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PAUL SAMUELSON, ROBERT. V. ROOSA, AND THE
ECONOMICS OF CREDIT RATIONING

BY

JUAN C.A. ACOSTA

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Paul Samuelson, Robert. V. Roosa, and the Economics of Credit Rationing

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Abstract: This paper discusses the role played by NY Fed economist Robert Roosa and Paul Samuelson in the emergence of the literature on credit rationing at the beginning of the 1950s. I argue that, contrary to the story one can find in the technical surveys, an intermediate step between Roosa and the models typical of the literature on credit rationing post-1960 took place and was of significant importance in reframing a practitioner's argument into something that could be more easily tackled by economists. Samuelson played a key role in this process and brought out the importance of credit rationing as a phenomenon that should be explained as the outcome of rational agents' behavior.

Keywords: Samuelson, Roosa, credit rationing, banks, monetary policy.

JEL Classification: B22, B26, E43, E50, G20.

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Paul Samuelson, Robert. V. Roosa, and the Economics of Credit Rationing

1. Introduction

At the end of the 1940s monetary policy had very little credibility in the United States as an effective tool against the business cycle. On top of its failure during the Great Depression and of the advent of the Keynesian revolution, the peg on the prices of government securities that the Federal Reserve had kept since 1942 seemed to leave no room for traditional interest rate policy. However, the idea that there was more to monetary policy than the level of the rate of interest was being explored by officials at the Federal Reserve System, who pointed out that the availability of credit--and not so much the cost--was the fundamental variable (Wallich 1946). This idea—under the name of the "Availability Doctrine"—is usually associated with Robert V. Roosa (1951a), of the Federal Reserve Bank of New York, who gave the most complete presentation of this position during the Fed's dispute with the Treasury over the peg.² In itself, the discussion surrounding this dispute, which ended with the Accord of March 4, 1951, is an important episode for the history of central banking in the United States. However, Roosa's position is particularly noteworthy because it is presented as the inspiration for the literature on credit rationing in the technical surveys (Jaffee 1970, Ch. 2; Baltensperger 1978; Baltensperger and Devinney 1985; Jaffee and Stiglitz 1990; Calomiris and Longhofer 2008).³

The emergence of the literature on credit rationing is an interesting example of the effects of policy discussions on the course of economic theory, and one that is particularly noteworthy

² See Roosa (1951a, 273-276) for a comment on his forefathers regarding this position. See also Scott (1957a).

³ Historians of economics have paid practically no attention to the development of the literature on credit rationing. Backhouse and Boianovsky (2013) do mention credit rationing as a form of disequilibrium included in the models developed during the 1970s and 1980s, but the focus of their story before that period is the modeling of disequilibrium in the labor market.

because it involves a neglected contribution by Paul Samuelson. My main claim in this paper is that Samuelson's testimony for the Patman inquiry (1952)—where he discussed the views put forth by Roosa (1951a)—was an important first step in the development of the literature on credit rationing as we know it today, for Samuelson anticipated the question that defined the development of this literature from the 1960s on: is credit rationing admissible as the outcome of the behavior of rational, profit-maximizing banks? His role, however, has been consistently ignored, minimized or misunderstood in the technical surveys, written by participants in this literature, who jump too easily from Roosa and the Availability Doctrine to the first formal statements of the problem of credit rationing that were motivated by Hodgman (1960). I will show that Samuelson's testimony was an important intermediate step in the reframing of a practitioner's argument into something that could be more easily tackled by economists, and that he explicitly located the issue of credit rationing in the theory of the (rational) behavior of the banking firm.

1.1 The puzzle of credit rationing

The story told in the various surveys of the literature on credit rationing agrees on placing Donald Hodgman's "Credit risk and Credit rationing" (1960) at the beginning of an effort to model this phenomenon. Hodgman (1959,1960) was responding to two earlier attempts to model the Availability Doctrine. The first, by John Kareken (1957c), a former student of Samuelson at MIT, concluded that there was no straightforward way to make the behavior of lenders assumed by the Availability Doctrine compatible with credit rationing. The second, by Ira Scott Jr. (1957b), was a simple optimal portfolio model where the lender chose between government and private securities, and that included the crucial assumption that the price of the private securities

was fixed. Addressing both of these issues, Hodgman (1960) presented the puzzle that would occupy economists working on this literature from then on:

My purpose is to provide a more general explanation for credit rationing which does not rely upon oligopolistic market structure or legal maxima to the interest rate, which is consistent with rational behavior along the lines of economic self-interest, and which is permanent rather than temporary in its effect for so long as the general credit situation which occasions it lasts. (Hodgman 1960, 259)

The goal was to build a model where the behavior of rational agents (banks and customers) would result in an equilibrium with credit rationing. It was a puzzle insofar as there was agreement on the pieces that needed to be used but there was no straightforward way to put them all together. Oligopolistic arguments and fixed prices were ad hoc shortcuts and thus not acceptable. As Jaffee and Stiglitz (1990, 949-853) point out, however, the attempts to solve this puzzle during the 1960s failed to deliver on Hodgman's original intention because the solutions presented depended on particular features of the commercial loan market without adequately explaining their origin.⁴ This literature was replaced by a second wave of papers that gave central importance to imperfect information as an explanation for the existence of these specific characteristics as well as the existence of credit rationing itself (Jaffee and Russell 1976; Stiglitz and Weiss 1981).

With the partial exception of Jaffee (1970, Ch. 2) and Baltensperger and Devinney (1985)—who are relatively generous with the space given to Roosa and the Availability

⁴ Three basic sources of the phenomenon of credit rationing were explored: credit default risk (Hodgman 1960), the lender-borrower relationship (Hodgman 1961; Kane and Malkiel 1965), and imperfect monopolist discrimination (Jaffee and Modigliani 1969).

Doctrine—the technical surveys don't really explore how the Availability Doctrine and the phenomenon of credit rationing became associated. In fact, the casual reader might think that Roosa (1951a) discussed credit rationing explicitly even if he didn't offer a formalization, which would be a mistake since it was not what Roosa was aiming for and the expression is not even in the text. These technical surveys cannot be blamed for not delving into this part of the story since it's not what they are meant to do, but this is a part of the story that is worth looking into as it reveals how credit rationing passed from being an empirical phenomenon—widely acknowledged yet not systematically studied—to a theoretical puzzle, part of the theory of the banking firm, and analyzed within a framework of rationality, equilibrium, and mathematical models.

