



Karl Brunner, Scholar: An Appreciation

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Abstract: This paper discusses the contributions of Karl Brunner and the enormous influence of his insights and analysis. It considers his work on economic policy--and monetary policy in particular--as well as his ideas for broadening the utility maximizing hypothesis of textbooks by describing how individuals search and grope as they confront incomplete information and uncertainty. It shows how, early on, he highlighted information, institutions and uncertainty as well as the importance of microanalysis in macroeconomics. Karl Brunner explained that nominal monetary impulses changed real variables by changing the relative price of assets to output prices. And he concluded that economic fluctuations occurred because of an unstable public sector—especially the monetary sector—that disturbs a more stable private sector, a policy lesson forgotten or never learned by many central banks.

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By Allan H. Meltzer

**For the Swiss National Bank Conference in Honor of Karl Brunner's 100th Anniversary
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Karl Brunner was my teacher, dissertation supervisor, later my co-author and lifelong friend. He was also a scholar of unusual depth and breadth. The strongly held positions he developed reflected his analysis and appraisal of ideas.

We spent little time in the same place, so most of our discussions were telephone conversations or short visits at conferences. To the annoyance of my teen-aged children, my Wednesday nights in the 1970s were the time for two or more hours working and discussing with Karl on the phone.

Karl was born 100 years ago, February 16, 1916. His father and mother met in pre-revolutionary Russia where many young Swiss went before World War I to find jobs. He was from the German cantons, she from the French. Karl always spoke Swiss German with his father but French to his mother.

Karl inherited the strong Swiss commitment to stability, based on constitutional provisions like the rule-of-law, a valuable inheritance. That commitment enabled Switzerland, an ethnically mixed society to become one of the wealthiest countries in the world with low average inflation. A single comparison highlights Swiss stability. At the end of World War II, a Swiss franc exchanged for twenty U.S. cents. Recently, the franc dollar exchange rate was \$1.20, a six-fold increase. And per capita Swiss GDP is now slightly larger than U.S. per capita GDP; the more stable, median term policies of the Swiss National Bank proved more successful over the long-term than the short-term orientation of U.S. policy. Swiss character benefits Swiss people.

Karl's father became the director of the Swiss Observatory. That gave Karl an introduction to science, especially applied science that grew and developed over his life. In 1937-38, he spent a year at the London School of Economics where he learned some of the

recent developments in Anglo Saxon economics. After completing military service he completed his doctorate in 1943 at the University of Zurich.

David Laidler¹ wrote that “Karl was a constructive and active editor. The standings that these enterprises (journals, conferences) achieved did not arise by chance, but out of the creative efforts of an economist with a remarkable eye for which ideas were important, and how they fitted together.” (634) Later, Laidler added: “Karl Brunner’s work contained far more than its share of good ideas.” (idem.) Besides being smart, Karl was wise.

Writing a dissertation that was not overly successful kept Karl from competing for a position at Swiss universities. After World War II, he worked at the Economic Commission for Europe. When Professor Leo Hurwicz visited the Commission, he recognized Karl Brunner’s ability and helped him gain a Rockefeller Foundation Fellowship. In 1943 Karl and his wife, the former Rosemarie Enderle moved to Harvard University.²

One of Karl’s dominant traits was his interest in scholarship, particularly in economics but not limited to economics. He was a scholar of very high ability and energy. Karl did not find Harvard’s Economic Department very stimulating. He asked the Foundation to permit him to move to the Cowles Commission, then at the University of Chicago. In 1951, he accepted appointment as an assistant professor at the Economics Department of the University of California, Los Angeles, UCLA.

At UCLA, Karl pursued his two main scholarly interests, economics, especially monetary or macroeconomic economics and the philosophy of science. Rudolph Carnap, a distinguished professor of philosophy joined the UCLA philosophy department in 1954. Karl attended his lectures. Karl’s interest was in methodology and the philosophy of science. This interest resulted in several papers. One in the journal *Synthese* has the title “Assumptions and the Cognitive Quality of Theories” (1969).³

Later, he served as a Visiting Professor at Northwestern University and Everett Reese Professor at Ohio State University. In 1971 he moved to the Simon School of Business at the University of Rochester where he served as Director of the Bradley Policy Research Center. In

¹ Laidler, David (1991). Karl Brunner’s *Monetary Economics – An Appreciation*. *Journal of Money, Credit and Banking*, 23, November, 633-58.

² Rosemarie Brunner died in 1986. She was an exciting and interesting companion and a great friend of ours.

³ It is reprinted in *Economic Analysis and Political Ideology, The Selected Essays of Karl Brunner*, ed. Thomas Lys. Edward Elgar (1996). Two other examples are “Assumptions and Cognitive Quality of Theories” in *Synthese* (1969) 20, 501-25 and “The Triple Revolution: A New Metaphysics,” in the *New Individual Review*, 4, spring 1966.

1979, he became the Fred Gowen Professor of Economics at the Simon School. He remained in that position while serving also at the University of Konstanz in Germany and then the University of Bern in Switzerland until 1981.

Karl Brunner died on May 9, 1989 at age 73. He was at home in Rochester. When my wife and I visited him a few days before his death I asked him if he had any message for his many friends in Europe. He said: “tell them my body failed me.” His mind was clear and active to the end.

Karl’s main work and his main contributions to economics were part of our joint work. The bulk of this paper discusses that work and our relationship, working and personal over nearly forty years. Karl had very broad interests read widely, and often discussed sociological topics and philosophical research. The annual Interlaken Seminars brought together people from economics and other areas, including some Marxists. Among frequently cited papers that began at Interlaken are the papers by William Mechling and Michael Jensen on agency costs and by Allan Meltzer and Scott Richard on political economy and the size of government.

In a 1980 paper, Karl explained his scholarly interests by listing three major concerns. First was monetary analysis and policy. The second is the “nature of our cognitive endeavors” (1980, 404). Third was a gradual understanding that developed over time that “economic analysis offers a systematic approach to the whole range of sociopolitical reality.”⁴ In later work, he formulated his third interest as REMM-resourceful, evaluating, maximizing, man. REMM replaced the narrower utility maximizing individual of the textbooks and extended the application to all social and political activities. Karl frequently described individuals as “searching” and “groping” as they applied thought in the presence of incomplete information and uncertainty. As this essay shows, uncertainty had a prominent place in his thinking.

The Beginning⁵

Since much of this paper discusses ideas we developed together in more than 25 joint papers, plus the many introductory essays in the Carnegie Rochester Conference volumes, and several books, I begin by briefly describing how our relation developed.

