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Symposium On

Countercyclical Stimulus Proposals For Single-Family Housing

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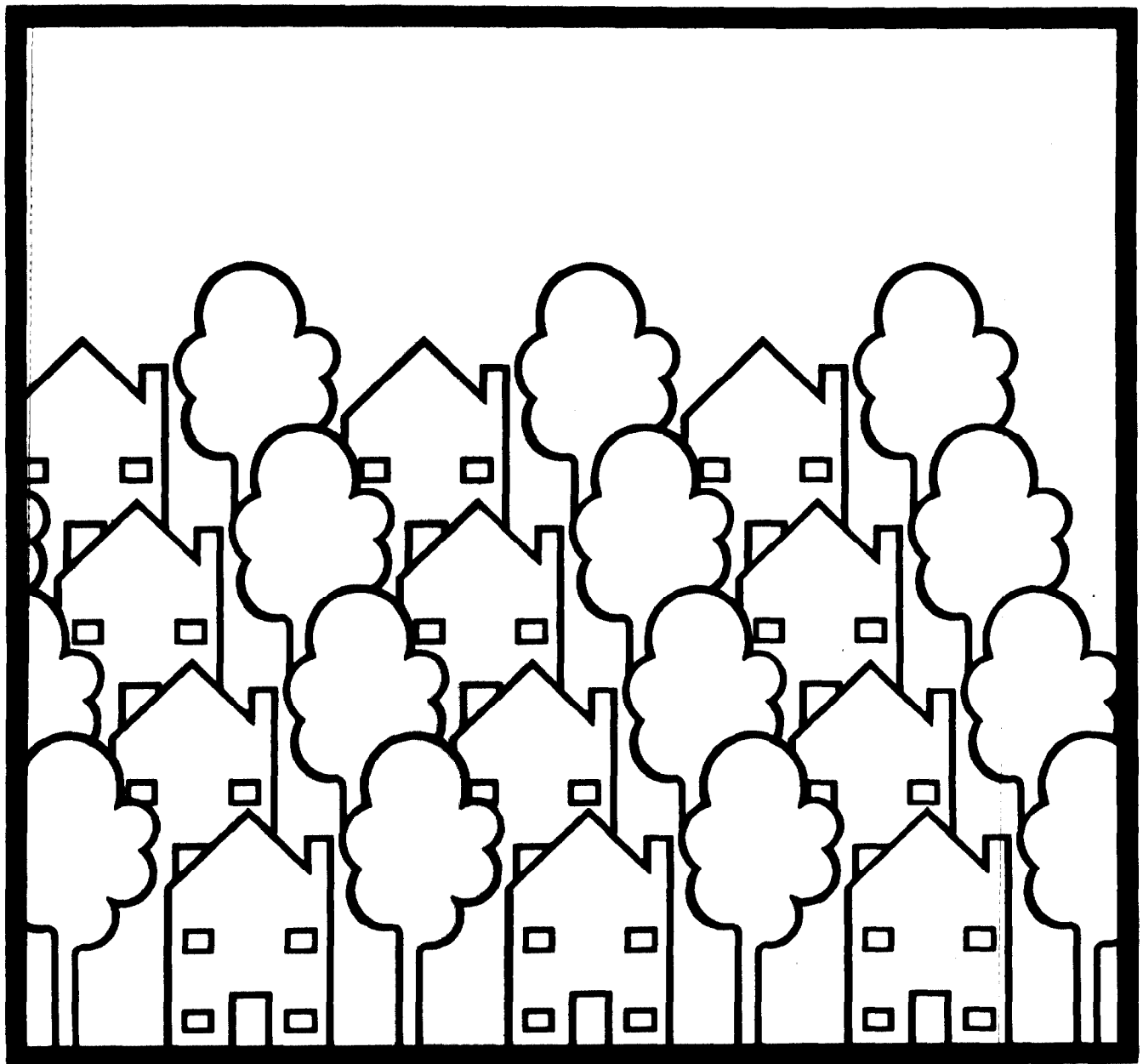

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FOREWORD

On August 31, 1982, the U.S. General Accounting Office issued to the Chairman, House Committee on Appropriations, a report entitled "Analysis of Options for Aiding the Homebuilding and Forest Products Industries" (GAO/CED-82-121). The report analyzed the causes of the current downturn in housing construction and compared a broad sample of homeownership and rental housing stimulus proposals in terms of their feasibility, speed of implementation, impact on construction and employment, and cost effectiveness. A special analysis of the problems of the forest products industry was also presented.

In conjunction with that effort, on June 21, 1982, GAO conducted a symposium on countercyclical stimulus for single-family housing. During that symposium, a large number of the Nation's leading housing experts discussed the key countercyclical housing stimulus issues and evaluated the most significant options for aiding the homebuilding industry. This report contains a summary of the day's proceedings as well as the papers presented at the symposium.

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COUNTERCYCLICAL STIMULUS FOR SINGLE-FAMILY HOUSING: A RECURRING POLICY DEBATE

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OVERVIEW

The housing industry is currently in its deepest and most prolonged recession since World War II. Homebuilding starts in 1981 fell to 1.1 million units, a drop of over 45 percent from the 2 million units started annually in 1977 and 1978. In 1982, housing starts fell still further, to annually adjusted rates hovering around 900,000.

As a result of this situation, many residential construction firms have failed, many more are in trouble, and unemployment among construction workers has soared. Last February, unemployment in the construction trades rose to 18.1 percent, which meant that 928,000 workers were without jobs. This accounts for approximately 10 percent of all those unemployed, and the rate is twice the national average. Add to this the fact that housing resales are off by perhaps 50 perhaps from an earlier 4 million units per year, and the picture indeed appears bleak.

Whether the earlier production and sales rates were normal or abnormal, and whether the current situation is primarily cyclical or secular, remains to be seen. Whether housing has absorbed too much capital in the past is a matter of argument.

What is less debatable is that the health of the housing sector (and the homebuilding industry in particular) is important to many parts of the economy. Residential construction is one of the largest sectors in the economy and serves as a trigger industry for many other businesses, such as lumber, masonry, steel, glass, and appliances.

The Policy Debate

Concern over the crisis in homebuilding has given rise to intense debate over what actions, if any, the Federal Government could or should take to aid the troubled industry. Not everyone is in agreement as to what should be done. The administration, for example, has stated that there can be no sound and stable housing industry without a sound and stable economy. It rejects short-term emergency Government intervention on the grounds that it would likely fuel inflation and thereby harm the economy as a whole. The administration and others have pointed out that housing is only one of the many industries that are currently feeling the impact of the Nation's economic recession, and they question why one industry should be singled out for help when so many others are also having difficulty.

Many members of the Congress and some industry groups feel differently--that the economy is dependent to a large degree on homebuilding and that to provide aid to homebuilding will be beneficial to the economy as a whole. A multitude of differing proposals have thus been advanced and are being contemplated.

The symposium papers in this volume were occasioned by a request from the Chairman of the House Committee on Appropriations who asked GAO to study the current recession in the housing industry. Chairman Whitten concluded that the housing recession and the effect of monetary and fiscal policies were of major importance to the Nation's economic health and requested us to conduct two comprehensive studies dealing with these issues. One study would analyze monetary and fiscal policy and the second would review existing Federal policies relating to home construction and would include an analysis of alternatives for reviving the homebuilding and lumber industries. 1/

The purpose of the symposium on single family housing was to explore possibilities for providing a short-term countercyclical stimulus for single-family housing. Another symposium which dealt with multifamily housing has also resulted in a set of papers to be published concurrently with this volume. The following are the criteria we used in evaluating the major proposals that were considered during the symposium and in our final report.

MACROECONOMIC EVALUTION CRITERIA

The rationale for any countercyclical housing stimulus program is that the subsidy (1) increases housing sales and production and hence employment above what it would have been in the near future and (2) does not in turn merely displace production and other investments by individuals and corporations but rather increases the overall level of jobs and activity in the economy, raises personal income, and increases GNP without causing excessive inflation. Thus, the principal measures of program effectiveness differ somewhat (particularly in emphasis) from those of a long-term housing assistance program but may include many of the same elements.

Net housing starts--A subsidy provided to new housing construction should produce net starts during some target period above what would be expected without the stimulus. Otherwise home buyers or builders may receive windfalls without providing economic stimulus. The target period for our analysis begins in October 1982 and ends in December 1983.

Employment increases--A subsidy should increase demand for housing and in turn other goods, which should boost employment in construction-related industries and in other sectors of the economy.

GNP changes--To ensure that an increase in housing activity is not merely offset by a decline in other sectors of the economy, a subsidy should result in aggregate net economic growth as measured by determining changes in GNP.

1/"Analysis of options for Aiding the Homebuilding and Forest Products Industries" (CED-82-121, August 31, 1982).

Inflation rate--Subsidy programs require additional Federal spending and leverage greater housing consumption, but some undersirable inflationary effects may occur. Changes in the consumer price index (CPI) and other price indexes can be used to gauge the magnitude of this unwanted, but perhaps unavoidable effect.

Interest rate changes--Increased housing demand may also inadvertently drive up mortgage and other interest rates, as home buyers seek increased mortgage credit. This may crowd out borrowing by nonassisted home buyers or for investment in other sectors. The effect on housing and non-housing interest rates measures this tradeoff.

Impact on the Federal deficit--It is imperative to weigh the merits of any housing assistance proposal against its relative impact on the Federal deficit. The ultimate cost to the Government would equal the direct subsidy expenditures plus tax revenues foregone due to increased homeownership deductions taken. The cost, however, may be reduced by tax revenues generated from an increase in GNP.

BASIC CONDITIONS FOR ANY SUCCESSFUL HOUSING STIMULUS PROPOSAL

Certain basic conditions must also be met if housing stimulus proposals are to be at all successful. These conditions can be thought of as additional evaluation criteria, but a proposal which does not meet most or all of these conditions should probably not be considered further. Programs must be implemented quickly, provide adequate incentives to buyers (or builders), and minimize program inefficiencies.

Implementation must be timely

To be effective, any countercyclical housing program must come on line when housing activity is at--or near--its low point. Because delay could cause the program to miss the low point, and possibly provide inflationary stimulus to a recovering housing market and the economy, speed of enactment and implementation are crucial and depend upon how simple a program is to implement and administer.

Adequate assistance must be provided home buyers

A housing stimulus proposal must offer home buyers the assistance they need to purchase homes if it is to be effective. Potential home buyers typically face a number of barriers in purchasing a home. These barriers can be overcome by

--making housing more affordable by lowering the real user cost of housing through a reduction in either the sales price or the mortgage interest rate,

--overcoming the "tilt" problem by lowering mortgage payments during the early years of homeownership when most households' incomes have not yet risen to cover such payments,

--helping home buyers accumulate sufficient wealth to surmount the downpayment barriers which especially impede first-time home buyers regardless of their ability to make monthly mortgage payments.

To make housing more affordable, a subsidy must be deep enough to attract additional buyers--otherwise no stimulus occurs--but not so deep as to overly subsidize buyers.

Substitution inefficiencies must be minimized

Past housing stimulus proposals have generally been thought to be inefficient because of a variety of leakages arising from, (1) credit diverted to purposes other than housing, (2) windfalls to sellers, (3) purchases by buyers who receive the subsidy but who would have bought without it at roughly the same time, (4) purchases by buyers who would have bought later but move up their purchases. However, the last group, those who move up their purchase decision, are really doing what a stimulus proposal attempts to do--moving forward consumer decisions to buy at a time when housing is in a slump and reducing demand during the next upswing in the economy. These consumers may also buy more expensive housing than they otherwise would have, which would tend to create more jobs and help the homebuilding industry. Whether or not a stimulus program which would result in moving consumer decisions forward is desirable depends heavily on the economic outlook. If strong recovery is anticipated it may prove helpful to shift starts forward. If only a weak recovery is anticipated, shifting starts may yield an even weaker recovery. The extent of these leakages have been heavily debated.

SHORT-TERM STIMULUS PROPOSALS FOR HOMEOWNERSHIP

Given high mortgage interest rates and the prospects that they may be around for some time, the alternatives we asked our symposia participants to analyze were confined to those proposals which might bring quick relief to the ailing homebuilding industry and the overall economy in terms of increased housing starts, employment, and other economic factors. The following are descriptions of the major proposals.

Temporary interest reduction

The temporary interest reduction--similar to the measure recently passed by the Congress, but vetoed by the President--would provide $3 billion over 4 years and reduce interest rates for low- and moderate-income home buyers. Specifically it would

--offer subsidies to buyers of new single-family homes amounting to the lesser of 4 percent or the difference between the market interest rate and 11 percent (unless market interest rates fall to 12.5 percent, at which point the program would terminate);

--subsidize the first 5 years of the mortgage with interest rates reverting to the unsubsidized level beginning in the sixth year;

--limit assistance to mortgages of $67,000 or below and to families earning a maximum of $30,000 per year (except in high cost areas) and for houses newly built, or substantially rehabilitated started after enactment and completed by January 1, 1984; and

--recapture the subsidy at the time of certain dispositions (limited to 60 percent of net equity).

The proposal which passed the Congress would also have utilized (1) the allocation of funds according to State population, unemployment rate, and declines in housing starts and (2) a growing equity mortgage (GEM) which increases the home buyer's contribution to principal in each of the first 5 years of ownership. Our macroeconometric simulations do not take into account either of these factors although the impact of the GEM is analyzed separately.

Permanent interest reduction

A permanent interest reduction--similar to the 1974 Brooke-Cranston Emergency Home Purchase Assistance Act (often referred to as Tandem)--would provide $3 billion to buy down the interest rate for the life of a standard fixed payment mortgage (SFPM). The Government National Mortgage Association (GNMA) would purchase these mortgages which would carry interest rates up to 4 percent below the market rate (minimum interest rate would be 11 percent) and then sell these mortgages at a discount on the secondary market. Mortgage and annual family income limits would be the same as the temporary interest reduction program. Only those houses newly built or substantially rehabilitated after enactment, but completed by January 1, 1984, would be eligible for assistance.

Home buyer tax credit

Under the home buyer tax credit (HBTC), home buyers, regardless of income, would be eligible for credits against their Federal

income taxes similar to those provided by the Tax Reduction Act of 1975. Specifically, households buying newly built or substantially rehabilitated homes which were started after enactment and completed by January 1, 1984, would qualify for a tax credit equal to 5 percent of the purchase price. The credit would not exceed $5,000.

Mortgage interest tax credit

To encourage additional mortgage investment, the mortgage interest tax credit (MITC) would make institutions with mortgage portfolios eligible for a Federal income tax credit equal to 2 percent of their mortgage interest income. Only those institutions allocating at least 50 percent of all new investments to housing would be eligible for the credit. The credit, however, would extend to all the mortgages in an eligible institution's portfolio.

Tax-exempt mortgage revenue bonds

It has been estimated that more below market interest rate mortgages could be financed by tax-exempt State and local bonds if Federal restrictions on their issuance were eased. The ability of State and local housing finance agencies to obtain low cost financing via tax exempt bond issues was limited by the 1980 Mortgage Subsidy Bond Act. This tax-exempt mortgage revenue bond (MRB) proposal would change the Act as follows:

--The spread between bond yields and mortgage interest rates (arbitrage) could increase from 1 to 1.25 percent.

--The price of eligible housing could increase from 90 to 110 percent of average area purchase price (120 percent in targeted areas).

--Instead of limiting assistance to first-time home buyers, all home buyers would be eligible for the subsidy, with income ceilings being set according to State and local discretion.

--The assistance would be limited to homes newly built or substantially rehabilitated, which were started after enactment and completed by January 1, 1984.

COUNTERCYCLICAL STIMULUS FOR SINGLE-FAMILY HOUSING: REVIEW AND SUMMARY

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INTRODUCTION

On June 21, 1982, the General Accounting Office conducted a conference on the subject of "Countercyclical Stimulus for Single-Family Housing" as part of a larger study of current conditions in the housing construction and lumber industries. This paper summarizes the conference, based on a transcript of the proceedings.

The conference brought together a large number of policy analysts and students of the housing market, including representatives of the academic community, the trade associations concerned with housing, and agencies within both the executive and the legislative branches of the Federal Government.

The conference comprised four papers, written in advance and summarized orally by the authors; formal comments on each paper by a designated discussant; and general discussion among the panelists and members of the audience. The authors of the papers were: Robert M. Buckley of the U.S. Department of Housing and Urban Development; Craig Swan of the University of Minnesota; James Alm and James R. Follain, Jr., of Syracuse University; and Patric Hendershott of Ohio State University and the National Bureau of Economic Research. Their papers were discussed, respectively, by Kent W. Colton of Brigham Young University; James Kearl of Brigham Young University; Martin D. Levine of the Congressional Budget Office; and Douglas B. Diamond, Jr., of North Carolina State University and the U.S. Department of Housing and Urban Development. Anthony Downs of the Brookings Institution served as chairman.

The conference was divided into two sessions, with two papers and the corresponding discussion in each session. In the first session, at which the papers by Buckley and Swan were presented, primary attention was given to the economic impacts of housing stimulus programs in general; in the second, the focus was on specific stimulus proposals and comparison of alternatives. (The distinction should not be overstressed, however; all four papers addressed both general issues and specific proposals, and discussion in both sessions ranged widely.) This summary paper follows that categorization, as a convenient organizational principle. It does not attempt a chronological summary of the conference; remarks made at different times during the day may be juxtaposed in this summary, if they appear to be germane to the same subject.

Panelists at the conference were asked to consider five specific stimulus proposals:

(1) a temporary interest rate subsidy, patterned after the Lugar bill;

(2) a permanent interest rate subsidy, patterned after the Government National Mortgage Association (GNMA) Tandem plan;

(3) expanded usage of tax-exempt financing, such as local mortgage revenue bonds;

(4) tax incentives for mortgage investors, such as a mortgage interest tax credit;

(5) a tax credit for home buyers, such as that enacted in the 1975 Emergency Housing Act.

Panelists and the audience were also invited to propose other alternatives. However, the bulk of the discusison revolved around the Lugar bill, as the most specific alternative and the one closest to enactment at the time of the conference. Much of the discussion of general issues used the Lugar bill as the point of departure.

