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## Remarks by Chairman Alan Greenspan

### *Rules vs. discretionary monetary policy*

**At the 15th Anniversary Conference of the Center for Economic Policy Research at Stanford University, Stanford, California  
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It is a pleasure to be at this conference marking the fifteenth anniversary of the Center for Economic Policy Research. The Center, by encouraging academic research into public policy and bringing that research to the attention of policymakers, is performing a most valuable role in our society.

I am particularly pleased that Milton Friedman has taken time to join us. His views have had as much, if not more, impact on the way we think about monetary policy and many other important economic issues as those of any person in the last half of the twentieth century.

Federal Reserve policy, over the years, has been subject to criticism, often with justification, from Professor Friedman and others. It has been argued, for example, that policy failed to anticipate the emerging inflation of the 1970s, and by fostering excessive monetary creation, contributed to the inflationary upsurge. Surely, it was maintained, some monetary policy rule, however imperfect, would have delivered far superior performance. Even if true in this case, though, policy rules might not always be preferable.

Policy rules, at least in a general way, presume some understanding of how economic forces work. Moreover, in effect, they anticipate that key causal connections observed in the past will remain fixed over time, or evolve only very slowly. Use of a rule presupposes that action x will, with a reasonably high probability, be followed over time by event y.

Another premise behind many rule-based policy prescriptions, however, is that our knowledge of the full workings of the system is quite limited, so that attempts to improve on the results of policy rules will, on average, only make matters worse. In this view, *ad hoc* or discretionary policy can cause uncertainty for private decision makers and be wrong for extended periods if there is no anchor to bring it back into line. In addition, discretionary policy is obviously vulnerable to political pressures; if *ad hoc* judgments are to be made, why shouldn't those of elected representatives supersede those of unelected officials?

The monetary policy of the Federal Reserve has involved varying degrees of rule- and discretionary-based modes of operation over time. Recognizing the potential drawbacks of purely discretionary policy, the Federal Reserve frequently has sought to exploit past patterns and regularities to operate in a systematic way. But we have found that very often historical regularities have been disrupted by unanticipated change, especially in

technologies. The evolving patterns mean that the performance of the economy under any rule, were it to be rigorously followed, would deviate from expectations. Accordingly we are constantly evaluating how much we can infer from the past and how relationships might have changed. In an ever changing world, some element of discretion appears to be an unavoidable aspect of policymaking.

Such changes mean that we can never construct a completely general model of the economy, invariant through time, on which to base our policy. Still, sensible policy *does* presuppose a conceptual framework, or implicit model, however incompletely specified, of how the economic system operates. Of necessity, we make judgments based importantly on historical regularities in behavior inferred from data relationships. These perceived regularities can be embodied in formal empirical models, often covering only a portion of the economic system. Generally, the regularities inform our interpretation of "experience" and tell us what to look for to determine whether history is in the process of repeating itself, and if not, why not. From such an examination, along with an assessment of past policy actions, we attempt to judge to what extent our current policies should deviate from our past patterns of behavior.

When this Center was founded 15 years ago, the rules versus discretion debate focussed on the appropriate policy role of the monetary aggregates, and this discussion was echoed in the Federal Reserve's policy process.

In the late 1970s, the Federal Reserve's actions to deal with developing inflationary instabilities were shaped in part by the reality portrayed by Milton Friedman's analysis that ever-rising inflation rate peaks, as well as ever-rising inflation rate troughs, followed on the heels of similar patterns of average money growth. The Federal Reserve, in response to such evaluations, acted aggressively under newly installed Chairman Paul Volcker. A considerable tightening of the average stance of policy--based on intermediate M1 targets tied to reserve operating objectives--eventually reversed the surge in inflation.

The last fifteen years have been a period of consolidating the gains of the early 1980s and extending them to their logical end--the achievement of price stability. We are not quite there yet, but we trust it is on the horizon.

Although the ultimate goals of policy have remained the same over these past fifteen years, the techniques used in formulating and implementing policy have changed considerably as a consequence of vast changes in technology and regulation. Focussing on M1, and following operating procedures that imparted a considerable degree of automaticity to short-term interest rate movements, was extraordinarily useful in the early Volcker years. But after nationwide NOW accounts were introduced, the demand for M1 in the judgment of the Federal Open Market Committee became too interest sensitive for that aggregate to be useful in implementing policy. Because the velocity of such an aggregate varies substantially in response to small changes in interest rates, target ranges for M1 growth in its judgment no longer were reliable guides for outcomes in nominal spending and inflation. In response to an unanticipated movement in spending and hence the quantity of money

demanded, a small variation in interest rates would be sufficient to bring money back to path but not to correct the deviation in spending.