⁴ Brunner, Karl (1986). *A Fascination with Economics*. Banca Nazionale del Lavoro, 135, December, 403-26.

⁵ An excellent summary and analyses of Karl’s work and contribution to monetary economics was written by David Laidler (1971) in the *Journal of Money, Credit and Banking*.

Since we lived in Los Angeles and my wife worked there, I enrolled in the Ph.D. program at UCLA in February 1953. I had worked in industry for a few years after completing my undergraduate degree in 1948. I married in 1950, so my wife Marilyn accepted the main responsibilities for our support when I returned to school.

My first meeting with Karl was in the spring semester 1953. He taught a course on logic and scientific method. The classroom was packed, but I learned later all of the economic students were there as auditors. I had signed up for credit along with a mathematics and philosophy student. I survived the experience. That was my introduction.

A second soon followed, Karl volunteered to take us through Samuelson's Foundation's in the evening. The next year I took his graduate course in macroeconomics. At the time Karl was a Keynesian. Much of the class explored and analyzed Franco Modigliani's famous paper on Keynesian economics.⁶ Gradually, together, we later became convinced that Keynesian theory, as in IS-LM models, failed to capture the developments in money, credit and asset markets that were a major feature of monetary transmission.

The following year, I took a reading class with Karl at which I was the only student. It was a great learning experience, and I report it to illustrate how Karl brought together his interests in economics and the methods by which we establish propositions. The course had one book, volume 10 of the Cowles Commission papers. Each week I had to discuss one or two papers from the volume by pointing out the main propositions and discussing the evidence that supported or rejected the proposition. A great learning experience!

The reading course proved to be more than an introduction to modern literature. Although Karl and I never discussed how to proceed, we both admired Karl Popper's discussion of scientific methods. Two elements of our common vision were, first, Popper's emphasis on testing propositions and refutation. Second was the importance of uncertainty in the sense of Knight and Keynes. Unlike many, probably most of our profession, we never considered our models as capable of treating uncertainty. This becomes most evident below when I discuss targets and indicators.

The reading course made me aware of Karl's methodological principles. Almost all of his subsequent work applied his methodological principles to monetary (and other) analyses. Central tenets included the principle that one accepted facts even if no theoretical foundation

⁶ "Liquidity Preference and the Theory of Interest and Money," *Econometrica*, (1944).

existed. And one never confused a model with “truth.” Economic and sociopolitical life were uncertain.

I passed my exams after 2 ½ years and was ready to write a thesis. I applied for and received both a Fulbright and a Social Science Research fellowship to fulfill a long-time ambition to go to France. My topic was the French money supply during German occupation and early postwar inflation. In 1958, I received my degree from UCLA. At the time I moved from instructor to assistant professor at Carnegie Tech, later Carnegie Mellon University.

My empirical study of the demand for money is based on the United States data. Unlike most other early studies that use a short-term rate of interest, I used a long-term interest rate to better capture expected inflation and deflation. I continue to believe that is the right formulation. Because our work went along similar lines, Karl visited Pittsburgh in 1960 to propose that we undertake a joint project to combine the demand and supply for money as part of a macro model. Our plan was to write a textbook incorporating monetary analyses and credit markets into macroeconomics. We never attempted the textbook.

To write this essay, I had to think back over the years principally from 1960 to 1990 or 1995, when we worked closely together. An obvious concern was to distinguish Karl’s ideas and work from mine. What did each contribute to the joint work? I can give only a very limited answer. I report on topics that interested Karl far more than me as well as topics like methodology that he had mastered. But though we wrote both individual and joint papers, we had so many, frequent discussions that the separation into single and joint authorship does not separate the source of the ideas or the analysis. We never, and I insist never, were concerned with assigning credit. Our long collaboration benefitted from an absence of jealousy. In the essay I do not consider who first came up with an idea or who developed it most effectively. Our product was a joint product.

We started with a shared vision of how to proceed. Uncertainty was at the forefront and gradually became central. Working out the *Uses of Money* paper over several years brought a specific type of uncertainty into monetary analysis by making uncertainty the reason for using money as a medium of exchange. We concluded that without uncertainty about the qualities and relative prices of goods and services, there would not be a medium of exchange. Later, with Alex Cukierman, we used uncertainty about the persistence of shocks as the force for developments in a macro model.

In 1963-64, we had our first experience with the making of monetary policy. Earlier, I had been invited to do a study for the Joint Economic Committee of the dealer market for government securities. In 1963, Congressman Patman invited me to do a follow up study. I explained that I did not think the main problems with implementing monetary policy came from the dealer market. The problems, I said, came from the lack of a useable theory or analysis by the Federal Reserve. Congressman Patman liked that, so he appointed me and soon after Karl as temporary staff of the House Banking Committee. That gave us the opportunity to interview the principal policymaking officials. It was the start of a shared lifetime interest in improving central bank performance.

We interviewed Chairman Martin and Vice Chairman Balderston of the Board of Governors and President Hayes of the New York Federal Reserve Bank, the Vice Chairman of the (FOMC) Federal Open Market Committee. We learned that the System's analysis was very loose and lacked coherence or supporting evidence. I was frankly surprised at how small was the role of economic analysis.

Chairman Martin used pictorial imagery to explain how Federal Reserve actions affected economic activity. He explained that monetary policy was like a river. It had to be kept near the banks but also had to avoid spilling over the banks. He never mentioned money, bank credit, or employment and prices.

Vice Chairman Balderston was no more analytic than Martin. His image was again a river, but for him the object was to get the river out of its banks enough to irrigate the fields. We could see the efforts both made to recognize the problem of too much and too little, but by pressing them to connect their imagery to their actions, we concluded that they did not make the connection.

The New York Federal Reserve Bank conducts the policy actions agreed upon by the FOMC. We met with President Hayes and Vice President Rouse, the operating official directly responsible for decisions to purchase or sell in the open market. When asked to explain how they decided to purchase or sell, President Hayes said they sought to control credit. We asked if they meant some measure of the total amount of credit outstanding or the flow of current or near term additions or reductions to the stock. The response was that our question was theoretical and required an economist. They called in Peter Sternlight.

These interviews and other information that we gathered in our investigation convinced us that the FOMC did not have even a rudimentary model or analysis of the money supply process to which their actions were a major input. Our report to Congress and the broader public giving our conclusions and the supporting evidence became the subject of a Congressional hearing.