MACROECONOMIC ASPECTS OF COUNTERCYCLICAL HOUSING PROGRAMS

Both macro- and microeconomic questions relating to housing stimulus proposals received attention during the conference, but the emphasis was predominantly on the former. In opening the conference, William Gainer of the General Accounting Office referred to the continuing recession in housing as providing the impetus for the conference and the larger GAO study; he mentioned the level of housing production and the unemployment rate as particular concerns, and the importance of housing both to related industries, such as lumber, and to the economy in general.

Buckley's paper, the first presented, characterized the present macroeconomic situation as "inefficient"; referring to the Accelerated Cost Recovery System enacted in 1981, he observed that, "For nonresidential investment to decline after the enactment of this massive tax break to encourage it, something fairly serious must be wrong with macro policy." He raised the possibility that stimulating housing might prove to be a relatively effective means of stimulating the overall economy, because of the labor-intensity of housing and its greater short-run responsiveness to interest rate changes, compared to other major sectors of the economy. During the subsequent discussion, Henry Schechter of the AFL-CIO argued for housing stimulus as a means to promote general economic recovery, stating that "There is some history that shows it can help us get out of the recession." He also argued that "housing is a large part of the macroeconomy and you have got to start somewhere." George Genung of the National Association of Home Builders also stressed the importance of a stimulus from the standpoint of the housing construction industry.

Interest rates

The problem of high interest rates, both real and nominal, was stressed by all four panelists at the first session and several other speakers. Hendershott, Colton, and Swan all argued that the high real and nominal rate levels were the main problem for both housing and the economy and attributed them to a tight monetary

policy, which was in turn induced by the highly stimulative fiscal policy expected over the next few years. Buckley also attributed the low level of nonresidential capital investment, as well as housing construction, to the high degree of future fiscal stimulus now in prospect. Hendershott advocated budget cuts for fiscal years 1984 and 1985 as being much more helpful to housing than any industry-specific stimulus program. Swan felt that, if Government deficits were controlled, then it would be possible to adjust the monetary and fiscal policy mix to bring down interest rates; in that event, "I see nothing that would prevent a market recovery for housing . . . when macro policy turns around, I fully expect that homebuilding activity would turn around." (Genung, however, favored the Lugar bill in the interim before macroeconomic policy could be changed: "We are going to have to keep things going until interest rates get better.")

Swan's remarks came in reply to Kearl, who, while recognizing the importance of interest rates in the current housing situation, argued that the high level of short-term Treasury borrowing rates had little to do with prospective deficits 2 or 3 years into the future, although long-term rates might be explainable in terms of future deficits relative to projected future savings. Schechter attributed high short-term rates to the need for business and municipal governments to restructure high volumes of short-term debt in the near future, in addition to Federal borrowing; these all contributed to "an overcrowded market." The basic cause, in his view, was the budget deficit generated by the tax cut.

The general thrust of the discussion of interest rates thus appeared to be that high long-term rates might well be attributable to concerns about future budget deficits and fiscal policy; high short-term rates were more problematical, but possibly resulted from the same cause.

The impact of housing stimulus

Assessments of the macroeconomic impact of the housing stimulus programs depended significantly on the analyst's general approach to macroeconomics. As Buckley and Swan noted, monetarists would expect little or no increase in aggregate economic activity from a housing stimulus program; Swan distinguished between "hard-line" monetarists who would expect both nominal and real GNP (gross national product) to be unaffected, and "less rigid" monetarists who might concede that there would be some short-run increase in employment and real GNP, "but such impacts would clearly be temporary and of second-order importance." Keynesian macroeconomists, on the other hand, would expect some increase in aggregate employment and output through the increased Government spending (and possibly induced private investment), even if monetary policy were unchanged.

Another key factor affecting the impact is the elasticity of supply of housing finance. If the supply is essentially fixed and unresponsive to interest rates (at least in the short run), then

any stimulus program may simply drive up mortgage rates rather than increase housing production, as the assisted buyers compete with, and "crowd out," unsubsidized buyers. Alternatively, if the supply of mortgage money is fairly elastic, then a stimulus program will have more impact on homebuilding and less on mortgage rates.

A stimulus program might itself contain a mechanism to increase the supply of mortgage money, rather than having to rely entirely on the market response. Swan argued that only the Tandem plan contained any such mechanism. The plan involves mortgage purchases by the Federal Government, and the Government's borrowing to finance the purchases would probably not come dollar-for-dollar out of the mortgage market; at least until the Government resells the mortgages, which might occur after a substantial lag, they would be financed by an increase in the Federal deficit.

It should be noted that Swan explicitly excluded tax-exempt financing from his list of alternatives; presumably some part of the funds for mortgage revenue bonds would not come from the mortgage market, at least initially. (Buckley, however, argued that the tax-exempt sector would be particularly affected by any mortgage subsidy plan, which would imply an especially large effect from issuance of mortgage revenue bonds.)

Few participants specifically described their opinions about the supply of mortgage funds, but Swan indicated during the general discussion that most seemed to believe the supply was not fixed. One who took a different view was Hendershott, who argued that the Federal Reserve Board was not likely to "accommodate" any housing stimulus program: "After all, if it wishes to stimulate aggregate demand, nothing prevents it from doing so even in the absence of a housing construction subsidy." Without such accommodation, interest rates would be driven up, and the increase in economic activity curtailed. A major reason for the rise in interest rates would be the increased private borrowing necessary to finance the new homes, which would be several times the amount of Federal budget outlay under the Lugar bill.

Robert Van Order of HUD agreed with Hendershott that monetary policy would be unchanged: "The Fed will do what the Fed will do." But Van Order viewed housing stimulus programs as being stimulative even if they had no impact on housing; by reducing the cost of buying a new home, the program was equivalent to a lump-sum tax cut for the buyer, and his or her reaction to the tax cut would generate economic activity through a standard Keynesian multiplier effect.

The "substitution effect" of stimulus programs

The panel agreed that the impact of a housing stimulus program should be measured not by the total number of subsidized starts, but on the extent of net new housing production. The degree of substitution of subsidized for unsubsidized starts was recognized as fundamental for policy analysis; it was extensively discussed at

the conference, as it has been in many past debates on housing policy. Several panelists attempted to quantify this substitution.

The first estimate was offered by Buckley in the first paper presented, and it became a kind of benchmark for later discussion. His estimate was that 20 to 25 percent of the subsidized homes would be incremental starts, homes that would not have been built in the absence of the subsidy. The estimate was based on previous work by George von Furstenberg of Indiana University, who studied the effect of the GNMA Tandem plan during the 1974-1975 housing downturn; Buckley adjusted his figure of 35 percent downward, based partly on the difference between the earlier Tandem plan and the Lugar bill, and partly on the changes in the housing market that have occurred in the intervening years. Hendershott felt that this number should be adjusted downward still further, because the cost of homeownership relative to renting had risen sharply in the last few years, and few households would respond to a shallow subsidy such as the Lugar bill offered; Buckley felt these factors were included adequately in his adjustment.

Swan offered two ways of estimating the fraction of subsidized starts that were incremental. The first was taken from a GAO evaluation of the 1974-1975 Tandem plan, in which "expert" opinion (Swan's quotation marks--he was himself one of the experts) estimated that between 10 and 18 percent of the subsidized starts were incremental; the second involved inferences by Swan from econometric models developed by Hendershott and by Dwight Jaffee of Princeton University and Kenneth Rosen of the University of California. Swan guessed that his "weighted average result of these would come out a little over Buckley's estimate of 20 to 25 percent." Discussing Swan's paper, Kearl argued that models and other evidence from the mid-1970's were inapplicable to current conditions, in which real (not nominal) interest rates have been fluctuating sharply; he felt that Swan's estimates were probably too low. But Kearl also raised the possibility that there would be no positive impact on starts at all, because financial markets would react sharply to the passage of a housing subsidy, reading it as a sign of future increases in the deficit as other industries sought relief from current interest rates, and hence of future inflation.

The other specific estimate presented at the conference was a 33 percent figure, derived from a model simulation conducted for GAO by Regional Data Associates, utilizing the Jaffee-Rosen model.

While a range of estimates and methodologies were presented during the conference, there seemed to be some consensus among the participants. Nobody offered an estimate as large as 50 percent--meaning that nobody thought that as many as half of the subsidized starts would be incremental. In the course of the day, various participants (for example, Tony Sulvetta of Justin Associates, and Hendershott) used the 25 percent upper bound of Buckley's estimate for the purposes of their own analyses.

After extended discussion about macroeconomic impacts, chairman Downs conducted a vote among participants. The results suggested that even the 25 percent figure was thought to be too high: 27 people expressed the view that the stimulative effect would be between zero and 25 percent of the size of the program; 12 placed it between 25 and 75 percent; and only one (Van Order) expected a larger impact. This is rather surprising; it appears to imply a strongly monetarist consensus although several participants besides Van Order had indicated a Keynesian predilection, either explicitly or implicitly. Given a 25 percent incremental impact, as suggested by Buckley, and the commonly used short-run Keynesian multiplier between 1 and 2, the consensus should have been for the middle range (i.e., somewhere between 25 and 50 percent). An alternative interpretation is that many participants felt that 25 percent was an overestimate of the incremental impact of a subsidy program.

At various points in the discussion subsequent to the vote, participants spoke as if they interpreted the vote to imply a more stimulative impact than the results would appear to suggest; thus Swan referred to a rather elastic supply of mortgage funds, and Kevin Villani of HUD to the possibility of creating jobs within the economy by shifting resources to housing from other sectors, as being consistent with the voting pattern.

Employment impact

The high unemployment rate among construction workers was one of the key concerns of the conference organizers, and several participants offered estimates of job creation from housing stimulus programs. Genung offered an NAHB estimate of 70,000 jobs resulting from the Lugar bill. Sulvetta calculated that between 85,000 and 130,000 would be generated by the bill, assuming that 25 percent of the starts were incremental. Also, since the average construction period for a house is less than 5 months, these jobs would be created quickly, within the next calendar year after enactment of the Lugar bill, with quick implemenation. Sulvetta contrasted this with the much slower rate of job creation for public works or CETA (Comprehensive Employment and Training Administration). Hendershott also mentioned the timing of the stimulus as an argument for a stimulus program; if enacted now, starts might occur during the 1982 building season in the Northeast and Midwest.

Sulvetta's estimate was based only on the number of incremental starts. However, Kearl pointed out that, to the extent that buyers were encouraged by the subsidy to purchase larger homes, job creation would also occur. Expanding on this point, Swan offered an estimate of 65,000 jobs from the Lugar bill--55,000 from the incremental starts (again, 25 percent of the total), and 10,000 from a 6 percent increase in house value for the non-incremental starts. The last figure was derived by Swan from the Alm-Follain paper, which estimated the impact of the various stimulus programs on the value of homes purchased.

The Swan estimate was lower than the lower bound of Sulvetta's range, even though Swan included job creation from larger homes and Sulvetta did not. While there was no explicit discussion of the reasons for the differences, several possibilities exist. Sulvetta apparently assumed that the Lugar bill would assist about 20 percent more housing units, and he included employment effects in the industries providing building materials for housing; it is not clear if Swan's "back of the envelope" calculations did also. (Genung's estimate of 70,000 jobs did not.)

Sulvetta made the point, in response to a comment by Schechter, that his estimates did not include the full multiplier effects throughout the entire economy, as would be expected in a standard Keynesian analysis. However, Swan argued that, for program evaluation purposes, it was appropriate to exclude these multiplier effects, because all stimulus programs would have them.

Some participants stressed the importance of macroeconomic policy in the context of the job creation issue. Thus, Buckley indicated that despite the possibility of job creation through housing stimulus programs, "given the current conditions and my expectations about the economy," there would be no net job creation. Buckley also felt that much current unemployment is long term, rather than cyclical, and thus might be better addressed through CETA or some other job training program, whether or not there was a "timing" difference in job creation, as suggested by Sulvetta. Buckley also questioned the redistributional impact from housing stimulus that helps construction workers, at the same time that there are cutbacks in job training programs for the poor.

While the current unemployment rate in construction is twice that in the economy at large, Swan pointed out that this relationship had held throughout the postwar period, and was not unique to this or other housing recessions. Sulvetta replied that the mix of unemployment among construction workers was different in the current recession; in the past, skilled construction workers had generally been able to get jobs in other industries during housing downturns, while unskilled workers had absorbed the brunt of unemployment; now both skilled and unskilled workers were going without jobs.

Budget impact

Perhaps the most serious difficulty in estimating the net impact of a stimulus program is the fact that most alternatives provide assistance only for a specific number of units during a time period, many fewer than are actually built and sold. This makes it especially difficult to determine how many of the assisted buyers would have actually bought homes during that period without the program.

The converse of this problem is that, without some such limitation, it is harder to estimate the budget impact of the stimulus program, because the number of units eligible for assistance cannot

be determined in advance. Swan and Levine gave particular attention to the budgetary implications of the various options.

The downpayment tax credit is the least "controllable," in the budget sense; it is available to all new home buyers. For the expenditure programs, the budget planning process is easier, but the outlays cannot be forecast perfectly. The subsidy under the Lugar bill depends on the course of interest rates over the following 5 years, and the date of subsequent sale and recapture; both must be forecast. For the Tandem plan, it is also necessary to forecast interest rates; indeed, the forecast here is more important, since the net budget impact depends entirely on the difference between the interest rates at which the Government buys and sells the mortgage, and the Government has some discretion in timing the sales. Thus budget outlay can never be projected with absolute certainty for any alternative; but the range of error is probably smallest for the Lugar bill, and largest for the downpayment tax credit. (Again, the mortgage revenue bond was not specifically discussed in this context, but since the decision to issue bonds is left to State and local governments, within a total volume limit set by the Federal Government, it is probably more difficult to forecast Federal revenue losses from tax-exempt financing than outlays under either the Lugar bill or the Tandem plan.)

Income limits

Most proposed stimulus programs have some limitation on the incomes of those receiving the assistance, and this feature attracted some discussion. Swan noted that, "if one is only interested in stimulating construction employment then there is little reason to include such restrictions. . . . As a general proposition it must be true that more limiting restrictions cannot increase the likely number of subsidized buyers." But such restrictions serve an equity purpose, limiting the assistance to relatively low-income households (though typically still within the upper half of the income distribution). Schechter noted that the limits may serve to target assistance to those who would not otherwise be able to buy, and thus increase the net stimulative impact of the program.

Reaction to housing stimulus programs

In the course of the conference, many participants indicated that one particularly undesirable feature of any housing construction industry stimulus was that other industries with severe economic problems would seek help from the Government in turn. If enacted, these further "bailouts" would increase the size of the Federal deficit. For this reason, the financial markets would react quite unfavorably to a housing stimulus program, even an inexpensive one along the lines of the Lugar bill. This point was made by every panelist during the first session, and several other participants; Swan described it as a "significant additional cost associated with any housing subsidy plan."

As against this consensus view, Buckley and Villani suggested other scenarios. The former raised the possibility that, if interest rates were expected to come down within a few months, a stimulus for housing might be desirable and the pressure for help for other industries would not build up before rates came down; however, this was not his expectation about interest rates. Villani thought that a bailout for housing now might reduce political pressure on the Federal Reserve to expand the money supply, rather than being the first in a series of bailouts, but did not indicate if he thought this scenario more likely.

Chairman Downs shifted the discussion from the economic implications of housing stimulus proposals to their political significance. He noted that,

> "there is no program whatever that is likely to be even proposed . . . that would 'save' the homebuilding industry. . . . Rather, the most that any such bill would do . . . is make a symbolic gesture of concern toward the industry, which does provide something for some people, essentially shows that Congress is interested in helping the industry in some way or another. And that is in fact the way Congress acts most of the time anyway."

MICROECONOMIC ISSUES

There seemed to be general agreement among conference participants that housing and mortgage markets were reasonably efficient, and that housing stimulus programs were not necessary in order to overcome any market imperfections. Kearl contrasted the present situation with earlier cyclical downturns, noting that problems of credit availability, stemming from Regulation Q and other credit market constraints, would have been regarded as the source of the cyclical problems. But at present, unlike 10 years ago, "we are not arguing that it is an inefficient cyclical downturn." Buckley also noted that "the 1980-82 downturn cannot be blamed as past downturns have been on the structure of the mortgage finance system which would not allow mortgage borrowers via the thrift industry to compete for funds."

The main dissent from this position came from Colton. Without denying the seriousness of the situation in the housing industry, he felt housing policy should address longer term structural problems in the housing finance system: "We go from crisis to crisis and never address the basic kinds of issues." Buckley took sharp issue with this view. Later in the general discussion, Colton clarified his remarks to indicate that the mortgage delivery system was more efficient than it had formerly been, but that there were still a number of residual problems stemming from the lingering effects of Regulation Q.

There was also some discussion of long-run changes in the housing market. Kearl raised the possibility of a decline in demand resulting from demographic changes and from high real

interest rates necessary to facilitate reindustrialization. Colton noted that most projections of long-term housing demand indicate a decline in the late 1980's or early 1990's, and questioned whether it was desirable to attempt to stimulate housing production in the next few years, given these projections; he advocated aiming for a production level of 1.3 to 1.6 million units annually. Genung forecast that typical new houses would be about 1,200 square feet in the future, compared to the current 1,700 square feet, as costs increased. Both Follain and Betsy Qutb of the National Association of Home Builders expressed concern that the costs of owner-occupancy have been rising rapidly in recent years, while land and house prices have been falling, reducing the desirability of owner-occupancy. Colton suggested that this may be part of the long-term shift in the housing market. The general purport of these scattered remarks was that the longer term outlook for housing construction is not particularly promising, quite apart from its current, presumably cyclical, condition.

COMPARISON OF STIMULUS PROPOSALS

Participants tended to focus on the Lugar bill, as by far the most specific proposal before them, and to constrain the other alternatives to a similar size and scope, in order to facilitate comparison. Thus, while it was generally recognized that the GNMA Tandem plan would involve a much larger budget outlay than the Lugar bill, if it were to assist the same number of units, discussion of the Tandem plan was usually based on the assumption that the total budget outlay would be the same, in a present value sense.

Countercyclical vs. long-run options

The purpose of the conference was to evaluate possible programs which could stimulate housing in the "short run," perhaps the next year to 18 months. Several panelists felt that one of the 5 listed options--the mortgage interest tax credit for investors--did not fall into this category, but was rather a long-term permanent change in the structure of the housing finance system. Colton, who was staff director for the President's Commission on Housing during 1981-1982, noted that the credit had been proposed by the commission, but as a means of facilitating the continuing structural transition of the housing finance system, not as a countercyclical program. Hendershott presented the most systematic analysis, concluding that the credit was a major new subsidy to to housing which might be an effective means of channeling credit to housing in the long run, but was probably an inefficient countercyclical device; the costs to the Treasury, which are nearly proportional to the mortgage rate, would be greater, the higher the interest rate, and therefore the lower the benefit to the home buyer. The only favorable reference to the credit was a passing suggestion by Buckley that the credit could be used countercyclically in combination with new types of mortgage instruments, but he did not elaborate on the idea.