An important source of this shortcoming of the story presented in these surveys is that, besides the purely anecdotal mention of the interest rate ceilings in the 19th century and Keynes' "fringe of unsatisfied borrowers," these surveys ignore that other economists had paid attention to the issue of credit rationing before the 1950s. They completely ignore an economics literature that looked at credit rationing—although more often than not calling it "capital rationing"—and that is responsible for much of the attention given to this phenomenon during the 1940s. In particular, these surveys completely pass over Albert Hart, who insisted on the importance of capital rationing for the analysis of the theory of the firm under uncertainty (Hart 1937, 290-291). Hart's insight for the existence of credit rationing is, however, particularly noteworthy for the importance he gives to uncertainty and information, an important part of Samuelson's Testimony, and the key element in the modern approach to credit rationing:

[O]n account of the uncertainty which other people feel about our honesty, competence and business prospects, we do not in fact have the unlimited borrowing-power at a fixed open-market rate which is usually assumed in capital theory. (Hart 1940a: 50)

At the time, capital/credit rationing was mentioned most frequently in the field of agricultural economics, but it was also mentioned by economists working on monetary policy.⁵ Most notably perhaps, its importance was explicitly acknowledged in the official report of the 1949 congressional inquiry chaired by Senator Paul Douglas, which laid the ground for the Fed's defense of a return to flexible monetary policy (Congress 1950: 21). And Wallich (1946), writing in the *American Economic Review*, had mentioned it as part of his analysis of the availability of credit and the new interpretation of the rate of interest—as a sign of the conditions of the market and not the equilibrating variable—that it proposed. This is, to the best of my knowledge, the first explicit connection between the idea of credit rationing and the argument about the importance of the availability of credit.

Roosa and the Availability Doctrine were not necessary to put the issue of credit rationing on the economists' table, but they do seem to have had an impact on the kind of explanation that was expected of this phenomenon. Compared to the 1960s, what was missing from the picture at the beginning of the 1950s was an explicit concern with the consistency of credit rationing with the rational behavior of banks, the key aspect of the literature that developed after Hodgman (1960). Taking this into account forces us to further explore the idea

⁵ It seems to have been a major obstacle for agricultural producers and farm owners during this period. A JSTOR search shows that more than half of the papers that mention either "credit rationing," "capital rationing" or a similar phrase (i.e. "rationing of capital") from 1919 to 1951 are about agricultural economics. Boulding, on the other hand, criticizing Allais's theory of the rate of interest for the lack of attention given to the imperfections of the capital market, pointed out that "We are all familiar, in this country at least, with the phenomenon of 'capital rationing,' and a theory which abstracts from this phenomenon has little claim to much generality." (1951, 72).

that Roosa inspired the literature on credit rationing and explain how this phenomenon became a theoretical issue on its own, to be tackled by looking at the behavior of banks.

The next two sections discuss the role that Roosa and Samuelson played in the emergence of credit rationing as a puzzle for economic theory. I will show that Roosa (1951a) was instrumental in calling attention to lenders as economic agents, and not directly to credit rationing. It was the argument of a policymaker, full of institutional detail and behavioral assumptions informed by his close experience dealing with the implementation of monetary policy; it was not an argument directly palatable to academic economists. Samuelson's discussion of Roosa's argument brought out the importance of credit rationing and framed it as a question about the rational behavior of banks. This laid the basis for credit rationing to become a puzzle of its own and not a complication for the theory of the firm as it was in Hart's case.

2. Roosa and the New York Fed

The argument put forth by Roosa (1951a) and the New York Fed was the outcome of the particular circumstances that the United States faced immediately after the end of World War II. As I mentioned above, these years were marked by the clash between the Treasury and the Federal Reserve System over the peg on interest rates that the latter had maintained since 1942.⁶ The Fed had started to slowly unfreeze short-term interest rates since 1947, but it faced a strong opposition from the Treasury and the President when it tried to move into the long-term segment of the market for government securities. The Fed, seriously concerned by the rising inflation experienced since 1946, wanted a return to flexible (higher) interest rates; the Treasury, on the other hand, was more concerned with the potential recession that might come with higher interest

⁶ This episode has been well documented by Wood (2005, 218-238) and Meltzer (2003, Ch. 7). For contemporary assessments of the situation see Fforde (1951), Tobin (1953), and Kareken (1957a,b).

rates, and with the higher costs of debt management this would also imply. The clash, which during the last months was filled with drama and intrigue, ended with the Accord of March 4, 1951, in which the Fed regained discretion over the rates of interest but committed to guarantee successful debt subscriptions by the Treasury.⁷

Allan Sproul, president of the NY Fed (1941-1956), was a strong advocate of the return to higher rates. At least since December of 1946, Sproul had spoken in favor of higher interest rates and the primacy of Open Market Operations (OMOs) over other forms of monetary policy—in particular the establishment of secondary reserve requirements, which was Chairman Eccles' and many others' preferred solution—to fight what was seen as the highest threat to price stability: the transformation of the government securities held by commercial banks into private loans (Sproul 1947). As can be seen in Figure 1, by 1946 commercial banks were getting rid of the Government securities they had accumulated over the war and private loans showed a sustained growth. The Fed feared that by keeping interest rates pegged, thus facilitating this transformation, it had become an "engine of inflation."

⁷ This meant that the Fed committed to maintaining "orderly markets" (i.e. stable interest rates) around the dates of offerings of debt by the Treasury so that they would be successful. Roosa referred to this commitment as "independence within the Government" (Bremner 2004, 90n74). For a discussion of the details of the 1951 Accord see the answer of the chairman of the Board to question 29 of the Patman Hearings (Congress 1952, Vol. I, 346-351).

