

Nominal GNP: An Anchor for Monetary Policy?

By George A. Kahn

In recent years, the usefulness of monetary aggregates as targets for monetary policy has diminished. Financial market deregulation and the breakdown of the relationship between money growth and economic activity have led the Federal Reserve to deemphasize the aggregates in the conduct of monetary policy. Although the Federal Reserve continues to target and monitor various monetary aggregates, it now interprets their behavior in light of information from a wide range of financial and economic variables.

Because the focus of monetary policy has shifted from a small set of monetary aggregates to a wider range of variables, some analysts contend that monetary policy currently has no anchor. Without an anchor, it is argued, policymakers could drift under the influence of short-run disturbances and, in the process, risk losing sight of long-run goals. With an anchor, however, policymakers could tie themselves to a long-run goal

while potentially allowing themselves some slack to respond to short-run disturbances. If a monetary anchor could be found, it is argued, policymakers could reduce the adverse output and inflation effects of short-run disturbances without sacrificing the goal of long-run price stability.

Several possible anchors have been proposed for monetary policy. Commodity prices, the foreign exchange value of the dollar, and the spread between long-term and short-term interest rates are three examples that have received substantial press coverage in recent months. Another proposed anchor for monetary policy that has circulated in academic writing for years, but has received less attention among business economists and policymakers, is nominal GNP. With this anchor, policymakers would focus their attention directly on targets for nominal GNP. This article argues that nominal GNP targeting has some appeal as a policy anchor but that its use in monetary policy is not without drawbacks.

The first section of the article reviews alternative approaches to nominal GNP targeting and their rationale. The second section explains the advantages and disadvantages of using nominal

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GNP targets to help policymakers achieve price stability in the long run. The third section shows how policymakers might adjust policy in the short run in response to various economic disturbances. The last section presents evidence showing that economic performance might be improved under a monetary policy based on nominal GNP.

Approaches and rationale for nominal GNP targeting

Under nominal GNP targeting, policymakers try to achieve a particular path for nominal GNP. Achieving this path for nominal GNP would be accomplished in much the same way as policymakers, in the past, have tried to achieve particular paths for various monetary aggregates. Monetary policy instruments—variables that policymakers closely control such as short-term interest rates and the availability of bank reserves—would be adjusted to keep nominal GNP as close as possible to target. Acting in this way, policymakers would focus on nominal GNP, not as an ultimate goal variable of monetary policy, but as an intermediate target.¹

Nominal GNP is closely related to two important goal variables of monetary policy even though it is not an ultimate goal variable itself. The ultimate goal of monetary policy is to achieve levels for prices and real output consistent with long-run price stability and sustainable economic growth.² By definition, nominal GNP is the product of the price level and the level of real output.

Consequently, nominal GNP growth is the sum of the inflation rate and the real growth rate. Thus, while nominal GNP is not an ultimate goal variable, the price and output components of nominal GNP are goal variables.

Approaches and procedures

Two fundamental approaches have been suggested for a monetary policy based on nominal GNP. The first is to use nominal GNP in conjunction with targets for other economic or financial variables. The second is to use targets for nominal GNP by themselves.

An example of the first approach is the use of nominal GNP targets in conjunction with money targets. Under this approach, policymakers would use nominal GNP targets as an initial step in determining appropriate targets for monetary aggregates. The behavior of the monetary aggregates would then determine the short-run response of monetary policy to economic disturbances. This approach is basically that of the West German Bundesbank. In determining the target for nominal GNP, the Bundesbank makes an allowance for “unavoidable” inflation of 0-2 percent, which it then adds to the long-run growth rate of real GNP. The Bundesbank then uses this target for nominal GNP as a justification for its announced targets for a weighted-average monetary aggregate.³

This article examines the second approach to nominal GNP targeting—the one in which nominal GNP is the sole target of monetary policy. Even with nominal GNP as the sole target,

¹ The concept of a target as used in this article corresponds to Benjamin Friedman's definition of an intermediate target in “Targets, Instruments, and Indicators of Monetary Policy,” *Journal of Monetary Economics*, Vol. 1, No. 4, October 1975, p. 456.

² Other goals of policy include full employment and external balance. This article, however, focuses on the goals of long-run price stability and sustainable economic growth.

³ This weighted average monetary aggregate is called “central bank money.” For a further description of monetary policy in West Germany, see Stanley Fischer, “Monetary Policy and Performance in the U.S., Japan, and Europe, 1973-86,” NBER Working Paper No. 2475, National Bureau of Economic Research, December 1987.

however, there are still a number of ways to conduct monetary policy. Some analysts have proposed targeting nominal GNP in much the same way as monetary aggregates have been targeted in the past.⁴ Under such a procedure, policymakers would set targets for nominal GNP that are consistent with the goals of monetary policy. Whenever the latest information indicates that nominal GNP is below target, policy would be eased by reducing short-term interest rates or increasing the availability of reserves. Whenever nominal GNP is above target, policy would be tightened by raising short-term interest rates or decreasing the availability of reserves. In this way, policymakers would try to keep nominal GNP close to its target.

This procedure has been criticized on two grounds. First, because GNP data are not collected fast enough to reflect current conditions, policy would be based on “stale” information. For example, GNP estimates for a particular quarter are not released until the beginning of the next quarter. Furthermore, these estimates are preliminary and subject to substantial revision. Policy actions based on this information, therefore, may be geared to an inaccurate view of last quarter’s problems. Second, because it takes time for policy actions to affect the economy, a policy action designed to respond to “current” economic conditions may not affect the economy for several quarters. As a result of this policy transmission lag, by the time a policy action takes effect, the action may no longer be appropriate.

As an alternative procedure, some analysts have proposed that policymakers focus on forecasts of

nominal GNP.⁵ Under this procedure, as in the previous one, a target would be set for nominal GNP that is consistent with the goals of monetary policy. However, policymakers would not wait for observed nominal GNP to diverge from target but would adjust policy whenever forecasts of nominal GNP six months to a year ahead indicated that nominal GNP would diverge from target. For example, if the six-month-ahead forecast of nominal GNP were above the target that policymakers had set, policy would be tightened. If, on the other hand, the six-month-ahead forecast were below target, policy would be eased. The advantage of this procedure is that it looks forward. Because of the policy transmission lag, policymakers adjust policy instruments to offset the expected future effects of economic disturbances.