As a consequence, by late 1982, M1 was de-emphasized and policy decisions per force became more discretionary. However, in recognition of the longer-run relationship of prices and M2, especially its stable long-term velocity, this broader aggregate was accorded more weight, along with a variety of other indicators, in setting our policy stance.

As an indicator, M2 served us well for a number of years. But by the early 1990s, its usefulness was undercut by the increased attractiveness and availability of alternative outlets for saving, such as bond and stock mutual funds, and by mounting financial difficulties for depositories and depositors that led to a restructuring of business and household balance sheets. The apparent result was a significant rise in the velocity of M2, which was especially unusual given continuing declines in short-term market interest rates. By 1993, this extraordinary velocity behavior had become so pronounced that the Federal Reserve was forced to begin disregarding the signals M2 was sending, at least for the time being.

Data since mid-1994 do seem to show the reemergence of a relationship of M2 with nominal income and short-term interest rates similar to that experienced during the three decades of the 1960s through the 1980s. As I indicated to the Congress recently, however, the period of predictable velocity is too brief to justify restoring M2 to its role of earlier years, though clearly persistent outsized changes would get our attention.

Increasingly since 1982 we have been setting the funds rate directly in response to a wide variety of factors and forecasts. We recognize that, in fixing the short-term rate, we lose much of the information on the balance of money supply and demand that changing market rates afford, but for the moment we see no alternative. In the current state of our knowledge, money demand has become too difficult to predict.

Although our operating target is a nominal short-term rate, we view its linkages to spending and prices as indirect and complex. For one, arguably, it is real, not nominal, rates that are more relevant to spending. For another, spending, prices and other economic variables respond to a whole host of financial variables. Hence, in judging the stance of policy we routinely look at the financial impulses coming from foreign exchange, bond, and equity markets, along with supply conditions in credit markets generally, including at financial intermediaries.

Nonetheless, we recognize that inflation is fundamentally a monetary phenomenon, and ultimately determined by the growth of the stock of money, not by nominal or real interest rates. In current circumstances, however, determining which financial data should be aggregated to provide an appropriate empirical proxy for the money stock that tracks income and spending represents a severe challenge for monetary analysts.

The absence of a monetary aggregate anchor, however, has not left policy completely adrift. From a longer-term perspective we have been guided by a firm commitment to contain any forces that would undermine economic expansion and efficiency by raising inflation, and we

have kept our focus firmly on the ultimate goal of achieving price stability. Within that framework we have attempted not only to lean against the potential for an overheating economy, but also to cushion shortfalls in economic growth. And, recognizing the lags in the effects of policy, we have tried to move in anticipation of such disequilibria developing.

But this is a very general framework and does not present clear guidance for day-to-day policy decisions. Thus, as the historic relationship between measured money supply and spending deteriorated, policymaking, seeing no alternative, turned more eclectic and discretionary.

Nonetheless, we try to develop as best we can a stable conceptual framework, so policy actions are as regular and predictable as possible--that is, governed by systematic behavior but open to evidence of structural macroeconomic changes that require policy to adapt.

The application of such an approach is illustrated by a number of disparate events we have confronted since 1982 that were in some important respects outside our previous experience. In the early and mid-1980s, the FOMC faced most notably the sharp swings in fiscal policy, the unprecedented rise and fall of the dollar, and the associated shifts in international trade and capital flows. But I will concentrate on several events of the last decade where I personally participated in forming the judgments used in policy implementation.

One such event was the stock market crash of October 1987 shortly after I arrived. Unlike many uncertain situations that have confronted monetary policy, there was little question that the appropriate central bank action was to ease policy significantly. We knew we would soon have to sop up the excess liquidity that we added to the system, but the timing and, I believe, the magnitude of our actions were among our easier decisions. Our concerns at that time reflected questions about how the financial markets and the economy would respond to the shock of a decline of more than one-fifth in stock prices in one day, and whether monetary policy alone could stabilize the system. By the early spring of 1988 it was evident that the economy *had* stabilized and we needed to begin reversing the easy stance of policy.

Another development that confronted policy was the commercial property price bust of the late 1980s and early 1990s. Since a large volume of bank and thrift loans was tied to the real estate market and backed by real estate collateral, the fall in property prices impaired the capital of a large number of depositories. These institutions reacted by curtailing new lending--the unprecedented "credit crunch" of 1990 and 1991.

Not unexpectedly, our policy response was to move toward significant ease. Our primary concern was the state of the credit markets and the economy, but we could also see that these broader issues were linked inextricably to the state of depository institutions' balance sheets and profitability. A satisfactory recovery from the recession of that period, in our judgment, required the active participation of a viable banking system. The extraordinary circumstances dictated a highly unusual path for monetary policy. The stance of policy eased substantially even after the economy began to recover from the 1990-91 recession, and a stimulative policy was deliberately maintained well into the early expansion period.