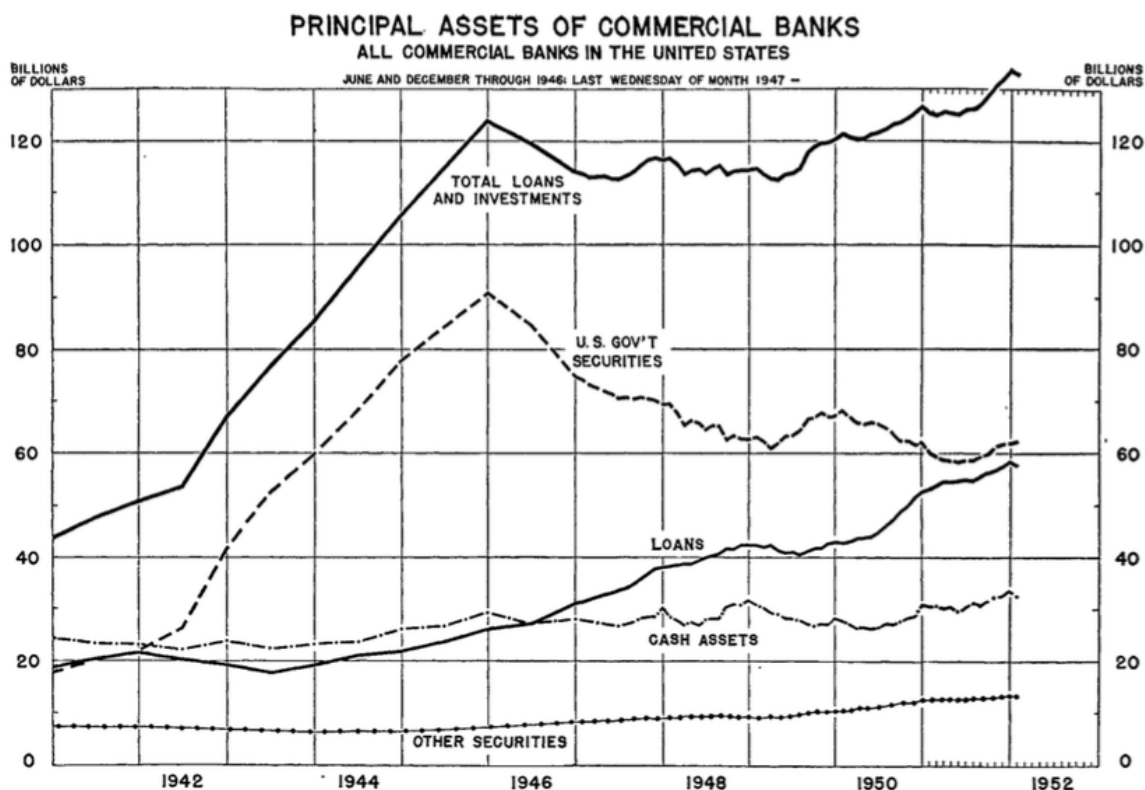


Figure 1

Source: Congress 1952, 705

This was the scenario denounced by Sproul in his 1946 speech, to which he latter added the role of other types of intermediaries in aggravating the problem (Sproul 1951). He wanted to unfreeze interest rates, and he considered that given (1) the broad holdings of Government securities among banks and other lenders, and (2) the high sensitivity of these agents to changes in the prices of government securities, it would be possible to use OMOs to dissuade them from transforming their securities into loans. He believed that small changes in the rates of interest together with the uncertainty about future movements would make them less willing to lend (Sproul 1947, 6-8). Sproul (1951) provided some empirical evidence in favor of this strategy, but he did not provide any further development of the mechanics of his argument. Instead, he

referred to Roosa (1951a) as providing the "theoretical aspects" of his view (Sproul 1951, 322). Whether Roosa (1951a) in fact delivered a "theory," as Sproul stated, is questionable, but in this and other contemporary texts he did provide us with a more elaborated picture of the NY Fed's argument, and his text became the most cited exposition of this point of view.

Roosa had entered the NY Fed in 1946 and by the time his text was published he was the Acting Manager of the Research Department. When he left in 1961, as Vice President of the Research Department, he had built a solid reputation as a central banker.⁸ Both Roosa (1951a) and Sproul (1951) were published as part of a volume honoring the legacy of John Henry Williams,⁹ a Harvard professor, President of the AEA (1951), and longtime advisor to the NY Fed. Sproul and Roosa gave major credit to Williams for fostering the idea that lenders were a key element in the working of monetary policy, remarking as well that his contributions were fundamentally in the form of oral discussions (Roosa 1951a, 275-276; Sproul 1951, 296).

The use of the expression "availability of credit" was characteristic of Roosa's and Sproul's texts, but they never gave an explicit definition of what they meant by it, and in particular—unlike Wallich (1946) and Ellis (1951)—they never addressed explicitly the issue of credit rationing. What can be understood from their texts is that the availability of credit was a way of speaking about the general amount of credit that borrowers could actually get at a particular moment in time; it was an expression meant to capture a dimension of tightness of the market different from the mere cost of credit. Roosa explained the relevance of the availability of

⁸ Samuelson, who suggested him for his next job, Treasury Undersecretary for monetary affairs, stated that "as far as technical competence and brightness and everything else, he's one of the best young central bankers in the world" (Ackley et. al. 1964, 159). Apparently, had Roosa been older he might have been named Secretary (ibid.)

⁹ Roosa was one of the editors of the volume. All of the chapters were ready by June 1950, but the publication got delayed until 1951. See the letter from Roosa to Samuelson, April 6, 1951, Box 63, Roosa Correspondence, Paul Anthony Samuelson Papers, Rubenstein Library, Duke University (PASP onwards).

credit, and of its usefulness for monetary policy, by going back to the famous Oxford Surveys of 1938 and 1940:

...the later (sic) of the two questionnaires, better devised and reaching a wider sample of respondents, showed the door opening upon what has become, at least in the United States since World War II, the dominant significance of interest rates and of central bank controls. Roughly a quarter of the replies indicated that the *availability* of bank credit, or of funds obtained through securities markets, affected businessmen's decisions to make (or the *timing* of their decisions to make) expenditures upon new plant, or upon repairs and maintenance, or upon inventories. It follows, although the Oxford writers did not draw this conclusion from their own data, that if changes in various market rates of interest exert an important influence upon the extent to which *lenders* make funds available, those rates will have some appreciable influence upon economic activity. (Roosa 1951a, 275)

Therefore, it made sense to look into the possibility of influencing the behavior of lenders. As I'll show below, this was what Roosa and the NY Fed's argument was all about.