Rationale

Whether a policy based solely on prospective or actual nominal GNP should be adopted depends on how well it helps policymakers reach ultimate goals. Even if policymakers could precisely hit nominal GNP targets, attaining a target for nominal GNP does not necessarily imply good economic performance. Any particular level of nominal GNP is consistent with many combinations of real output and the price level. Society clearly prefers some of these combinations to others. For example, the best combination would be a real output level associated with full employment and a price level associated with no inflation. Thus, policymakers ultimately care about how a given level of nominal GNP is divided

⁴ See, for example, Robert Hall, “Macroeconomic Policy under Structural Change,” *Industrial Change and Public Policy*, Federal Reserve Bank of Kansas City, 1983, pp. 102-03.

⁵ See, for example, Robert Gordon, “The Conduct of Domestic Monetary Policy,” in Albert Ando, Hidekazu Eguchi, Roger Farmer, and Yoshio Suzuki, eds., *Monetary Policy in Our Times*, Cambridge: MIT Press, 1985, pp. 45-81.

between prices and output, not about the level of nominal GNP itself.

So why focus on nominal GNP? Why not focus directly on ultimate goal variables or on some other target variable?⁶ Advocates of nominal GNP targeting give three main reasons.

One reason is that monetary policy instruments may be more reliably related to nominal GNP than they are to other potential target or ultimate goal variables. For example, proponents of nominal GNP targeting argue that while economists have a practical understanding of the determinants of nominal GNP, they do not understand what determines the division of nominal GNP between prices and output.⁷ Thus, they claim, policymakers could come closer to consistently hitting a nominal GNP target than they could to hitting a price or output target. Furthermore, with the deregulation of financial markets, the relationship between policy instruments and other potential targets—such as money and credit aggregates—has become less reliable. The relationship of these other potential targets to ultimate goal variables has also become less reliable.

A second reason for focusing on nominal GNP is that nominal GNP targets may prevent policymakers from exploiting the short-run tradeoff between output and inflation. According to economic theory, policymakers can temporarily boost real output at the cost of permanently higher inflation. But policymakers should avoid such a

myopic policy if the cost of permanently higher inflation is greater than the benefit of a temporary increase in real output. A nominal GNP target could help policymakers avoid this kind of myopia. If nominal GNP were kept on a constant growth target, it would be impossible for policymakers to engineer a short-run increase in real output by allowing inflation to rise.⁸ Such a policy would increase nominal GNP growth, causing it to deviate from target. Thus, targets for nominal GNP could force policymakers to reject policies that exploit the short-run output-inflation trade-off.⁹

A third, related reason for focusing on nominal GNP is that nominal GNP targets could be effective in ensuring long-run price stability while still allowing policymakers some leeway in responding to short-run economic disturbances. This feature is perhaps the most compelling rationale for nominal GNP targeting. It arises from the inherent long-run and short-run relationships of nominal GNP to inflation and output growth. The next two sections explore in detail these long-run and short-run relationships.

Nominal GNP targeting in the long run

Because nominal GNP is not an ultimate goal, evaluating a monetary policy based on nominal GNP targets requires looking at the policy's effect

⁶ The use of such a target, it would seem, only interjects another source of confusion between the instruments and ultimate goals of monetary policy. See, for example, Ralph Bryant, *Controlling Money: The Federal Reserve and Its Critics*, Washington, D.C.: Brookings Institution, 1983, and Friedman, "Targets, Instruments, and Indicators of Monetary Policy," p. 470.

⁷ See, for example, Bennett McCallum, "On Consequences and Criticisms of Monetary Targeting," *Journal of Money, Credit, and Banking*, Vol. 17, No. 4, Part 2, November 1985, p. 587.

⁸ This assumes that the target is fixed relative to potential real GNP, which would only be the case if starting at full employment with no inflation.

⁹ Thus, nominal GNP targets have been proposed as a solution to the time-inconsistency problem. See, for example, Bennett McCallum, "The Case for Rules in the Conduct of Monetary Policy," *Weltwirtschaftliches Archiv*, Vol. 123, No. 3, 1987, pp. 415-29. See also Anne Sibert and Stuart E. Weiner, "Maintaining Central Bank Credibility," *Economic Review*, Federal Reserve Bank of Kansas City, Vol. 73, No. 8, September/October 1988, pp. 3-15.

on ultimate goal variables. In other words, is the policy likely to contribute to long-run price stability and sustainable growth? This section discusses the long-run attributes of nominal GNP targeting, describes how policymakers might determine long-run targets, and identifies potential problems with setting long-run targets for nominal GNP. It is assumed that nominal GNP is the sole target of monetary policy and that nominal GNP forecasts are used in short-run policymaking. The choice of long-run targets for nominal GNP does not depend, however, on whether short-run policy decisions are based on actual or prospective nominal GNP.

Long-run characteristics of a nominal GNP target

One of the appealing features of nominal GNP as a target of monetary policy is the long-run relationship between nominal GNP growth and inflation. In the long run, factors unrelated to monetary policy determine the economy's real growth rate. These nonmonetary factors, such as demographic and technological changes, affect growth in the labor force and productivity. Together, these factors generate a fairly constant long-run growth rate that is currently estimated to be around 2.5 percent annually in the United States. Thus, if policymakers can determine the rate of nominal GNP growth, they will, at the same time, determine the long-run inflation rate. Since nominal GNP growth is the sum of the inflation rate and the growth rate of real output, the long-run inflation rate is the growth rate of nominal GNP minus the long-run growth rate of real output. With nominal GNP growth of 6 percent, for example, and a long-run real growth rate of 2.5 percent, the long-run inflation rate is 3.5 percent. Thus, targeting nominal GNP is tantamount to targeting the long-run inflation rate.

To the extent policymakers can hit nominal GNP growth targets, the targets provide a sim-

ple guide for achieving price stability over time. To lower the long-run inflation rate, policymakers must reduce, over time, the target for nominal GNP growth. For example, to reduce the inflation rate to zero in the long run requires reducing nominal GNP growth to 2.5 percent—a rate just equal to the economy's long-run real growth rate. Thus, a disinflationary monetary policy requires policymakers to reduce the growth rate of nominal GNP until it equals the economy's long-run real growth rate.

Procedures to determine long-run targets

Monetary policymaking with nominal GNP or any other target variable first requires setting a long-run target that is consistent with long-run goals. The choice of a long-run target for nominal GNP depends on the initial state of the economy.

If the economy starts from a position where the long-run inflation rate is zero, setting an appropriate long-run target for nominal GNP is easy. Policymakers would simply set a path for nominal GNP that held the long-run price level constant. To do this, they would need only an estimate of the economy's long-run growth potential. The target growth rate of nominal GNP would then be set equal to this long-run growth rate. Because it would always be consistent with the goals of long-run price stability and sustainable economic growth, the target would remain in effect as long as the long-run growth rate remained constant.