By mid-1993, however, property prices stabilized and the credit crunch gradually began to dissipate. It was clear as the year moved toward a close that monetary policy, characterized by a real federal funds rate of virtually zero, was now far too easy in light of the strengthening economy on the horizon. Financial and economic conditions were returning to more traditional relationships, and policy had to shift from a situation-specific formulation to one based more closely on previous historical patterns. Although it was difficult at that time to discern any overt inflationary signals, the balance of risks, in our judgment, clearly dictated preemptive action.

The 1994 to 1995 period was most instructive. It appears we were successful in moving preemptively to throttle down an impending unstable boom, which almost surely would have resulted in the current expansion coming to an earlier halt. Because this was the first change in the stance of policy after a prolonged period of unusual ease, we took special care to spell out our analysis and expectations for policy in an unusually explicit way to inform the markets well before we began to tighten. In addition, we began for the first time to issue explanatory statements as changes in the stance of policy were implemented. Even so, the idea of tightening to head off inflation before it was visible in the data was not universally applauded or perhaps understood.

Financial markets reacted unusually strongly to our 1994 policy actions, often ratcheting up their expectations for further rate increases when we actually tightened, resulting in very large increases in longer-term interest rates. At the time, these reactions seemed to reflect the extent to which investment strategies had been counting on a persistence of low interest rates. This was a classic case in which we had to be careful not to allow market expectations of Federal Reserve actions to be major elements of policy determination. We are always concerned about assuming that short-term movements in market prices are reflections of changes in underlying supply and demand conditions when we may be observing nothing more than fluctuating expectations about our own policy actions.

Most recently, the economy has demonstrated a remarkable confluence of robust growth, high resource utilization, and damped inflation. Once again we have been faced with analyzing and reacting to a situation in which incoming data have not readily conformed to historical experience.

Specifically, the persistence of *rising* profit margins in the face of stable or falling inflation raises the question of what is happening to productivity. If data on profits and prices are even approximately accurate, total consolidated corporate unit costs have, of necessity, been materially contained. With labor costs constituting three-fourths of costs, unless *growth* in compensation per hour is falling, which seems most unlikely from other information, it is difficult to avoid the conclusion that output per hour has to be rising at a pace significantly in excess of the officially published annual growth rate of nonfarm productivity of one percent over recent quarters. The degree to which these data may be understated is underlined by backing out from the total what appears to be a reasonably accurate, or at least consistent, measure of productivity of corporate businesses. The *level* of nonfarm noncorporate productivity implied by this exercise has been falling continuously since 1973 despite reasonable earnings margins for proprietorships and partnerships. Presumably this

reflects the significant upward bias in our measurement of service prices, which dominate our noncorporate sector.

Nonetheless, the still open question is whether productivity growth is in the process of *picking up*. For it is the answer to this question that is material to the current debate between those who argue that the economy is entering a "new era" of greatly enhanced sustainable growth and unusually high levels of resource utilization, and those who do not.

A central bank, while needing to be open to evidence of structural economic change, also needs to be cautious. Supplying excess liquidity to support growth that turns out to have been ephemeral would undermine the very good economic performance we have enjoyed. We raised the federal funds rate in March to help protect against this latter possibility, and with labor resources currently stretched tight, we need to remain on alert.

Whatever its successes, the current monetary policy regime is far from ideal. Each episode has had to be treated as unique or nearly so. It may have been the best we could do at the moment. But we continuously examine alternatives that might better anchor policy, so that it becomes less subject to the abilities of the Federal Open Market Committee to analyze developments and make predictions.

Gold was such an anchor or rule, prior to World War I, but it was first compromised and eventually abandoned because it restrained the type of discretionary monetary and fiscal policies that modern democracies appear to value.

A fixed, or even adaptive, rule on the expansion of the monetary base would anchor the system, but it is hard to envision acceptance for that approach because it also limits economic policy discretion. Moreover, flows of U.S. currency abroad, which are variable and difficult to estimate, and bank reserves avoidance are subverting any relationship that might have existed between growth in the monetary base and U.S. economic performance.

Another type of rule using readings on output and prices to help *guide* monetary policy, such as John Taylor's, has attracted widening interest in recent years in the financial markets, the academic community, and at central banks.

Taylor-type rules or reaction functions have a number of attractive features. They assume that central banks can appropriately pay attention simultaneously to developments in both output and inflation, provided their reactions occur in the context of a longer-run goal of price stability and that they recognize that activity is limited by the economy's sustainable potential.