2.1 The scope for central bank action

Roosa (1951a) provided an assessment of the possibilities for Central Bank action in the postwar and argued that monetary policy could make a modest but real contribution to stabilization policy, particularly in fighting inflation. This assessment started by a critique of past views on central banking—what Roosa called the "main stream of analysis" from Wicksell to Keynes—which were at fault for exaggerating the power of monetary policy, for not paying attention to lenders, and for an overall disconnection from the real world (Roosa 1951a, 275). Accordingly, Roosa first carefully analyzed the actual characteristics of the context in which the

Fed had to act, describing the main changes in the money and Government securities market in the US since the establishment of the Fed in 1914—and especially since the beginning of World War II—which had made it considerably more sensitive to changes in interest rates.

The first important change was the increase in the public debt and in the holdings of government securities. This was important mainly because it provided the market with a riskless asset, which didn't exist before, and that allowed a clearer distinction between risk and liquidity considerations (Roosa 1951a, 277). The second important change was the institutionalization of savings, which, due to "a steadily growing popular insistence on 'security,'" made such institutions adverse to risk and very sensitive to changes in the yields of their investments (Roosa 1951a, 278). Finally, Roosa remarked on the growth of a specialized market in government securities, as well as on the reduction of the spreads quoted and the units used to do so, which were evidence of the increased level of activity and sensitivity to small changes (Roosa 1951a, 278-279).

In this context, the Central Bank could carry out OMOs in any segment of the Government securities market and expect to influence the behavior of lenders. In particular, by acting in the short-term segment of the market the Fed could:

1. Absorb or release funds on its own initiative (Roosa 1951a, 287).
2. Change the willingness of lenders to lend, not just because of the effect of changes in interest rates on the value of their assets, but also because of the uncertainty regarding future changes that the Fed's actions created (*ibid.*).
3. Change the expectations on the long-term market, which could influence "the timing of lender's long-term commitments," including their decisions to switch between long-term Government securities and private issues (*ibid.*).

On the other hand, direct action on the long-term end of the market was expected to:

4. Change the lender's willingness to grant long-term loans, due in part to the gain or cost of doing so (the so called "pin-in" or "lock-in" effect),¹⁰ but also due to the uncertainty about future changes in interest rates (Roosa 1951a, 291-292).

5. Change the market price of other new security issues, which would change the willingness of dealers to "float" new issues¹¹ (Roosa 1951a, 288-290)

6. Change the borrowers' willingness to borrow due both to the cost as well as the availability of credit. Mortgages were highlighted (*ibid.*).

Lastly, Roosa also considered the spread between short- and long-term rates. He considered that there was nothing "natural" about the gently upwards sloping yield curve that lenders had grown accustomed to during the war, and as they constantly evaluated their positions in the short- and long-term segments of the market, influencing this spread could play a useful part in monetary policy. Reductions in this spread and even a short term rate higher than the long term rate should be considered part of the Central Bank's tools (Roosa 1951a, 202).

The key aspects behind the effectiveness of monetary policy were timing and flexibility: monetary policy had to act at the critical points, "at the early stages of a change in business activity before the extremes of a dangerous cumulative development have been reached" (Roosa 1951b, 30) and it "require[d] the use of delicate (and readily reversible) instruments" (Roosa

¹⁰ Changes in the value of securities are greater the longer the maturity of the security. Thus a 1% increase in the rate of interest on a 20-year bond will produce bigger change in its price than the same increase would in a 15-year bond. Therefore, the cost argument, while still present in the short-term segment of the market, was much more powerful in the mid- and long-term segments.

¹¹ A firm willing to sell debt would usually go to a dealer who would buy it--on credit obtained from banks--to add it to the stock of securities that it offers to interested buyers. In this sense, the dealer "floats" the company's debt, as he does not intend to be the final owner.

1951a, 295). The ability to act on different maturities through OMOs gave the Fed the opportunity to act precisely in this way, that is, of course, if it was free to act as it saw fit.

These six expected outcomes of monetary policy were of varying novelty. The first one, in particular, was the standard advantage of OMOs over the discount mechanism.¹² The main point was that contrary to the discount mechanism, where the Fed played a passive role, OMOs gave the Fed the possibility to reduce or increase the amount of reserves of the banking system as a whole, at its discretion, with the accompanying effect of changes in the rates of interest.¹³ The sixth result was also partly conventional insofar as it said that the cost of credit was a direct and dissuasive element for economic activity. The novelty of the NY Fed's view lay in its insistence on the direct importance of lenders, and in the importance accorded to uncertainty and to the changes in the availability of credit it produced. I will now look closer at these elements of the mechanism.

2.2 The role of uncertainty in the market for Government securities

Uncertainty was an essential part of the NY Fed's view because it allowed them to bypass the idea, common at the time, that only large increases in the rates of interest would be effective in containing inflation and that such changes would likely cause a depression: monetary policy was thought to be ineffective unless it was used with drastic force, but then it became dangerous.¹⁴ Roosa and Sproul shared the belief that large changes in the rate of interest were impractical; the difference was that they thought that such changes would not be necessary as

¹² See for example the description of OMOs in the Fed's *Purposes and Functions*, an official publication of the Board of Governors intended to explain how monetary policy worked (Board of Governors 1947;1954).

¹³ The Fed didn't actually buy or sell securities directly in the open market. Instead, the Fed placed orders with a set of selected dealers who quoted prices for the whole spectrum of maturities. This is the ancestor of the current system of primary dealers (see Garbade 2015).

¹⁴ An idea that can be found, for example, in Samuelson (1948; 1951) and Hansen (1949).

uncertainty about future movements would amplify the effect of small changes in interest rates enough to influence the behavior of lenders and impact economic activity.¹⁵

The specifics of the effects of uncertainty on lenders were, however, not completely clear. For example, he explained the effect of changes in the short-term rates, were OMOs were usually focused, as follows:

A decline, however slight, if sustained for any appreciable length of time will create uncertainty over the possibility that credit may be turning generally easier, and that other rates may also fall. A rise may set off an opposite chain of expectations. And often times the mere indication of a change in the direction of rate movements may be enough to transform many of the dominant institutions from willing to reluctant lenders, or the reverse. Or, given a gradual development of small rate changes, in an upward direction for example, one more slight twist of the screw may be sufficient to *deter a lender's commitment of funds, turning him toward the relative security of a short-term Government issue until the growing uncertainty shall have cleared away.* (Roosa 1951a, 286, my emphasis)

