago Law School. His influence at the University is evidenced in the characterization provided by Stigler, who called Simons the "crown prince" of Chicago economics (quoted from Rockoff, 2000, p. 1).

2.1 Theory of the cycle

Simons' analytic framework was the Fisherine equation of exchange, MV=PT, where M is the quantity of money, V is the velocity of circulation of money, P is the price level, and T is the volume of transactions. Three main characteristics marked Simons' theory of the cycle.[8] First, he believed that velocity is inherently unstable and the major

8. Discussions of Simons' analytical framework include those by Friedman (1967), Patinkin (1969), and Rockoff (2000).

cause of the business cycle (Simons, 1936, p. 164).[9] In turn, changes in velocity are attributable mainly to changes in business confidence; any major event could act as a sunspot and trigger a change in confidence. That sets off a change in the demand for liquidity that cannot be met, but the attempt to meet it can lead to widespread liquidation of bank loans, a run on banks, and a decline in the quantity of money (Simons, 1933). The event that triggered the Great Depression was, according to Simons, the stock-market crash of 1929.[10] Second, Simons believed that the main cause of economic instability lies in the nature of the fractional-reserve financial system which, for liquidity, relies excessively on debt, mainly in the form of short-term obligations. This debt acts as a substitute for money -- currency and demand deposits -- such that there is no clear demarcation between money and interest bearing financial instruments. Simons (1936, p. 166) argued: "Short-term obligations provide abundant money substitutes during booms, thus releasing money from cash reserves; and they precipitate hopeless efforts at liquidation during depressions." Third, Simons (1936, p. 165) believed that "rigidities in crucial areas of the price structure" convert shocks in velocity into "adjustments made through output and employment instead of through prices and wage rates." A decline in output prices will lead, given the rigidity of the prices of inputs, to a rise in real wages and a decline in profits, resulting in a fall in production. The falls in profits and production set-off a self-perpetuating process to which there is no limit: "The bottom of an uncontrolled deflation, for all practical purposes, is nonexistent -- with adverse expectations causing price declines and with the actual declines aggravating expectations, etc." (Simons, 1942, p. 188).

2.2. Policy proposals

Simons' policy proposals derived from his exposition of the business cycle. His remedy for the inherent instability of the economic system ran along two main lines: (1) a reform of the financial structure, and (2) a rule to govern the conduct of monetary policy.

Financial-sector reform. To insulate the banking system from the instability

9. The notion that velocity is unstable was a characteristic feature of the 1930s Chicago monetary tradition. See Patinkin (1969) and Tavlas (1997).
10. Simons (1944, p. 272) stated: "Reflect casually on what the thirties might have been if only we had not permitted the stock-market crash to initiate a long and precipitous deflation in the United States…."

inherent in "perverse" behavior of a fractional-reserve banking system, which expands credit in booms and contracts it in depressions, Simons (1936, p. 164; 1946, p. 231) proposed separating commercial banks into two distinct groups of institutions. One group would be required to hold reserves in either currency or deposits with the Fed against 100 per cent of its deposits - - the so-called 100 per cent reserves proposal (Simons, 1934, p. 64). This group would get income from service charges paid by depositors. The other group would take over the lending activities of commercial banks, deriving its capital by issuing securities.

To insulate government finance from the instability inherent in short-term debt, Simons (1944) proposed the issuance of only two kinds of debt -- currency and consols, simplifying greatly the conduct of debt management.[11] The proportion of a budget deficit to be financed by either money or debt would depend on whether, to bring the actual price level back to its target, it is necessary to generate inflation or deflation. Deficits financed by issuing money would have an expansionary effect on the economy, while debt-financed deficits would have a contractionary effect: "I should argue that there is never any excuse for borrowing save to *prevent* expansion. Borrowing is a means for displacing money (deposits) with less effective money substitutes (consols). If we want expansion the way to get it is by noninterest bearing issues …. Borrowing has little place in sound policy, save as a temporary, temporizing means for checking incipient inflationary movements…" (1942, p. 196, original italics).

Policy rules. Simons believed that the Fed's discretionary policies had increased uncertainty and exacerbated the cycle. "An enterprise system", he wrote, "cannot function effectively in the face of extreme uncertainty as to the action of the monetary authorities" (1936, p. 161). There is a need, he argued, of "definite, stable, legislative rules of the game as to money…" (1936, p. 136). In his 1936 paper, "Rules versus Authorities in Monetary Policy", he argued that there are several advantages to a rule that would fix the quantity of money: (1) "it avoids reliance on discretionary (dictatorial, arbitrary) action"; (2) "it provides automatically for downward adjustment of commodity

11. Because Simons considered debt of varying maturities to be near moneys, with the substitutability with money varying in direct proportion to the shortness of the maturity, he considered that budget deficits financed other than by consols are a kind of monetary financing of the deficits. See Rockoff (2000).