As Taylor himself has pointed out, these types of formulations are at best "guideposts" to help central banks, not inflexible rules that eliminate discretion. One reason is that their formulation depends on the values of certain key variables--most crucially the equilibrium real federal funds rate and the production potential of the economy. In practice these have been obtained by observation of past macroeconomic behavior--either through informal inspection of the data, or more formally as embedded in models. In that sense, like all rules,

as I noted earlier, they embody a forecast that the future will be like the past. Unfortunately, however, history is not an infallible guide to the future, and the levels of these two variables are currently under active debate.

The mechanics of monetary policy that I have been addressing are merely means to an end. What are we endeavoring to achieve, and why? The goal of macroeconomic policy should be maximum sustainable growth over the long term, and evidence has continued to accumulate around the world that price stability is a necessary condition for the achievement of that goal.

Beyond this very general statement, however, lie difficult issues of concept and measurement for policymakers and academicians to keep us occupied for the *next* fifteen years and more.

Inflation impairs economic efficiency in part because people have difficulty separating movements in relative prices from movements in the general price level. But what prices matter? Certainly prices of goods and services now being produced--our basic measure of inflation--matter. But what about prices of claims on future goods and services, like equities, real estate or other earning assets? Is stability in the average level of these prices essential to the stability of the economy? Recent Japanese economic history only underlines the difficulty and importance of this question. The prices of final goods and services were stable in Japan in the mid-to-late 1980s, but soaring asset prices distorted resource allocation and ultimately undermined the performance of the macroeconomy.

In the United States, evaluating the effects on the economy of shifts in balance sheets and variations in asset prices have been an integral part of the development of monetary policy. In recent years, for example, we have expended considerable effort to understand the implications of changes in household balance sheets in the form of high and rising consumer debt burdens and increases in market wealth from the run-up in the stock market. And the equity market itself has been the subject of analysis as we attempt to assess the implications for financial and economic stability of the extraordinary rise in equity prices--a rise based apparently on continuing upward revisions in estimates of our corporations' already robust long-term earning prospects. But, unless they are moving together, prices of assets and of goods and services cannot both be an objective of a particular monetary policy, which, after all, has one effective instrument--the short-term interest rate. We have chosen product prices as our primary focus on the grounds that stability in the average level of these prices is likely to be consistent with financial stability as well as maximum sustainable growth. History, however, is somewhat ambiguous on the issue of whether central banks can safely ignore asset markets, except as they affect product prices.

Over the coming decades, moreover, what constitutes product price and, hence, price stability will itself become harder to measure.

When industrial product was the centerpiece of the economy during the first two-thirds of this century, our overall price indexes served us well. Pricing a pound of electrolytic copper

presented few definitional problems. The price of a ton of cold rolled steel sheet, or a linear yard of cotton broad woven fabrics, could be reasonably compared over a period of years.

I have already noted the problems in defining price and output and, hence, in measuring productivity over the past twenty years. The simple notion of price has turned decidedly complex. What is the price of a unit of software or of a medical procedure? How does one evaluate the price change of a cataract operation over a ten-year period when the nature of the procedure and its impact on the patient has been altered so radically? The pace of change and the shifting to harder-to-measure types of output are more likely to quicken than to slow down. Indeed, how will we measure inflation in the future when our data--using current techniques--could become increasingly less adequate to trace price trends over time?

However, so long as individuals make contractual arrangements for future payments valued in dollars and other currencies, there must be a presumption on the part of those involved in the transaction about the future purchasing power of money. No matter how complex individual products become, there will always be some general sense of the purchasing power of money both across time and across goods and services. Hence, we must assume that embodied in all products is some unit of output, and hence of price, that is recognizable to producers and consumers and upon which they will base their decisions.

The emergence of inflation-indexed bonds does not solve the problem of pinning down an economically meaningful measure of the general price level. While there is, of course, an inflation expectation premium embodied in all nominal interest rates, it is fundamentally unobservable. Returns on indexed bonds are tied to forecasts of specific published price indexes, which may or may not reflect the market's judgment of the future purchasing power of money. To the extent they do not, of course, the implicit real interest rate is biased in the opposite direction.

Doubtless, we will develop new techniques of measurement to unearth those true prices as the years go on. It is crucial that we do, for inflation can destabilize an economy even if faulty price indexes fail to reveal it.

It should be evident from my remarks that ample challenges will continue to face monetary policy. I have concentrated on how we have tried to identify and analyze new developments, and endeavored to use that analysis to fashion and balance policy responses. I have also tried to highlight the questions about how to specify and measure the ultimate goals of policy. Nonetheless, all of us could easily add to the list. In dealing with these issues, policy can only benefit from focussed and relevant academic research. I look forward to learning about and utilizing the contributions made under the sponsorship of the Center for Economic Policy Research over the years to come.

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