Two other proposals received brief mention, but were dismissed as being long-term and inappropriate as countercyclical strategies: the Individual Housing Account (a tax-exempt Savings Account, similar to the Individual Retirement Account, to be used only for the downpayment on a home), and permitting withdrawals from IRA's for downpayments.

With these proposals set aside, participants concentrated on the remaining four as potential countercyclical devices. Some participants also discussed alternative mortgage instruments, notably price level adjusted mortgages (PLAM's) and graduated payment mortgages (GPM's).

Program differences

Kearl presented a "straw man" argument which proved to be an effective method for highlighting differences among the countercyclical options. He suggested that the form of the subsidy did not affect the extent to which a program was stimulative, but only the dollar value mattered: "For an appropriately calculated equal subsidy, you have got to have the same effect . . . . You have got to get a flow of capital to this market . . . and it doesn't matter how you do it, if it is an equivalent buydown of the real cost of capital." In response to this, four or five "real" differences among the options were brought forward.

The tilt problem

The most basic of these, which Kearl acknowledged in making his argument, is the extent to which the subsidy is concentrated at the point of purchase, or in the early years of the mortgage. Throughout the conference, panelists distinguished between the high real and nominal mortgage interest rates (or the high real user cost of housing), and the extent to which potential buyers suffered from a cash-flow problem, meaning that they could afford a home, based on their long-term prospective income and long-term housing costs, but current income was inadequate to qualify for a mortgage. Of the stimulus proposals, only the Lugar bill addresses this problem, in the opinion of most participants who discussed the issue; the GNMA Tandem plan and the mortgage revenue bonds provide a uniform cost reduction to the home buyer over the life of the mortgage. This was generally seen as an advantage of the Lugar bill.

The downpayment tax credit was generally ignored explicitly in discussions of the "tilt" problem. However, Buckley included "downpayment constraints" with cash-flow problems, and noted that "low downpayment loans" overcome this problem; by inference it would seem that the downpayment tax credit would fall into this category as well as the Lugar bill, since it shortens the period of time needed to accumulate a downpayment.

The tilt problem is also addressed by PLAM's, GPM's, and other alternative mortgage instruments. Villani argued that these

instruments provide relatively free and costless mechanisms for doing so, and also that builders could themselves mitigate the problem by provididng their own buydowns, without recourse to the Federal Government. However, Jayne Shontell of the Federal Home Loan Mortgage Corporation commented that the GPM was not a particularly desirable mortgage from the investor's point of view, and Betsy Qutb of the National Association of Home Builders noted that the partial buydown feature of the Lugar bill was less attractive to investors than the fixed-rate mortgage subsidized under the GNMA Tandem plan.

Insofar as the problem of qualifying for a mortgage is related to the state of the economy--that is, households' current incomes are low, or they have been slow to accumulate assets, because of the recession--then proposals addressing the tilt problem are likely to be more effective countercyclical devices than long-term subsidies. Moreover, some participants, most notably Buckley and Villani, appeared to treat the tilt problem as a market imperfection which should be addressed regardless of the general state of the housing construction industry, although others, such as Hendershott, regarded it as a diminishing problem given this widespread use of builder and owner buydowns.

Tax-exempt financing

Every panelist who discussed expanded use of local mortgage revenue bonds referred to an excess cost of tax-exempt financing compared to other stimulus programs. Tax-exempt bonds generally impose a revenue loss to the Federal Government greater than the interest saving to the State or municipality (and in the present case to the mortgagor as well), because the difference between the tax-exempt and taxable interest rates is determined by the tax bracket of the marginal investor in tax-exempt securities, while investors in higher brackets save more in taxes. For example, with a tax-exempt rate of 10 percent and a taxable rate of 15 percent, investors in the 33-percent tax bracket will have a tax saving just equal to the Federal Government's revenue loss if they buy tax-exempt bonds, but investors in the 50-percent bracket will save more. For example, suppose the taxable interest rate is 15 percent and the tax-exempt rate 10 percent. This means that the investor in the 33-percent tax bracket will be the "marginal" investor, indifferent between the two securities: if he switches from taxable to tax-exempt bonds, his taxes will fall by 5 cents per dollar of principal amount on the bonds, which corresponds exactly to the interest saving for the State or local government. But for an investor in a higher bracket, such as 50 percent, taxes fall by 7-1/2 cents for each dollar, while the interest savings to the state or municipality is the same. Thus the Federal Government loses 2-1/2 cents per dollar more than the State or local government gains.

This common criticism applies to mortgage revenue bonds as well as tax-exempt securities. It does not apply to any of the other stimulus proposals; for all of these, the cost to the Federal Government is the same as the savings to the home buyer.

Non-linear impact

Hendershott argued that there is presently "substantial disequilibrium" in the housing market which reduces the demand for additional homes. This occurs because the cost of owning has risen rapidly in recent years, relative to renting, so that few renters are likely to be "near the margin of shifting to owning" because the price of existing homes is very low in many parts of the country and because many current owners have mortgages carrying interest rates well below the current market rate. For all these reasons, few households are likely to respond to a shallow new home subsidy, such as that provided by the Lugar bill, tax-exempt financing, or the downpayment tax credit. However, the GNMA Tandem plan, offering a much more substantial subsidy per unit, is likely to have some impact on the housing market, which would be disproportionately greater than the difference between the subsidies might indicate. The Tandem plan subsidy would be "deep enough" to reach households not presently close to buying a new home. This analysis was subsequently questioned by Swan and Kearl.

Administrative costs

Villani raised the possibility that the costs of administration could differ among the stimulus programs. There was virtually no discussion of this, however. Levine mentioned "low administrative costs" as an advantage of the downpayment tax credit.

Targeting

Diamond argued that it would be easier to target expenditure programs, such as the Lugar bill and the Tandem plan, to buyers who were particularly a concern of public policy--that is, within a certain income group, or located in a certain area. He stressed that it would be difficult to target the downpayment tax credit, or other tax incentives, to first-time home buyers. Geographical targeting would appear to be difficult also for tax-exempt financing; Outb pointed out that jurisdictions with higher credit ratings would have more favorable terms in the bond market.

Other differences

In the course of the conference, a few other distinctions among the stimulus proposals were noted more or less briefly. Since they were not mentioned specifically in response to Kearl's "straw man" argument, it may be that participants viewed them as minor; but they are mentioned here for completeness.

Villani cited past studies of the GNMA Tandem plan showing that builders were able to capitalize "a good part" of the subsidy into the price of the home, rather than passing it on to the buyer, because the subsidy is restricted to a relatively few homes in the market. He noted that the same problem could arise with the Lugar Bill. Swan also made this point, which would appear to apply

to all of the mortgage subsidy programs, but not to the downpayment tax credit, which would be available on all new homes. It would probably be most serious for the Tandem plan, which has the deepest subsidies, available on the smallest number of homes.

A truly countercyclical program should start and terminate according to some measure of economic conditions. This is provided in the Lugar bill, which has a "trigger" turning off the program when mortgage rates drop below 12-1/2 percent. Such a mechanism could also be incorporated in the Tandem plan, though it has not been in the past; instead, a subsidized interest rate has been specified in the law. Tandem mortgages would become undesirable to borrowers if mortgage rates fell below the specified subsidized rate (which they did not). In theory, either limitation could be applied to mortgage revenue bonds, but there was no discussion of the idea.

Swan noted that a limitation would be difficult to apply to a tax credit; any limitation would have to be based on the date of purchase, and it would be hard to forecast in advance whether recovery would occur by any specified termination date.

The Lugar bill: special issues

Some provisions of the Lugar bill received particular attention at the conference. These were features not found in any of the alternatives, in some instances because the alternatives were less well specified. They were also provisions which could be modified or deleted without changing the basic thrust of the bill.

Geographical targeting

The bill allocates funds to States on the basis of population, unemployment, and decline in housing starts. Several participants--among them, Diamond, Hendershott, Sulvetta, and Irving Welfeld of HUD--criticized this formula for directing too large a share of assistance to the Northeast and Midwest; Hendershott felt this would guarantee excess capacity for assistance in depressed areas. However, Buckley pointed out that the States with high levels of housing production were generally low-price States (except California), so the loan or price limits would tend to target funds to the South and Southwest.

Recapture

The bill contains a provision that the assisted home buyer must repay the amount of the subsidy when he or she sells the house, or half of the increase in equity, whichever is less. Interest would not be charged on the subsidy, so that, even if it were repaid in full, the buyer would still have received an interest-free loan.

Alm and Follain estimated that recapture had relatively little impact on the stimulative effect of the Lugar bill, even if

interest were charged on the subsidy; they therefore favored the latter. However, other panelists opposed recapture, with or without interest. Diamond termed it "essentially an element of uncertainty," and felt many potential buyers would wonder if it would ever be enforced. Colton thought it a good idea conceptually, but difficult to administer over an extended period of time. Hendershott calculated that it would wipe out the value of the subsidy entirely, if interest rates were to fall by 1 percentage point per year over the life of the subsidy.

The GEM mortgage

For the same period that it provides an interest rate subsidy, the Lugar bill requires the homeowner to prepay principal on the mortgage. This feature is known as the growing equity mortgage, or GEM. It enables the home buyer to adjust gradually to the unsubsidized interest rate in the sixth year without confronting an extraordinarily large increase in mortgage payments.

There was general dissatisfaction with this aspect of the bill. Alm and Follain felt that it greatly reduced the stimulative effect of the buydown, and was thereby counterproductive. Welfeld preferred simply reducing the subsidy as the household's income rose, which would make the program less expensive. Grace Milgram of the Congressional Research Service noted that the GEM is a new mortgage instrument, which lenders are not familiar with; it might therefore delay the effective implementation of the program.

Ranking the alternatives

Both of the papers presented at the second session compared the alternatives and presented a rank ordering reflecting the preferences of the authors.

Setting aside the mortgage interest tax credit because it was both a long-term proposal, rather than countercyclical, and an expensive one, Hendershott divided the other four alternatives on the basis of the depth of subsidy. Of the two deep subsidies, he preferred the GNMA Tandem plan to the mortgage revenue bond, because the latter involved costs to the Government beyond the subsidy to the buyer. He termed the Lugar bill and the downpayment tax credit as "shallow" subsidies, and preferred the former because it addressed the tilt problem.

Hendershott then ranked the Tandem plan ahead of the Lugar bill on the "disequilibrium" grounds mentioned earlier: under current housing market conditions, a subsidy will have to be deep in order to reach marginal home buyers. Offsetting this, the Lugar bill is more equitable; for a given outlay it can help more households. "But as far as 'bang for the buck' is concerned, I guess I would settle on Tandem as the best."

Alm and Follain took quite a different approach, utilizing a model of housing expenditure by households who are already

homeowners to evaluate the stimulative impact of the various proposals. The model does not permit any direct inferences about the impact on housing starts or tenure shift. Follain indicated that the authors are still looking for a methodology to translate their results into net changes in starts or new owners. He felt, however, that the relative ranking of the proposals in terms of starts would be the same as in terms of increase in housing demand.

Alm and Follain evaluated several alternatives not on the original list, and also developed modified versions of some of those which were included. Their most stimulative programs were in these categories: alternative mortgage instruments or other options which address the tilt problem.

In terms of the percentage increase in the value of the home chosen by the assisted household, the greatest impact, by a wide margin, was achieved by the PLAM (price-level adjusted mortgage). Second was a combination of the Tandem plan and a GPM (graduated payment mortgage). Third was the Tandem plan itself--the highest rated of the alternatives from the original list proposed for evaluation. It was followed in order by a variant of the Lugar bill (no recapture and no GEM), the "shallow" mortgage revenue bond subsidy, the GPM without any subsidy (an alternative mortgage added to the list by the authors), the downpayment tax credit, and another Lugar variant (no recapture, with a GEM). The importance of the GEM, and its counterproductive impact, can be seen from the relative ranking of the two Lugar versions.

A better measure of the programs' impact is the "stimulus per dollar of subsidy." In this ranking, the two alternative mortgage instruments, the PLAM and GPM, received identical, and very high, ratings, "because the tax subsidy per unit of housing is identical for each program," and because there are no subsidies other than the tax expenditures. The Lugar bill without the GEM generally was more efficient than the Tandem plan with the GPM, but both were ranked well above any of the original alternatives. Of these, the downpayment tax credit was the most stimulative. The Lugar bill was slightly more stimulative than the mortgage revenue bond and the Tandem plan at lower inflation rates, and slightly less at higher ones; the latter two alternatives were almost exactly equally stimulative.

In their discussion, the authors identified their "shallow" subsidy as being either a mortgage revenue bond or "a mild FHA (Federal Housing Administration) 235(i) or (q) plan." The latter is an interest rate subsidy conditioned on the income of the buyer. While the interest rate reductions might be similar, the mortgage revenue bond involves tax revenue reductions which the FHA program does not, as noted earlier. Follain has since indicated that the cost of the "shallow" subsidy excludes these losses; thus the mortgage revenue bond would appear to be the least stimulative alternative.

In summarizing their results, Alm and Follain stressed the importance of the tilt problem, in an inflationary environment. The low ranking of the Lugar bill results from the GEM feature, which aggravates the tilt problem.

Pros and cons: a summary

Chairman Downs concluded the conference by asking participants simply to identify the relative advantages and disadvantages of each alternative, without voting or otherwise attempting to determine which was the "best." He urged everyone to state "obvious" points, as well as subtle ones. In the course of this discussion, participants did not mention every point that had previously been made in the papers or the discussion, and some were suggested that had not been mentioned earlier at all. Thus the summary may not fully reflect the consensus of the conference; but a recapitulation of this final discussion may still be useful.

Lugar bill

The first advantage mentioned was that it addresses the tilt problem. It does not institute a permanent change in the housing market, or at least is less likely than any of the other alternatives to become a permanent new subsidy program for housing. It is thought to be countercyclical, by bringing starts forward from next year to the present.

Disadvantages include the GEM feature (for several reasons), the geographical allocation mechanism, and the fact that some of the funds would be used to assist buyers of the existing inventory. Hendershott reiterated his view that the subsidy was too shallow to affect the current market. A new point was raised by Follain; he argued that it would restrict mobility and be less useful for young first-time home buyers, because the value of the subsidy increases, the longer one occupies the house, and young families tend to move more frequently.

GNMA Tandem plan

The depth of subsidy was alternatively viewed as an advantage, because it would overcome the "disequilibrium" problem posed by Hendershott and as a drawback, on equity grounds and because some panelists felt that it would not reach marginal buyers any more effectively than the Lugar bill. This latter point was stressed by Swann and Kearl. Kearl, however, also argued that the impact on starts was not the same as the impact on employment; jobs would be created either by more starts or by more expensive homes being purchased by inframarginal buyers.

Another advantage is past experience with Tandem. The Tandem mortgage is a known quantity in the mortgage market, and greater investor acceptability should expedite the program and/or generate a slightly lower interest rate and program cost. Also, the program should be relatively easy to administer.

To some extent the Tandem plan was evaluated by reference to the Lugar bill. Thus, the absence of a recapture provision was cited as an advantage and it was also viewed as "less risky" from the buyer's standpoint, because it would not restrict mobility.

Mortgage revenue bonds

Tax-exempt financing is off-budget, which was immediately seen as both an advantage and a disadvantage. (Chairman Downs summarized, "That is a point, anyway.")

There was an extended discussion as to whether the program could be quickly implemented. Lee Holmes of the National Association of Realtors felt that "it could get on the street a lot faster than any of the other programs . . . it would be almost immediate." But Diamond, Gainer, and Chairman Downs all noted that a large volume of bonds already authorized had not been issued, and questioned the speed of response. Gainer and Qutb cited structural problems in the Ullman bill regulations; the latter thought that relaxing the regulations could permit a substantially greater volume.

Otherwise, the participants listed disadvantages. The tax-exempt instruments impose an excess revenue loss on the Treasury. Fiscally stronger jurisdictions, rather than those where the housing would be most "needed," would be best able to take advantage of the program (but income limits might offset this). The bonds displace traditional purposes of tax-exempt financing. The program is harder to control, in scope and timing; it might be less countercyclical than the others. Administratively, it is slower, because two transactions must occur: the local government issues the bonds and then relends the proceeds to the home buyer. The subsidy is very shallow.

Downpayment tax credit

As a tax provision rather than an expenditure, the credit has low administrative costs. The main drawback is the inability to restrict the subsidy at all; all new home buyers, marginal or not, would be eligible for it. It also might be difficult to police.

Some panelists questioned whether it could be restricted to new construction, but Levine pointed out that the 1975 credit was was in fact so limited. Recapture, if desirable, would probably be much more difficult.

Mortgage interest tax credit

Again panelists stressed that this was not a countercyclical stimulus.

PLAM

After reviewing the listed alternatives, Chairman Downs asked for additional suggestions. A. Thomas King of the Federal Home

Loan Bank Board suggested that the PLAM, while not countercyclical in the normal sense, was still an effective way of stimulating housing at present, because mortgage interest rates would not need to incorporate an inflation premium. Follain reiterated his findings on stimulative effect and efficiency.

However, the PLAM was criticized by Qutb on the grounds that it was a very uncertain investment from the lender's standpoint; she also noted that the Lugar bill originally incorporated a PLAM, but both lenders and borrowers found this unsatisfactory, and the GEM was utilized instead. Both found the uncertainty of the payment stream to be a major drawback to the PLAM. Ozanne objected that the same argument applied to the VRM (variable rate mortgage) as well, which was in fact being used as a mortgage instrument.

Swan also criticized the PLAM under present market conditions. The borrowers were forced to commit to a fixed real repayment schedule over the life of the mortgage, while his or her income was not fixed in real terms; indeed, future income prospects might be considered particularly uncertain because of the recession, and home prices (both real and nominal) were going down.