We wrote three booklets for the House Banking Committee to report our findings. The first, *Some General Features of the Federal Reserve's Approach to Policymaking* (February, 1964) developed what we had learned from reading the publication, the policy decisions, the statements of research staff and officials including the interviews with the Chairman of the Board of Governors and other officials. To supplement these sources, we sent a questionnaire to the presidents of the 12 reserve banks and to each member of the Board of Governors.

We described our interest as concern for four basic questions, listed as (1) What are the Federal Reserve's beliefs about the way its policy actions affect the monetary system? (2) What are their main ideas of what later was called the transmission mechanism? (3) How are these ideas translated into decisions and actions? (4) Are the guiding beliefs based on a "body of" tested propositions about the nature of the monetary process?

Federal Reserve discussions often use terms like "tone, feel, credit and liquidity." We tried to explain what these terms meant and how they were used. We concluded that the Federal Reserve failed to have a coherent analysis that could be replicated.

We offered two explanations for this failure. First, the System (1) "places overriding importance and focusses principal attention on week-to-week, day-to-day and even hour-to-hour changes in the money and securities markets. (2) The viewpoint of the System is frequently that of an individual banker rather than that of a regulating authority for the monetary system and for the economy as a whole." We then gave some examples of how the two principles were used. One of the applications we noted was "the concern with essentially random and often self-reversing changes in reserve positions."

Fifty years later, that problem is still very apparent. During 2009-12, the Federal Reserve used the monthly change in employment as its main indicator of the economy. Publication of the number early each month often resulted in strong market responses. The following month the past announcement was often reversed. A large increase frequently changed to a reduction or conversely, a reduction became an increase. That is an example of how the Federal Reserve

increases variability by focusing its actions on short-term mainly random events. Although it has added a first rate staff of economists, so its analyses are much more sophisticated than in the past, the over-emphasis on near term events remains. And it continues to ignore longer-term growth of money and credit aggregates.

One of the less desirable results of the development of research staffs is the heightened attention to quarterly forecasting models. Economics is not the science that produces good quarterly forecasts. There is no such science, in part for reasons Karl and I did not develop sufficiently in 1964. Much of monthly and quarterly data is dominated by random changes. The Fed's forecasts are no better and not very different from private forecasts. Its recent forecasts have frequently been wrong.

From our early work we recognized the uncertainty that accompanies monetary policy actions. One of our first efforts to analyze how monetary policy could reduce uncertainty was our work on the role of monetary indicators. In "The Meaning of Monetary Indicators" (George Horwich, ed., *Monetary Process and Policy*, R.D. Irwin 1968) we compared the information conveyed about the future value of economic activity – real GDP – by several different variables. The variables included the widely used free reserves, short-term interest rates and monetary aggregates. Each of the possible indicators was affected by monetary policy but also by fiscal actions and other events, so none of the measures indicated only the thrust of monetary actions. None of the measures was exact or ideal, but the paper showed that the Federal Reserve's use of free reserves at times signaled increased restraint just when monetary aggregates accelerated. A main inference was that changes in free reserves and short-term interest misled the Federal Reserve. The highly inflationary policy in the 1970s later showed again how the use of changes in free reserves and the federal funds rate misled the Federal Reserve.

Karl followed our joint paper with a conference volume on *Targets and Indicators of Monetary Policy*, (1969). The chapters included papers by a cross section of economists. Karl included in the volume a paper by James Tobin who was not at the conference.

Our paper for the volume "The Nature of the Policy Problem," related the role of an indicator of the thrust of monetary policy and the uncertainty that surrounds projections and forecasts especially in the short to medium-term relevant for policy action.

Several of the participants at the conference did not agree with the presence of uncertainty. Their papers and comments claimed that once they had a good econometric model,

the model's projections would give the required information. The conference discussion brought out a major difference. Some, I believe large number of economists, reject uncertainty. They insist that when they have the "correct" econometric model, they will be able to control the economic system. Karl and others who accepted that future events were at times uncertain, and therefore unpredictable, regarded any model as a tool that could be wrong. This fundamental difference was not resolved at the conference. Those who rejected uncertainty saw no reason for an indicator.

Many years later, Professor Otmar Issing seemed to side with those of us who favored indicators. As chief economist of the European Central Bank, he relied on econometric models but supplemented the model with a measure of money. In effect, he asked the money data to alert him to times when the model made a large error.

James Tobin's paper, "Monetary Semantics," agreed that econometric models would not eliminate uncertainty. He agreed in principle that an indicator would be useful. Like Karl, he said that all variables used to indicate the current thrust of monetary policy – free reserves, total reserves, money and interest rates – were affected by non-monetary changes. He was very critical of proposals to use money or money growth as providing useful information about the thrust of monetary policy. "I can see that along one of the nice steady balanced growth paths ... everything including presumably the demand for money increases at the pervasive natural rate of growth. ... But when we are off such a path, there is no presumption that the money supply should grow at any particular rate." (171)

William Dewald wrote a summary of the conference papers and discussions. His summary concluded: "Most participants agreed that it was useful to spell out the logical elements of the indicator problem, but several did not think it was worthwhile to test money supply against interest rates ... They thought continued research was needed to find behavior relationships on which one could base predictions of policy effects. Brunner and Meltzer, among others, stood fast to the position that this was idealistic and impractical because one must evaluate policies in an uncertain world." (316)

Looking back after nearly fifty years, it seems clear that little progress has been made on this issue. During the recovery from the major recession, the Federal Reserve relied on growth of employment to indicate the thrust of its actions. The number was very variable and subject to considerable revisions. An announcement of (say) 220,000 new jobs could be reduced in half

when a revised estimate became available subsequently. Markets responded to this noisy indicator because they expected the Federal Reserve to rely on it. After several years of reliance on the indicator, the Federal Reserve abandoned it presumably because it was faulty.

Several years later, Karl, Alex Cukierman and I proposed a different source of policymaker's errors, failure to distinguish between permanent (or persistent), and temporary (or transitory) changes. Our first paper, "Stagflation, Persistent Unemployment and Permanence of Economic Shocks," *Journal of Monetary Economics*, October 1980, showed that uncertainty about the persistence of shocks was sufficient to generate responses with the features of a Phillips Curve. Later, we imbedded the distinction in a broader model.

We recognized in 1964 that improved policy required more attention to medium-term effects. From 1986 to 2002, the Federal Reserve produced evidence to support that claim. Chairman Greenspan more or less followed a Taylor rule. Instead of shifting his concern from inflation to unemployment and the recovery he aimed at medium-term values of both. This achieved less variability – called the Great Moderation. It also achieved the longest period of low inflation and low unemployment, with small recessions and rapid recoveries experienced in the first 100 years of Federal Reserve history. Unfortunately, the Federal Reserve stopped following the Taylor rule about 2003 and has returned to its traditional concern for short-term changes.