If the economy starts from a position where the long-run inflation rate is positive, setting an appropriate long-run target for nominal GNP is more difficult. In this case, to reach the goal of long-run price stability, policymakers must choose a strategy to eliminate long-run inflation over time. Ultimately, nominal GNP growth will have to decline to a rate that equals the economy's long-run growth rate. Only then will long-run inflation be eliminated. Getting there, however,

can be costly to the economy.

Reducing nominal GNP growth requires a contractionary policy that, in the short run, could decrease output growth. The severity of any temporary decline in real growth depends on how rapidly public expectations of inflation change. If expectations adjust slowly, for example, workers will be reluctant to accept a slower rate of increase in their wages. Real wages will rise, and output will fall. In this case, a fall in nominal GNP growth will generate a relatively small initial decrease in inflation along with a relatively large decrease in real output growth. This reduced rate of output growth could persist for a long time.

The output loss associated with disinflation may be reduced by a gradualist approach. Because the public adjusts its inflation expectations slowly, nominal GNP targets that are set with the intention of gradually eliminating inflation over time may reduce the cost of disinflation. One approach would be to announce a multiyear plan for reducing nominal GNP growth. Under this approach, targets would be set for nominal GNP that over the course of several years reduced nominal GNP growth to a rate equal to the economy's long-run growth potential.

This approach corresponds to the current policy of gradually reducing money growth over time. An important difference, however, is that multiyear targets would be announced for nominal GNP rather than one-year targets for money growth. Because policymakers would not have to compensate for a potentially unstable relationship between economic activity and the money supply in setting long-run targets, establishing a multiyear strategy for eliminating long-run inflation might be more straightforward under nominal GNP targets. Furthermore, policymakers might be more willing to commit themselves to a multiyear plan if they did not have to anticipate changes in the relationship of the money supply to economic activity. Such a plan for nominal GNP might require five or more years to achieve price

stability.

One possible benefit of a gradualist program is that it gives the public an opportunity to adjust expectations. If after some experience with a multiyear nominal GNP target, the public begins to accept policymakers' commitment to long-run targets, public expectations of inflation might adjust downward more rapidly, and disinflation could be carried out with a lower output cost. In fact, this expectation effect could be built into a long-run target. Policymakers could set a target that, at first, slowly reduced the growth rate of nominal GNP and that later, as credibility was established, more rapidly reduced the growth rate of nominal GNP.

Multiyear targets for nominal GNP could be reviewed each year. Targets would have to be adjusted if estimates of the potential growth rate of real output changed.¹⁰ Targets could also be adjusted as new estimates of the short-run inflation-output tradeoff became available. For example, if the output loss from a disinflationary program was more severe than originally esti-

¹⁰ Once a year, policymakers could re-estimate the economy's long-run growth potential. The estimate of the long-run growth rate could change as estimation techniques improved, new data became available, and such economic fundamentals as demographics and technology changed. If the estimated long-run growth rate changed, the long-run target for nominal GNP growth would be adjusted. This annual adjustment corresponds to the annual setting of targets for the money and credit aggregates that occurs every February under current monetary policy procedures.

Adjustments to long-run growth targets resulting from new estimates of the potential growth rate may require rebasing the target. If new estimates imply that the potential growth rate will change in the future, due perhaps to prospective demographic or technological changes, the new growth target should be based at the current target level of nominal GNP for the year in which the change is expected to occur. If, however, historical potential growth rates were misestimated and, as a result, nominal GNP diverged from target, a new base should be set for nominal GNP growth. The new base should equal the actual current level of nominal GNP. Thus, base drift is permitted only when nominal GNP diverges from target because of mistaken estimates of past potential growth rates.

mated, policymakers might choose to slow the process of reducing nominal GNP growth.¹¹ Policymakers would have to consider, however, the effect that such a change would have on the credibility of nominal GNP targets. Frequent adjustment of long-run targets might delay the adjustment of expectations and prolong the disinflationary process.¹²

Potential problems with multiyear targets

The concept of setting multiyear targets for nominal GNP is controversial. For a number of reasons, policymakers may be reluctant to adopt the concept for monetary policy.¹³

First, people might misinterpret announced targets for nominal GNP. They might think targets imply that monetary policymakers somehow control aggregate demand or production in the economy. While monetary policy influences aggregate demand, other factors beyond the control of monetary policymakers are clearly important. Aggregate demand is influenced not just by monetary policy but also by fiscal policy and the actions of millions of businesses and individuals. Furthermore, policymakers have little or no control over supply factors such as the price of oil.

As a result, monetary policymakers must take these other factors as constraints on their policymaking, not as variables they directly control. If nominal GNP targets lead people to believe that monetary policy alone determines aggregate economic activity, then policymakers might be held responsible for achieving goals beyond their control.

Second, along these same lines, setting targets for nominal GNP is just one step away from setting targets for real output and prices. If people incorrectly view control over nominal GNP as tantamount to control over real output, policymakers may be pressured into stimulating real output. This may be especially problematic during a recession when public attention is focused on unemployment. The consequences of targeting real GNP, however, are potentially serious. Targeting too high a level of output can result in escalating inflation rates. By being held responsible for short-run real output, policymakers might lose sight of long-run goals such as price stability.

Finally, multiyear nominal GNP targets may not significantly reduce the cost of disinflation because targets may have little credibility beyond the first year or two. To the extent that businesses and workers discount the future, they may assign little weight to policymakers' intentions five years down the road. Instead, people may be much more interested in policy for the short run. In a recession, they will only want to know the immediate plans of policymakers for stimulating a recovery, and in an inflationary boom, they will only want to know plans for dealing with the near-term inflation problem. Likewise, in response to a supply disruption such as an oil embargo, they will only want to know plans for countering near-term inflation or output effects. As a result, the public may focus only on short-run objectives, ignoring the central bank's strategy for long-run price stability. Public expectations of long-run inflation, therefore, may not change to reflect

¹¹ If targets were set on the basis of poor estimates of the short-run inflation-output tradeoff, rebasing could be necessary. Rebasing might also be necessary if revisions to nominal GNP statistics changed the base over which targets were set. Such revisions occur frequently and sometimes significantly change historical estimates of nominal GNP.

¹² This would especially be true if rebasing were involved.

¹³ For the perspective of a former Federal Reserve official, see Stephen Axilrod, "Comments," *Monetary Policy in Our Times*, Cambridge: MIT Press, 1985, pp. 123-26. For a response to some of the arguments made against nominal GNP targeting, see Stephen McNees, "Prospective Nominal GNP Targeting: An Alternative Framework for Monetary Policy," *New England Economic Review*, Federal Reserve Bank of Boston, September/October 1987, pp. 3-9.

policymakers' intentions. If not, the cost of disinflation could remain high despite the announcement of multiyear targets for nominal GNP.