prices as output expands through improvement in technical efficiency;" (3) it "is ideally simple and definite"; and (4) "it is clear enough and reasonable enough" so as to be easily understood and "it is compatible with the rule of balancing government revenues and expenditures" (Simons, 1936, pp. 163-64). Despite these advantages, his preferred policy was a rule that stabilized the price level.[12] As he explained, given the inherent instability of velocity under a financial system dominated by short-term debt instruments, the "limitations [of the fixed quantity rule] have to do mainly with the unfortunate character of our financial structure -- with the abundance of what we may call "near moneys' -- *with the difficulty of defining money* in such a manner as to give practical significance to the conception of quantity" (Simons, 1936, p. 171, italics supplied). Thus, "the obvious weakness of a fixed quantity lies in the danger of sharp changes on the velocity side. The fixing of the quantity of circulating media might merely serve to increase the perverse variability in the amounts of 'near moneys' and in the degree of their general acceptability, just as the restrictions on the issuance of bank notes presumably served to hasten the development of deposit banking" (1936, p. 164). In light of these limitations, by 1936 Simons opted for a rule in terms of "price-level stabilization" (1936, p. 174). Specifically, he believed that "a monetary rule of maintaining the constancy of some index, preferably an index of prices of competitively produced commodities, appears to be the only promising escape from the present monetary chaos and uncertainty" (1936, p. 183).[13] Its "one great advantage", he (1936, p. 331) argued, is "that it defines, within a definite long-term rule, appropriate measures for dealing with velocity changes." The operational rule would aim to expand the money supply when the price level falls and to decrease the money supply when the price level rises.[14]

How would the rule be implemented? Simons thought that "central-bank action [*e.g.*, open market operations, changes in the discount rate] is a feeble, inadequate and

12. Bordo and Rockoff (2011, pp. 33-34) suggest that Simons may have been influenced by Irving Fisher, who, in 1935, proposed a rule to stabilize the price level, although Simons did not refer to Fisher in this connection. Fisher's proposal differed from that of Simons in that Fisher's rule had the central bank adjusting, via open market operations, the monetary base in response to deviations from the targeted price level (Fisher, 1935). Humphrey (1997) discussed Fisher's price-level proposal. Hetzel (1985, 2012, Chapter 3) critically reviewed the origins of the rules versus discretion debates in the 1920s.
13. Friedman (1967) equated this index with the wholesale price index.
14. Simons (1936, p. 183) left open the possibility of "a rule calling for the outright fixing of the total quantity of money…as a perhaps preferable solution in the more distant future".

anomalous implementation of monetary policy" (1942, p. 190). Thus, he argued that "The task [of stabilizing the price level] is certainly not to be entrusted to banking authorities, with their limited powers and restricted techniques, as should be abundantly evident from recent experience. Ultimate control over the value of money lies in fiscal practices -- in the spending, taxing, and borrowing operations of the central government" (1936, p. 175)." Specifically, budget deficits would be used to increase the supply of money and budget surpluses would be used to decrease the money supply with the aim of keeping the price level stable in the short term. Over the course of the business cycle, he argued, the budget should be balanced (Simons, 1942, p. 196).

3. Friedman: late-1940s, early-1950s

Friedman joined the University of Chicago faculty in 1946. During his first ten years or so at Chicago, he refrained from putting forward anything resembling an explicit and comprehensive analytic framework that underpinned his thinking about monetary economics. He did, however, offer policy proposals, which were clearly influenced by Simons' policy proposals. To demonstrate, consider the following evidence from three papers: (1) "A Monetary and Fiscal Framework for Economic Stability", published in the *American Economic Review* in 1948, (2) an unpublished 1948 document, "Preliminary Plan for Completion of Data for Study of Monetary Factors of Business Cycles", prepared as an initial input for his joint collaboration with Schwartz, and (3) "Commodity-Reserve Currency", published in the *Journal of Political Economy* in 1951.

- In the published 1948 paper, Friedman referred to "some extraneous or perverse reactions of our present monetary and fiscal structure" (1948a, p. 139), by which he meant was "the tendency for the total volume of money to change when there is a change in the proportion of its total stock of money the community wishes to hold in the form of deposits" (1948a, p. 139).
- In the unpublished 1948 document, Friedman discussed the implications of fractional-reserve banking, under which there are different reserve requirements for different types of money, for the total quantity of money. During "the panic

of 1933" and other "currency panics", attempts by the public, he argued, to move into more liquid forms of money led to reductions in the quantity of money: "For cyclical analysis, interest attaches not only and perhaps not mainly to the total quantity of circulating medium but also to its form and to the interchangeability of different forms. The most dramatic monetary episodes of business cycle history all relate to attempts on the part of the general public to change the form in which they hold the circulating medium, in particular, attempts to convert bank deposits into hand-to-hand currency…." (1948b, p. 2).

- Once a movement into money has started during a depression, what is the limit to this movement? In the 1948 unpublished document Friedman argued that, in periods of serious monetary disorder, there is "hardly any limit to the 'velocity of circulation'" (Friedman, 1948b, p. 3).

- In his 1951 paper, Friedman argued that "to eliminate the inherent instability of the monetary system [in] a satisfactory way", there is a need to separate "the depository and check-clearance function of existing banks from their lending and investing activities, that is, what has come to be known as the 100 per cent reserve proposal" (1951, p. 220).

How should monetary policy be conducted and what should be the aim of monetary policy? Friedman (1948a) argued that "the chief function of the monetary authorities should be the creation of money to meet government deficits and the retirement of money when the government has a surplus" (1948a, p. 136). Specifically, he proposed that fiscal policy be conducted so as "to change appropriately the supply of money" to stabilize aggregate demand and balance the budget at full employment (1948a, p. 139). Budgetary balances would change automatically in a counter-cyclical direction over the business cycle. Like Simons, he argued that "the government would not issue interest-bearing securities…" (1948a, p. 139). However, Friedman (1948a, p.142) argued that rigidities in the price structure and lags in response to changes in policies make it difficult to achieve full employment under any proposal designed to mitigate the cycle. The advantage of his proposal is that it "seems likely to do less harm under the circumstances envisaged than alternative proposals which provide for discretionary action in addition to automatic

reactions" (1948a, p. 145).[15]

Friedman (1948a) also argued that the effectiveness of any proposal that aims to stabilize aggregate demand depends on its impact on expectations. Taking the possibility of *stabilizing* expectations into account, a budgetary rule that changes the money supply with the goal of price-level stability could be optimal: "It must be granted, however, that the present [*i.e.*, full-employment] proposal is less likely to stimulate such a favorable psychological climate than a proposal which sets a stable price level as its announced goal. *If the business world were sufficiently confident of the ability of the government to achieve the goal* it would have a strong incentive to behave in such a way as greatly to simplify the government's task" (1948a, p. 148, original italics).