Following our 1964 criticisms, Congress did little, but the Federal Reserve's Board of Governors and many of the Reserve Banks expanded their research staffs and began serious efforts to analyze and forecast responses of money and credit markets. Much of this effort concentrated on the effects on the Federal funds rate.

Our Next Steps

We began joint papers in 1963 with two papers presented at the annual meetings of the Allied Social Sciences. We extended our work on the demand for money by comparing predictions of monetary velocity using most of the known demand functions for money available at the time. The other paper combined demand and supply functions for money. The paper, "Some Further Investigations of Demand and Supply Functions for Money," published in the *Journal of Finance*, May 1964 was a first effort ever to jointly estimate demand and supply functions for money. The paper continued the beginning analysis of credit markets and what

became known as the transmission of monetary policy and it introduced the idea about the use of money later developed in “The Uses of Money.” Our 1964 paper followed the development Karl started in his review of the work of the Commission on Money and Credit (JPE, December 1961). Although critics continued to claim that we failed to discuss the ways in which monetary policy reached output and inflation, Karl initiated the discussion in his review of the Commission’s work.⁷

Over the years, we developed the analysis further. In 1966, we published “A Credit Market Theory of the Money Supply and the Explanation of Two Puzzles in U.S. Monetary Policy” in an Italian publication *Essays in Honor of Marco Fanno*. We extended the “Credit Market Theory ...” in a JPE paper “Liquidity Traps for Money, Bank Credit, and Interest Rates,” JPE, Jan. – Feb. 1968.

Our “Liquidity Trap ...” paper used our developing model of money and credit markets to show that a liquidity trap could not occur in an economy with multiple asset markets. I was surprised, as I am sure Karl would have been, by the large volume of research on the so called lower bound. As the QE programs at the Federal Reserve and other central banks showed, a zero short-term interest rate did not prevent monetary expansion. The Federal Reserve purchased medium- and long-term debt. Asset prices rose and the exchange rate depreciated, as our conclusion about liquidity traps implied. The so-called zero lower bound turned out to bind very little other than very short-term rates.

One point we wanted to make called attention to the role of credit markets in the transmission from a central bank decision to increase or reduce bank reserves to the effect of reserve changes on real variables. A central issue in monetary analysis is to explain how a change in money, a nominal change, creates changes in real variables. In our Liquidity Trap paper we showed that a monetary variable affects real variables by changing asset prices. The rise in asset prices increases real investment by making new production of capital relatively cheap compared to existing asset prices. In subsequent publications such as “Money, Debt, and Economic Activity,” (JPE, Sept.-Oct., 1972) and “An Aggregative Theory for a Closed Economy,” in *Monetarism*, J. Stein (ed.) North Holland, 1976. We developed this theme as part of our work on monetarism. At about the same time, Professor James Tobin developed a similar

⁷ A few years later Milton Friedman and David Meiselman offered an extensive discussion of the transmission of monetary policy.

analysis in “A General Equilibrium Approach to Monetary Policy”, in the first issue (Feb. 1969) of the *Journal of Money, Credit and Banking*, that Karl Brunner started in his years at Ohio State University. Tobin’s transmission mechanism, like ours, emphasized the relative price of assets and output, called “ q ” in his paper.

Federal Reserve discussion of monetary transmission concentrates on the labor market. They limit their discussion of how nominal policy changes affect real variables to a Phillips Curve. We accept that an increased (or reduced) demand for labor follows the increase (reduction) in reserves and accompanying change in interest rates. We believed then, and I continue to believe, that the Federal Reserve ignores the transmission to relative prices of equity shares and houses that is a visible feature of monetary policy transmissions. The main reason for this neglect is that the Federal Reserve ignores changes in money and credit.

I do not plan to dwell on the many joint papers that we wrote. Instead, I will discuss one more of our major contributions and some of Karl’s other interests. Karl and I never discussed what was joint work and what was not. During our long association, each of us wrote papers as individuals or with other co-authors.

The Uses of Money

In the late 1960s, influenced by our joint work on money and credit markets and a major difference with James Tobin’s work along somewhat similar line, we began a long discussion about the properties of money. In Tobin’s work, money is used only as a convenient way to transact. Our interest in uncertainty and transaction costs suggested that we develop the role of money more fully.

The result after much back and forth discussion sometimes involving Armen Alchian, was “The Uses of Money: Money in the Theory of an Exchange Economy,” (*American Economic Review*, Dec. 1971). We analyzed a consumer’s allocation of resources to shopping. The consumer acquires information about prices and qualities of goods at different outlets. The shopper is uncertain about market opportunities. Money for the group is the asset used to transact. It reduces the amount of information about opportunities needed for exchange and the number of transactions required to achieve a desired commodity bundle.

What is true for the individual is in this case true for the group. Money is the asset used as a medium of exchange. Savings are realized if the same asset is used as a unit of account.

Our paper showed that the use of money involved an uncertain world. In a world of certainty, exchange ratios and prices are known to everyone, so the services of money and indirect exchange vanish. This paper tied our interests in the role of money to our belief that economic and sociopolitical life occurs in uncertain environment. Without uncertainty the main reason for using money disappears.

Econometrics

At the University of Bern where Karl served as a professor every spring term in much of the 1980s, his main responsibility was teaching econometrics. Earlier, in 1971 and 1972, he organized conferences on econometric models. The conferences combined his long standing interest in scientific method with his strong interest in learning about the world and economic policy.

A volume, *Problems and Issues in Current Econometric Practice*, 1972, had papers by Robert Basmann, Lawrence Klein, Dale Jorgenson, and Jan Kmenta, among others. The volume considers the cognitive aspect of large econometric models, such as the Federal Reserve-MIT model or the Brookings model developed at about this time.

Karl wrote a short introduction to the volume. He pointed out that “the formulas usually introduced at the beginning of an econometric enterprise are frequently without content. ... The first chapter contributed by Robert Basmann ... contends that econometric practice has evolved into numerology analogous in some respects to astrology.” (iv) An example is the use of an attitudinal index. This magnitude is arbitrary. It can be replaced by any order preserving transformation, but the standard errors change and other measures also. Thus, Basmann said the results reported are not meaningful.