Nominal GNP targeting in the short run

Setting long-run targets for nominal GNP is relatively simple compared to the complexities of dealing with short-run economic disturbances. One of the complexities associated with short-run policy decisions is the lag between the time policymakers change policy instruments and the time those changes affect the economy. As previously indicated, this policy transmission lag creates a need for economic forecasts.

This section describes how short-run disturbances affect economic performance and how policymakers might respond to these disturbances using nominal GNP forecasts and a long-run nominal GNP target. The section also discusses potential problems with the approach. Because the issues involved are complex, the discussion begins with a description of the short-run characteristics of a nominal GNP target under the unrealistic assumptions that policymakers can predict economic disturbances before they occur and that policy actions take effect immediately. Later, when short-run policy procedures are considered, these assumptions are relaxed.

Short-run characteristics of a nominal GNP target

Short-run economic disturbances take the economy off its long-run growth path, causing fluctuations in prices and real output. As long as the price and output effects do not cancel each other out, nominal GNP will also fluctuate in response to short-run disturbances. A monetary policy with nominal GNP targets counteracts these fluctuations in nominal GNP.

The two broad categories of economic distur-

bances—demand disturbances and supply disturbances—have different implications for nominal GNP, output, and prices.¹⁴ While a nominal GNP target leads policymakers to offset completely the price and output effects of demand disturbances, it leads policymakers to accept at least part of the price and output effects of supply disturbances.

Effects of demand disturbances. Demand disturbances include changes in business or consumer confidence, changes in government spending or taxes, and changes in net exports. Examples of positive demand disturbances are a cut in taxes or an increase in confidence. Such positive disturbances cause both prices and real output to rise in the short run. As a result, nominal GNP rises. Examples of negative demand disturbances are an increase in taxes or a decrease in confidence. Such negative disturbances cause both prices and real output to fall in the short run. As a result, nominal GNP falls.

Under a nominal GNP target, policymakers would tighten monetary policy in response to a positive demand disturbance and ease policy in response to a negative demand disturbance. To tighten policy, short-term interest rates would be raised by restricting the availability of reserves to the banking system. To ease policy, short-term interest rates would be lowered by increasing the availability of reserves. Either way, monetary policy would be adjusted to offset the tendency for nominal GNP to deviate from target. By keeping nominal GNP on a fixed target in the face of demand disturbances, policymakers would keep both prices and output at their original levels.

The most obvious recent example of a demand disturbance was the reduction in business and consumer confidence caused by the October 1987

¹⁴ For a formal analysis of supply and demand shocks under a monetary policy based on nominal GNP targets, see Charles Bean, "Targeting Nominal Income: An Appraisal," *Economic Journal*, Vol. 93, No. 372, December 1983, pp. 806-19.

stock market collapse. Such a loss of confidence might be expected to lower consumer and business spending and, therefore, nominal GNP. Just as occurred under current monetary procedures, policy would be eased under a fixed target for nominal GNP. If nominal GNP were kept on target, the price and output effects of the stock market decline would be completely offset. Thus, the outcome under nominal GNP targeting would probably not have differed much from what actually occurred.

Effects of supply disturbances. Supply disturbances include changes in inflation expectations and input costs. Examples of positive supply disturbances are a lowering of inflation expectations or a reduction in food or oil prices. Such positive disturbances lower prices and raise real output in the short run. Examples of negative supply disturbances are increases in inflation expectations or increases in food or oil prices. Such negative disturbances raise prices and lower real output in the short run. Because the price and output effects of supply disturbances go in opposite directions, their overall effect on nominal GNP could be either positive or negative.

Under a nominal GNP target, the response of policymakers to a supply disturbance depends on whether nominal GNP rises or falls. If nominal GNP rises, policy would be tightened. If nominal GNP falls, policy would be eased. Either way, a nominal GNP target could not prevent prices and output from fluctuating. If policymakers held nominal GNP constant in the face of a positive supply disturbance, for example, the resulting percentage decrease in prices would necessarily equal the percentage increase in output. Likewise, holding nominal GNP constant in the face of a negative supply disturbance would cause prices to rise and output to fall by equal percentage amounts.¹⁵ Thus, a monetary policy with nominal

GNP targets could not prevent price and output fluctuations in the face of supply disturbances. However, such a policy would divide the impact of a supply disturbance equally between prices and output. This equal division is an appealing feature of nominal GNP targeting to the extent society views stability of prices and output as equally desirable.

The most obvious recent example of a supply disturbance was the increase in food prices caused by this year's drought. This supply disturbance resulted in a reduction in agricultural output and an increase in its price. Because agriculture is a relatively small proportion of aggregate production, however, overall real output was depressed only slightly, and the overall price level was raised only slightly. Thus, the price and output effects were small and offsetting. Assuming the price effects were a little bigger than the output effects, though, implies that nominal GNP rose slightly. Therefore, the recent drought might call for a slight tightening of monetary policy under a fixed nominal GNP target.

Conclusions. In summary, the response of policymakers to short-run disturbances under a nominal GNP target depends on the nature of the disturbance. Demand disturbances, which cause prices and output to move in the same direction, are completely offset. Clearly, this response is an appealing feature of nominal GNP targets. Supply disturbances, on the other hand, cause

only approximately equals the percentage decrease (increase) in output. Let Y represent nominal GNP, P represent the price level, and Q represent real output. Then $Y = PQ$. With lower case letters representing rates of change,

$$y = p + q + pq.$$

If nominal GNP is held constant, then y must equal 0. Therefore,

$$p = -q + pq.$$

Since pq is relatively small, however, p is approximately equal to $-q$.

¹⁵ Strictly speaking, the percentage increase (decrease) in prices

prices and output to move in opposite directions. By maintaining constant nominal GNP in the face of a supply disturbance, policymakers split the burden of the disturbance between prices and output. For example, in the case of an adverse supply disturbance, the percentage increase in prices equals the percentage decrease in real output. As long as society equally values price and output stability, this response to supply disturbances is another appealing feature of nominal GNP targets.

Short-run policy procedures

As discussed above, supply and demand disturbances potentially take the economy off course in the short run. The goal of short-run monetary policy is to minimize the adverse effects of these disturbances, without sacrificing long-run goals.

Monetary policy in the short run under a nominal GNP target involves adjusting policy instruments to offset any tendency for nominal GNP to diverge from target. Because of lags in the transmission of policy actions to the economy, however, policymakers must focus on nominal GNP growth forecasts rather than on the latest nominal GNP growth statistic. For example, if policymakers raise short-term interest rates today, the effect of higher rates might not be felt for six or more months. Thus, the actions policymakers take today must be based on their expectations about economic conditions six or more months into the future.