4. The path to a money-supply rule

The basis of Friedman's conversion from a Simons-type rule, under which fiscal measures would be used to generate changes in the money supply with the aim of attaining either full employment and/or a stable price level, to a rule under which the Fed would use open market operations to target a constant growth rate of the money supply, was his capacity and proclivity to apply statistical analysis to economic data. By the mid-1940s, Friedman had demonstrated the potential to become a statistician of considerable stature.[16]

Friedman began his collaboration with Schwartz in 1948, around the time that he began conducting a Workshop in Money and Banking at the University of Chicago.[17] The statistical approach that Friedman brought to both these endeavors was the application of

15. In proposing a price-level rule, Simons (1936, p. 174) argued along similar lines: "If price-level stabilization is a poor system, it is still…infinitely better than no system at all. And it seems now highly questionable whether any better system is feasible or possible at all within the significant future." The connections between Simons' views and those of Friedman discussed above provide strong evidence that Friedman's monetary economics were a direct outgrowth of an earlier Chicago monetary tradition, as claimed by Friedman (1956b). Having developed the quantity theory in such a way that it could support the use of fiscal deficits during the Great Depression, the Chicagoans did not need to convert to the Keynesian theoretical apparatus. See Tavlas (1997, 1998).

16. Walters (1987, p. 423) conjectured that, had Friedman chosen a career in the area of statistics, "he would have achieved a stature probably as great as that of his most influential teacher, Harold Hotelling."

17. In his initial correspondence with Schwartz in 1948, Friedman estimated that their research project on U. S. monetary history would be completed in three years. See Hammond (1996).

correlation analysis to a wide array of data to develop quantitative and qualitative evidence. This evidence led to the formulation of broad hypotheses and informal testing based on data other than those used to derive the hypotheses. Throughout, Friedman eschewed formal statistical testing and avoided the use of statistical analysis to draw conclusions about cause and effect.[18] In what follows, I show that the results of his empirical research from the late-1940s to the late-1950s were largely responsible for his switch to a monetary growth rule.

4.1 The long run

Friedman first proposed the constant money-growth rule in a 1958 paper, "The Supply of Money and Changes in Prices and Output", submitted to the Congressional Joint Economic Committee. Friedman (1958, p. 174) stated that his aim was to summarize "the preliminary results" of his work with Schwartz and the series of studies conducted in the Chicago Workshop in Money and Banking. A main implication of those results is the need to distinguish between long-run, or secular, empirical relationships and short-run, or cyclical, relationships; the former tend to show considerable stability whereas the latter are subject to large uncertainty. The following discussion draws on three studies: (1) the 1958 study presented to the Joint Economic Committee; (2) a 1959 paper, "The Demand for Money: Some Theoretical and Empirical Results", published in the *Journal of Political Economy,* and (3) a 1960 book, *A Program for Monetary Stability*, which was based on lectures Friedman gave at Fordham University in 1959.[19]

Money and prices. The historical evidence suggests that there is a strong regularity between changes in the stock of money per unit of output and changes in prices in the same direction. Friedman (1958, p 173) noted that, while this regularity "tells nothing about direction of influence, the variety of monetary arrangements -- for example, the gold standard, flexible exchange rates, regimes with and without a central bank -- over

18. Friedman's main method of testing hypotheses involved the assessment of the ability of hypotheses to predict over alternative data samples. A description of his statistical methodology, and a criticism of formal econometric methods, is provided in Friedman and Schwartz (1991). For discussions of Friedman's empirical approach, see Hammond (1996, pp. 192-207), Rockoff (2006), and Lothian (2009).
19. It should be kept in mind that the Friedman and Schwartz evidence to which Friedman referred in these studies was preliminary. Moreover, during the 1960s Friedman's views on some of the issues discussed below, including the Great Depression, would undergo refinement. The data periods to which Friedman referred in these studies alternated among either 1867-1954, 1867-1957, and 1870-1954.

which this regularity has been observed "supports strongly… [the view] that substantial changes in the stock of money are both a necessary and sufficient condition for substantial changes in the general level of prices" (1958, p. 173).

Definition of money. Friedman argued that "there is a continuum of assets possessing in various degrees the qualities we attribute to the ideal construct of 'money' and, hence, there is no unique way to draw a line separating 'money' from 'near-moneys'" (1960, p. 90). The "most useful concept" is that corresponding to currency held by the public plus adjusted demand deposits plus time deposits in commercial banks "because it seems *more closely related empirically* to income and other economic magnitudes than other concepts" (1960, pp. 90-91, italics supplied). [20]

Output and prices. Historical evidence indicates that there is no clear-cut relation between price changes and output changes. The underpinnings to economic growth are to be found in such factors as "available resources, the industrial organization of a society, the growth of knowledge and technical skills, the growth of population, the accumulation of capital and so on" (1959, p. 182). On average, over a period of 90 years (from 1867-1957), the average annual growth in output has been "something over three percent" (1960, p. 91).