Roosa's characterization of the institutions and markets at the beginning of the 1950s supported the idea that sensitive lenders, constantly facing the decision to adjust their position on government securities of different maturities, would care about changes in their prices, and that they would also pay close attention to the behavior and pronouncements of the Fed. The one sure thing was that lenders reacted to changes in the rates of interest and the increased uncertainty

¹⁵ The defense of this argument was also accompanied by a critique of alternative forms of monetary policy, which could not accomplish what flexible interest rates could. Instruments such as moral suasion, credit controls, the raising of the required ratio of reserves, and the establishment of secondary reserves of Government securities were the main type. Roosa and Sproul did not find these instrument completely useless, but they did consider them inferior to flexible interest rate policy, and especially so in the context of pegged rates. Roosa offered detailed criticisms of these instruments (1951a, 283-285; 1951b, 34-36; 1952b, 258-259). On more philosophical grounds, flexible interest rate policy was also considered to be more neutral, impersonal, and thus more compatible with a free, democratic, and capitalistic society than selective controls (Sproul 1951, 324-325).

these changes brought with them. The Fed could create "a general desire to 'wait and see'" (Roosa 1951a, 287). Other than that, however, there was not much regarding the specific behavior of lenders: how did these lenders incorporate new knowledge? How far into the future did lenders plan on? How often did they reconsider their plans? In this sense, Roosa didn't provide a fully worked out theory of expectations or lender's behavior. Instead, what Roosa offered was the analysis of somebody who was knee deep in the practical considerations of monetary policy implementation and who had come to "know" the markets well enough to "know" what he could expect from them. It should come as no surprise that this view emerged at the Federal Reserve Bank closest to the markets and charged with the actual implementation of monetary policy.¹⁶ Monetary policy was just too complicated, and having knowledgeable officials with the power to exercise discretion was the best way to face it.¹⁷

The pattern of lender reactions need not necessarily be the same for a change of the same direction, or the same magnitude, at two different points in time. The one assured fact is that lenders will always be sensitive to slight changes, careful to balance the possible capital loss (or gain) resulting from a rise (or reduction) in rates against the possibilities of a greater (or lower) yield. But because lenders cannot always be expected to take the same steps following a given rate

¹⁶ The way things worked back then was the following. The decisions taken (on a biweekly basis) by the FOMC were transmitted to the manager of the trading desk, the part of the Federal Reserve System charged with the actual implementation of monetary policy: buying and selling Government securities. The trading desk was located at the NY Fed and its manager was a vice president of the NY Fed. The trading desk was in constant contact with the selected dealers through which it carried out OMOs, receiving their assessments of the situation at the market periodically and monitoring the price they quoted throughout the day. See Garbade (2015), the Report of the Subcommittee on the Government Securities Market (Congress 1954, 257-305), and in particular Roosa (1956) for a description of the working of the market of Government securities, the key role of dealers, and the tasks involved in running the trading desk of the NY Fed.

¹⁷ At the time, the implementation of monetary policy carried with it an important amount of discretion on the part of the manager of the trading desk. The instructions from the FOMC were vague, so the decision over when to buy, in what maturities, and exactly how much were all pretty much left to the manager's discretion. As Meltzer shows, this was not something that the Board accepted kindly, in part because it contributed to the dominant position of the NY Fed over the system (Meltzer 2010, 44, 57).

change, the System's open market account cannot be operated according to a formula. Operations must instead be based on continuous close study of the money markets. Achievement of a desired degree of ease or of restraint will depend heavily on the ability of the central bank officials to "play by ear." And the supreme advantage of open market operations for this purpose is that they can proceed in small steps, where appropriate; they need not be accompanied by formal announcements of intentions, with the rigidity and the possible exaggerated emphasis inherent in such announcements; and they can be readily reversed if the desired response is attained more quickly than expected, or in the event of a subsequent change in the underlying market situation. (Roosa 1951a, 286-287)

This type of close observation and knowledge of the market was also important since the Fed still had the responsibility to help the Treasury make successful debt subscriptions.¹⁸ In any case, the key element was to eliminate the certitude that pegged interest rates gave lenders and take back the control over the availability of credit. The point was not to replace the war peg with a higher one, but to create a scenario where lenders had to think long and hard about the future behavior of rates. Achieving this was essential for the argument that small changes could be very effective. As Sproul pointed out, "[i]f it is not known in advance exactly what we are going to do, we may well find that very little pressure will have sizable and beneficial results" (1947, 7-8).

However, it is difficult to accept Roosa's characterization without feeling that it is not completely tight, in particular regarding the way agents—both lenders and borrowers—formed and revised their expectations. Robertson (1953), for example, found it paradoxical that lenders were influenced by their expectations of changes in the rates of interest, but that borrowers

¹⁸ Early on Sproul had pointed out the inseparable nature of money and debt management (Sproul 1947, 6), and Roosa offered a detailed analysis of the possibilities of cooperation between both institutions (Roosa 1952b).

would be more discouraged by the absolute changes. To this Roosa responded with policymaker's pragmatism, pointing out that it was a valid concern but that it also reflected the actual state of the money and loan markets.¹⁹

2.3 The next step for credit rationing

The main point of this section has been to show the extent to which Roosa and the NY Fed's argument was a policy and not a theoretical argument. While Roosa (1951a) insisted on the behavior of lenders, it was certainly not in the same sense that their behavior is considered in post-1960 literature on credit rationing. Two major differences can be pointed out: First, lender's behavior is not meant to be irrational or arbitrary but its rationality is not explicitly presented as the basis for the analysis. Rather, the weight of Roosa and Sproul's argument rests on their appreciation as practitioners of the behavior of lenders under uncertainty. Second, their emphasis was on the government securities market and not on the commercial loan market. Roosa and Sproul were interested in the way in which the Fed's actions could influence the behavior of lenders and they took for granted that this would translate itself into less credits being granted in the commercial loan market.

Some of the surveys on the literature on credit rationing acknowledge that the Availability Doctrine was mainly related to policy and that as such it motivated more theoretical questions than answers (notably Baltensperger and Devinney 1985, and Jaffee 1971, Ch. 2). However, a closer look at the arguments put forth by Roosa and Sproul shows just how wide is the gap separating them from the post-1960s literature and the importance of the intermediate steps that connect them. This is where Samuelson's Testimony (1952) for the Patman inquiry comes in.