HOUSING STIMULUS PROGRAMS AND THE CURRENT ECONOMIC ENVIRONMENT

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INTRODUCTION

Most of my discussion--and I suspect that of the others here--will focus on the inefficiencies involved with housing stimulus proposals. Given that, it is important to consider why there appears to be so much congressional support for these these apparently inefficient Federal programs. The answer, I think, is that there are also very large inefficiencies inherent in the current fiscal program, and that the stimulus proposals are a response to these inefficiencies. Simply pointing out that the stimulus proposals are inefficient does not tell us whether the proposals will improve economic conditions. An answer to this question requires that the proposals be considered within two broad and interrelated contexts: (1) current and expected macroeconomic conditions and (2) within the scope of the proposed Federal budget.

In what follows, I first discuss how these broader contexts might affect one's evaluation of the proposals, and then I consider ways to minimize the inefficiencies inherent in such proposals. My analysis suggests that the answer to the question, "Are housing stimulus programs a good idea?" depends largely upon expectations about the economy, and values about income distribution. My analysis also suggests that many of the inefficiencies in housing stimulus programs can be avoided.

MACROECONOMIC CONDITIONS AND THE PROPOSED BUDGET

To focus on the efficiencies or lack thereof of any stimulus program as though the entire economy were perking along in some kind of efficient Walrasian equilibrium is to condemn these options at the outset. By definition, they will be less efficient. However, the economy cannot be characterized as efficient in a macroeconomic sense. 1/ Indeed, I think that the present macroeconomic situation is probably as inefficient as it has ever been in the post-war period. Furthermore, it is worth remembering that current fiscal policy differs in important respects from its traditional role. Instead of being reactive and attempting to stabilize or diffuse variations in aggregate demand by the private sector, fiscal policy has become a principal driving force of the economy. Many have argued that it will be so stimulative in coming years--but perhaps equally importantly that it is not stimulative at

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The views expressed are not those of HUD. Without implicating them in any of the errors I would like to thank Doug Diamond, Ann Dougherty, Beth Preiss and Robert Van Order for their helpful comments.

1/The notion of macro efficiency that is used in what follows is based on that presented in Robert E. Hall "Employment Fluctuations and Wage Rigidity," Brookings Papers on Economic Activity, 1980:1.

present--that we are now bearing the costs of the future fiscal stimulus well before the economy derives any benefits from the policies.

Through higher real interest rates the producers of long-lived goods are bearing much of these costs. For example, all the forecasts and surveys that I have seen predict decreases in nonresidential capital investment throughout this year and 1983; and these declines occur after the enactment of the Accelerated Cost Recovery System of the Economic Recovery Tax Act of 1981. For nonresidential investment to decline after the enaactment of this massive tax break to encourage it, something fairly serious must be wrong with macro policy.

As I said earlier, I think that housing stimulus proposals are being offered as a means to redistribute the costs and inefficiencies of current macroeconomic policy away from the production of new houses. But, why should these costs be distributed away from housing production? Residential construction is not the sector most likely to contribute to an increase in the efficiency of resource allocation. Another unit of housing is hardly the most productive good that could be produced. Nor is the housing sector even very troubled by changes in economic condition. Most households have not and will not change residences during the current downturn so that their housing consumption is unaffected by current conditions. Indeed, it is precisely because most households are unaffected by high interest rates that cutbacks in housing production have in the past appealed to policymakers. See, for example, Lyle Gramley (1972).

However, if we focus simply on the creation of employment opportunities, it would not surprise me to find housing construction come out as one of the more effective sectors to stimulate. Therefore, I think the finding that I am sure everyone will arrive at--that housing stimulus proposals are inefficient--has to be appended by the phrase, "Compared to what?" While housing production may not be capable of "efficient" stimulation, in terms of its relative ability to produce job opportunities it may not be too bad. Given its labor-intensity it may be able to produce more jobs more quickly than can other sectors.

It is interesting to compare this perspective with Guttentag's recent argument (1982 GAO Mortgage Finance Symposium) that housing stimulus programs are inefficient. He suggests the following stylized model of the economy to support his argument: Housing is the only sector with any interest rate elasticity; in the short run all other sectors are completely unresponsive to interest rate changes. Under these conditions, housing is the only sector that "gives up" activity in response to Government borrowing to finance the housing stimulus. The result is a somewhat different configuration of housing units, and very little net increase. However, if his stylized view is accepted, no other sector of the economy can respond at all to interest rate subsidies. Housing may respond weakly, but it does respond; the other sectors by

assumption cannot respond. Therefore, in Guttentag's model, if a stimulus is desirable, an inefficient housing stimulus is the way to do it. But what is it that may make a stimulus program desirable?

Even if we accept the idea that job production may provide an economic rationale for a housing stimulus program, there is still a question of whether overall fiscal policy is inducing the perceived need for a stimulus program. It is possible that fiscal policy inclusive of the types of construction stimulus currently approved by Congress--is taking away more with one hand than it is giving back with the other, and thus inducing the demand for a stimulus program.

Consider, for example, the following:

--It is now recognized that most unemployment is concentrated in very long spells rather than the relatively brief transitional unemployment associated with job changes, etc. In fact, a recent study found that 75 percent of unemployment was for more than 15 weeks. 2/

--The unemployment rate among black teenagers is at a record level of almost 50 percent. Without employment it is not hard to imagine the relatively lower level of human capital of many in this group depreciating to less than zero.

--The 1983 Federal Budget proposal calls for about $7 billion in cuts for job-related training programs, such as CETA, the work incentive program, and the Employment Service. These programs direct much more assistance to lower income households who appear to suffer more longer term unemployment than do those affected by housing stimulus programs.

--Although the construction industry is in the third year of what is now the deepest housing cycle since the Depression, unemployment in the construction industry--which is about 19 percent--has not been as high as it was in the last housing cycle.

All this is not to say that more blood can be gotten from this stone, or that housing should simply "hang tough." It is merely to suggest that a simultaneous $7 billion cut in job training programs, and the implementation of a $3 billion housing stimulus program will not only redistribute income more regressively--and these kinds of programs are at least as much an income transfer program as they are employment programs--it will also ineffectively deal with our current unemployment problem.

2/See Clark and Summers, Brookings Papers on Economic Activity (1979).

THE SOURCES OF INEFFICIENCIES IN HOUSING STIMULUS PROGRAMS

Housing stimulus programs are generally thought to be inefficient because much of the expenditure does not further the desired behavior. Because it is difficult to target the subsidy to those who are at the "margin," many of the subsidies go to those who would have purchased anyhow.

A measure of the amount of inefficiency is the proportion of the Federal expenditures that are expended on different goods than those intended. For example, a program that produces one incremental unit for every two that receives a subsidy is more efficient than one that produces one extra unit for every three that get subsidies. In the latter case two out of three of the subsidy dollars are leakage; in the former every other dollar is similarly wasted.

A discussion of the various ways that subsidy dollars wander from their intended target can yield a good deal of information on how the leakage can be minimized.

Basically, there are four directions of leakage: (1) to expenditures on non-housing goods that do not produce as much employment (subsidized credit, for example, does not necessarily imply subsidized housing) (2) to expenditures on housing that would have been produced without the subsidy (3) to expenditures on new housing that simply replace expenditures on other goods--the so-called "crowding-out" effect and (4) to expenditures on units that would have been produced later. Each of these is discussed in turn. However, before that, it is worth mentioning that this last source of leakage is an inefficiency only if the objective of the program is to produce more housing. If, on the other hand, the objective is to increase employment now, then this is not an inefficiency at all. This borrowing from the future is what the program should try to do.

Subsidized non-housing expenditures

One of the most important things that affects housing demand is financing costs. 3/ This cost is largely due to housing's durability. That is, because housing is so long lived most people must borrow to buy it and financing costs become a major element of housing cost. An increase in the demand for housing, therefore, generally increases the demand for mortgage credit.

However, while an increase in housing investment will, other things being equal, lead to an increase in mortgage debt, the

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3/Much of this section is based on Robert Buckley and Robert Van Order, "Housing and the Economy: Popular Myths," Journal of the American Real Estate and Urban Economics Association.

opposite does not hold. An increase in mortgage debt can occur without a corresponding increase in construction or even housing sales activity. The primary reason for this is the increased integration of capital and mortgage markets and the lack of such integration in other financial markets open to households. Rather than use the more expensive and less efficient consumer credit market, households have made use of the mortgage market to finance a whole range of expenditures.

The principal source of the improved efficiency of the mortgage market has come from the Government-underwritten loans, particularaly from mortgage pools guaranteed by GNMA. These pools have made mortgages more comparable to corporate securities. They accounted for a negligible share of investment in residential mortgages prior to 1964, but have grown rapidly. By 1975, they accounted for over 20 percent of mortgage investment. In 1980, they made up over $22 billion, or about 28 percent of total investment in residential mortgages, and in 1981, the new FNMA conventionally financed mortgage-backed securities accounted for more than $6 billion in commitments. Although the estimates are imprecise, as much as 25 percent of the pools may be held by pension funds and insurance companies which in many years have not been heavy mortgage investors. In any event, it is clear, first, that mortgage pools have expanded the supply of mortgage credit, making its availability similar to the availability of credit to the corporate sector; second, that they have allowed households to arrange their wealth in a more flexible way, using mortgages to finance other goods; and third, that mortgage credit programs are really not housing programs but household portfolio programs.

All this implies that housing stimulus subsidies targeted to lenders or the mortgage market have an inefficiency that subsidies targeted to new housing do not have. Mortgage credit does not have to be and frequently has not been spent on housing. Therefore, these programs have less to recommend them.

A second reason for making sure that any subsidy is tied to new housing rather than mortgage credit stems from the evolution of the housing finance system. Recent changes threaten the ability of thrift institutions to supply mortgage credit, and these lenders have found it difficult both to attract funds for lending and to pay the high cost of the funds which are available. Moreover, because they have traditionally held large fixed-rate mortgage portfolios, they have assumed much of the capital losses associated with mortgage interest rate increases. The continued viability of many thrift institutions is now threatened, and commercial banks that have been active in mortgage lending show severely reduced earnings or even losses.

However, in the current downturn thrift problems are less important for the housing industry. They are less important for three reasons: (1) new vehicles for making mortgage loans such as the GNMA mortgage-backed security have made thrifts less essential in providing mortgage funds (2) removal of binding deposit rate

ceilings and pre-emptions of State usury ceilings enable lenders to react more flexibly to rising interest rates and (3) the revolution of creative financing and new mortgage instruments (e.g., variable rate, shared appreciation, and graduated payment mortgages) allow both lenders and borrowers to adjust to rising interest rates.

From the standpoint of housing production, these changes mean that unlike past cycles, the structure of the financial system will no longer be an additional burden during housing cycles, nor will it provide low cost funds to housing. 4/ The 1980-1982 downturn cannot be blamed as past downturns have been on the structure of the mortgage finance system which would not allow mortgage borrowers via the thrift industry to compete for funds. Rather, it is the result of a general rise in real interest rates that has sharply increased real housing costs along with real borrowing costs for all sectors. It does, however, seem likely that high nominal rates have also reduced housing demand and are also involved in this downturn.

The evolution in the housing finance system implies that past mortgage credit policies worked by simply increasing the availability of mortgage credit. However, in the present this is not enough. More mortgage credit or fiscally healthier thrift institutions will not produce more housing units. Therefore, if the mortgage market has anything near the efficiency that either Hendershott (1980) or Jaffee and Rosen (1979) estimate, then mortgage credit programs that do not carry subsidies will have very little effect on housing production. It follows that any subsidies given to the thrift industry must be rationalized on grounds other than their assistance for the housing market.

Intramarginal subsidies

This inefficiency occurs because of the difficulty in discriminating between those who would have purchased without the subsidy and those who are induced to purchase because of the subsidy. George von Furstenberg (1976) derived a clever way of estimating this breakdown, and his results suggest that the number of incremental units will equal a percentage of the subsidized units that is approximately 50 percent larger than the percentage reduction in the mortgage rate. For example, if 100,000 units receive subsidies of 20 percent of the mortgage rate, starts will increase by about 30 percent, or 30,000 units. Therefore, in this case 70,000 units would be intramarginal and receive the subsidy for doing what they would have done anyhow.

This will be the largest source of inefficiency. There are simply no readily discernible characteristics that permit policy-makers to discriminate fairly between those who are at the

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4/See Buckley (1978) for a discussion of the possible credit market effects of mortgage credit programs.

margin and those who are not. Nevertheless, a number of things can be done to try to reduce the number of intramarginal buyers.

--The subsidy should not be used for units that have already been built. Whether builders made a profit or loss on previously built units is all water over the dam. If the objective is to provide jobs, these units should not be subsidized. A HUD study of a tax credit for unsold units in 1974-1975 indicates that the subsidy had virtually no effect on production.

--The subsidy should not be geared to high cost areas. Although limiting the subsidy to lower or moderate-income households could have a dampening effect on the simulus provided, it appears that of the high production States only California has above-average house prices. So while low loan or house price limits on eligibility based upon national averages could very well reduce the program's impact by a good deal in this and similar areas, such limitations are probably in keeping with the program's employment objectives. Consequently, the use of FHA adjustments for high-cost areas to target the plan, as is suggested in the House-Senate conference proposal, would probably target subsidy dollars to areas where there is already a relatively greater amount of demand and less unemployment.

--If the subsidy goes to borrowers, budget expenditures are probably more effective than tax expenditures. Tax expenditures have the advantage of simplicity and speed. They can be enacted rapidly with little or no Federal machinations in the credit market. However, their enactment applies to all units produced, and this is a large number of units to subsidize. If, as is discussed in the next section, current housing demand is reduced simply because of the market's failure to supply certain kinds of contracts (e.g., with steeply graduated payments), then part of the stimulus can be provided costlessly. With a rationed subsidy program that is combined with a market-perfecting instrument, we can expect more stimulation per dollar of expenditure than we can expect with a straight subsidy that does not change the contracting arrangements. The market-perfecting instrument can be self-rationing in that only those who prefer the instrument will seek the subsidy. On the other hand, with a tax expenditure all purchasers will receive the subsidy. An expenditure of the same size will therefore mean a much smaller subsidy per unit.

--Manufactured housing is probably less effective to stimulate. Manufactured housing is largely produced on an assembly line basis under what I suspect are much less labor-intensive methods than single-family housing. Accordingly, a dollar spent on it stimulates fewer jobs.

Intertemporal substitution

As I said earlier, the objective of a stimulus program should be to shift the timing of production from the future to the present. There are four reasons why households might be deferring a purchase of a new house: (1) high real rates of interest make it expensive now, (2) there are implicit costs associated with the types of mortgage contracts that are available--i.e., either a cash-flow or downpayment constraint, (3) many households would have to realize capital losses if they gave up their lower rate mortgages, and (4) the price of existing units is relatively low. I don't think that anything "cheap" can be done about problem 3, and 4 is not a problem so I'll just treat the first two.

A subsidy will reduce the first motive for deferral. However, because most new house buyers already own homes and most of them have non-assumable loans with interest rates far below the current market rate, the stimulus of the subsidy will probably be offset to some extent. An effective way to increase stimulus is to use the subsidy to buy down the early years of a loan, as has been proposed, rather than use the subsidy to buy down interest payments over the life of a loan as does the traditional GNMA plan.

Graduated payment loans, balloon payment loans combined with limited period amortization at a below-market rate, and other forms of creative financing are means to address the second motive for deferral. Low downpayment loans do much the same thing with downpayment constraints. Growing equity mortgages, on the other hand, do not help in recasting the mortgage payment stream in a way that households are likely to find preferable to the level payment loan. Unless borrowers are given a significant interest rate reduction for agreeing to this more rapid loan repayment, this instrument will not be helpful in overcoming obstacles to house purchase.

Finally, a major element of intertemporal substitution has to do with the timing of the stimulus. For multifamily units, any projects that would be eligible for the subsidy should already be well along in their planning stage, in which case the subsidy is largely a windfall to the producer. Otherwise, it is much more likely that the program would have a pro-cyclical rather than counter-cyclical effect. The FHA commitment process for multifamily units is a long one and it may be the case that reducing this time period for counter-cyclical purposes results in the production of

even less valuable units than those that have been subsidized in the past. 5/ Single-family stimulus avoids this kind of problem.

Intersectoral substitution

It does not appear likely that stimulus programs of the scale currently being discussed, $3-5 billion, would have much effect on financial markets or other investors. The full employment deficit is very small, and was actually in surplus as recently as 1981:4. As a result, the effects on other sectors and non-subsidized buyers should be trivial. However, the size of this effect depends upon the kind of model you use. Monetarists, for instance, would probably disagree.

To the extent that any sector of the economy is being crowded out of the markets, it is the tax-exempt borrowers. Budget cuts have reduced Federal grants to local government by 25 percent in real terms, and the increase in the range of tax-exempt investments has not helped either. Accordingly, if any stimulus is to have short-run crowding effects, it would be the use of the tax-exempt route to finance the subsidy. Thus, tax-exempt financing is less desirable on this score.

CONCLUSION

Clearly, all the stimulus proposals will be inefficient in the sense that more than half of the expenditures will not further the desired objective. However, this may not be too bad given the alternatives.

At present, we simply do not have very good estimates of the amount of incremental units that a particular stimulus would induce. Von Furstenberg's estimates are based on empirical results that predate the cash-flow affordability problem; they do not take into account the fundamental changes in the structure of the mortgage market, nor do they consider the large capital losses involved with terminating a low interest rate loan. Frankly, I am skeptical of all the net impact figures that I have seen. However, if I were pressed to give a guess as to the kind of impact of a subsidy the size of the Lugar proposal, I would say that 20-25 percent of the number of subsidized units would be induced. I would also say that the program's cost would certainly be positive, although probably less than the Federal outlays.

5/A recent HUD study indicates that FHA gets about 6 cents back on a dollar of insurance for a defaulted multifamily project, whereas FHA gets about 60 cents on the dollar for the Section 203(b) Program. There are obviously a whole range of factors involved in this discrepancy between values, but one fairly strong hypothesis is that the multifamily units built with Government assistance simply add much less value to the capital stock than they cost.

Whether or not one supports a housing stimulus proposal depends, as I said earlier, on expectations of macroeconomic conditions and value judgments about income distribution. If you think that high real interest rates are likely to be with us over the next few years, then support for this kind of measure is antithetical to the overall administration budget. Housing is simply the first in a very long queue of demanders of assistance. The thrift institutions, steel, agriculture, automobiles, and airplanes will all (or already have) followed suit with similar requests for assistance. Cumulatively, the administration's budget would collapse under such a deluge.