Lawrence Klein and Gary Fromm responded to Basmann’s criticisms. They dismissed the charges without responding directly. They said: “If we pursued Basmann’s thesis to its ultimate conclusion, inductive science must perish. Nothing can be quantified absolutely.” (61)

The conference also discussed frequent re-estimation of the models. Some defend this procedure. Others argued that it may reflect the underlying variability of the economic structure. In this case, we record history but do not estimate economic structure. Although Karl did not continue his methodological critique of econometric models as failing to meet scientific standards, his critique remains unanswered.

Brunner on Monetary Theory

Karl Brunner wrote about monetary theory and policy many times. To summarize his views I chose a paper he published in 1971 in the *Schweizerische Zeitschrift*. The paper is a complete statement of his ideas at the time, and it shows his command of monetary analysis +. It is the longest journal article I have ever seen, 130 printed pages followed by 6 appendixes covering an additional 16 pages. The paper covers micro-analysis of money, the transmission mechanism, and other topics. I will summarize some of the main points but I can only skim the topics. A reader can gain much from reading the full text. Although I am very familiar with Karl's ideas, when re-reading the paper, I was impressed by the range of his interests and the depth and breadth of his knowledge. The reader must remember that Karl wrote these papers in 1971 well in advance of developments that made some of these ideas familiar to current readers.

The paper has eight sections: The Nature of Our Problem, the Micro Analysis of Money, The Transmission Mechanism, Issues Associated with Alternative Views on the Transmission Mechanism, Impulse Forces and Dynamics of Economic Fluctuations, An Elaboration of the Monetarist Hypothesis, The Supply and Control of Money, and the Analysis of Monetary Policy. I will give some main propositions from the texts. My short summaries cannot do justice to his insightful analyses.

The Nature of Our Problem

The introduction cites the uneven path followed by development of scientific analysis. Developments in monetary analysis have expanded after neglect during the period of Keynesian development. He emphasizes the important change of relating monetary policy to monetary theory. In place of "impressionistic responses" (3) guiding policy, economists have developed an analysis of monetary policy that is related to monetary theory. Previously discussion of "institutional arrangements of the banking system or credit markets" (3) was unrelated to policy analysis.

This section concludes by claiming that all policy problems can be treated as an information problem, an interpretation problem, and a determination problem "confronting the monetary authorities of each country." (5)

Micro Analysis of Money

Karl saw the value of money as a medium of exchange as central to his thinking. Before our 1971 paper the analysis of a medium of exchange was not developed and could not be in models that neglected uncertainty. Uncertainty about the price level presupposes money, and uncertainty about interest rates implies portfolio adjustment of assets. To explain the role of money as a medium of exchange requires uncertainty about the quality of goods in a world of incomplete information. We must abandon models of full information to explain the use of money as a medium of exchange. Insistence on uncertainty and incomplete information contrasts with full rational expectations. Despite this major difference the Carnegie Rochester Conferences offered scholars the opportunity to present major papers, e.g. by Lucas and Prescott, that developed the rational expectations model. Uncertainty gives rise to the productivity of holding and using money. Once money is held, it may acquire an amenity yield, but that yield only occurs if money is held as a medium of exchange.

By using money, “individuals reduce the amount of information they must acquire, process, or store and the number of transactions in which they engage in order to exchange their initial endowments for optimal baskets of goods. The use of money increases the welfare of each money user by reducing the uncertainty he or she faces, the length of transaction chains, the variance of price ratios and by increasing expected wealth and time available for leisure.” (13)

Karl then discussed alternative explanations including the work of Baumol and Tobin, what was then called the “new view” and analysis of money by Milton Friedman, Friedman and Schwartz and Harry Johnson. He then applied the micro analysis to the optimum quantity of money.

On long-run monetary neutrality, Karl carefully separated price level effects resulting from large relative price changes from the neutrality proposition. He showed that his analysis explained the difference in speed of response of real output and price level to monetary changes. This analysis became highly relevant a few years later, when oil prices rose. The Federal Reserve and other central banks treated the relative oil price change as inflation. Economies were forced to respond to this error in 1973-74 and again in 1980. By 2000, the Federal Reserve recognized the difference but did not acknowledge the previous errors. Karl concluded that the social cost of an anticipated rate of price change is negligible, “but the transition to this state involves ... substantial costs.” (25)

The Transmission Mechanism

Karl separated discussion of the way monetary change affects real variables into three sub-sections. The issue is how a nominal change produces effects on real variables like output, production and employment.

The Keynesian Transmission System

Karl briefly mentioned income-expenditure models, mainly econometric models before turning to the IS-LM model. The core of this analysis depends on the slopes of the IS and LM curves. A main point of Karl's criticism of IS-LM is that, as in Paul Samuelson's formulation, the government stabilizes an unruly private sector. This was the opposite of the truth as Karl saw it. He regarded the private sector as stable except for destabilizing shocks emanating from the government. Wealth effects other than the real balance effect are neglected in IS-LM. Open economy responses are ignored also. Interest rates are mainly borrowing costs. Karl regarded the IS-LM model as deficient. It lacked a role for credit and relative price adjustment that he regarded as a central feature of macro analysis.

Introducing Bank Credit to the Keynesian Model

Although no common Keynesian model with bank credit is available, there are many suggestions that a credit market should be included. One of Karl's appendixes developed a Keynesian model with a credit market. The model highlights "availability of credit." A large flow of credit increases aggregate demand.

A main implication is that interest rates are determined in the credit market. The marginal response to additional credit depends on whether the addition occurs as loans or bond purchases. The response to new loans is larger. Since interest rates are determined on the credit market, IS-LM determines the real rate on real capital, as in James Tobin's work.

In the credit model, monetary impulses affect both IS and LM. Increased flow of credit increases aggregate demand and by changing the money stock changes LM. Thus, the transmission of monetary policy no longer depends solely on the slopes of the two curves (neglecting a real balance effect.)

A current reader should compare these ideas with the later appeal of the Woodford models to many economists at the Federal Reserve and other central banks. Woodford's models at first denied that credit and money had any importance. After the credit market debacle in 2008, Woodford acknowledged a small effect. For Tobin, Brunner and Meltzer, the opposite is true.

In a final section on transmission, Karl discussed what he called "the new price theory." A main point is rejection of the idea that interest rates are only borrowing costs. Karl credits Keynes with recognizing this failure of the Walrasian model to explain that nominal shocks have real effects. But Keynes did not offer an explanation of how that occurs, and mainstream Keynesians did not pursue the issue beyond reliance on the Phillips Curve.⁸

For Karl, monetary or other shocks affect relative price by first changing asset prices—equities and houses are examples. This changes the price of existing capital relative to the price of newly produced assets. A real or monetary shock that reduces asset prices raises the relative price of new capital and reduces investment. Monetary expansion works the opposite way, raising real investment. This analysis is similar to James Tobin's.