Income velocity. Friedman (1959) reported empirical findings of his work with Schwartz on secular changes in the real money stock per capita and secular changes in real income per capita over the period 1870 to 1954 using observations that consisted of average values of the variables concerned over the complete cycle. [21] The findings showed that "secular changes in the real stock of money per capita are highly correlated with secular changes in real income per capita" (1959, p.113). In the same paper (1959), Friedman's (log-linear) estimation of the demand for money corroborated that finding. He used the regression results to compute annual estimates of velocity, which he compared with the actual figures. He found that the estimates accounted for "the bulk of

20. During the late-1950s the particular concept of money in question corresponded to currency plus commercial banks' demand and time deposits; subsequently, this measure corresponded to what was called M2.

21. As Lothian (2008, p. 1089) pointed out: "By using reference-cycle averages as his basic units of observation, Friedman was able to focus on positions of long-run equilibrium. He, therefore, was able to get around to the problems of monetary endogeneity and the partially related econometric problems inherent in modelling short-run monetary adjustment."

the fluctuations of measured velocity" (1959, p. 130). "These results", he argued, "give strong support to the view that cyclical movements in velocity largely reflect movements along a stable demand curve for money" (1959, p. 130).[22]

4.2 The short run

The foregoing secular empirical relationships, Friedman found, do not hold tightly within the cycle. By the late-1950s his interpretation of cyclical relationships incorporated, in part, elements of both his earlier thinking and of Simons' views.

The business cycle. Friedman (1958, p. 179) reported that his research with Schwartz revealed that "the direction of influence between the money stock and income and prices is less clear-cut and more complex for the business cycle than for the longer movements". This circumstance reflected three factors. First, "the character of our monetary and banking system means that an expansion of income contributes to expansion in the money stock, partly through inducing banks to trim more closely their cash reserve position, partly through a tendency for currency in public hands to decline relative to deposits" (1958, p. 179). Thus, during the cycle, changes in the money supply are "a consequence as well as an independent cause of changes in income and prices" (1958, p. 179). Second, within the cycle, the relationship between the money supply and income and prices is subject to long lags that vary considerably from cycle to cycle (1958, p. 180). Third, within the cycle, velocity movements have contributed to the depth of economic fluctuations (1958, p. 89); velocity rises (relative to trend) during expansions and falls (relative to trend) during contractions. As Friedman (1967, p. 92) stated, "the movements in velocity -- which Simons took as an independent source of instability -- occur later than the movements in the quantity of money and are mild when the movements in the quantity of money are mild."[23]

The Great Depression. Friedman believed that the evidence that emerged from his work with Schwartz demonstrated conclusively that all significant monetary contractions have been followed by severe economic contractions, with the Great Depression being a

22. See, also, Friedman (1958, p. 175), which cited evidence on velocity behavior in papers by Cagan (1956) and Selden (1956), both of which were written for the Chicago Workshop in Money and Banking.
23. In a 1973 paper, Friedman argued that "if we knew about autonomous changes in the real demand for money, it would be right to adjust the money supply to them. However, we don't know about them" (Friedman 1973; quoted from Nelson, 2008, p. 101).

prime example. The Fed contributed to that episode in two ways. First, the Fed *precipitated* the Great Depression in 1929 through its "tight monetary policy from early 1928 on and the [resulting] lack of growth of the money supply which coexisted with economic expansion but contributed to both the occurrence and the severity of the 1929 downturn" (1958, p. 181). Second, from the end of 1930 the Fed permitted the Depression to *worsen* when a series of bank failures led to a liquidity crisis (1960, pp. 18-19). During this period, the Fed failed to provide sufficient liquidity to enable banks to meet the demands of their customers.

4.3 The policy rule

The above evidence underpinned Friedman's proposal that the money supply should increase by between 3 to 5 per cent per year (1958, p. 184).[24] The secular empirical relationships informed both the particular concept of money used and the numerical margins (*i.e.*, 3 to 5 per cent) of the growth range. Specifically, he chose M2 because of its close empirical relationship to "income and other economic magnitudes" (1960, p. 91).[25] During the period (1867-1957), output growth, Friedman noted, had averaged about 3 per cent a year while velocity had exhibited a secular decrease of about 1 per cent a year (1958, pp. 184-85; 1960, pp. 90-91). Thus, "to judge from this evidence, a rate of increase [of M2] of 3 to 5 per cent per year might be expected to correspond with a roughly stable price level for this particular concept of money" (1960, p. 91).

Why conduct policy in term of a rule instead of using discretion? Friedman (1960) pointed out that this question had originally been posed by Simons. Like Simons, Friedman (1960, p. 86) believed that a rule would eliminate "the danger of instability and uncertainty of policy". Also like Simons, Friedman (1960, p. 85) argued that discretion "is highly objectionable on political grounds in a free society". Moreover, Friedman believed that discretion absolves the policymakers of any criteria from which to judge their performance and leaves them vulnerable to political pressures (1960, p. 85). Finally, relying on the evidence of his work with Schwartz on short-term relationships, Friedman

24. Friedman may have been influenced by Clark Warburton who, during the 1940s, proposed a rule under which the money supply would grow by 5 per cent a year. Friedman and Schwarz (1963) contains numerous references to Warburton's work, although not to the latter's monetary rule.
25. Friedman (1960, p. 91) stated that "the evidence for this concept is certainly far from conclusive." In the early-1980s he switched to M1. Nelson (2007) provides a discussion of the reasons for the switch.