With a policy transmission lag, policymakers must determine what currently available information implies about the state of the economy two or more quarters into the future. Furthermore, with data collection lags, this current information may reflect last quarter's economy and may be subject to substantial revision. If policymakers merely react to incoming data, real output fluctuations might be exacerbated. For example, if policymakers base instrument adjustments on current nominal GNP growth, they might tend to

tighten policy near cyclical peaks and loosen policy near troughs. Such policy actions might become effective too late and, as a result, exacerbate cyclical fluctuations.

Many economic disturbances are impossible to predict and, therefore, to offset completely. However, as soon as a disturbance is observed, forecasts can be made about its effect on future nominal GNP. These effects can potentially be offset. Thus, while it would be impossible to precisely control nominal GNP in the short run, it might be possible to keep nominal GNP within a relatively narrow target range.

In making nominal GNP forecasts, policymakers need models of how the economy functions. These models could take many forms. They might be large econometric models that incorporate economic theory, judgment, and a lot of information. They might be relatively small econometric models with differing degrees of emphasis on economic theory. Or the models might be informal, reflecting expert judgment and experience, but not necessarily lending themselves to expression as a set of econometric equations. Alternatively, an average of forecasts from many models might be used in determining future prospects for nominal GNP.

The most important quality of the model or models, however, is that they provide useful forecasts of nominal GNP growth. Although the model need not precisely predict nominal GNP, it should, over long time spans, correctly predict nominal GNP's average growth rate. Because forecasts would be revised frequently—as often as policymakers met to consider short-run policy options—new information would be incorporated into forecasts as it became available. While forecast errors will doubtlessly be made, policymakers cannot, under any monetary policy that attempts to offset economic disturbances, escape the policy transmission lag. Thus, forecasts will have to be made. Success or failure of any policy will inevitably depend in part on policymakers'

ability to forecast target variables.¹⁶

Given the inevitable need for forecasts, how might forecasts be used in determining short-run monetary policy under a nominal GNP target? Each period, policymakers would forecast future nominal GNP growth based on the current setting of policy instruments. These instruments might include some combination of the federal funds rate, the discount rate, the monetary base, or bank reserves. If the forecast indicated that nominal GNP was likely to exceed target in the future, policymakers would immediately adjust instruments to tighten monetary policy. If, on the other hand, the forecast indicated that nominal GNP was likely to fall below target, policymakers would immediately adjust instruments to loosen policy.

Implicit in this procedure is a reliable relationship between nominal GNP and policy instruments. Policymakers would need to know that by adjusting instruments by a given amount, nominal GNP would be changed in a predictable fashion. Again, an economic model would be useful, and some experience required, before policymakers could pin down a reliable relationship between instruments and nominal GNP.

As an example of how policymakers might adjust monetary policy in response to an economic disturbance, consider the effect of the recent stock market collapse. Before October, major economic forecasters did not anticipate a stock market collapse and, as a result, did not incorporate a sharp fall in stock prices into forecasts for nominal GNP. Therefore, monetary policy would not have anticipated the collapse. However, after the collapse occurred, economic forecasters adjusted downward their forecasts of nominal GNP

growth. Had monetary policy been operated under a nominal GNP target, these forecasts would have led policymakers to ease policy. After the collapse, as new information indicated that the economy remained strong, forecasters raised their estimates of nominal GNP growth. Along with these revised forecasts, policymakers would have tightened monetary policy. As a result, policy under a nominal GNP target would probably not have differed substantially from its actual course.

Potential problems with the short-run policy procedure

Just as there are potential problems in setting long-run targets for nominal GNP, there are also potential problems with the procedure described for dealing with short-run economic disturbances. The two main potential problems are the symmetric treatment of price and output fluctuations under supply shocks and the emphasis placed on economic forecasts.

With nominal GNP targets, prices and output are viewed symmetrically. An increase in real output is acceptable only if it is offset by an equal decrease in the price level. But policymakers or the public may have other preferences. For example, they may regard output stability as more important than price level stability. If so, they might be willing to tolerate a substantial increase in prices to moderate the real output effect of an adverse supply disturbance. Given these preferences, sticking to a nominal GNP target would lead to excessive output volatility.¹⁷

¹⁶ For an analysis of the use of forecasts in monetary policy, see John Judd, "Looking Forward," *FRBSF Weekly Letter*, Federal Reserve Bank of San Francisco, July 8, 1988.

¹⁷ If the public views output stability as more important than price stability and supply shocks predominate demand shocks, an alternative monetary policy procedure, such as money targeting, might work better than nominal GNP targeting. For example, if aggregate demand is relatively price insensitive, the impact of supply disturbances on real output is less severe with a money target than with a nominal GNP target. See, for

Furthermore, the implementation of a nominal GNP target places great emphasis on forecasts.¹⁸ But the economic models on which forecasts are based may be unreliable. Even if the models have forecast well in the past, there is no guarantee that they will continue to forecast well in the future. Furthermore, most economic models—formal or informal—are notoriously bad at predicting recessions and recoveries. Predicting such turning points in the business cycle, however, is crucial in implementing any countercyclical policy, including a policy with nominal GNP targets or a policy with monetary aggregate targets. To keep nominal GNP on target, for example, policy would likely need to be adjusted well in advance of any predicted turning point. If turning points are not predicted, actions will not be taken to moderate cyclical fluctuations.

Given the need for nominal GNP forecasts, how should these forecasts be made? As a practical matter, monetary policy is made by a committee—the Federal Open Market Committee (FOMC). Therefore, each committee member would need to forecast nominal GNP. Because each committee member could use a different model or set of models in forecasting nominal GNP, a range of forecasts could result. For example, the range of forecasts that the Federal Reserve reports each February from the FOMC and other Federal

example, John Taylor, "What Would Nominal GNP Targeting Do to the Business Cycle?" in Karl Brunner and Allan Meltzer, eds., *Understanding Monetary Regimes*, Carnegie-Rochester Conference on Public Policy, Vol. 22, Amsterdam: North-Holland, 1985, pp. 65-67.

To resolve this potential problem with nominal GNP, a weighted average of the price level and output could be used as the target of monetary policy, with the weights reflecting society's preferences. However, such an approach would require separate price and output forecasts and defeat one advantage of nominal GNP targets.

¹⁸ See Axilrod, "Comments," pp. 123-26, and McNeese, "Prospective Nominal GNP Targeting," pp. 3-9.