¹⁹ Letter from Roosa, August 22, 1951, item C18/107, Papers of Sir Dennis Robertson, Trinity College Library, Cambridge.

3. Samuelson on credit rationing

By the time Samuelson presented his testimony he was no stranger to discussions about monetary policy. Not only had he been involved in a discussion about the effects of an increase on the rates of interest on banks (Samuelson 1945), but he had also already published two editions of his *Economics* (1948, 1951), a book that gave major importance to the policy implications of economic theory and that discussed monetary policy quite extensively. The first edition contained an unclear relation between the aggregate-income analysis that was at the core of the book's argument (i.e. the 45 degree model) and monetary policy (Hoover and Pearce 1995), but the second edition clarified this connection and explicitly incorporated the typical interest-rate transmission channel that is usually associated with Keynesian (IS-LM) models.²⁰ More important for this paper's argument, though, is the addition of a short subsection, "Lower interest rates reinforced by more liberal credit rationing," where he pointed out that credit rationing was an important element to be taken into account when analyzing the effects of "easy money" policies:

Even if a lender should make little or no change in the rate of interest that he advertises to his customers, there may probably still be the following important effect of "easy money."

Borrowers who previously would have been considered to be just a little too risky will now be granted loans. This is because the lender now has plenty of money on hand begging for investment opportunities; *the lender will now be rationing out credit much more liberally than would be the case if the money market were very tight and interest rates were tending to rise.* The

²⁰ "To put matters most simply, an increase in the amount of money tends to depress the rate of interest; and a reduction in the interest rate tends to increase the flow of investment spending, thereby raising income, consumption, and production or prices" (Samuelson 1951, 339). Samuelson, however, did not include a discussion of the IS-LM model until the third edition of his textbook, and it was in the chapter about capital theory.

plentiful supply of money will also tend to bid up the prices of common stocks. It will be easier now to find buyers for new issues of common stocks. And business firms generally will find it somewhat easier to raise equity capital as well as to raise loan capital.

Whenever in what follows I speak of a lowering of interest rates, I shall also have in mind the equally important relaxation of the rationing of credit and general increase in the availability of equity and loan capital to business. (Samuelson 1951, 341, my emphasis)

Credit rationing doesn't appear in the rest of the book. As Samuelson points out in the last sentence of the quote, its effect can be assumed to accompany the effects caused by movements in the rate of interest so there's no need to elaborate any further. The more interesting point about this quote, however, is that it shows that Samuelson had no difficulty accepting the existence of credit rationing even when the policy being studied was one of easy, not tight money.

3.1 The Patman testimony

On March 25, 1952, Samuelson participated in one of the many hearings held for the congressional inquiry on monetary policy chaired by Senator Wright Patman.²¹ The core of Samuelson's testimony is what he called a "down-to-earth realistic way of describing the mechanism of monetary policy" (Samuelson 1952, 742), that he used to criticize some contemporary views on monetary policy. He summarized his argument in the following way: "the real problem of monetary policy open to the central-bank authorities is the problem of its effects upon the cost and availability of credit to spenders" (1952, 693), and he further insisted on the fact that "[a]ll that a central bank can do is to *bid up or down the price of assets*; it can

²¹ See Murphy (1953) for information on how the inquiry was carried out.

thereby bribe the banks and public into changing the composition of assets, but it cannot primarily affect the total of such assets" (ibid., my emphasis).

Samuelson's main targets were the arguments about monetary policy, "amply represented...both on the part of Government agencies and on the part of private voluntary answers" to the questionnaires of the Patman inquiry (1952, 693), that focused on the importance of the "demonetization of debt," the supply of money, and on controlling bank reserves in a mechanic way, without explicitly taking into account the effects of the cost and availability of credit. These elements were only important for their connection with the cost and availability of credit—what the Central Bank could affect and what the banks cared about—and therefore it made no sense to speak in terms of these other elements, or even worse to think that they were somehow independent from the cost and availability of credit. Doing so only hid what was actually going on when the Central Bank carried out monetary policy and fostered the idea that it was carried out following a mechanistic "meaningless sequence" based on the deposit-reserve multiplier and a quantity equation.²² Samuelson urged us, "as an economic theorist," to "show how each individual bank will be compelled or tempted by your central-bank policies to refuse credit to would be borrowers" (1952, 694).

Next, Samuelson focused on "a more subtle form that the doctrine now takes among us academic economists and also among the Federal Reserve System spokesmen" (1952, 694). Although he didn't name names, this "subtle form of the doctrine" was the view associated with the NY Fed, and Samuelson criticized it mainly because its proponents had not understood the extent to which their view depended on the imperfect nature of the loan market:

²² Samuelson presented this "meaningless sequence" in three steps: "(1) cut down on bank reserves, (2) apply a 5-- or 6--1 leverage factor to determine the resulting contraction in bank deposit money, (3) apply a 'quantity equation' to show how the cut in total M results in a cut in prices or dollar spending." (1952, 742).

The imperfect competition aspect of banking is absolutely crucial for the recently fashionable doctrine that the central bank gains its leverage not through its effects upon the cost of credit but by its effects upon the availability of credit. I would gladly trade 100 pages of the written and oral testimony before this committee for even a few paragraphs of careful analysis on this point (Samuelson 1952, 696).

The imperfect competition element was fundamental because the sensitivity of lenders, which Samuelson saw as the main trait of the NY Fed's view, was not enough to explain why monetary policy could be effective through its effect on lenders:

There is the germ of truth that insurance companies and banks are very responsive to slight changes in interest rates.

However, if you examine the problem you find that this elasticity works against monetary policy. The more elastic the supply in a perfectly competitive market of large financial lenders, the more is contractionary policy thwarted. You have to do more to get the same effect.