On the other hand, if you think rates will fall by the beginning of next year, after the elections, then support for this kind of measure is very much in support of the administration's fiscal package. The lower rates will eliminate the rationale for more Federal assistance and the program's pre-election stimulus, or appearance of stimulus, will enhance the administration's status in the election.

As far as the value judgments go, I think it is important to realize that because of the inherent inefficiencies in all such programs--not just those with respect to housing--that a good part of the issue is who should be insulated from macroeconomic conditions. I suspect that housing stimulus programs probably produce income transfers to higher income households than do programs that have been cut back. Finally, if unemployment is primarily a long-term phenomenon, then even if housing production can effectively generate jobs in the short run, it is not clear that it addresses the unemployment problem we currently confront.

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SOME ISSUES IN THE EVALUATION OF COUNTERCYCLICAL STIMULATION OF SINGLE-FAMILY HOUSING

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INTRODUCTION

There are so many proposals to stimulate homebuilding that simply keeping track of the various proposals is becoming a major effort. There is real danger that the task of understanding the details and mechanics of individual proposals may substitute for more fundamental analysis of their likely impact. Part of the difficulty also reflects the lack of an agreed framework, i.e., model of the housing market, within which to analyze proposals. While economists will typically use some sort of demand and supply model, noneconomists often do not. A major part of this paper discusses a model of housing markets to use when considering specific proposals.

A model may be an explicit econometric model or it may be a set of notions that an analyst has in his or her head. A model of housing markets helps one determine quantitatively and/or qualitatively what the level of homebuilding would be in the absence of government intervention, how proposed policy actions will affect the decisions of the relevant economic agents, and, finally, what the impact of proposed changes in policy are likely to be.

A model based on market-determined outcomes emphasizes the point that the current depressed level of homebuilding is not simply a fluke but rather is a market outcome in which home buyers, home sellers, home builders, and mortgage lenders are all making decisions they perceive to be in their own self-interest given current economic conditions--specifically, exceptionally high real interest rates and great uncertainty about the future. Such a perspective suggests that there is no magic, costless form of government intervention that will lead to a significant increase in the amount of homebuilding. Most of the proposals that have been advanced in recent months call for subsidies to housing demand. A demand curve for housing optimizing behavior suggests that one stimulates demand by either increasing individual incomes or decreasing prices that individuals face. Neither alternative will be costless.

The rest of this paper first sketches a model of housing markets. This model is then used to suggest a framework for evaluating specific subsidy proposals; the paper concludes with some comments directed at specific subsidy proposals under current consideration.

A MODEL OF THE HOUSING SECTOR

Models of the housing sector should distinguish between three different types of economic agents: demanders, suppliers, and financers. The discussion below is organized according to this tripart division. It is also important to distinguish between the stock and flow nature of housing. A house is a durable good and, once built, will typically provide housing services for many years. Economists think of a demand for housing services with the supply coming mainly from the existing stock. The demand for housing

services implies a demand for a stock of houses to provide those services. There are incentives for builders and others to add to the stock of houses--that is, start new units when the demand for the stock of houses is, or is expected to be, greater than the existing stock. Because the flow of starts is so small when compared to the existing stock of houses, small shifts in the demand for housing services can imply large fluctuations in starts. Similarly, large fluctuations in starts have only small impacts on the size of the housing stock and, hence, only a small impact on the supply of housing services. On this view it is difficult, if not impossible, to identify a separate demand for new units per se. The determinants of housing starts should be linked with the existing stock and the aggregate demand for housing services.

The demand for housing

It is households who demand housing services. The quantity of housing services--the size, location, and amenities--demanded by an individual household will depend upon permanent income, the relative price of housing services, and household characteristics such as size, age, and tastes. When considering the demand for housing in the aggregate, the number and type of households is clearly important. It is also important to note that the quantity of housing services is not the same thing as the number of housing starts. A single household occupies a single housing unit or buys a single completed housing start, but the quantity of house, and hence the quantity of housing services provided, will vary in line with the determinants of that household's demand.

In the case of renters, the price of housing services is relatively clear cut. It is the market rent. In the case of homeowners, it is less clear how one should measure the price of housing services, a flow concept. A number of alternatives have been proposed. Among economists a professional consensus appears to have developed that some measure of user costs is the appropriate procedure. For example, see Hendershott and Shilling, Dougherty and Van Order, or Van Order and Villani.

Measures of user costs typically stress the implications of the special tax treatment of owner-occupied housing: tax deductible nominal interest rates capital gains that are essentially tax free, and no tax on the income-in-kind received by owner occupants. Such special tax treatment means that the user cost of owner-occupied housing declines as income and hence marginal tax rates increase. It also means that the user cost of owner-occupied housing will most likely decline in an inflationary environment

if nominal interest rates increase on a one-to-one basis with increases in the rate of inflation. 1/

A number of researchers have pointed out that increases in nominal interest rates need not imply any increase in real interest rates. Further, in the case of housing, they may imply a decrease in real user cost. It is still true that increases in nominal interest rates, due to increases in inflation, "tilt" the time profile of real mortgage payments. This "tilt" may have a depressing impact on the demand for housing services. For example, see Poole, Kearl, and Schwab. Other researchers, while acknowledging the theoretical correctness of the tilt phenomenon have doubted its empirical importance. For example, see von Furstenburg.

The supply of houses and housing services

A second set of economic agents are those who provide housing services. Here it is useful to make a further distinction between those who provide housing services--landlords or owner-occupants --and those who provide residential structures--builders and land developers. Presumably, both of these agents agree to provide housing services or structures in the expectations of profits.

Landlords and owner-occupants agree to purchase units if expected net rents--explicit in the case of landlords and implicit in the case of owner-occupants and including relevant provisions of the tax laws in both cases--look like they offer a good deal. In more technical terms, landlords and owner-occupants are interested in whether, at existing prices, expected net rents offer the prospect of a risk-adjusted competitive rate of return. Builders and developers provide new units when their expectations of selling prices are greater than construction costs, including an appropriate allowance for economic profits. Existing owners who decide to sell are another source of units for landlords or potential owner-occupants, although existing owners are not a source of new units.

Housing finance

The third set of economic agents are those who provide housing finance. Interest in these agents derives from a number of

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1/The conclusion that the user cost of owner-occupied housing declines with increases in the expected rate of inflation is usually explained as a result of the tax deductibility of nominal interest rates and the tax-free nature of capital gains. Such explanations typically make no reference to impacts on housing prices, an important additional component of user cost. In the short run, expectations of higher inflation are likely to increase house prices and may, therefore, increase user costs for some actual or potential owner-occupants. See Swan for a discussion of this possibility.

concerns. The purchase of a home typically involves extensive use of mortgage credit. Historical and institutional practices in the provision of housing finance have closely linked the provision of housing finance to the fortunes of specialized mortgage lenders, i.e., thrift institutions. Fluctuations in the availability of mortgage finance appear to have played an important role in cycles of housing starts. 2/ Concern with the cyclicality of homebuilding led to a number of institutional changes during the 1970's in an effort to break the close link between housing finance and thrift institutions, i.e., GNMA mortgage-backed mortgage securities, creation of the Federal Home Loan Mortgage Corporation, expanded powers for FNMA, the development of private mortgage insurance.

If a model like that sketched above were fully articulated and estimated, we could estimate the impact of housing market policy by simply pushing a computer button. It is virtually certain that we will never reach that stage as differences in specification and difficulties of estimation will preclude agreement on many important issues. At the same time, general qualitative agreement as to important sectors and links can help to establish a checklist or framework to use when evaluating proposed policies.

FRAMEWORK FOR EVALUATING SUBSIDIES TO HOMEBUILDING

In line with the discussion above, it is useful to start to consider countercyclical subsidy proposals in terms of their impacts on the three major type of agents involved in housing markets--demanders, suppliers, and financers. Since housing is only one part of a large macro-economy, a complete analysis must go on to consider several macro-economic issues.

Demanders

For a given number of households, the demand for owner-occupied housing can be stimulated by increasing individual incomes or by changing the price of housing that individuals face. Most of the proposals currently under consideration have focused on changing the price through various subsidy schemes. Price subsidies can influence two aspects of the demand for housing. They can influence how much housing a subsidized household will demand, and, if available for only a limited period of time, they can influence when a subsidized household will choose to purchase. Virtually all current proposals restrict the timing of availability of subsidies in an effort to stimulate demand now.

The durable nature of housing units means units that are added to the stock today will be around to provide housing services for

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2/Much of the literature on housing cycles can be seen as investigations of this assertion. Needless to say, different researchers put different weight on the importance of mortgage finance as an important determinant of cycles in homebuilding.

so, in part, by depressing future housing production. The more permanent impact on the stock of housing comes not from influencing the timing of individual demand decisions but from the interaction between the price subsidy and the price elasticity of demand. Subsidized households will demand larger homes and this increase in demand will, with relatively elastic supply, mean a larger housing stock.

There is some question as to how to measure the magnitude of the price subsidy. The most popular options among economists are likely to be either the present value of the subsidy--that is, a cash grant that if paid today would enable the subsidized household to make the same set of purchases but at unsubsidized prices--or the change in the user cost of owner-occupied housing. For subsidy proposals that work through subsidizing mortgage finance, the change in the user cost will be roughly equal to the reduction in the effective after-tax mortgage rate as a result of the subsidy. This reduction is found by calculating the internal rate of return for the set of future cash flows associated with the subsidized mortgage.

These two measures of the price subsidy are not to be added together. They are alternative ways of looking at the same thing, and, to a large extent, the choice between them is one of convenience. When measuring the cost to the Government, it is most natural to use a present-value measure. Among other things, such a measure highlights the fact that subsidies that are repaid in full but without interest are in fact interest-free loans and have a substantial cost element. When measuring the impact on consumer demand, it is appropriate to use the measure that corresponds to the program demand. A cash grant program is a conditional income transfer and should be evaluated as such. A subsidy that reduces mortgage payments is a price subsidy and is most naturally considered in terms of its impact on user cost. Although, if the subsidized mortgage is assumable, then a subsidized borrower may be able to turn a price subsidy into its equivalent cash grant by selling the house with the subsidized mortgage.

While present value and internal rate of return calculations have different implicit assumptions about reinvestment options, both do assume that capital markets function well enough so that the timing aspects of intertemporal decisions are essentially unimportant and household decisions can be analyzed in terms of a single variable, either present value or internal rate of return. Researchers like Kearl, Poole, and Schwab are likely to object and stress the importance of the tilt problem for mortgage borrowers. On this view, subsidy proposals that, in the current environment of high nominal interest rates enable borrowers to even out the time profile of real mortgage payments, are likely to have a more stimulative impact than other proposals with the same present value or internal rate of return.

When considering ex-ante or measuring ex-post the impact of any subsidy proposal on the level of homebuilding, it is important

to distinguish between marginal and intra-marginal decisions. It is simply incorrect to measure the effectiveness of the subsidy by counting the number of subsidized buyers. Marginal decisions refer to those additional elements of demand that are there because of the subsidy and would not be there in its absence. Homebuilding activity is not increased by subsidizing intra-marginal buyers, that is, those who would have bought even without a subsidy. (There is a potential increase in construction activity to the extent that intra-marginal, subsidized buyers demand a larger quantity of housing services--that is, larger or more luxurious houses--than they otherwise would.) Production effects of a given volume of subsidy dollars would be maximized if one could restrict the subsidy to marginal decisions. I am unaware of any practical way of doing this.

Many subsidy proposals contain income-targeting provisions, i.e., the subsidy is only available to households with income below some cutoff level. If one is only interested in stimulating construction employment, then there is little reason to include such restrictions. Construction employment will respond to increases in demand regardless of the income of the demander. The issue of income restrictions does, however, raise two related questions. One involves a more complete consideration of equity concerns and the other relates to whether there will be enough qualified buyers. As a general proposition it must be true that more limiting restrictions cannot increase the likely number of subsidized buyers. At the same time, the type of restrictions that have been discussed in connection with the Luger bill, an income limit of $30,000 except in designated high-cost areas, do not seem to be very restrictive.

Number of qualified buyers--the demand for new houses comes from three sources: (1) new households that decide to purchase a new home, (2) current renters who decide to switch from renting to owning and, further, decide to purchase a new rather than an existing home, and (3) current owners who move and decide to purchase a new home. There are currently somewhat over 60 million families and unrelated individuals with incomes less than $30,000. 3/ If one concentrates on families and unrelated individuals with incomes between $20,000 and $30,000, there are approximately 17 million. The original Luger proposal called for 400,000 subsidized units, or 2.35 percent of this subset of the eligible population. It is

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3/These estimates of income distribution in 1982 are derived from data for 1980 on the assumption that the whole income distribution has shifted in line with the percentage change in personal disposable income per capita between the first quarter of 1980 and 1982. On this basis, $20,000 and $30,000 in 1982 were assumed to correspond to $17,500 and $26,000 in 1980. If the impact of high cost exclusions can be approximated by a 1982 average income level of $32,500, then the number of qualifying families and unrelated individuals is about 60 million.

somewhat unclear whether 2.35 percent is a large or small number. For comparison, over the period 1975 to 1980, single-family starts averaged about 1.3 percent of total families and unrelated individuals and 3.3 percent of those with incomes over $20,000.

Equity concerns-current subsidy proposals raise a number of other equity considerations that I want to briefly mention. One question has to do with the equity of subsidizing the purchase of new as opposed to existing housing. Proposals to subsidize new housing must have larger short-run employment effects. Such an acknowledgement makes it clear that the ultimate objective of the subsidy is not housing per se, but rather something else such as construction or aggregate employment or the well-being of housing suppliers, specifically homebuilders. Income restrictions raise questions of equity across income classes. To some, eliminating higher income groups may seem appropriate in view of the substantial owner's subsidy they already receive from current tax laws. However, one might wonder about the ultimate outcome of a process that tries to find a subsidy for every income class.

Current proposals have an inherent inequity to the extent that full subsidies are available up to, but not beyond, some critical level of income eligibility. A very small increase in income, in theory just a penny, could make a household totally ineligible for a rather large subsidy. Such procedures lead to localized leapfrogging, a situation where, on an after-subsidy basis, subsidized households near the cutoff point are made better off than ineligible households just above the cutoff point. Experience with housing and welfare programs in the seventies suggested that significant leapfrogging was politically unpopular and socially dangerous.

Finally, the discussion of subsidy programs now, coming after the use of similar subsidies in 1974, raises the issue of possible intertemporal inequities over the business cycles. In the limit, it is possible that subsidies could become an endogenous part of housing cycles as households and builders restrict demand and construction activity in order to induce enactment of a new subsidy.

Suppliers

Housing subsidies to demand will increase homebuilding as the demand curve shifts along an unchanged supply curve. 4/ One might wonder whether the value of the subsidy might not be reflected in higher house prices with no net benefit for buyers. Formally, this result would occur in a program of unlimited subsidies if the supply of new units was perfectly inelastic. In view of the

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4/Construction employment could also be increased with a direct subsidy to builders and others to build. Experience with agricultural subsidy programs suggests that one needs to be very careful about the design of supply-side subsidies.

current depressed level of homebuilding, such a result seems unlikely. However, if consumers can receive subsidies only by dealing with a restricted number of builders and if there is only a limited number of subsidies available, then excess demand for subsidized units could increase prices on those units.

Most of the concern about supply effects centers around the question of builder inventories. Will a demand subsidy simply facilitate the liquidation of existing inventory with little impact on current construction? Clearly the language of specific subsidy proposals, in particular the definition of units eligible for a subsidy, can have a big impact in this regard. If current unsold inventory is eligible for a subsidy, then there is likely to be a smaller impact on current production from any given subsidy than if current inventory is not eligible.

Note that the issue of inventory involves questions of timing not unlike those associated with the demand aspects of the subsidy. If current inventory levels are in some sense excessive and need to be eliminated before there can be a sustained increase in new construction, then making existing inventory eligible for the subsidy depresses current construction but facilitates future increases. Making existing inventory ineligible increases current construction but implies reduced levels of future construction as inventory levels still need to be adjusted.

A subsidy restricted to new units raises questions about the impact of the subsidy on the price of existing units. Households interested in purchasing homes weigh the advantages and disadvantages of new and existing homes against their relative prices. A subsidy to new homes will tip that balance in favor of new homes for many households. Market forces then imply that the price of existing homes will necessarily be somewhat depressed for the period of time that the subsidy is available. This effect on the price of existing units cuts several ways. A positive benefit is that it helps to generalize the benefit of the subsidy to buyers of existing homes. A less positive benefit is that it reduces the wealth of those existing owners who for whatever reason must sell their homes during this period.

Housing finance

The supply of housing finance must also be considered in an evaluation of the impact of subsidy proposals. Here are likely to be important differences depending upon the mechanics of the subsidy and one's view about the nature of the supply curve of mortgage finance. For example, if one views the supply of mortgage finance as relatively inelastic--that is, essentially predetermined and with little short-run responsiveness to mortgage rates--then proposals that increase demand with no provision for increasing the supply of mortgage finance will lead to a substantial increase in mortgage rates with only a small impact on homebuilding. In essence, the increase in demand induced by the subsidy will increase mortgage rates and "crowd out" unsubsidized borrowers.

There will be less of an effect on mortgage rates and more of an effect on homebuilding the greater is the elasticity of the mortgage supply curve and/or the more proposals have specific mechanisms to increase the supply of mortgage financing.

The Lugar subsidy appears to be a pure demand subsidy with little or no provisions to affect supply. A subsidized Tandem plan has ambiguous impacts on supply. If patterned after the 1974 experience, GNMA would buy low-rate mortgages at par and sell them to ultimate investors at discount. If these purchase/sales were done quickly, then the program would be equivalent to a demand subsidy without provision of additional mortgage credit. However, if by design or happenstance there is a substantial lag between the purchase and sale of subsidized mortgages, then one can view the program as simultaneously providing a demand subsidy along with a short-run increase in the supply of mortgage credit. This increase in mortgage credit would be financed by the increase in the Government deficit. While the increase in mortgage credit helps to minimize the impact of the demand subsidy on mortgage rates, the financing of this increase through the issuance of Government debt does have more general impacts on market interest rates which would, in turn, be expected to have some impact on mortgage rates.