Reserve Bank presidents is typically two or more percentage points wide. On whose forecast would policymakers base short-run policy adjustments? Either a consensus would have to be reached among committee members or the forecasts would have to be averaged.

In summary, there are potential problems with using nominal GNP as a guide for short-run monetary policy. Economists differ on the importance of these problems. Those economists who have confidence in economic models and their forecasting ability and who believe that price and output stability are equally important might downplay the objections. On the other hand, those who consider economic models unreliable and who value output stability more (or less) than price stability might find the entire concept troublesome.

Empirical evidence on the usefulness of nominal GNP targeting

As emphasized in the last section, policymakers must be able to forecast and control nominal GNP if nominal GNP targets are to be implemented. Furthermore, the desirability of nominal GNP targets as a guide for monetary policy depends on their potential for improving the performance of the economy. This section briefly reviews evidence on three empirical issues—the forecastability of nominal GNP, the controllability of nominal GNP, and the hypothetical performance of the economy under a nominal GNP target. Evidence on these issues is crucial in determining the viability of nominal GNP targeting. Because the evidence on these issues is mixed, the viability of nominal GNP targeting remains an open question.

Forecastability of nominal GNP

If policymakers are to use nominal GNP in the conduct of monetary policy, they need reliable

forecasts of nominal GNP six months to a year in advance. Are reliable forecasts available? Although the record of forecasters in the 1970s and 1980s has not been particularly good, forecasts of nominal GNP have been good enough to predict several important cyclical turning points in the economy.

Because the business of economic forecasting is widespread, there are too many forecasts to analyze each one in detail. Rather, two composite forecasts are examined. One is the composite compiled by Stephen McNees of the Federal Reserve Bank of Boston; the other is the Blue Chip composite compiled by Robert Eggert.¹⁹ These two composites are examined because they incorporate different sets of forecasts, different forecast horizons, and different sample periods. While the McNees composite includes primarily the forecasts from a few large econometric models, the Blue Chip composite includes, in addition to formal forecasts from econometric models, the informal forecasts of many business economists. While FOMC members would certainly look closely at these private forecasts, they would not be bound to adopt such forecasts as their own. These composite forecasts are used only as proxies for the forecasts that FOMC members might make.

The McNees composite forecasts—available from 1971 to 1985—are plotted in Chart 1. These one-year-ahead median quarterly forecasts come from five leading forecasting organizations. In comparing actual nominal GNP growth to the composite forecast, it is clear that forecasters made large errors. In particular, forecasters

underpredicted nominal GNP growth in the early and late 1970s and substantially overpredicted nominal GNP growth in 1982-83. However, over the entire sample, positive prediction errors tended to offset negative prediction errors.²⁰ Therefore, had these forecasts actually been used for short-run policy adjustment, there would have been no tendency for nominal GNP to persistently exceed or fall below target.

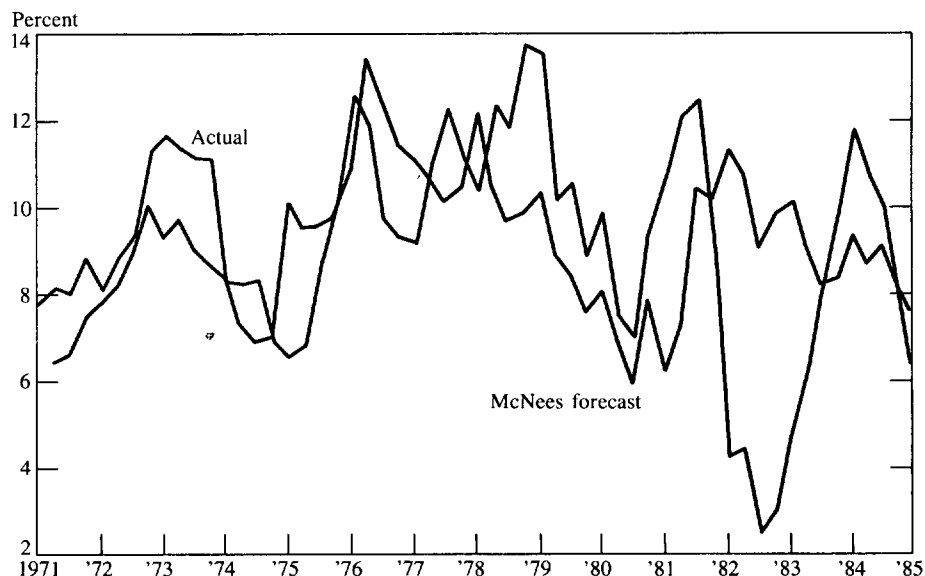
How important were the forecast errors for nominal GNP? If monetary policy had been based on nominal GNP growth forecasts during this period, a recession would not have been predicted for 1981-82. One-year-ahead forecasts for nominal GNP growth in late 1981 and early 1982 were relatively high and stable, while actual nominal GNP growth fell from over 12 percent to less than 5 percent. As a result, monetary policy would not have eased soon enough to prevent the downturn. However, because growth targets would not have been revised downward in response to the cyclical downturn, monetary policy would have been eased as forecasts of nominal GNP growth were revised downward to reflect unexpectedly weak performance. Furthermore, despite this one glaring forecast failure, nominal GNP forecasts correctly anticipated the direction, if not the magnitude, of cyclical

¹⁹ Stephen McNees, "Which Forecast Should You Use?" *New England Economic Review*, July/August 1985, pp. 36-42, and Robert Eggert, *Blue Chip Economic Indicators*, Sedona, Arizona: Eggert Economic Enterprises, Inc., various issues.

²⁰ This was not true of forecasts for inflation and real output growth. Over the same period, forecasts for the inflation rate and real output growth (not shown) contained prediction errors of roughly the same magnitude as nominal GNP errors, but these errors did not average out over time. A tendency to underpredict inflation offset a tendency to overpredict real output growth. Thus, the argument that economists understand the determinants of nominal GNP better than they understand the division of nominal GNP between prices and output may have some merit. More recent evidence compiled by McNees, however, indicates that while forecasts of inflation and real growth have improved somewhat over time, forecasts for nominal GNP have not. See McNees, "How Accurate Are Economic Forecasts?" *New England Economic Review*, Federal Reserve Bank of Boston, July/August 1988, pp. 15-36.