(1960, p. 85) argued that, in the past, discretion had led to "continual and unpredictable shifts in policy and in the content of policy as the persons and attitudes dominating the authorities had changed". A money growth rule, he believed, would have avoided the "excessive" mistakes of the past, including the collapse of money from 1929 to 1933, the discount-rate increases of 1931, and the resulting depression (1960, p. 93). It would not rule out mild cyclical fluctuations, but it "would almost certainly rule out…rapid and sizeable fluctuations" (1960, p. 92).

Like Simons, Friedman thought that a benefit of his particular proposal is that it would be easy to understand (1960, p. 90). However, in contrast to Simons' proposal and his own earlier proposal, Friedman argued that the money supply should be controlled by the Fed instead of being connected to the government's fiscal operations. Also, in marked contrast to both Simons' proposal and his own earlier proposal, Friedman (1960, p. 90) agued that the implementation of his money supply proposal has a further advantage; "it would largely separate the monetary problem from the fiscal [problem]".

Another difference between the views of Simons and Friedman is important to mention. Simons believed that movements in velocity are an independent source of instability. Therefore, he sought to prevent such movements from occurring or to lessen their severity should they occur. His remedy was a reform on the financial structure, including his 100 per cent money proposal and his proposal for the issuance of only two kinds of government debt (currency and consols), both of which would contain velocity movements, and his price level rule, which would reduce uncertainty (and, thus, the potential for large velocity movements).[26] Friedman, in contrast, believed that, during the cycle, large movements in velocity are typically preceded by large movements in the quantity of money. Therefore, he believed that a monetary rule, which by its specification would confine the annual increase in money, would moderate pro-cyclical fluctuations in velocity.

Why not a rule that directly targets the price level? A price-level target, he argued,

26. Simons also favored the elimination of medium-term private debt. He stated that: "Only a little farther away from the best system is one where all borrowing and lending contracts are entered into for long periods -- say, for at least fifty years" (Simons, 1936, pp. 165-66). I am grateful to a referee for bringing this circumstance to my attention.

has two major problems. First, it is not evident which particular price index should be targeted (1960, p. 87). Second, as his work with Schwartz had shown "the link between price changes and monetary changes *over short periods* is too loose and too imperfectly known to make price stability an objective and unambiguous guide to policy" (1960, p. 87, italics supplied). What caused Friedman to switch from his earlier Simons-type framework under which fiscal policy would be used to generate changes in the money supply, with the aim of achieving either full employment or price-level stability? Friedman (1958, p. 186, italics supplied) provided the answer: "The *evidence* has persuaded me that the major problem [of that earlier rule] is to prevent monetary changes from themselves contributing to instability rather than to use monetary changes to offset other forces". This explanation, however, raises the issue whether the type of evidence that Friedman relied upon to underpin his money-growth rule would have persuaded Simons. This issue is considered in the following section.

5. Simons, Friedman and empirical work

5.1 Currie, Simons and a monetary rule

Had Simons been aware of the empirical evidence that was available to Friedman, would Simons have opted for a rule in terms of the quantity of money? As mentioned in the introduction, in 1935 Simons reviewed Currie's book, *The Supply and Control of Money in the United States* (1934a), in which Currie presented annual estimates of the money supply, the year-on-year changes of which were similar to those presented by Friedman and Schwartz, and put forward the thesis, subsequently offered by Friedman and Schwartz (1963), that the Fed tended not to prevent -- but to bring on -- the 1930s depression. Simons' review of Currie's book formed the basis of Patinkin's assertion that Simons knew the facts about the depression and had an explanation of those facts that was broadly along the lines of the one later developed by Friedman and Schwartz. Consequently, according to Patinkin, Friedman's (1967) conjecture, that Simons favored a price-level rule because Simons did not know the facts about the Great Depression, was misleading. In what follows, I argue that it was Patinkin's line of reasoning that was misleading.

In the first half of the 1930s, Currie published several path-breaking studies (1933, 1934b) related to the subject of money-supply determination, with the main results gathered in his 1934 book.[27] These studies established Currie as a pioneer in the construction and assessment of data on the money stock and the development of a theory of the money-supply process.[28] He constructed a narrow measure of money -- currency plus demand deposits (M1) -- to show (1934a, p. 33) that the money supply contracted by 24 per cent during 1929-33, similar to the 33 per cent contraction estimated by Friedman and Schwartz (1963, p. 302), who focused on a broader measure (M2) of money. Currie used these data and his analysis of the money-supply process to take issue with "the widespread fear that a business expansion initiated by monetary means might not be subject to control -- the widespread skepticism, in other words, of the effectiveness of central bank control" (1934a, p. 4). In this connection, Currie (1934a, p. 147) provided evidence that led him to argue that the Fed's policy during 1929-33 "was one of almost complete passivity and quiescence." Anticipating Friedman and Schwartz, Currie asserted that the Fed failed to ease policy in 1929 because it was overly concerned with stock-market speculation. Like Friedman and Schwartz, Currie believed that the Fed could have prevented the decline in the money supply had it engaged in aggressive open-market purchases (Currie, 1934a, p. 144). "The drastic contraction of money from 1929 to 1932", he argued, "proceeded automatically with no real effort made to offset it" (1934a, p. 148). In light of the above contributions, Currie is generally recognised to be an important forerunner of Friedman and Schwartz.[29]

Nevertheless, it would be unreasonable to suggest that Currie's 1934 book could have made anything like the impact made by the Friedman and Schwartz study. The aims and scopes of the two works were of a different order. Consider the following.

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27. These studies were outgrowths of his Ph.D. thesis, "Bank Assets and Banking Theory", submitted to the Harvard faculty in 1934.

28. Currie (1934a, p. 54) noted that "there does not exist in any of the [Federal Reserve] system's publications, so far as I am aware, a series of money."