Karl agrees that the economic theory that Keynes criticized could not explain the existence of unemployment. He added that the problem was not limited to the labor market. Inherited price theory could not explain unemployment of any asset. (31, italics in the original.) Keynes attempted to reformulate price theory and macro theory, but Keynesians discarded the price-theoretic ideas. That gave us macro theory divorced from price theory. The rest of the section, pages 32-35 and Appendix 4, develop a price-theoretical model. This work was later published in several places including our joint paper "Money, Debt and Economic Activity," *Journal of Political Economy*, Sept./Oct. 1972.

Issues Associated with Alternative Views on the Transmission Mechanism and Impulse Forces and Dynamics of Economic Fluctuations

In these two lengthy sections, Karl analyzes some major issues of the time and some long standing issues in macroeconomics. The role of wealth effects is an example of an issue that is no longer current. The analysis of fiscal policy involving careful discussion of the effects of

⁸ In most of the years in Phillips original study Britain was on the gold standard, so long-term expected inflation was controlled.

wealth and substitution remains relevant as does his treatment of interest rates in the transmission process. These sections display the high quality and clarity of his macro analysis and its relation to price theoretic concerns as in the above discussion of the role of relative prices.

An example is his analysis of an increase in government spending. He considers three kinds of spending: spending on existing real assets, current output, and labor. The relative and wealth effects of each is a major departure from standard practice of treating fiscal policy as a shift in the position the IS curve. The result is richer and more relevant. Karl's analysis includes the effects of deficits on current and future activity.

A main feature of the relative price approach to macro analysis was expanded and developed in our subsequent work. Karl's effort to analyze fiscal and interest rate changes based on relative prices merges micro and macro aspects at a very early point in their important development.

Elaboration of the Monetarist Hypothesis

In this section, Karl develops the monetarist analysis of economic activity and the price level. He explains that two conditions characterize monetarist analyses. First, unlike fiscalist theories, monetarism regards the real sector as dynamically stable. And it considers monetary mechanisms as the dominant impulse generating fluctuations. Fiscal actions are considered secondary with principal effect on the allocation of resources between private and public sectors.

The lengthy section treats several issues. One is a thorough discussion of Milton Friedman's work on monetarism. A principal criticism is Friedman's neglect of relative prices in his discussion of monetary transmission. Karl takes the opportunity to develop some of the dynamics that are part of our revision of monetarism. An appendix analyzes the effect of acceleration and deceleration of money growth on the observed growth of output. The text summarizes the analysis of the complex dynamics. Monetarist analysis was the name given to this approach. A separate section discusses it in more detail.

The Supply and Control of Money

The section begins by remarking on the difference between development of money supply theory in the 1920s and its almost total neglect from the 1930s to the 1950s. In the 1920s and early 1930s, the Federal Reserve developed the Riefler-Burgess analysis of member bank

borrowing as a principal determinant of bank credit. This influenced the Federal Reserve to conclude, wrongly, that a low level of borrowing in the 1930s implied that monetary policy was expansive.

A more thorough analysis by Lauchlin Currie followed. Currie's "remarkable work" (90) carefully analyzed the role of institutional arrangements and distinguished between money and credit in a way well beyond later developments at the Federal Reserve up to the present. In contrast to Federal Reserve statements about policy, Currie showed that the Federal Reserve did very little to ease policy and expand activity in the depression.

The rest of this section discusses four different hypotheses or approaches to the analysis of money supply. The Federal Reserve approach differs from Brunner-Meltzer and Tobin, but all "assign an important causal role to the [monetary] base whether or not the base is exogenous or endogenous." (93) Karl presents empirical analysis that distinguishes the different theories. And he shows that so-called reverse causation from output to money supply, though present, is a small fraction of the direct effect of money on output.

The Analysis of Monetary Policy

The last 20 pages of text discuss monetary policy. There are three main topics: the information problem, the interpretation problem, and the determination problem. Recall that this was written in 1970 and published in 1971, long before information became a major topic for economists.

Discussion of the length of the lag between economic changes and official recognition leads Karl to revisit the choice of indicator, discussed in a previous section of this review. The Federal Reserve's use of free reserves to indicate the current thrust of its actions misleads them, as we found in our 1964 work for the Congressional Joint Economic Committee.

The "Determination Problem" (121)

In this sub-section, Karl considers the optimal strategy guiding policymakers under prevailing institutional arrangements followed by a discussion of the institutional arrangements. The optimal policy involves choice of a target. Karl's analysis again emphasizes the uncertainty that surrounds our knowledge of response mechanisms, the length of lags affecting responses,

and the extent to which random and reversible changes affect money, credit and other variables of interest.

The discussion of uncertainty, here and elsewhere in the essays and in his thinking and writing goes well beyond analytic work at the Federal Reserve, at other central banks and outside. Keynes highlighted the role of uncertainty. Contemporary economists ignore it.

The last part of the essay discusses the institutional structure. This brings Karl to treat the choice of fixed or floating exchange rates, a topic neglected in earlier sections.

A novel issue raised in this section concerns the fact that “demanding tasks are increasingly assigned to the monetary authorities without much thought as to whether or not these tasks can be effectively accomplished under the existing arrangements. More importantly, arrangements are complicated, and extended without much thought concerning the consequences for rational policy making.” (129)

Monetarism

As David Laidler noted, Karl disliked the name “monetarism”, despite having coined the term. He thought of his work as monetary theory that combined micro and macro analysis in an uncertain world. Laidler (641) quotes from Harry Johnson’s “extremely influential (1962)” message where Johnson copied Karl’s statement in his 1961 (p. 612) critique of the report of the Commission on Money and Credit. I reproduce them because they show how early Karl has formed the ideas that were central to his analysis as well as to monetary theory. Regrettably, they have not become the mainstream macro analysis.

“Variations in policy variables induce a reallocation of assets (or liabilities) in the balance sheets of economic units which spills over to current output and thus affect the price level. Injections of base money ... modify the composition of financial assets and total wealth available to banks and other economic units. Absorption of the new base money requires suitable alterations in asset yields or asset prices. The banks and the public are thus induced to reshuffle their balance sheets to adjust desired and actual balance-sheet positions.

“The interaction between banks and public, which forms the essential core of money-supply theory, generates the peculiar leverage or multiplier effect of injections of base money on bank assets and deposits and, correspondingly, on specific asset and

liability items of the public's balance sheet. The readjustment process induces a change in the relative yield (or price) structure of assets crucial for the transmission of monetary policy-action to the rate of economic activity. The relative price of base money and its close substitutes falls, and the relative price of other assets rises.