CHART 1

McNees composite forecast of nominal GNP growth and actual nominal GNP growth



Source: Department of Commerce and Stephen McNees, "Which Forecast Should You Use?" *New England Economic Review*, July/August 1985.

changes in most other instances. For example, forecasts indicated a need to tighten in 1972-73 as inflation was accelerating and to ease in 1974 and 1981 as the economy faltered.²¹

A slightly better picture of the quality of nominal GNP forecasts emerges from the Blue Chip consensus. Chart 2 plots the mean forecasts from this larger group of private forecasters. Unlike the McNees survey, the Blue Chip consensus does not rely primarily on forecasts from large econometric models. Furthermore, Blue Chip forecasts for quarterly growth rates of nominal GNP are available monthly from 1980

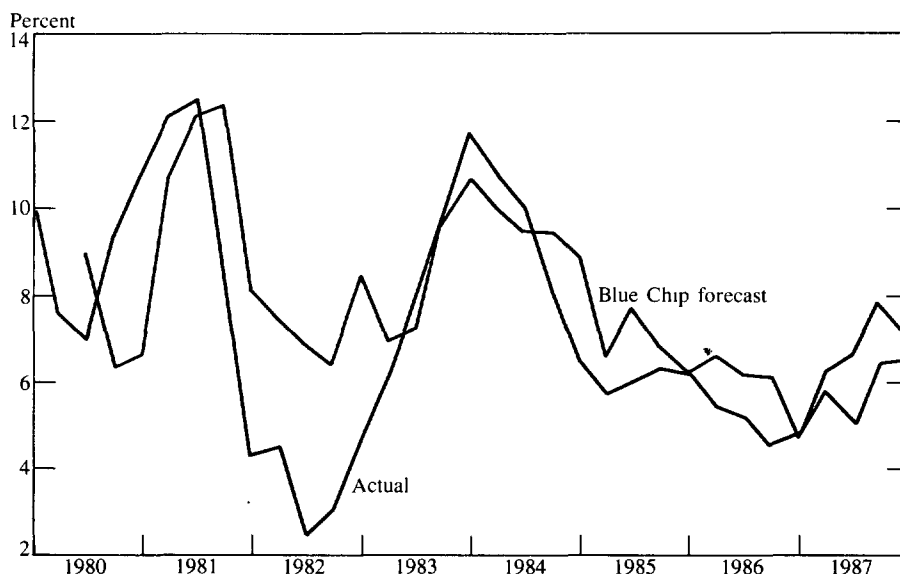
and therefore provide forecasts reaching into 1989. Each point on the chart represents a forecast of the four-quarter nominal GNP growth rate made six months earlier. For example, the observation for the third quarter of any given year is the forecast made in March for the four-quarter growth rate of nominal GNP beginning in the third quarter of the previous year and ending four quarters later.

Because the forecast horizon is shorter than in the McNees sample—six months instead of one year—it is not surprising that the forecasts are better. Using this sample of forecasters with a six-month-ahead horizon indicates that forecasters did a better job at predicting the 1982 recession. Furthermore, for the decade of the 1980s, the errors from the Blue Chip six-month-ahead forecast were relatively small. However, it is not

²¹ See also Robert Gordon, *Macroeconomics*, 4th edition, Boston: Little, Brown and Company, 1987, pp. 442-43.

CHART 2

Blue Chip composite forecast of nominal GNP growth and actual nominal GNP growth



Source: Department of Commerce and Robert Eggert, *Blue Chip Economic Indicators*, various issues.

sufficient that forecasts errors be small for nominal GNP targeting to be useful. In addition to being able to forecast nominal GNP reasonably well, policymakers must be able to exert control over nominal GNP.

Controllability of nominal GNP

While policymakers cannot control nominal GNP in the very short run, they do exert some influence over nominal GNP over longer horizons. This lack of control in the very short run is simply another reflection of the policy transmission lag. It also underscores the need for forecasts in implementing policy.

Evidence on the controllability issue comes from estimated relationships between nominal GNP and policy instruments. Two possible instruments of monetary policy are the federal

funds rate and the monetary base. Lagged values of each of these instrument variables explain a statistically significant proportion of nominal GNP growth.²² Although the federal funds rate has more explanatory power than the monetary base, in a statistical sense, past values of both the monetary base and the federal funds rate help explain subsequent fluctuations in nominal GNP growth. Thus, policymakers could conceivably

²² In bivariate Granger causality tests, the hypothesis that the federal funds rate does not cause nominal GNP can be rejected at a 0.001 significance level, and the hypothesis that the monetary base does not cause nominal GNP can be rejected at a 0.074 significance level. The sample period for the test is 1960:Q2 to 1988:Q1, and four lagged values of nominal GNP and the relevant instrument variable are included on the right-hand side. All variables are expressed in quarterly growth rates.

use these instruments to influence the course of nominal GNP.

Based on this evidence, however, it is highly doubtful that policymakers could precisely control nominal GNP. Precise control would require that policymakers offset all factors that tend to take nominal GNP away from target. Many of these factors, however, would be difficult to predict. Furthermore, the relationship between policy instruments and nominal GNP, while statistically significant, is not necessarily economically strong. In other words, it may take relatively large movements in policy instruments to make relatively small adjustments in nominal GNP.

Further evidence comes from simulation studies. For example, one study simulates a model in which the monetary base is determined by a simple formula or rule.²³ This rule represents the hypothetical behavior of policymakers under a nominal GNP target. The rule requires policymakers to make specific adjustments to the base in response to departures of nominal GNP from target. When the economy is simulated with this rule in place, the rule is found to keep actual nominal GNP close to its target. Furthermore, the rule keeps nominal GNP closer to target than alternative rules such as a constant growth rate for the base. And when the performance of the rule is compared to actual monetary policy from 1954 to 1985, the rule yields less variability in nominal GNP. Therefore, according to this study, policymakers can keep nominal GNP growing smoothly at a noninflationary rate by adjusting the monetary base.