29. Laidler (1993) provided an interesting discussion of Currie's contributions (see, also, Brunner (1968)). Laidler and Sandilands (2002, p. 261) noted that in Currie's 1931 Ph. D. dissertation, Currie "explore[d] the links between monetary policy and the incentive to expand public works." Such links were a hallmark of the 1930s Chicago monetary tradition (Tavlas, 1997). In Tavlas, (1997) I stated that a feature of Currie's policy stance in the early 1930s was his belief in the inefficiency of open market operations. My interpretation was based on Currie's (1978) recollections of his earlier views. My interpretation, and Currie's recollections, do not accord with Currie's publications in 1933 and 1934.

- The Friedman and Schwartz study contains 860 pages, including 33 tables and 64 charts. Currie's book contains 231 pages, including 13 tables and nine charts. The crucial chapter in Friedman and Schwartz on the Great Depression (*i.e.,* the years 1929-33) is 120 pages in length; moreover, the book contains lengthy discussions of that episode in other chapters. Currie's book consists mainly of chapters on subjects unrelated to the Great Depression. These subjects include monetary theory, the "concept" of money, the "concept" of credit, the control of the money supply, and the "commercial loan theory of banking" (*i.e.,* the real bills doctrine). The total number of pages that refer directly, or in passing, to developments during the period 1929-33 is fewer than forty.[30]

- The Friedman and Schwartz study evaluated 94 years of annual data and more than fifty years of monthly data on a number of time series, including the money supply and its determinants, credit, real output, velocity (several measures), prices, Federal Reserve credit outstanding, interest rates, reserves, share prices, personal income, industrial production, capital flows, gold flows and estimates of the purchasing power price of gold. Currie's study covered the years 1921-33.[31] It reported mainly annual data related to the money-supply (and its determinants), velocity, bills discounted, gold flows, and reserves.

- Friedman and Schwartz settled on their measure of money (M2) on the basis of its correlation with output and prices. Currie chose his measure (M1) on the basis of judgment. Friedman and Schwartz used their data to examine both secular and within-cycle co-movements among variables. In this regard, the basis for Friedman's money-growth rule rested on more than the kind of annual money-supply data presented in Currie's book. The money-growth rule was

29. Many of these pages deal with institutional developments. The pages that refer to the period 1929-33 are as follows: p. 44 (criticizes the Fed failing to prevent "the drastic contraction of money from 1929 to 1932"), pp. 56-61 (discusses the Fed's focus on stock-market speculation in 1928-29), p. 101, pp. 106-08 (discusses gold outflows), pp. 121-25 (discusses the relation between the demand for loans and the money supply), p. 127 (discusses the geographic distribution of excess reserves), pp. 133-34 (determinants of excess reserves), pp. 139-41 (discusses the Fed's focus tight monetary policy in reaction to stock-market speculation in 1928-1929), pp. 144-48 (the pages the most relevant to the conduct of monetary policy during the depression), p. 153, pp. 170-72, and pp. 175-79 (discusses the use of reserve requirements to control the supply of money).

30. Some of the series presented in Currie's book were for a shorter period. As noted above, Patinkin (1979) referred to the implications of Simons' data that covered the period 1921-32.

founded on empirical *relationships*: (1) the high and positive correlation between secular changes in money (M2 per unit of output) and secular changes in prices, which allowed a particular measure of the money supply to be targeted; (2) the secular decline in velocity, which Friedman and his students had found to be stable, and (3) a secular rise in output growth, which was found to be largely independent of moderate changes in money and prices.

- There are subtle, but significant, differences between the monetary-origins theses of the Great Depression of Friedman and Schwartz and of Currie. For example, Friedman (1958) pointed out that the Fed's tightening from the *beginning of 1928* helped precipitate the Great Depression, whereas Currie (1934a, p. 44) argued that the Fed's "tight monetary policy of 1928 was acceptable".[32] It was the further tightening in the spring of 1929 during which "a grave blunder was made" (Currie, 1934b, p. 170; see, also, Currie, 1934a, p. 44). Friedman and Schwartz (1963, pp. 311-12, 322-24) showed that there were times during the Depression when the Fed acted -- beginning in December 1930 when the Fed provided banks with liquidity through discount operations, and beginning in April 1932 when, under heavy Congressional pressure, the Fed embarked on large-scale open market purchases. These actions had positive effects on the economy (e.g., in early 1931, sharp declines in bank failures and in banks' demand for liquidity; in the summer of 1932, rises in wholesale prices and production), but were subsequently reversed. The actions and their reversals provided important evidence that the Fed had the power to reverse the slide. Currie (1934b) did not provide such evidence.

In his book, Currie did not analyze co-movements among variables.[33] Currie (1934a, p.6) did, however, report estimates of the income velocity of money over the period 1921 to 1929 showing that velocity rose appreciably during that period. He also found that "the income velocity of money is subject to fluctuations from year to year, sometimes very wide, but it apparently does not increase sufficiently over a period of

31. For an anticipation of the Friedman and Schwartz thesis that was published prior to the beginning of the Great Depression, see the discussion of the work of Foster and Catchings in Tavlas (2011).
32. Currie (1934a) did not report time series of real output or prices.

years to maintain prices", a finding that would have *reinforced* Simons' belief in a price-level -- rather than a monetary -- rule. That finding was broadly consistent with Friedman and Schwartz's estimates of velocity for the period 1921 to 1929 and with their finding that velocity rises relative to trend during expansions (as during the 1921-29 expansion), but it conflicts with their finding of a secular decline in velocity, the latter of which underpinned Friedman's money-growth rule.[34] Lacking in empirical analysis, and containing a narrow information set and a limited scope, Currie's book did not provide the kind of convincing case for the role of monetary policy in precipitating the Great Depression made by Friedman and Schwartz, and its estimates of upward and "sometimes very wide" fluctuating velocity movements were, if anything, supportive of a price-level stabilization rule rather than a money-growth rule.[35]

5.2. Simons and empiricism

The conclusion that emerges from the above discussion is that, when Patinkin argued that Simons had before him the facts, as reported in Currie's book, of the Great Depression, known to Friedman, Patinkin had set-up a misleading line of reasoning. In Currie's book, Simons did not have available to him the breadth and depth of information, data analysis, and sweeping historical narrative that were to mark the Friedman and Schwartz study.