Let me illustrate that by an extreme case. Suppose that the supply was so elastic on the part of all commercial banks, insurance companies and other institutions that you could not get any change of the interest rate. You see that the peg of the Federal Reserve System would then be replaced by the peg of the private free market and, therefore, there would be no leverage for you to tighten on borrowers. So, we have to go to a different aspect of this argument, which is a more subtle one, and is an ancient one, but has been resurrected in recent years--and I think properly so--namely, that the market for borrowing funds is an imperfectly competitive one. (Samuelson 1952, 695)

Samuelson's criticism is somewhat opaque in the sense that it doesn't address separately the behavior of lenders in the government securities market and its relationship with their behavior in the loan market. Furthermore, he discusses a general idea of sensitivity or responsiveness of lenders that is not the same as Roosa's: while for Samuelson this sensitivity is the usual price elasticity of supply, in Roosa's argument the sensitivity of lenders was about their behavior under uncertainty regarding the prices of government securities. Samuelson didn't take into account the uncertainty in the government securities market that Roosa insisted so much on.²³ However, the fact that he presented his argument in this way is quite telling: he started with perfect competition and didn't get the result he was looking for, so he passed to imperfect competition; he showed that the original assumptions were not enough and the problem remained tractable in terms of individual behavior.

The loan market is imperfect, Samuelson pointed out, mainly because of the nature of the good that is being transacted; some lenders may be bigger than others, but "monopolistic impurities" are secondary and what matters is the fact that getting a loan is the result of a negotiation with the banker and there is a great deal of uncertainty involved in the process (Samuelson 1952, 696).²⁴ For Samuelson, the loan market always displays some degree of imperfection and thus there will always be some degree of credit rationing. He didn't explain why banks wouldn't immediately change the interest rates on loans to compensate for the effects

²³ Samuelson's criticism of the "Bills Only" regime adopted by the Fed in 1953—where he sided with the NY Fed and against the Board—shows that he seems to have not really understood what Roosa and the NY Fed people meant by uncertainty. He was, however, willing to give it the benefit of the doubt as a tool for monetary policy: "Lessening the 'Fed' 's power to create uncertainty in the minds of the men in the market is to rob the New York Federal Reserve writers of one of their choicest weapons. While I am not sure that Allan Sproul, Robert V. Roosa and John H. Williams themselves always knew quite what they meant when they preached the virtues of creating uncertainty, this device may have its place in the Central Banker's arsenal and should not be thrown away or limited without careful consideration" (Samuelson 1956, 1470 n1)

²⁴ "No one can read the future and therefore each lender must necessarily have a different opinion as to the credit worthiness of different borrowers" (Samuelson 1952, 696).

of monetary policy, simply stating that "[t]here are good reasons why in the short run in an imperfectly competitive market you will not change your charges but simply increase the frequency with which you arbitrarily say 'No' to people" (1952, 697). It is noteworthy, however, that the emphasis of his argument for the imperfect nature of the commercial loan market is on the behavior of the individual banker, who has to assess the borrower's credit worthiness and act accordingly.

Samuelson's conclusion was that, if monetary policy acted through lenders, it was effective only in so far as it increased the degree of imperfection, thus increasing credit rationing and decreasing the availability of credit. This extra amount of imperfection, however, could only be temporary. After a rise in interest rates an individual banker would deny some of the loans he would have granted before the monetary policy was put in place, but after a short amount of time he would start granting those loans again, at a higher rate, and the market would return to its original degree of imperfection (Samuelson 1952, 697). The banker would return to the previous degree of credit rationing and simply increase the rates of interest charged to borrowers to compensate for the increased tightness induced by the Fed. These were rather bad news for the NY view, for it meant that the only lasting effect of monetary policy would be a higher interest rate for borrowers. It also meant that the fundamental question for judging the effectiveness of monetary policy beyond the very short-run necessarily depended on the empirical findings of the elasticities of demand of borrowers (Samuelson 1952, 698).

The published Testimony is not a verbatim transcription of Samuelson's speech during the Hearings. Participants had the opportunity to elaborate on their testimonies before final publication and Samuelson sent a summary of a revised version of his testimony to several

economists asking for comments.²⁵ Among them was Howard Ellis, who seems to have played a particularly important role in the final content of Samuelson's Testimony. In his letter to Ellis Samuelson wrote:

I felt it desirable to elaborate explanations on a few points. The enclosed represents the principal additions.

You will note that the insert on imperfect competition aspects on banking grew out of the few words we had together after the session. I am grateful to you for calling to my attention the need to elaborate my position. (Letter to Ellis, April 11, 1952, Box 59, Patman Testimony, PASP)

In his response Ellis included a summary of what he understood to be Samuelson's view—judging from the summary he received—and it would seem that he understood Samuelson's use of the expression "imperfect competition" to mean that the issue was about monopoly or oligopoly problems. Ellis insisted on the fact that credit was not an uniform good and thus credit-worthiness was important, on the fact that credit rationing was always present although its stringency was variable, and on the fact that interest rates were "rather inflexible" in the US.²⁶ Thus Samuelson's initial version seems to have been less clear about the character of the imperfect competition that he thought was important. Unfortunately, the summary was not present in the correspondence available among Samuelson's papers so it is difficult to see exactly how important were Ellis' remarks, but given the similarity of the published testimony and of Ellis' position it is clear that he played an important role in the final outcome.

²⁵ Box 59, Patman Testimony, PASP.

²⁶ Letter from Ellis, April 30, 1952, Box 59, Patman Testimony, PASP. Haberler seems to have had some trouble understanding Samuelson as well since he wrote in his reply: "When I read about imperfect competition on p.1, I didn't realize immediately that you meant imperfection in the Chamberlinian sense, but that is explained later on" Letter from Haberler, May 7, 1952, Box 59, Patman Testimony, PASP.

It is also noteworthy to point out that Samuelson didn't build on his previous engagement with the behavior of banks (Samuelson 1945). Contrary to the testimony, where the banks' behavior in the government securities market is largely neglected, Samuelson (1945) was essentially an analysis of the importance of bank's holdings of securities and the relevance of changes in the rates of interest. Arguing against the idea that higher interest rates would bankrupt the banking system Samuelson stated that the present value of the income that a bank could expect from its assets was an inadequate indicator of its solvency. Instead, he proposed an alternative indicator that included not only the revenues but also the payments of the banks to argue that the effect of an increase in the rates of interest was only negative for banks if it resulted in a change in the relative frequency with which a bank could expect to receive and pay a dollar. Therefore, an increase in the rates of interest, as long as it didn't alter the frequencies of payments and revenues, was not a devastating blow to banks. In fact, the losses caused in the books of the banks could be recovered in a couple of years and the bank would be left with higher earning assets.²⁷ Later commentators referred to this argument in their criticism of the lock-in effect and the Availability Doctrine (e.g. Smith 1956) but Samuelson didn't. Other than a passing dismissal of the relevance of the lock-in effect, which was based on factual experience and not theory (Samuelson 1952, 740), Samuelson didn't mention the issue during his testimony.