One might imagine interest rates on different types of securities as being composed of two elements, one a common element that reflects aggregate market forces in terms of aggregate savings and investment and a second individual element that reflects security-specific demand and supply factors. The relative importance of these two factors depends upon the degree of integration of specific security markets which, in turn, depends upon the cross-elasticities of demand and supply. A GNMA Tandem plan could help to offset the impact of increased mortgage market supply, but it could not avoid the general interest rate implications of an increase in aggregate investment spending.

Macroeconomic implications

It is important to remember that housing markets are but one part of a larger macroeconomy. The discussion of mortgage financing necessarily entails a consideration of aggregate financial markets and raises the serious possibility that policies to stimulate homebuilding may do so at the cost of reduced activity in other parts of the economy. Thus while construction employment and the profitability of homebuilders may be increased, it may be at the cost of employment and business prospects elsewhere. One's a priori belief of the likelihood of such macroeconomic crowding-out is likely to be a leading indicator of one's macroeconomic orientation, Keynesian or monetarist.

A hard-line monetarist would simply deny that housing subsidy proposals in the absence of an increase in the money supply would have any impact on nominal GNP. It is hard to see how a hard-line monetarist would expect any direct impact on inflation or real GNP either. But such an individual would be concerned about the

inflationary implications of the temptation to monetize increased Government deficits induced by the subsidy. A less rigid monetarist might allow for some short run impact on employment and real GNP, but such impacts would clearly be temporary and of second-order importance.

A Keynesian macroeconomist is likely to be more optimistic that a housing subsidy program can increase aggregate employment. Assuming that monetary policy defined in terms of monetary aggregates is unchanged, the subsidy program can be seen as shifting the IS curve along an unchanged LM curve. In this case the important determinant of the stimulative impact of the subsidy depends upon the magnitude of the shift in the IS curve and the slope of the LM curve. The slope of the LM curve depends upon the income and interest elasticities of the demand for money and helps to determine the amount of macro crowding out following the shift in the IS curve. The shift in the IS curve, in turn, depends upon the marginal impact of the subsidy evaluated at initial interest rates. That is, it depends not upon the total number of subsidized buyers, but rather the amount of new home construction to satisfy the increase in demand by marginal buyers, who in the absence of the subsidy would not have bought at this time, and the marginal increase in the quantity of housing demand by subsidized intramarginal buyers.

Macroeconomic considerations also raise fundamental questions about the appropriateness of any subsidy to homebuilding, no matter how effective. Homebuilding activity is clearly depressed from historical experience and popular notions of "normal" demand or "need." Construction unemployment is extremely high and the short-run prospects for many homebuilders are extremely grim. However, similar statements can be made about many other sectors of the economy. 5/ Special interest in stimulating homebuilding could reflect a political desire for pump priming and a belief that housing offers an especially quick and big bang for the buck. It could also simply represent the political power of the housing industry

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5/The following result suggests that, by one measure, construction activity--not homebuilding but construction activity--has not been differentially devastated by the current recession. Ordinarily least squares with annual data from 1948 to 1981 shows

$$UC = 0.905 + 1.96\ UA \qquad R = 0.82$$
$$\qquad\quad (11.93)$$

where UC - construction unemployment rate
UA - aggregate unemployment rate

For the first 3 months of 1982, aggregate unemployment has averaged 8.77 percent and construction unemployment has averaged 18.2 percent, results that are consistent with longer run experience as represented by the regression equation.

lobby. In either case, it is bound to set a precedent for special assistance and make denials to other special interests more difficult. These political implications of favored treatment in a time of more general difficulties are a significant additional cost associated with any housing subsidy plan.

COMMENTS ON CURRENT SUBSIDY PROPOSALS

There were seven subsidy proposals listed on the agenda for this symposium:

1. Temporary interest rate subsidy, i.e., the Lugar subsidy.
2. Permanent interest rate subsidy, i.e., a Tandem plan subsidy.
3. Expanded tax-exempt mortgage financing from State and local housing finance agencies.
4. A mortgage investment tax credit.
5. A home buyers tax credit.
6. Tax-exempt accounts for first time home buyers.
7. Tax-free IRA withdrawals for home buyers.

My comments are addressed primarily to proposals 1, 2, and 5. Proposals 6 and 7 are simply unlikely to have much if any immediate impact on homebuilding. Proposals 3 and 4 are better characterized as long-term, permanent changes in the structure of housing and mortgage markets than as short-run housing stimulus measures. Adoption of either measure would not be easily reversed. Both need more deliberate consideration than current conditions allow. Also, there are others with more expertise concerning proposals 3 and 4.

Proposals 1, 2, and 5 have all been discussed in terms of subsidies to the purchase of new, owner-occupied housing units. The tax credit is a lump sum payment to home buyers in the form of reduced taxes. The Tandem subsidy reduces mortgage rates for subsidized borrowers over the life of the loan. The 1974 experiment with this subsidy involved no "recapture," that is, a subsidized borrower had no obligation to pay back the subsidy. The temporary interest rate reduction, a la Lugar, involves a more substantial initial reduction in mortgage payments and a provision for recapture at the time of home sale or mortgage refinancing. As mentioned above, this proposal is equivalent to an interest-free loan by the government to subsidized borrowers to meet part of their mortgage payments.

Before considering numerical estimates of the impact of these proposals, I want to briefly comment on three related issues: the impact on government deficits, the value of the subsidy to different households and the use of triggers to eliminate the subsidy.

Government deficit

In principle one can adjust provisions of all three programs so each has the same aggregate cost and thus, an equivalent initial impact on the Government deficit. Thus each program would cost the Government the same amount of money in present-value terms. This sort of equal cost adjustment is necessary if one is going to make sense out of any econometric horse race to see which proposal is most effective.

In practice it is somewhat more difficult to equalize costs, although probably not impossible. All three proposals have uncertain elements about their actual cost. The tax credit proposal is in the nature of an entitlement program and less subject to direct cost control, although cost can be estimated. In contrast, one can specify the maximum number of subsidized units under either of the other two alternatives. While one can limit the number of subsidies, the ultimate cost of the Tandem subsidy depends upon the difference between the contract rate on the subsidized mortgages at the time of origination and market rates up to the time GNMA sells the mortgages. This magnitude can be estimated; but it cannot be controlled directly. While one can control the magnitude of initial subsidy payments under a Lugar-type subsidy, the true cost is the opportunity cost of the interest-free loan and will depend upon the course of future interest rates and the time allowed for repayment of the subsidy. Again, these factors can be estimated but not controlled directly.

Currently, the timing aspect of these three subsidies may be considered more important than their total cost. If the tax credit subsidy is restricted to homes started in 1982, then the total cost of the program will be reflected in the Government's budget for 1983, with some carryover into 1984. The timing impact of a Tandem subsidy depends upon the time lag between the purchase and sale of mortgages by GNMA. If it turns out, as in 1974, that GNMA holds these mortgages for some time, then here can be a tremendous initial impact on the Government deficit. Initial outlays could equal total mortgage lending on all subsidized loans, a number substantially greater than the cost of the subsidy. Revenues that offset this huge cost, and are important for a correct accounting of the cost of the subsidy, will be realized in the future as the loans are sold or mortgage payments are received. The Lugar subsidy shows increased expenditures for 5 years with increased revenues coming from loan repayments.

Value to home buyers

The special tax treatment of housing raises questions about whether the proposed subsidies affect home buyers differentially depending upon their marginal tax rates. A dollar of tax credit subsidy substitutes for a dollar of after-tax income regardless of a home buyer's marginal tax rate. A dollar of Tandem or Lugar subsidy is actually worth a tiny bit more to individuals with lower marginal tax rates. This result occurs because after-tax interest

rates are inversely related to marginal tax rates. As shown in tables used in my testimony on the Lugar bill, the magnitude of this effect is quite small.

Triggers

It is probably easier to devise regulations or administrative control such that the availability of either interest rate subsidy could be terminated conditional on economic conditions. The availability of a tax credit subsidy would almost of necessity have to be defined in terms of calendar time rather than economic events.

Estimates of the impact of subsidy proposals

An estimate of the impact of any of the three subsidy proposals on homebuilding requires quantification of the exact magnitude of the subsidy and knowledge of relevant demand and supply responses, i.e., the relevant parameters for the model of housing markets sketched above. One should interpret the estimates discussed below as measures of expected values with rather large standard errors. The large implicit standard errors are a reflection of two factors: (1) unfortunate, but very real, limitations on our current ability to measure important relationships that characterize housing markets and (2) the nature of the rounding that I have done in my own calculations. Rounding facilitated the calculations and did not seem inappropriate given my objective to estimate only an order of magnitude.

In work related to testimony on the original Lugar proposal, I concluded that the Lugar subsidy was equivalent to a 100 to 150 basis point reduction in the after-tax effective mortgage rate. Precise results depend upon a borrower's marginal tax rate, the length of time until repayment, and the tax status of the repayment. With appropriate funding, a Tandem subsidy could reduce mortgage rates by any arbitrary amount, but I will assume that the viable alternative is a Tandem subsidy that also offers a 100 to 150 basis point reduction. A tax credit could also be funded at any rate, but there seems to be some sort of consensus about a 5-percent credit. Five percent is also about the present value of both the Lugar subsidy and a 100 to 150 basis point Tandem subsidy. Thus, in terms of present value, all three subsidies are of similar magnitude.

Discussions about the Lugar and Tandem subsidies have consistently involved the notion that the subsidies would be limited, in terms of income limits and/or appropriations. A tax credit could, in theory, contain income limits. A tax credit without income limits would have a larger stimulative effect on demand, but it would also be substantially more expensive as one would be subsidizing all new construction. The Lugar subsidy does offer the largest initial decline in mortgage payments. If the tilt effect is a significant drag on demand, then the temporary, but deeper subsidy might be expected to have a slightly more stimulative effect. The Tandem plan subsidy appears to be the only subsidy

with direct mortgage supply effects. None of the proposals appear to have any differential implications for builder behavior.

One estimate of possible impacts comes from the GAO evaluation of the 1974 Tandem plan subsidy. That analysis concerned a Tandem plan subsidy that reduced interest rates by 1 or 2 percent on a before-tax basis. This subsidy is roughly equivalent to the Lugar subsidy. The GAO evaluation used both econometric estimates and "expert" opinion from a group of consultants--Professors Dwight Jaffee, Patric Hendershott, Ken Rosen, George von Furstenberg, and myself. The consultants estimated that 190,000 subsidized loans resulted in 20,000 to 35,000 new net housing starts. To the extent that the relevant demand and supply relationships are linear and invariant over time, one might expect a similar response to a similar subsidy today.

A second set of estimates can be obtained at relatively low cost from recent published work on the determinants of single-family housing starts. In particular, I have in mind recent work by Jaffee and Rosen and work by Hendershott, both papers published in the Brookings Papers on Economic Activity.

Jaffee and Rosen find that starts are explained by the existing stock, a measure of the incidence of homeownership, nominal mortgage rates, and two measures of the availability of mortgage financing. As explained in the appendix, I have estimated that the Jaffee-Rosen results imply that a 150 basis point mortgage rate reduction would mean 231,000 additional single-family starts. There is reason to believe that the Jaffee-Rosen interest rate effect may be too large as their equation appears to over explain the decline in single-family starts since 1978.

Hendershott's econometric work focuses much more explicitly on measures of user cost as the important determinant of starts. His econometric work also includes variables to measure the availability of mortgage credit. As explained in the appendix, I estimate that the Hendershott equations imply that a 150 basis point reduction will increase single-family starts by 120,000 units.

There are a number of important qualifications that must be made to both of my estimates. I have simply estimated the impact of a 150 basis point reduction in the nominal mortgage rate, available to all. Strictly speaking, I am simulating a general 150 basis point reduction in mortgage rates available to all, not a mortgage rate subsidy available only in limited number and only to qualified buyers who meet an income test. Restricted income eligibility suggests that the estimates are an upper bound as the econometric coefficients reflect the behavior of households over the entire income distribution. One should adjust my estimates down to reflect both the limits on income eligibility and possible limits on the number of subsidized units.

One adjustment for income limits would multiply these estimates by the ratio of qualifying households to total households,

or by about 0.70. One might want to weigh higher income groups more heavily and use only the proportion of qualifying households to total households with incomes over $20,000. This formulation implies a multiplication factor of 0.5 to 0.57.

These adjustments would lower the Jaffee-Rosen estimate to a range of 127,000 to 162,000 units. The Hendershott estimate would be lowered to 66,000 to 84,000. If a subsidy is further limited in terms of total numbers and there is excess demand for subsidies, then these estimates would need to be further reduced to reflect the limited number of total subsidies and the difficulties in limiting subsidies to marginal buyers.

It is somewhat unclear what, if any, adjustments one should make for the limited time availability of the subsidies. One might argue that the estimates from a mechanical manipulation of standard econometric results should be increased to reflect a "buy-now-before-prices-increase" effect. The subsidy does offer a sure savings vis-a-vis current mortgage rates as against the uncertainty of future rates. However, one can overestimate such an effect. The Lucas critique of traditional macroeconometric models and work to estimate rational expectations models have both stressed that estimated econometric coefficients reflect, in part, parameters characterizing optimal forecasts of relevant economic variables. To the extent that consumers have, over the relevant sample periods, perceived declines in mortgage rates as temporary, then estimated coefficients would already include the "buy-now-before-prices-increase" effect.

A third adjustment concerns possible crowding-out effects, both within the residential construction sector and in the macro-economy. The Jaffee-Rosen paper argues that credit availability is an important factor in short-run cycles. Their paper includes an equation that expresses the mortgage rate as a function of the ratio of residential construction to deposit flows at thrift institutions and mortgage activity by federally sponsored credit agencies. I have not attempted to derive an estimate of the impact on mortgage rates of the marginal increase in house construction due to the subsidy, but the direction of the effect is clear. The Hendershott paper does not contain a mortgage rate equation, and his discussion argues that the availability of mortgage credit is no longer an important factor in housing cycles. When considering a Tandem subsidy one should make an appropriate adjustment for a possible mortgage supply effect. The numbers above do not contain such an adjustment.

Some have argued that currently mortgage lending could be expanded without much pressure on mortgage rates. This position is supported by reference to things such as the low ratio of mortgage acquisitions to deposit flows plus FHLB advances for savings and loan associations and the decline in mortgage lending as a percentage of total credit raised. In the context of explicit models of disequilibrium, the recent declines in mortgage rates would suggest that the current regime is not one of excess demand.

However, a large enough subsidy stimulus to demand could easily turn a position of excess supply into one of excess demand. This comment should not be misinterpreted to imply that any recovery in homebuilding is impossible. A "market" recovery would follow a general reduction in market interest rates and would reflect a basic shift in the determinants of mortgage supply.

To derive macroeconomic impacts, any estimate of net impacts on homebuilding would have to be adjusted for the crowding-out effects from an increase in general interest rates. A hard-line monetarist would expect complete crowding out in housing or other sectors of the economy for little if any net macro stimulus. Keynesian-oriented large econometric models have short-run multipliers that are somewhere between 1.0 and 2.0. The appropriate multiplier should be applied to the marginal increase in construction activity after intra-mortgage market crowding out.

APPENDIX

Before beginning, a few caveats seem appropriate. There are tremendous hazards involved in using econometric models that one has not estimated oneself. It is embarrassingly easy to make any number of mistakes, even on such simple matters as how variables are measured or whether results are at annual or quarterly rates. There are also tremendous hazards using models of housing starts that are even 1 or 2 years old. The structure of starts equations are notoriously unstable.

Jaffe and Rosen model

In the Jaffee-Rosen model a reduction in mortgage rates would be expected to affect starts both directly and indirectly through its impact on tenure choice. Jaffe and Rosen report that "an increase of 1 percentage point in interest rates on mortgages reduces housing starts by about 140,000 units at annual rates" (p. 351). In context, the quotation appears to apply to the mortgage rate term in their starts equation, equation (4), but I cannot reconcile this result with my interpretation of the reported coefficients and the likely magnitude of the unreported variable, KSF. Accepting the Jaffee-Rosen characterization of their own result suggests that a 150 basis point unrestricted subsidy might increase starts by 210,000 in the first year.

The impact of a change in mortgage rates on tenure choice can be estimated by the use of equation (2). In this equation the relative price effect on the decision to own or rent is measured by the ratio of the CPI [Consumer Price Index] homeownership and rental price indexes. Assuming that a 150 basis point reduction in the mortgage rate is a 10 percent reduction, and using Blinder's finding that mortgage rates have a weight of about one-third in the consumer price index of the cost of homeownership, suggests a 3.3-percent reduction in the relative cost of owning vs. renting. Using this result in equation (2) and assuming that the variable HADJ is about 50 million, suggests an 82,500 increase in the number of homeowners in the first four quarters following the reduction in the mortgage rate. This increase in the number of homeowners implies a further increase in starts of 21,000.

Hendershott model

In the Hendershott model, a reduction in mortgage rates affects housing starts through its impacts on user costs and tenure choice. Hendershott says that "if the ratio of user costs (owner to rental) had not fallen over this period (early 1960 to 1978), 3.5 to 4.0 million fewer households would have been homeowners at the end of 1978. . . . " (p. 418). Eyeballing figure 2 suggests that the decline in the ratio of user costs was from about 0.8 to 0.5. If the user cost for owners with a marginal tax rate of 0.15 is currently 12 percent, then a 150 basis point reduction in nominal mortgage rates is perhaps a 10-percent reduction in user cost. If user costs are higher, then the use of 10 percent will overstate

the impact on starts. Mechanically, the impact of this decline on starts depends upon the current ratio of user costs for owners and renters. If this ratio is currently as large as 0.8, then the 10-percent reduction in owner user costs implies a 0.08 reduction in the ratio. If at the end of 1978 a reduction in the ratio of 0.3 meant an increase of 3.5 to 4 million homeowners, then in 1982 a reduction of 0.08 could mean about 1 million more owners. While somewhat unclear, it appears that Hendershott's estimate of 3.5 to 4 million and, thus, my estimate of 1 million are long-run equilibrium responses. Hendershott's equations for tenure choice include substantial lags. Equation 1.1 in table 2 suggests that over the first four quarters after a change in user costs, only 12 percent of the equilibrium response has taken place. Hendershott finds that "the long-run impact of a change in homeownership (on starts) is close to one-for-one" (p. 421), suggesting that one might expect perhaps 120,000 new starts.