“The stock of real capital dominates these other assets. The increase in the price of capital relative to the price of financial assets simultaneously raises real capital's market value relative to the capital stock's replacement costs and increases the desired stock relative to the actual stock. The relative increase in the desired stock of capital induces an adjustment in the actual stock through new production. In this manner current output and prices of durable goods are affected by the readjustments in the balance sheets and related price movements set in motion by the injection of base money. The wealth, income, and relative price effects involved in the whole transmission process also tend to raise demand for non-durable goods.” (1961, p. 612)

Even at that early date, Karl's discussion of the transmission process relies on relative prices to connect monetary variables to real variables. His well-developed account is far superior, and empirically more relevant, than the reliance on a Phillips Curve by many central banks. Further, unlike the IS-LM model, which limited analysis to the margin between money and bonds, his analysis broadens the policy effect to reach real capital and new investment. Like Keynes, increased investment, not consumption, spending was the route to recovery.

As Laidler reminds us (642) Karl's approach had much in common with James Tobin's work. It differed “in the way it cut through the forest of Jacobians ... by incorporating specific hypotheses about crucial aspects of those interactions and by using a general equilibrium model ruthlessly simplified.” Also critical was Karl's determination of a price level where Tobin held the price level fixed throughout.

Karl returned to discussion of monetarism in another exceptionally long paper, “Has Monetarism Failed?” for the 1983 *Cato Journal*. Before turning to that essay, I offer Karl's description in a 1978 interview with the St. Louis Federal Reserve Bank in (8) which he discusses monetarism.

“Public opinion occasionally interprets monetarism as a view attributing to money and monetary policy an all-embracing power. This involves a serious misconception. Monetarist analysis essentially emphasizes two aspects of the range of policy problems:

the relation between monetary growth and the basic rate of inflation and the relation between monetary acceleration (or under-anticipated monetary growth) and temporary changes in output or employment. ... Monetary analysis implies moreover that monetary manipulation cannot raise the trend of real growth.”

Karl went on to discuss three problems that illustrated differences between monetarist and Keynesian analysis at the time. (9)

“These problems are:

- (i) the possibility and usefulness of an activist approach to policy based on optimal control techniques;
- (ii) the relative stability of the private and government sector;
- (iii) the relevant perspective bearing on the behavior of the government sector.”

“A neo-Keynesian position asserts the potential of optimal control techniques and an activist approach to policymaking. The Keynesian tradition also asserts the need for a stabilizing government sector to contain or offset the inherent instability of the private sector. Lastly, this tradition reflects a concept of government expressed by the ‘public interest’ or ‘good will’ theory of government behavior. This theory assumes that bureaucracies and politicians in general attempt to maximize social welfare. The alternative position rejects this neo-Keynesian perspective. It emphasizes, in particular, that optimal control techniques and activism are likely to create instabilities to the economic process. It also stresses the basic stability of the private sector confronting a destabilizing public sector.”

Asked by his interviewer whether “price stability is the only economic objective of government”, Karl replied: “Hardly. The main responsibility was to provide a stable and predictable framework.” (10)

In the spring of 1983 when he published *Has Monetarism Failed?* Karl introduced a succinct restatement of differences between monetarists and Keynesians. “The difference ... reaches beyond some narrow ‘technical’ issues. The two are separated by fundamentally different views about the political economy of institutions and policymaking. They also determine many different approaches to the range of macro-economic problems.” (24)

Keynesian analysis proceeds within the IS-LM framework. Keynesians frequently write, talk and act as if they knew the position of these two curves. And the mix of fiscal and monetary actions that would guide the curves to a full employment position.

Monetarists find the IS-LM framework incomplete, especially because it admits no role for relative price adjustment and fails to acknowledge the uncertainty that pervades economic life and policy.

The central section of the paper then considers five topics constituting the core of monetarism. “The nature of the transmission mechanism, the internal stability of the system, the impulse problem, the money supply process and monetary policy, and aspects of political economy.” (25-26)

Karl develops a detailed analysis of each of the five themes along the lines discussed in detail earlier. Where applicable he contrasts the different perspectives, and he elaborates why we reject IS-LM as incomplete. He also explains our incomplete acceptance of rational expectations. It solves a major problem, but it neglects the uncertainty the costs of acquiring information that are central in a money using economy. And he analyzes “reverse causation” to show that while it is present, it is small relative to the effect of money on output.

Karl develops a main difference between monetarists and Keynesians in the treatment of full employment. In Keynes’s analyses, the economy reaches an underemployment equilibrium that lies below maximum employment determined by preferences and technology.⁹ The principal reason is uncertainty.

Karl’s response to uncertainty was to choose an indicator to show whether economic or econometric policy analysis was wrong for current circumstances. The recent accumulation of massive idle reserve balances combined with the long sequence of forecast errors illustrates Karl’s idea.

In his discussion of money supply, Karl says: “Shocks operating on the credit and money markets influence the money supply process very differently. In recent work, Marvin Goodfriend (2004) and Goodfriend and Bennett McCallum (2007) have further developed this central idea.”¹⁰

⁹ Brunner credits Meltzer’s (1981) paper in the *Journal of Economic Literature*. The point is developed more fully in my book, *Keynes Monetary Theory: A Different Interpretation*, Cambridge, 1988. There I show that Keynes, following Cambridge tradition, developed an externality. Uncertainty about the future induced people to hold more real money balances and, therefore, less physical capital, than the optimum. Lori Tarshios, who attended Keynes’s lectures in the 1930s, reviewed my book in the *Journal of Economic Literature*. Although he did not agree with everything I wrote, he concluded (Sept. 1990, 1204): “This study is as stimulating as it is rich. I cannot recommend it too strongly. It complements *The General Theory* handsomely.”

¹⁰ Goodfriend, Marvin (2004). “Narrow Money, Broad Money, and the Transition of Monetary Policy,” in Faust, J., Orphanides, A., and Reifschneider, D., eds. *Models of Monetary Policy*, Washington, Board of Governors, 277-

Karl's discussion of the politics of monetary policy emphasizes that the two conditions for an accurate public interest theory of government are (1) use of the full information and (2) exploit the information in the public interest. Karl wrote that neither condition is fulfilled in practice. A recent excellent application of political economy to banking is the book by Calomiris and Haber.¹¹

Failure

Supply siders, Keynesians and others declared the monetarist experiment by the Federal Reserve a failure. There were different reasons and different "failures."