Moreover, there is another reason to believe that, even if Simons had known the "facts" that became available to Friedman by the late-1950s, these facts would not necessarily have influenced his views. In contrast to Friedman, Simons shunned

33. Currie (1934a, p. 6) reported that M1 velocity rose from 2.58 in 1921 to 3.26 in 1929. For the same period, Friedman and Schwartz (1963, p. 772) found velocity of M1 rose from 2.90 to 3.42; for the period 1915 to 1960, M1 velocity declined from 2.68 to 1.69. (The authors did not report M1 velocity before 1915.) For the period 1869 to 1960, Friedman and Schwartz reported that M2 velocity fell from 4.57 to 1.69. Friedman and Schwartz (1963, pp. 679-82) summarized their findings with regard to secular movements in velocity as follows: "The velocity of money, which reflects the money-holding propensities of the community, offers another example of the stability of basic monetary relations. As the real income of the people of the United States rose…, the community came to hold a decidedly larger amount of money relative to its income, which is to say, the velocity of money declined. In 1869, the stock of money amounted to less than three months' income; in 1960, to more than seven months' income. The numerical value of velocity therefore changed considerably. However, the change occurred rather steadily.…In response to cyclical fluctuations, velocity has shown a systematic and stable movement about its trend, rising during expansion and falling during contraction."

34. Simons (1935), in his (generally favorable) review of Currie's book, criticized Currie for choosing an overly-narrow definition of money. He also criticized Currie for the latter's "faith" in discretionary policy (Simons, 1935, p. 372).

empiricism *of any kind.* All of his papers were entirely narrative in content -- none of his works assesses data; none of his works presents data. In particular, Simons' studies contain narratives that strongly suggest that he would not have been influenced by the kind of evidence found and used by Friedman in the latter's formulation of the money-growth rule. In this connection, Simons discussed the role of empiricism in economics on at least three occasions. On each occasion the discussion was part of a footnote -- there are two such footnotes in his 1936 paper, "Rules versus Authorities in Monetary Policy" and one such footnote in his 1946 paper, "Debt Policy and Banking Policy". Each of the discussions provides evidence against Friedman's (1967) conjecture that Simons would have advocated a rule based on the quantity of money had Simons been aware of the empirical results available to Friedman as of the late-1950s / early-1960s. Consider the following. (1) In "Rules versus Authorities", Simons presented a long digression on the expansion of near moneys during the expansionary phase of the cycle. In this connection, he noted that, while the expansion of near moneys can exacerbate the boom, the rise of deposit money during the boom serves to "absorb" the expansion of near moneys, making it easier to issue near moneys. Therefore, is the increased issuance of near moneys during the boom a contributing *cause* of the boom or an *effect* of the boom? Empirical evidence, he argued, is unlikely to help answer that question: "a merely empirical study [of the issue] of industrial fluctuations (especially the so-called long cycles) may easily lead to unfortunate inferences as to causation…" (1936, p. 328). (2) What about Friedman's finding that velocity is stable over the long run, which was a core component of his money-growth rule? Simons addressed this issue in "Rules versus Authorities". In a discussion about the relative merits of a fixed-quantity rule and a price-level rule, he argued that the key weakness of the former is its reliance on statistical estimates of velocity. He argued: "provision should be made for temporary changes to offset changes in velocity. But this view, however commendable in principle, has not been, and probably cannot be, translated into significant practical proposals. The difficulties of drafting satisfactory rules based on elaborate statistical measures of velocity seem decisive" (1936, p. 331). (3) Friedman's proposal was based on evidence that the *secular increase* in money-demand was stable. In his 1946 paper, Simons addressed this issue: "Empirical evidence as to secular increase in the demand for money or liquidity is, however, a

precarious basis for long-term policy. Trends in such demands cannot confidently be extrapolated from periods of extreme monetary instability and uncertainty into a long future of (proposed) highly stable money value" (1946, p. 341).[36]

6. Connection to modern policy rules

The debate on alternative targeting rules has remained at center stage in monetary economics. The late-1970s and early-1980s saw the abandonment of monetary targeting in favor of interest-rate targeting procedures by central banks, a move that was precipitated by the substantial instability of money-demand relationships experienced in the 1970s. A little later, in the 1990s, central banks moved farther away from passive targeting procedures, adopting inflation (or price) targeting. This development was based on both theoretical and empirical considerations. On the empirical front, Taylor (1993) demonstrated that the Fed had been following a simple inflation-output stability gap targeting rule (the Taylor rule), and that this rule performed quite well in terms of both output stability and price stability (as the period of Great Moderation demonstrated). On the theoretical front, inflation targeting was perceived as a rule that exhibited more transparency and supported greater accountability of the central banks than other, more discretionary procedures (an argument very much in line with the views of both Friedman and Simons on rules versus discretion). More importantly, the then-developing New Keynesian theory provided strong theoretical support for price (inflation) targeting procedures on the basis of at least two considerations.