The Hendershott model underscores the fact that proposals for a current stimulation do so by borrowing from the future. When the subsidy disappears and user costs revert to their unsubsidized levels, the equations predict a decline in the number of homeowners and a resulting drop in the number of single-family starts.

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AN ANALYSIS OF FIVE PROPOSALS TO STIMULATE SINGLE-FAMILY HOUSING ACTIVITY

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INTRODUCTION

The combination of high real and nominal interest rates and declining real incomes has cut housing production sharply. In contrast to an average annual level of housing starts of 2 million in 1977 and 1978, starts have been less than 1 million during the last year. The absolute and percentage decline is greater for single- than multifamily units. For the year June 1981-May 1982, the percentage decline vis-a-vis 1977-78 was 58 percent for single-family units versus 40 percent for multifamily units. Nonetheless, an even sharper drop in ownership has created an excess supply of single-family units. Because builder inventories have been cut back sharply (36 percent or 150,000 units between December 1978 and December 1981), although they are still a little high relative to the snail-like pace of sales, this excess supply is now concentrated in the area of vacant existing homes; the vacancy rate for existing owner-occupied housing has risen by 40 percent (1 percent to 1.4). 1/ By historic standards, there are now 200,000 more vacant existing homes for sale than is normal. As a result, existing house prices have been under substantial downward pressure.

There has been a vague recognition that the reindustrialization and redefense of the United States would require or lead to some reduction in housing production from the peak levels of the later 1970's and that the transition to the lower level of activity might be difficult. But virtually no one envisioned the disaster of the last year and a half. In response to the disaster, a number of housing stimuli measures are currently being considered by Congress. Five that will be discussed in the present paper are: expanded usage of tax-exempt mortgage revenue bonds (MRB's), the mortgage interest tax credit (MITC) proposed by the President's Commission on Housing, two direct mortgage interest subsidies (the Lugar proposal and the Tandem plan in the 1974 Emergency Home Purchase Assistance Act), and a homeowner tax credit analogous to that provided in the 1975 Tax Reduction Act.

This paper begins with discussions of the merits of contracyclical housing subsidies and of restricting subsidies to new units. Next comes a general analysis of the limits current conditions in the housing market put on the impact of any subsidy on housing starts. The five proposals are then compared as to the relative magnitudes of both the values to home buyers of the subsidies and the costs to the Treasury (taxpayers).

1/The rental vacancy rate has hardly risen throughout this period of stagnant housing activity (had actually fallen prior to the first quarter of 1982).

SHOULD A CONTRACYCLICAL HOUSING SUBSIDY BE ADOPTED?

It is often argued that the economic cost of producing housing during a period of substantial unemployment of capital and labor in the construction industry is far less than the value of the construction put in place. Such an argument assumes that the Federal Reserve would accommodate the increased aggregate demand, i.e., would prevent interest rates from being driven up by the increased demand for funds (mortgages). Without accommodation, an increase in interest rates would restrain the demand for nonsubsidized housing and the demand for other goods, thereby sharply raising the net economic cost of producing the housing.

Whatever one's view of how the Federal Reserve ought to respond, there is little evidence that the Federal Reserve would be accommodating. After all, if it wishes to stimulate aggregate demand, nothing prevents it from doing so even in the absence of a housing subsidy. Thus, the value of subsidies aimed at housing is questionable.

There is, however, one condition in which passage of a single-family housing subsidy in the spring of 1982 would have made sense. That condition is confidence that the pressures of the November elections will induce Congress to pass a budget improving chances for an eventual full-employment surplus and that the Federal Reserve will respond by sharply lowering interest rates. The decline in real and nominal interest rates and the resumption of real income growth along a sharp upward path would trigger rapid household formation and the demand for housing units, turning an excess supply condition into one of excess demand and creating potential inflationary pressures in the housing industry. While I would caution against the naive extrapolation of past household formation rates (and especially rates of increase) into the future and reemphasize that reindustrialization and redefense will require a temporary reduction in consumption, including that of housing services, the assumption of growing housing demand in the 1980's is plausible. This is especially true given the length and depth of the current housing retrenchment.

The purpose of the passage of a housing subsidy program in the spring of 1982 would be to save the 1982 building season in the northern half of the United States. The decline in mortgage rates triggered by the assumed shift in the composition of stabilization policy (tighter fiscal, easier monetary) might not occur until September or October at which point a construction subsidy would neither be needed or desirable. However, an opportunity to build needed (shortly) houses at relatively little cost would have been

missed. 2/ When put in these terms, the case for subsidizing single- rather than multifamily housing is clear. Given the long production period of multifamily housing, the passage of a limited subsidy program in the spring of 1982 would have little impact on the production of multifamily housing in 1982.

To summarize, the case for passage of a contracyclical housing subsidy in, say, June 1982 is based upon the assumption that interest rates will decline sharply within a 3- to 6-month period from then. (If rates decline sooner, then no subsidy is needed; if rates do not decline within 6 months, then the Federal Reserve will likely offset the stimulative impact of a subsidy passed today, causing even more severe problems for the existing housing market and other industries.) Moreover, the longer the subsidy legislation is delayed, the weaker is the case for it. That is, the legislation will become less useful (the 1982 building season will be sliding by) and less necessary (the September-October decline in mortgage rates will soon become imminent).

SHOULD THE SUBSIDY BE RESTRICTED TO NEW UNITS?

Restriction of a subsidy to new units is sometimes advocated on the grounds that doing so will induce more production for a given subsidy and will cost the Government less per unit subsidized. The former is true if house prices are rigid; and the latter is always true but is largely irrelevant. While the cost to households as taxpayers is less, the total cost to households is not.

If real house prices are perfectly flexible, the net price of newly produced subsidized units--production cost less the present value of the subsidy--will equal the net price of existing units--quoted price less the present value of the subsidy. If a subsidy is directed at new units only, then demand will shift away from existing units. If flexible, existing house prices will fall sharply. In contrast, with the same subsidy applied to all housing, existing house prices will rise. The net price of housing will be the same, in either case, as will be the number of starts. Removing the subsidy from existing units simply necessitates a decline in existing house prices. Instead of households paying the full subsidy as taxpayers, they pay part of the subsidy as homeowners. While the Federal deficit may be less, the cost is not.

If existing house prices are sluggish in the short run, then a subsidy directed solely at new units will not cause an immediate

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2/The long-run impacts of the same-dollar housing subsidy might appear to be the same irrespective of the timing of the subsidy. However, if subsidies are timed so as to smooth production and/or prevent a reduction in construction capacity, then they will have a relatively greater impact (result in a relatively lower average construction cost).

sharp fall in existing house prices and the net price of newly produced houses will be less than if the subsidy is for all units. As a result, the number of starts will be greater for a given level subsidy.

IMPACT ON SINGLE-FAMILY HOUSING STARTS: GENERAL CONSIDERATIONS

Housing construction has historically been a contracyclical activity, expanding (late) in recessions and contracting (late) in upswings. This pattern followed from the behavior of interest rates and (expected) inflation. Interest rates generally declined swiftly and inflation slowly. As a result, the price of housing services provided by owner-occupied housing fell (the real after-tax mortgage rate--RATMR--declined) and owner-occupied housing became more affordable (the ratio of the initial nominal mortgage payment to income declined).

The current recession differs in that mortgage rates have fallen hardly at all and inflation has dropped sharply. RATMR is probably up by a full 5 percentage points since late 1978, and there is nothing affordable about 17 percent mortgage rates. 3/ The steep decline in housing demand is hardly surprising.

The relative roles of RATMR and nominal mortgage rates in this decline are unclear. In my own view, the increase in RATMR is sufficient to explain the current housing depression. Thus, policies directed solely at solving the tilt problem will do little to stimulate starts. (I base this view, in part, on the fact that most builders are already addressing the tilt issue by engaging in buydowns.) On the other hand, a subsidy that addresses the tilt issue may stimulate housing demand slightly more than an equivalent subsidy that does not.

The impact of a subsidy on housing demand depends on many factors in addition to the magnitude of the subsidy (and whether the tilt problem is addressed). The most obvious of these is the extent of the targeting incorporated in the legislation. Restrictions of eligibility to first-time buyers, to households with incomes below a given level, to mortgages below a given size, and to especially "needy" regions would all act to limit the demand for

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3/For a short discussion of the impact of real (after-tax) and nominal mortgage rates on housing demand, see my articles in the Quarterly Review of the Federal Home Loan Bank of Cincinnati, 1 and 2, 1982. For more comprehensive analysis, see the references therein.

subsidized units. 4/ Of course, if the number of subsidized units made available is less than the demand in each region, even after the targeting, then the targeting does not result in reduction in the effective demand for units. Moreover, in this case a restriction of the subsidy to starts would obviously increase the impact of the subsidy on the number of units started. In what follows, I assume that the subsidy will be directed (largely) at newly produced units both because house prices are generally viewed as being sluggish and because the appearance of bailing out existing losers is to be avoided.

The impact of a subsidy on the demand for subsidized starts also depends on conditions in the housing market. If the housing market were in full equilibrium, then one would expect numerous renters to attempt to become owners of new houses and many owners of existing houses to desire to purchase new houses. To the extent that the loans were supplied and household demands became effective, vacancy rates for both owner-occupied and rental housing would rise. The rise would be reversed in the future when lower interest rates and more rapid income growth triggered an increase in household formation.

The demand for subsidized units will be substantially limited by current conditions in the housing markets. First, the sharp run-up in real and nominal interest rates has raised the economic cost of owner-occupied housing considerably vis-a-vis the cost of rental housing. There are few renting households near the margin of shifting to owning. Even with a significant subsidy for new owner-occupants, there may not be a large desired shift from rental to owner-occupied housing. Second, the housing market is severely depressed in a number of areas of the country. In these areas, the price of existing housing is substantially below its replacement cost. Even with a subsidy to new starts, existing housing could be cheaper. (A State allocation formula based heavily on unemployment, especially in the housing construction trades, virtually guarantees that there will be a substantial excess supply of subsidized loans in depressed areas.) Third, many current homeowners have existing mortgages at rates 2 and 3 percentage points below the 12-percent subsidized rate. To the extent that gains are uncapturable on

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4/Most of the eligibility restrictions are based upon equity considerations. For example, first-time buyers are more worthy of subsidies because they have not been recipients of fortuitous, unanticipated real housing capital gains. Also, collecting taxes from middle-income households to subsidize high-income households seems rather bizarre.

sale, 5/ these households will not find the subsidies superior to their present below-market rates. 6/

From the above, one can compute the effective demand for subsidized units. The net impact of a subsidy on housing starts requires two subtractions. These are the number of subsidized starts that would have occurred even in the absence of the subsidy and the number of unsubsidized starts that will be lost as a result of a general increase in interest rates produced by the subsidy-induced increase in the demand for credit. Of course, the more the Federal Reserve accommodates the increased demand for credit, the less will the latter be.

THE MAGNITUDE OF THE SUBSIDIES

The five subsidy proposals are a homeownership tax credit, a permanent interest subsidy (Tandem), a temporary subsidy (Lugar), usage of tax-exempt financing (MRB's) and introduction of a mortgage interest tax credit (MITC). While the precise legislative proposals differ enormously in their targeting, any targeting can be achieved with any of the subsidies. For example, a MITC could be given for interest earned only on mortgages associated with houses started after March 6, 1982, and substantially completed by January 1, 1983, that were purchased by households with incomes below $30,000. Thus targeting should not be an issue in selecting among the subsidies. The major relevant issues in selecting among the alternatives are the magnitudes of the subsidies and the cost to the Federal Government (taxpayers). The former are discussed in this section, the latter in the next.

The value of a below-market interest rate on a long-term instrument depends upon one's expectation of future interest rates and of one's tax bracket (because interest is deductible). The present value of a dollar loan at the rate i^* is

$$(1)\quad PV = \sum_{j=1}^{N} \frac{(1-\theta_h)\,(i_j^e - i^*)\,x_j}{\prod_{k=1}^{j} [1+(1-\theta_h) i_k^e]},$$

5/See Patric H. Hendershott, Sheng Hu, and Kevin E. Villani, "The Economics of Mortgage Terminations: Implications for Mortgage Terms and Mortgage Lenders," Housing Finance Review, 1982, for a discussion of mortgage capital gains and their capturability.

6/Given the conditions described in this paragraph, a shallow subsidy such as the Lugar proposal would likely not raise the demand for subsidized units sufficiently to make a State allocation formula necessary.

where x_j is the fraction of the loan outstanding in period j, N is the life of the loan, i_j^e is the "market" interest rate the household expects to pay in period j in the absence of a subsidy, and θ_h is the household's tax bracket. 7/

The Tandem, MRB, and MITC proposals

Comparison of the Tandem, MRB, and MITC proposals does not require the calculation of (1). Because the underlying mortgages will amortize at roughly the same rates (the x_j are precisely the same for the different plans if the i*'s are the same) and households' expectations of future interest rates and tax brackets are the same regardless of which subsidy is employed, one need only compare the i*'s for the different plans. Equivalently, one can compare i_o-i*, the per annum interest rate subsidy, assuming interest rates do not change in the future.

The Tandem plan is to lower the mortgage rate 4 percentage points below market. However, the value of the subsidy to the household is somewhat less than 4 percentage points. When the household obtains a 16-percent mortgage, the household receives an option to repay the mortgage and refinance if interest rates should decline. Given a significant probability that mortgage rates will decline sufficiently to trigger refinancing, the interest cost to the household is significantly less than 16 percent in an expected value sense. 8/ I take the value of the subsidy to be 3.5 percentage points, i.e., i_o-i*=0.035.

Currently, yields on GNMA mortgage-backed securities are roughly 16 percent, 10-year Treasury yields are 14.5 percent, and high-quality tax-exempt housing bonds 10.5 percent. The 0.015 differential between the GNMAs and Treasury's reflects the terminations or call premium to compensate lenders for the lack of call protection on mortgages and the differential taxation of interest from GNMA's and Treasury's at the State and local level. The ratio of this exempt yield to a risk-equivalent taxable yield--the Treasury yield plus 0.005 --is 0.7. 9/

7/One might write the numerator as $[(1-\theta^e_{h_j})\, i^e_j - (1-\theta^*_{h_j})\, i^*]\, x_j$, where $\theta^e_{h_j} < \theta^*_{h_j}$ --with a lower interest rate ($i^*_j < i^e_j$) household taxable income is higher--and the tax rates generally could be expected to change over time. On the issue of the relevant tax rates, see Patric H. Hendershott and Joel Slemrod, "Taxes and the User Cost of Capital for Owner-Occupied Housing," NBER Working Paper, July 1982.

8/The likelihood that rates will fall below the 12 percent subsidized rate is obviously much less. For a full discussion of the terminations option, see Hendershott, Hu, and Villani, op. cit.

9/Equals 10.5/(14.5+0.5)

Given a 1.5-percent markup on the housing bonds to obtain the home buyer's borrowing rate when tax-exempt financing is employed, this rate is also 4 percentage points below the market mortgage rate. 10/ Here, too, consideration of the borrower's call option suggests that the subsidy is less; again I take $i_o - i^*$ to be 3.5 percentage points.

With an MITC equal to m percent of mortgage interest earned on incremental investments, the mortgage rate $\overline{Rmor}$ at which an investor in the τ tax bracket is indifferent between mortgage and Treasury securities can be obtained by solving

$$(2)\quad (1-\tau)\overline{Rmor} + m\overline{Rmor} = (1-\tau)Rtrea + (1-\tau)0.015.$$

Solving,

$$(2')\quad \overline{Rmor} = \frac{1}{1+ m/(1-\tau)}\ (Rtrea + 0.015).$$

The MITC has been advocated by the President's Commission on Housing on an at least quasi-permanent basis, although no specific form of the MITC is presented in the report of the Commission. 11/ In order to make the subsidy under MITC roughly comparable to that under Tandem and the MRB's, a 20-percent credit for all interest earned on new investments in mortgages is analyzed. With Rtrea = 0.145, τ = 0.3 (unity less the ratio of exempt to taxable yields) and m = 0.2, $\overline{Rmor}$ is 0.1244. After allowance for the call option, I set $i_o - i^*$ = 0.032. 12/ For investors in lower tax brackets, $\overline{Rmor}$ is higher, but the greater relative value of the tax credit to high bracket investors will lead them to compete for the subsidized mortgages, driving the yield down and lesser taxed investors out of the market in the long run. A permanent MITC would be an extraordinary new subsidy for housing (for household borrowing generally). 13/ However, it is unclear that a long-run equilibrium result would hold for a limited MITC. Many qualified mortgages would likely be originated at rates above 12.5 percent, resulting in a smaller

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10/Large issues of MRB's will raise the yield on tax-exempt housing bonds significantly. The roughly $25 billion in issues envisioned in this targeted proposal should not raise yields by more than a quarter point.

11/GAO was initially advised by a Commission staff member that a specific tax credit proposal was contemplated. Later, the Commission's Staff Director advised GAO that no specific credit was considered.

12/For m = 0.2333, $\overline{Rmor}$ = 0.12 and $i_o - i^*$ is again 0.035. The same holds for m = 0.2 but τ = 0.4.

13/A 2 percent credit (see note 11) would lower the mortgage rate by only 44 bases points using the other parameters assumed in the text.

housing stimulus and a greater cost to the Treasury (the tax loss being nearly proportional to the mortgage rate). I will return to this point below.

Ownership tax credit

The credit considered here equals 5 percent of the house purchased by eligible buyers, eligibility being defined so that this proposal is targeted in the same way that the other proposals are. The present value of the subsidy is the 5 percent of the value of the house purchased. To compare this with the other proposals, their present value must be calculated from equation (1).

If the household assumes interest rates will be constant for 10 years and then decline to the mortgage subsidy rate ($i_j^e = i^*$ for $j>N$) and if the household has an initial loan-to-value ratio of 90 percent and is in the 0.25 tax bracket, then the present values of the Tandem and MRB subsidies are 12 percent of the value of the house. If the household assumes that interest rates will be constant for 5 years and then decline to the subsidized rate, the subsidy is 8 percent of the value of the house. Finally, if rates are assumed to decline by 1 percentage point per year, the subsidy is worth 5 percent of the house value. For the long-run MITC, the subsidy is not quite as large (recall the $i_o - i^*$ was $0.032 < 0.035$).