Supply-side economists wanted continued high money growth to help their tax reduction program to succeed. Some criticisms claimed that monetarists policy caused considerable pain during the severe 1982 recession. They offered no alternative that would have reduced inflation at lower social cost. Karl, therefore, found the criticisms badly lacking analytically.

However, he pointed to the statements made at the semi-annual Shadow Open Market Committee to show that monetarists did not claim ever that ending inflation could be socially costless. At most, they claimed that the present value of future stability exceeded the temporary costs of recession.

Karl cited the Shadow's criticism of the variable Federal Reserve policy and its improper procedures for controlling money growth. These repeated criticisms show that the monetarist members of SOMC did not consider Federal Reserve policy from 1979 to 1982 to be a test of monetarism. It did succeed, however, in showing that a determined effort to prevent inflation, if pursued long enough, could succeed.

Karl concluded this section by remarking that the principal media reported the critics' views. This sustained the idea of failure. Here is his assessment of the claim that monetarism failed.

"The questions addressed all involve empirical issues. Any answer ... can conceivably be false. ... But the major thrust of discussion does not address the correctness or empirical falsehood of the contentions advanced. My emphasis is on the quality of the arguments

303. Goodfriend, Marvin. and McCallum, Bennett. (2007). "Banking and Interest Rates in Monetary Policy Analyses: A Quantitative Exploration." *Journal of Monetary Economics*, July, 1480-1507.

¹¹ Calomiris, Charles and Haber, Stephen (2014). *Fragile By Design: The Political Economy of Banking Crises and Scarce Credit*, Princeton: University Press.

encountered. They hardly satisfy professional standards. The level of impressionistic language occasionally appearing corresponds to arguments advanced by members of the flat earth society.” (44)

One criticism of monetarism that bothered Karl more than most came from James Tobin. Tobin claimed that “Friedman and Brunner and Meltzer ... turn multi-asset systems of equations into single equation monetarism.” (48)

Karl responded by rejecting Tobin’s claim. Citing prior asset market models and the empirical studies for the U.S. and for other countries by Korteweg, Fratianni, Myrhman and others. He compared the papers by Brunner and Meltzer based on multiple assets with the Tobin-Buiter paper based on IS-LM. Both were presented at the same 1976 conference on monetarism.

Economic and Social Institutions

In 1969, Karl became a visiting professor at the University of Konstanz. It was the start of his annual trip to Europe, first at Konstanz and later at Bern. He was surprised by the apparent strength of Marxist ideas that he encountered. His response was to raise funds to start the Interlaken Seminar on Analysis and Ideology that met annually from 1974 to his death. Although I had no official role, I was heavily involved from the beginning and I participated every year.

The aim of the Interlaken Seminar was to extend economic analysis into many areas of social policy. The conference organization was as unusual as the topics discussed. We met only in the morning. Afternoons were given over to hiking in the Swiss Alps, or for a few playing golf. The idea was to have informal discussions while hiking. We reassembled for dinner.

The conference drew a very mixed group of scholars. Some including Armen Alchian, Hans Albert, Michael Jensen, Jim Buchanan, me, and of course Karl came most years. A wide variety of others, one year including a German Marxist, completed the annual roster.

Karl published a book that included some of the early papers, *Economic and Social Institutions*, 1979. In a short introduction to the volume he put forward “Adam Smith’s Vision of Economics as the Social Science” and proposed it as a way of responding to the Marxist challenge.

The first paper in the volume, by Hans Albert discusses economics as a research program for social science. Albert was a well-regarded German philosopher who taught in the sociology department at Mannheim University. Albert starts by noting that economic theory is the only social science theory capable of extension to a wide range of social problems and issues. His penetrating analysis of its strengths also recognizes its lack of adequate development of the role of information and expectations.

Karl included the paper he gave at the 1977 Allied Social Science luncheon to celebrate the award of a Nobel prize to Milton Friedman. Karl used the occasion to talk about Adam Smith's conception of economics as the social science and the relation to Friedman's work. Among the eleven papers in the volume, Karl reprinted Mechling and Jensen's "Theory of the Firm: Managerial Behavior, Agency Costs, and Ownership Structure", originally presented at the first Interlaken Seminar. The volume also included papers presented at Interlaken by James Buchanan, Armen Alchian, Peter Bauer, Svetozar Pejovich, and Harold Demsetz.

Conclusion

This survey of Karl Brunner's work shows both the breadth of his interests and of the work he did and encouraged others to do. But it only skims the surface of his scholarly interests and economic imagination and creativity. I have not touched his founding and development of the *Journal of Money Credit and Banking*, the *Journal of Monetary Economics* and the *Carnegie Rochester Conference Series*, and I have not mentioned his role with the Swiss National Bank, Lady Thatcher and other political leaders. Assisted ably by our friend Kurt Schiltknecht, he advised President Leutwiler through some of the difficult monetary problems faced by Switzerland in the inflationary 1970s.

A recent email from Schiltknecht describes their relationship and Karl's influence on President Leutwiler. "He came quite often to my office to discuss Leutwiler's positions. ... The relationship with Karl became much more intensive. He called me every second or third day asking questions, making remarks or providing me with information about the latest research. ... I do not think there was a formal relationship between the Swiss National Bank and Karl, but Leutwiler enjoyed very much to talk to him and to take up some of his advice."¹²

¹² Email from Kurt Schiltknecht September 12, 2015.

When Prime Minister Thatcher asked President Leutwiler a detailed series of questions about monetary policy, Leutwiler directed her to Karl Brunner. Karl met with her and we later joined four others in a meeting at 10 Downing Street.

At the end of their first meeting in Switzerland, Karl urged the prime minister to appoint someone to look after her interests. They agreed on Alan Walters, who served for several years in that role.

Finally, I did not mention the many students he trained in the U.S., Germany, and Switzerland. Some like Jerry Jordan and Manfred Neumann had important influence on policy in their country, and Manfred Neumann maintained the Konstanz seminar for many years as well as training at the University of Bonn a generation of German monetary economists.

As his student and later close associate and close friend for 30 years, I was a major beneficiary of his insights and analysis. We reinforced each other for many years. It was a wonderful experience. As early as 1961, Karl Brunner highlighted information, institutions and uncertainty as well as the importance of micro analysis in macroeconomics. To answer two critical questions, Karl explained that nominal monetary impulses changed real variables by changing the relative price of assets to output prices. And he concluded that economic fluctuations occurred because of an unstable public sector, especially the monetary sector, that disturbs a more stable private sector. Many central banks have not reached similar conclusions to our detriment.