Hypothetical performance under a nominal GNP target

Determining how the economy would have

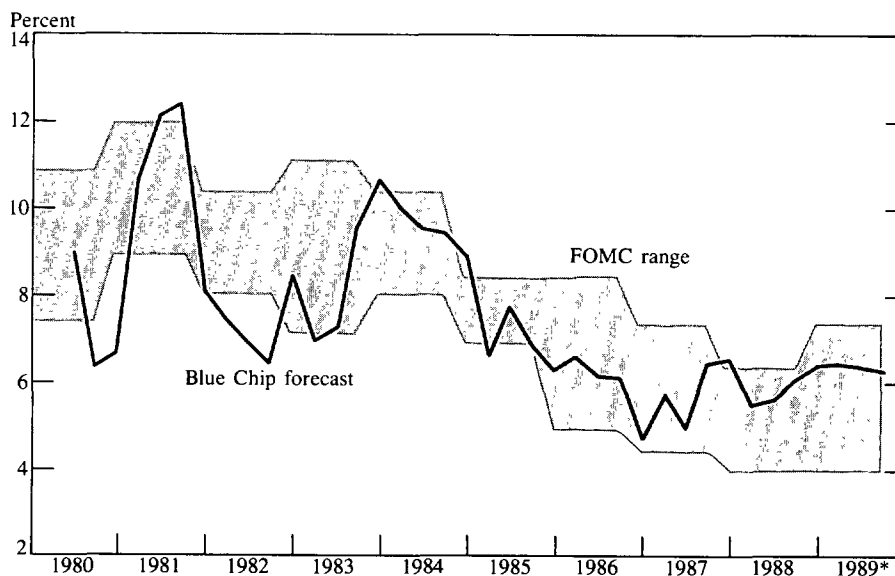
operated under a monetary policy with nominal GNP targets is a difficult task. The best that can be done without resorting to complicated econometrics is to give an idea of how monetary policy might have differed had targets for nominal GNP been in use. Because such targets were not in use, a first step in the analysis is to determine targets for nominal GNP that might have been consistent with policymakers' historical goals under actual policy procedures. Forecasts for nominal GNP can then be compared with hypothetical targets to determine if and when policy was too tight or too easy.

Hypothetical targets for nominal GNP were selected by looking at historical economic projections made by members of the FOMC and other Federal Reserve Bank presidents. Each year in February, the Federal Reserve reports on monetary policy objectives. Since 1980, FOMC members and other Reserve Bank presidents have provided their estimate of a nominal GNP growth rate range that is consistent with monetary policy objectives. These ranges, which in the last section were used as an indication of differences in policymakers' nominal GNP growth forecasts, in this section are used as hypothetical nominal GNP targets. Although the ranges have in no sense been used as targets for monetary policy, they do represent a broad indication of the kind of nominal GNP performance that would be consistent with stated monetary policy goals. It should also be noted that projected nominal GNP growth reflects not only the Federal Reserve's monetary policy objectives but also its assessment of other prospective influences on the economy.²⁴

²³ Bennett McCallum, "The Case for Rules . . . ," pp. 415-29.

²⁴ Even as a hypothetical target, the historically projected ranges for nominal GNP growth have several flaws. First, the ranges are probably too wide to serve as effective targets. They are typically over two percentage points wide, allowing for a

CHART 3
FOMC forecast ranges and 6-month-ahead Blue Chip forecasts



*Ranges and forecasts for 1989 were determined in July 1988.

Source: Board of Governors of the Federal Reserve System, "Monetary Policy Objectives," various issues and Robert Eggert, *Blue Chip Economic Indicators*, various issues.

The Blue Chip consensus forecast of nominal GNP growth (from Chart 2) is compared with FOMC projected ranges in Chart 3. The Blue Chip consensus is used once again as a proxy for forecasts that might have been generated at policy

considerable range of economic outcomes. Nevertheless, because of uncertainty about what nominal GNP growth rates might have been consistent with long-run FOMC objectives, a relatively wide range is required. Second, the ranges represent one-year targets rather than multiyear targets. Because the ranges are estimated from the actual level of nominal GNP in the previous fourth quarter to the predicted level for the current fourth quarter, they are rebased every year. Thus, if nominal GNP ended the year above target, there would be no requirement that, in the next year, it be brought back down. Finally, projected ranges for nominal GNP growth incorporate a long-term strategy for achieving monetary goals only to the extent they reflect the FOMC's long-term strategy for other variables.

meetings. It is used rather than the McNees composite because it contains more recent forecasts and therefore overlaps more of the period for which hypothetical ranges are available. Reflecting the disinflation of the 1980s, both the forecast growth rates and projected growth ranges declined over time. For most of the period, nominal GNP growth forecasts fell within their hypothetical target ranges. In particular, from 1985 to the end of the sample, forecasts did not significantly diverge from target. Thus, during this period, monetary policy would not have differed substantially from historical policy, given the hypothetical ranges.

During the period before 1985, however, monetary policy might have been somewhat different. In particular, in late 1980 and throughout most of 1982, nominal GNP forecasts fell below

the FOMC's projected ranges, perhaps indicating a need for an easier monetary policy than actually occurred. An easier monetary policy carried out in advance of these periods might have led to less severe drops in real GNP than actually occurred. Furthermore, nominal GNP forecasts made in early 1981 for six months later exceeded the FOMC's projected ranges, indicating a need for a tighter monetary policy. A tighter monetary policy in this period might have reduced the build-up of inflationary pressure and reduced the need for more drastic tightening later. Thus, had nominal GNP targeting been used during the early 1980s, the recessions of 1980 and 1981-82 might have been less severe.

This kind of evidence, however, is imprecise. When fundamental changes in policy occur, the behavior of the economy may also change fundamentally.²⁵ Thus, predictions from empirical models based on one policy regime may not hold under a different regime. Because of this fundamental problem, empirical evidence on the performance of the economy under a monetary policy based on nominal GNP targets can only be suggestive.

Despite its inevitable imprecision, however, the evidence suggests that nominal GNP targets might contribute to favorable economic performance. In periods of relatively stable nominal demand growth, such as has occurred since 1985, nominal

GNP targets may make little difference. However, in periods of sharp economic fluctuations, nominal GNP targets might make policy respond faster and reduce the severity of business cycles.

Conclusions

Nominal GNP has some theoretical appeal as a target of monetary policy. A nominal GNP target provides monetary policy an anchor by holding policymakers to the goal of long-run price stability. It provides some slack, however, to allow policymakers to reduce the adverse consequences of short-run economic disturbances. Demand shocks are completely offset, and the impact of supply shocks is divided equally between price effects and output effects. The desirability of a nominal GNP target in the face of supply shocks, therefore, depends on society placing the same value on price stability that it places on output stability.

Whether policymakers can translate this theoretical appeal into an actual policy that improves economic performance is an open question. Any such policy would require explicit nominal GNP forecasts and a long-run strategy for dealing with inflation. In the past, forecasts for nominal GNP have sometimes widely missed the mark. In the future, forecasts may not improve. Policymakers, therefore, may resist adopting a policy procedure that depends so explicitly and openly on fallible forecasts. Furthermore, policymakers may be reluctant to commit to any long-run strategy that could tie their hands in the face of unusual circumstances. Despite these problems, some evidence does suggest that nominal GNP targets could be useful tools to help policymakers achieve their goals.

²⁵ This proposition is known as the Lucas Critique. See Robert Lucas, "Econometric Policy Evaluation: A Critique," in Karl Brunner and Allan Meltzer, eds., *The Phillips Curve and the Labor Markets*, Carnegie-Rochester Conference Series on Public Policy, Vol. 1, Amsterdam: North-Holland, 1976, pp. 19-46.