3.2 Samuelson and Roosa

²⁷ To be sure, just as it would be the case in the first edition of *Economics* (1949) he wasn't arguing in favor of monetary policy but against a bad theoretical argument. His stance on the place of interest rate policy was clear: increases in the rate of interest "imply enormous, unneeded, unnecessary, undesirable, and arbitrary gifts to certain investors at the expense of the Treasury" (Samuelson 1945a, 26). This outweighed any "doubtful minor benefits" in controlling inflation, which could be controlled by other forms of banking policy (ibid.)

Samuelson also sent Roosa the summary of his testimony and explicitly acknowledged his influence on it:

I would be especially interested in your reactions to my discussion of the imperfect competition aspects of banking. I purposely overstated the problem a little to draw attention to its importance; and much of the stimulus to examine this paper came from your valuable chapter in the Williams volume. (Letter to Roosa, April 11, 1952, Box 59, Patman Testimony, PASP)

In his response, Roosa briefly sketched some qualifications to Samuelson's argument. His main point was that the effect of monetary policy could be of longer duration than Samuelson assumed, and that there was room for a repeat if lenders weren't sure about where the market for government securities would "hit bottom" if they tried to unload their holdings of these assets to grant a new credit. As he would later do in print (1952a, 256-257), Roosa insisted that it was this type of uncertainty that was fundamental for the argument he was making, much more than the lock-in effect. In the end, however, Roosa stated that he agreed with the core of Samuelson's argument:

In any event, whether this qualification or some of the others that occur to me should actually bear up under the scrutiny of a closely reasoned analysis, I think the main body of your argument will still hold. when we do get the opportunity to talk these things through I feel reasonably sure that we will not find ourselves very far apart in the end. (Letter from Roosa, April 29, 1952, Box 59, Patman Testimony, PASP)

Together with the evidence presented above, this shows that neither Roosa nor Samuelson considered that the latter's testimony had been an outright rejection Roosa and the

NY Fed's point of view. The idea that Samuelson simply rejected Roosa's argument because credit rationing was incompatible with rational behavior (Baltensperger 1978, 171; Kashyap and Stein 1994, 225),²⁸ or that its existence was only a short-run phenomenon (Jaffee 1971, 22-23; Baltensperger and Devinney 1985, 478) is not accurate and also ignores the position that Samuelson had already expressed in his textbook. Instead, Samuelson's testimony should be understood as a piece of constructive criticism that tried to make the analysis more transparent for economists.

The real difference between Samuelson and Roosa was the lens through which each one of them looked at the problem. Samuelson, the economist, could not accept at face value Roosa's argument about the behavior of lenders and its market outcome. As he pointed out to Hansen, it was wrong to focus only on the fact that major lenders could not unload on the government securities market without depressing the price to an unknowable extent. This was an obvious case in the new scenario where the Fed was not publicly bound to keep the rates pegged and due to the fact that the dealers' market was very "thin," however, this left out the behavior of the other thousands of small banks:

Here is where Roosa goes wrong: he says that the banks as a whole cannot sell bonds unless the Fed buys them; he somehow thinks that each of the 15,000 small banks will therefore hold in its sales because it realizes how narrow the eye of the needle is in the 6-dealer bond market. This is all wrong: each small bank can try to sell, and it is *attempts* to sell that depress prices not transfer to securities outside the bank. Even for the big fellows, Roosa is relying on a thin day-to-day reed (sic). (Letter to Hansen, January 29, 1954, Box 59, Patman Testimony, PASP)

²⁸ According to Jaffee many people seem to have held a similar view in the 1960s (1971, 23n18).

This is a key point for the argument of this paper. The NY Fed's view that Roosa presented incorporated the policymakers' first hand experience with the market for government securities in their assessment of the effectiveness of monetary policy. Samuelson's argument, on the other hand, emphasized the need to think about what any bank would do if it was looking to make the most profitable decision. Roosa relied on his experience and was concerned with policy above all, and Samuelson was well aware of this:

Roosa's best defense, and he has made it in a letter to me dealing with related points, would be this: "Central Bankers live from day to day. They needn't wind (sic) permanent victories. In the long-run we're all dead. The important thing is to take advantage of each short-run and benefit from what you, Samuelson, dismiss lightly as a transient." (Letter to Hansen, January 29, 1954, Box 59, Patman Testimony, PASP)

4. Conclusions

The goal of the preceding sections has been to show the differences between the arguments put forth by Roosa and Samuelson. These differences are mainly due to the specific way in which each one of them approached the subjects of monetary policy and bank behavior, and what they were ultimately interested in. As I showed above, Roosa's was, above all, the argument of a policymaker, while Samuelson's was much more concerned with having a consistent and logical explanation that did not go against what one would expect of rational agents. Roosa and the Availability Doctrine's contribution was to put lenders on the map as an important agent whose behavior mattered for monetary policy. Samuelson reframed the argument and put imperfect competition--caused by the uncertainty characteristic of the

commercial loan market--at the center of it. This opened the way for the type of credit rationing literature that developed later.

The connection between the availability of credit and credit rationing was not new by the time of Samuelson's testimony as Wallich (1946) and Ellis (1951) had both pointed it out before. Samuelson's particular viewpoint, however, was, by framing the issue in such a way that you could understand the existence of credit rationing by looking at the behavior of bankers acting in their best interest. He failed to present a more detailed explanation, but the idea that credit rationing was to be explained by looking at the behavior of banks remained and was something that an economist could build on. As Wallich pointed out in his response to Samuelson's summary:

I think you have put your finger on an important weak spot in the "availability" doctrine. This doctrine says in effect that price is not a function of quantity, but merely a symbol. The interest rate goes up as the volume of credit is reduced, but in no specifiable proportion. This proposition is very hard to swallow for economists and needs to be reformulated somehow as to make it fit within our framework. Your point about the change in the imperfection of the market seems to be a very practical way of achieving this fit. I have a feeling, however, that this may not yet be the last word. What would be needed, I think, would be an analysis of how bankers maximize their various advantages by this change in imperfection. (Letter from Wallich, May 8, 1952, Box 59, Patman Testimony, PASP)

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