The first consideration relates to Friedman's and Simons' argument about how fixing a relevant nominal variable (money in the case of Friedman, the price level in the case of Simons) can prevent excessive mistakes. Eggertsson and Woodford (2003) argued that a price-level stabilization rule would have averted the 1990s Japanese depression because it automatically instructs the central bank to reverse any negative, recessionary

35. In addition to the above discussions, in his review of Currie's book, Simons referred to Currie's "patient competence in the analysis of banking statistics". He continued: "For critical students, however, Dr. Currie's inductive verifications will be largely gratuitous…. In general, the author's fundamental insights are so sound that failure of statistical confirmation would only indicate error or inadequacy of statistics" (Simons, 1935, p. 370).

price shocks[37]. Simons' policy rule has precisely the same property and would have very likely reduced the severity of the Great Depression had it been followed.

The second consideration stems from the New Keynesian model's implication that the pursuit of price stability is a way of minimizing the effects of nominal distortions on relative prices. Specifically, in the presence of nominal rigidities and price adjustments that are staggered in the way assumed by Calvo (with equal probability that any given price will be reversed in any time period), and in the absence of inefficient (mark-up) shocks around a steady state, New Keynesian research (Woodford, 2003, 2010, Gali, 2008), using sticky-price dynamic stochastic general equilibrium models, has shown that price targeting (or zero inflation targeting) is optimal. Remarkably, as mentioned in Section 2, Simons favored a price-level rule, in part, because it would help deal with the effects on the business cycle produced by the interaction of price-level changes and "rigidities in crucial areas of the price structure" (1936, p. 165). Thus, both empirical success (the Great Moderation) and theory contributed to the case for Simons-type rule.

It must be noted, however, that the theoretical argument becomes weaker when the New Keynesian model incorporates the effects of lags and information that made price-level rules problematic for Friedman. Moreover, it may be premature to judge whether the price-targeting rule would retain its good properties (i.e. in terms of macroeconomic stability) in a more volatile environment than that prevailing in the 1990s and early 2000s (i.e. in the present environment following the onset of the 2007 financial crisis). It should also be noted that Simons' rule differs significantly from modern rules in terms of implementation. In contrast to Simons, the literature on optimal monetary policy focuses on implementation of the rule through interest-rate adjustments, effectuated through open market operations, instead of through fiscal policy.

Friedman and the Taylor rule. As noted in the introduction, Friedman's rule provided the intellectual bloodline for the Taylor rule.[38] Both rules focus on an instrument of Fed policy (the money supply in the case of the former, the interest rate in

36. In this connection, Eggertsson and Woodford (2003, p. 70) stated: "in our view, the announcement of a price-level target can be valuable, even when it is not considered likely that the target can be hit within, say, the coming year."
37. See Nelson (2008, p. 98)

the case of the latter). There are important differences, however, between the two rules. The Taylor rule allows the Fed to adjust its instrument in reaction to deviations from the Fed's inflation target and the output gap, providing more activism than under a money-supply rule. In this connection, the Taylor rule relies on knowledge of key parameters, including the output gap. Friedman, however, was skeptical about Taylor-type rules because of the underlying lack of knowledge of two inter-related matters. First, he had doubts about our knowledge of an economy's structural parameters, such as the output gap.[39] Effectively, Friedman was a Bayesian (Wallis, 1980). Models constructed on the basis of a good fit for a given sample were certain, in his view, to exhibit instability over time. Second, even in the presence of model certainty about structural parameters, policy makers were confronted with the problem of long and variable lags. Both a Taylor rule and a Simons-type rule are more activistic than a money-supply rule; therefore, in a world characterized by uncertain policy lags, Friedman believed that such rules would lead to more short-run instability than a monetary rule.

7. Conclusions

The discussion in this paper has aimed to explain the reasons for the different policy rules proposed by Simons, beginning in the mid-1930s, and by Friedman, beginning in the late-1950s, rules that were the point of departure for Lucas's work on business-cycle theory and forerunners of modern Taylor-type rules. The following conclusions emerge from the discussion. First, the main objective of both Simons' price-level stabilization rule and Friedman's money-growth rule was to eliminate policy uncertainty. Second, underlying Friedman's switch to a money-growth rule in the late-1950s were the empirical findings contained in (1) Friedman's work with Schwartz, (2) Friedman's study of the long-run demand for money, and (3) his students' work in the Chicago Workshop in Money and Banking. The upshot of that work is that relationships involving money are (a) sufficiently unreliable in the short run so that a price-level rule is untenable and (b) sufficiently reliable for practical use in the long run so that a money-

38. This is the position taken by Orphanides (2003), who credited Friedman's earlier contributions for motivating his own work.

growth rule is a tenable and, therefore, the preferred option. Third, Patinkin's criticism (1979) of Friedman's conjecture about Simons' knowledge of the facts of the Great Depression had the effect of being misleading. It is not surprising that Simons was not motivated to adopt a rule formulated in terms of money on the basis of the limited information set provided in Currie's work and Currie's estimates of "wide" fluctuations in velocity behavior. Fourth, Simons' misgivings about empirical relationships would likely have prevented him from switching to a money-growth rule had he known the "facts" about the Great Depression that Friedman knew by the late-1950s / early-1960s. Fifth, the fundamental reason for the different proposals put forward by Simons and Friedman was the different weights given by those two economists, respectively, to data construction and analysis for the purpose of developing testable hypotheses.

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