Temporary interest subsidy with recapture

Because the Lugar proposal calls for only a temporary subsidy ($i^* = i_j^e$ for $N>5$) and requires recapture of the subsidy, 14/ the present value of the subsidy is clearly less than that of a permanent subsidy. If interest rates were expected to be constant in the future and recapture to occur at the end of the 12th year, the present value of the subsidy is just over 5 percent or the same as the ownership tax credit. If interest rates were expected to by 1 percentage point a year, then there is no subsidy at all. 15/

THE COSTS OF THE SUBSIDIES

The cost of the ownership tax credit is simply 5 percent of the value of the housing subsidized. Costs of the other subsidies

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14/ $5(i_o - i^*)/II[1+(1-\theta_{hk})i_k^e]$ should be subtracted from the right side of equation (1).

15/ This is because (1) the amount recaptured is based upon the rate, not the difference between the mortgage rate observed through time and the subsidized rate, and (2) the household saves only net (after-tax) interest but the gross (pre-tax) interest differential is recaptured.

again require present value calculations. The present-value formulae all take the general form

$$(3) \quad PVC = \sum_{j=1}^{N} \frac{COST_j x_j}{\Pi[1+(1-\theta_i)i_k^e]} + PVRECAP,$$

where $COST_j$ is the cost in period j per dollar of subsidized mortgage outstanding and PVRECAP is the present value of recapture and equals zero except for the Lugar proposal. In contrast to equation (1), θ_i in the discount factor is the marginal tax rate of the representative investor in Treasury securities, not that of the representative household issuing subsidized debt.

Because the x_j, $(1-\theta_i)i_k^e$, and PVRECAP (=0) terms are the same for the Tandem, MRB, and MITC proposals, only the $COST_j$ terms need be compared. For the Tandem (T), MITC (M), and tax-exempt MRB (E) proposals, the costs are

$$(3T) \quad COSTT_j = (i_o - i^*) - \theta_h(i_j^e - i^*)$$

$$(3M) \quad COSTM_j = m\overline{Rmor} - (\tau-\theta_h)(i_j^e - \overline{Rmor})$$

and

$$(3E) \quad COSTE_j = \theta_h(Rtrea + .005) - \theta_h(i_j^e - i^*)\ 0.85$$

A few words about each of these follow.

For the Tandem plan, the Government pays the present value of $i_o - i^*$ times the x_j's up front by selling the subsidized mortgages at a discount. This cost is partially offset by reduced household interest deductions over time. Note that the initial cost is independent of subsequent movements in market interest rates, but the deduction offset is not. 16/ More specifically, if the alternative (in absence of subsidy) mortgage cost to the borrower should decline, either through a variable rate loan or refinancing, the cost to the Treasury rises.

For MITC, the cost is the tax credit given to the mortgage investor less the lost tax revenue owing to the lower mortgage rate (reduced investor interest income less reduced household interest deduction). In this case, both terms can be affected by changes in interest rates. For example, if rates decline sufficiently for the mortgage to be refinanced in period k, $COSTM_t$ goes to zero for t>k.

For the MRB's, the cost is the taxes foregone owing to investors purchasing exempt rather than taxable debt less the

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16/This would not be true if interest rates declined before GNMA sold the mortgages.

reduction in household interest deductions. 17/ The comparable taxable yield is taken to be the Treasury yield plus a half percent. The 0.85 in (3E) reflects the assumption that only 85 percent of MRB's actually finance housing; the remaining 15 percent is invested by State and local units in taxable securities. Here, too, changes in interest rates can affect both terms. More specifically, a sharp decline in interest rates that induces refinancing in period k will cause $COSTE_t$ to be zero for t>k.

To evaluate expressions (3T)-(3E), we set $i_o - i^* = i_j^e - i^* = 0.035$, $\theta_h = 0.25$, m=0.2, $\overline{Rmor} = 0.1244$, $i_j^e - \overline{Rmor} = 0.032$ and Rtrea = 0.145. The results are

$$COSTT_j = 0.0263$$

$$COSTM_j = 0.0233$$

$$COSTE_j = 0.0301$$

The cost of the direct subsidy is about 10 percent less than that of tax-exempt financing, and the cost of MITC is another 10 percent less. However, the subsidy with MITC was also about 10 percent less than that with the Tandem. Thus the benefit/cost ratios for these two proposals are roughly equal and greater than that for tax-exempt financing. However, as noted above, a short-run limited MITC might not yield this equilibrium result. More specifically, the average rate on mortgages qualifying for the MITC would likely exceed 12.44 percent. Thus the subsidy would be less and the cost greater, in which case the ratio of benefits to costs would exceed that of the Tandem plan.

The relative costs of the various proposals are influenced by the ex-post course of interest rates. A sharp decline in interest rates will lead to refinancing. When this occurs, the streams of costs under the MITC and MRB plans are truncated, lowering the present value of the total costs. In effect, the Treasury gains at the expense of the lenders. 18/ This does not occur under the Tandem plan because the present value of the costs was paid up

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17/There are innumerable second-order effects. For full discussions of MRB's, see Patric H. Hendershott, "Mortgage Revenue Bonds: Tax Exemption with a Vengeance," and Harvey Galper and Eric Toder, "Modelling Revenue and Allocation Effects of the Use of Tax-Exempt Bonds for Private Purposes," both in Kaufman (ed.), Efficiency in the Municipal Bond Market, JAI Press Inc., 1981.

18/The reverse is true, although to a much smaller extent, if interest rates should rise. The average life of all mortgages will be longer than originally anticipated, and the costs will be greater.

front. If Congress really believes the long-run scenario in which interest rates decline sharply, then the case for the Tandem proposal suffers.

The present value of the costs of the Tandem proposal equals the present value of the benefits under the assumption that the tax rate for the representative investor in Treasury securities equals that of the representative household issuing mortgages. This is also approximately true for the MITC in the long run. For MRB's, the present value of the costs exceeds that of the benefits.

The cost of the Lugar proposal is less than that of Tandem both because the $COST_j$ term is truncated after 5 years and because of recapture. Under the assumption that $\theta_i=\theta_h$, the expected costs equal the expected benefits, just as was the case with Tandem. Unlike Tandem, a sharp decline in interest rates will lower the cost of the Lugar proposal, conceivably to zero.

SUMMARY

The logical underpinnings of arguments for a contracyclical stimulus of housing and for restricting the stimulus to new units are not strong. There is good reason to believe that the Federal Reserve would offset the macroeconomic effects of a housing stimulus; to a large extent, subsidized housing would simply replace nonsubsidized housing and other outlays. Moreover, current conditions in the housing market suggest that a shallow subsidy for single-family housing would have little impact on new construction. The sharp runup in real interest rates has greatly altered the "terms of trade" against owner-occupied (single-family) housing for new households, and the enormous mortgage capital gains of existing households constitute a significant disincentive for movement to new housing.

Restriction of a housing subsidy to newly produced units has some political appeal in that a given subsidy program would appear to have a larger impact on starts at a smaller cost to the Treasury. The legislation would seem to be a fiscally conservative stimulus program that does not bail out those who speculated on continued inflation. In a world with flexible (downward) real house prices, restriction of the subsidy to new units will not increase the impact of the subsidy on starts; it will only decrease further the price of existing housing. Subsidized and nonsubsidized housing will trade at the same (net of subsidy) price. While the cost to the Treasury will be limited, the cost to households will not. What households will save as taxpayers, they will lose as homeowners. Not only will the restriction prevent the bailing out of existing losers, it will aggravate their plight.

The present paper provides a framework for computing the effective reductions in the cost of housing under five different subsidy proposals and reports the results for the terms of the subsidies as given in specific legislative initiatives.

Of the five proposals, the permanent (Tandem) interest subsidy (4 percentage points below market) and tax-exempt financing would provide the greatest effective reduction in the cost of owner-occupied housing. The 20 percent mortgage interest tax credit has the next largest effect; the cost reduction provided by the 5 percent homeownership tax credit and the temporary interest subsidy (4 percentage points) with recapture (Lugar) generate much smaller reductions. The latter might be only a third of that provided by either Tandem or tax-exempt financing, which lower the cost of housing by roughly 15 percent. Not surprising, the more a proposal lowers the cost of housing, the more it tends to cost the Treasury. The preferred subsidy method is that which achieves a given cost reduction at the lowest possible cost. 19/

A mortgage interest tax credit would be a new subsidy to housing (or household borrowing generally). Even a 2 percent credit would reduce the mortgage rate by 44 bases points which is in the neighborhood of the 20-50 bases point estimated impact of the MITC's proposed in the Financial Institutions Acts in the 1970's. 20/ While the Commission does describe the MITC as "transitional," it is so only in the sense that it should be reconsidered "when a thorough review of sectoral subsidies in the entire tax system is conducted." That is, it would be as transitional as the exclusion of imputed rents on owner-occupied housing from taxation. While an MITC does appear to be a relatively efficient long-run mechanism for allocating money to the mortgage market, a temporary MITC is probably not an efficient contracyclical mechanism because the reduction in the mortgage rate would likely be less, lowering the subsidy and increasing the cost.

The Tandem direct-interest reduction is generally more cost effective than tax-exempt financing (MRB's) if interest rates stay at current levels. However, if interest rates should decline sharply over the next 5 years, as the administration forecasts, then tax-exempt financing could be more cost effective. With Tandem (and the homeowner tax credit), the Treasury pays its costs up front; even if interest rates decline and the subsidized

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19/Because all five subsidy proposals can be targeted (to first-time home buyers, to households with incomes below a given level, or to households in particular regions of the country) in a similar manner, targeting is not a basis for choosing among proposals.

20/See Patric H. Hendershott, "An Analysis of the Expected Impact of the Financial Institutions Act of 1975," in Buckley, Tuccillo and Villani (eds.), Capital Markets and the Housing Sector, Ballinger Publishing Company, 1977; and Edward J. Kane, "Costs and Benefits of the Proposed Credit on Residential-Mortgage Income," Journal of Bank Research, Summer, 1975.

mortgage expires via refinancing, the Treasury's costs do not decline. With tax-exempt financing (and the MITC and Lugar plans), the costs are paid over time. Termination of the subsidized mortgages truncates the subsidy payments at that time; the ex-post cost to the Treasury is thus lower (the decline in interest rates causes the Treasury to gain at the expense of lenders).

The Lugar proposal is a shallow subsidy roughly equivalent to the 5-percent homeownership tax credit if interest rates do not decline. Moreover, if interest rates do decline by 1 percentage point a year for each of the next 5 years, then there is no subsidy at all. This is because households save the interest subsidy net of tax, but repay the gross interest subsidy.

The Lugar proposal has two favorable attributes. First, it addresses the tilt problem as well as the basic cost problem. Second, because it is a shallow subsidy, it can be made available to all qualifying households within a reasonable total cost outlay (the homeownership tax credit shares this attribute). (Thus the questionable regional allocation of moneys in the legislation could be deleted.) Given the likely budgetary constraint, deeper subsidies would have to be allocated in an arbitrary and thus inequitable manner among qualifying households; some households with lower incomes than those receiving the subsidy would be excluded and some households receiving the subsidy could afford housing far superior to that of taxpayers paying the subsidy. That is, all the equity-based criticisms of rental housing subsidies would apply. 21/

21/Edgar O. Olsen, "Housing Programs and the Forgotton Taxpayer," The Public Interest, Winter, 1982.

COUNTERCYCLICAL STIMULATION OF SINGLE-FAMILY HOUSING:

IT'S LIKELY TO BE EXPENSIVE

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INTRODUCTION

The message of this paper is simple: if a sizable increase in investment in single-family housing is desired, then obtaining the increase is likely to be quite expensive. A corollary to this is that many current proposals to stimulate housing demand are unlikely to have a significant effect upon housing activity precisely because they do not give large subsidies to prospective home buyers.

The case for the above argument is made in two ways. First, recent trends in housing affordability and recent debates concerning the correct measure of affordability are analyzed. The conclusion of this review is that housing has increased in cost over the last 2 years by any reasonable measure of affordability. Consequently, restoration of housing construction activity to the levels attained in the second half of the 1970's is likely to be quite expensive, and relatively inexpensive and well-known devices like the graduated payment mortgage are unlikely to have a sizable effect in this particular housing cycle.

Second, the impact of four families of proposals upon the housing demand of three representative households is analyzed using a non-linear programing model of household choice developed by Alm and Follain [1982a and b]. The four families analyzed include two versions of the Lugar proposal (with and without the graduated equity mortgage (GEM) provision), the home buyer's tax credit, three variants of permanent subsidy proposals, and two alternative mortgage instruments (the graduated payment mortgage (GPM) and the price-level adjusted mortgage (PLAM)). In addition to identifying the impact of the proposals upon housing demand, the model also calculates the direct subsidy costs and the tax expenditures of each proposal.

It is important to note that the focus of the simulation model is somewhat limited. Each proposal is designed to affect the housing demand of two types of home buyers: those households that would have purchased a home even in the absence of the specific plan but that now opt for a more expensive house due to the plan and those that decide to purchase a home only because of the incentive offered by the proposal. The model used here considers only the first group, and the results measure the incremental housing demand of this group attributable to each proposal. The impact of, say, the Lugar proposal on new housing starts is therefore not considered. Nevertheless, the model does allow calculation of the costs to the Government of each plan, for those home buyers that qualify.

The outline of the paper is as follows. The second section reviews recent trends in affordability measures and the debate over the correct way to measure affordability. The third section presents the results of the modeling exercises. A final section summarizes the results of the paper and suggests some ideas that

should be kept in mind by those responsible for deciding whether the benefits of stimulating the housing sector are worth the costs.

RECENT TRENDS IN AFFORDABILITY MEASURES AND THE AFFORDABILITY DEBATE

During the 1970's there was much debate among economists about the correct way to measure the cost of housing, especially owner-occupied housing. The debate began when a number of analysts noted that the size of the mortgage payment relative to the income needed to buy the median-priced new home by the median income household rose in the early 1970's (e.g., Frieden and Solomon [1977]). This led some to conclude that assistance to the housing sector was needed if housing demand was to remain at high levels. Some economists rejected this argument and this measure of affordability by arguing that in a competitive economy with perfect capital markets, the correct measure of the cost of owner-occupied housing in an inflationary environment is the real after-tax user cost of capital, a measure that takes into account the tax advantages of homeownership and the capital gains enjoyed by owners (see, for example, deLeeuw and Ozanne [1979], Diamond [1980], Dougherty and Van Order [1982], Hendershott and Hu [1981], and Villani [1981]). When this measure is used, quite a different picture of affordability is seen for much of the 1970's; that is, housing costs actually declined through the 1970's. Consequently, this latter group argued that there was no affordability crisis and, hence, no need for housing subsidies. Indeed, evidence was presented (Hendershott [1980] and Rosen and Rosen [1980]) to show that the decline in the user cost of capital gave a major stimulus to housing demand in the 1970's.

An obvious counterargument to the proponents of the user cost measure is that markets are not all perfectly competitive; in particular, mortgage markets in the 1970's were imperfect, given the reliance on the standard fixed-payment mortgage (SFPM) instrument and on lending rules that limited the amount of money a household could borrow to some fraction of its income in the first year of the mortgage. Consequently, it was argued that the ratio of mortgage payments to income is a good indicator of the difficulty of buying a house, if not the affordability. Evidence was presented that this "tilt problem," as it was called, did have a dampening effect upon housing demand at least through 1975 (see Follain [1982] and Kearl [1979] for examples of this work).

Nevertheless, the case for subsidies to homeownership was still weak. If capital markets are imperfect, then the solution is not more subsidies to homeownership, but rather improvements in mortgage instruments used in the market. The graduated payment mortgage and the price-level adjusted mortgage are excellent examples of instruments that could solve the affordability problems faced by home buyers in the 1970's. This view, in our opinion, was widely held by analysts of the housing market at the end of the 1970's.

The situation thus far in the 1980's is quite different than the experience of the 1970's. Two things have happened to alter both the severity of the housing affordability problem in the current housing depression and the remedy for the problem. First, housing has increased in cost since 1979, using either measure of housing affordability. Second, innovations have occurred in the housing and mortgage market that to some extent circumvent the affordability problems associated with the use of the SFPM during inflationary times. Consequently, it is unlikely that relatively inexpensive interventions in the housing market--new mortgage instruments--will restore housing demand to levels attained in the late 1970's; that is, although alternative mortgage instruments are still needed and will still be a net stimulant to housing demand, they will not by themselves be sufficient to restore demand to its previous levels.

Table 1 presents evidence that housing affordability using either measure has become more difficult in the past 2 years. The first column contains estimates of the real after-tax user cost of owner-occupied housing since 1968, as presented in Dougherty and Van Order [1982]. The second column equals the mortgage interest rate times .8 times the price of a constant-quality new house. This is a rough measure of the mortgage payment on a 75 percent loan. Note the decline in the user cost measure of housing during the 1970's and the dramatic increase in 1980 and 1981. Although we have not calculated the user cost for the first half of 1982, our guess is that the number would be even higher, given the rise in real rates experienced in 1982. The second column also indicates that housing costs as measured by the size of the initial mortgage payment have increased substantially in the past few years.

The second point is more difficult to demonstrate, since innovations in the mortgage market are difficult to monitor and measure. However, some valuable information was recently reported in an article by Connie Vickroy of the Federal Home Loan Bank of San Francisco, in which she discussed recent changes in rules used by lenders to determine the size of a loan for which a household qualifies. As noted by Vickroy, "for almost a century, the rule of thumb governing housing affordability was that a household should not spend much more than 25 percent of its monthly income for housing payments." It is this fact coupled with the SFPM that has caused so much difficulty for people trying to buy housing in the 1970's.

Vickroy reports, however, that lenders are fast changing this outdated rule of thumb. To substantiate her point she reports the results of a survey done by the Chicago Title Insurance Company, which showed that the average ratio of mortgage payments to income for first-time home buyers rose from 23 percent in 1976 to 38.4 percent for 1981. The ratio for repeat buyers rose from 24.9 to 33.4 for the same period. Vickroy also reports that two major suppliers of mortgage funds--FNMA and FHLMC--adjusted their underwriting requirements in 1979. Until then, FNMA and FHLMC required that the maximum proportions of gross income for monthly mortgage

payments be 25 percent, and 33 percent for total fixed debt. The rules were changed in 1979 to 28 percent and 35 percent, respectively. Since many lenders sell their loans to these institutions, this policy change also probably had significant effect upon the rules of thumb used by lenders.

Table 1

Trends in Measures of Affordability

	User cost	Initial mortgage payment
1968	892	1510
1969	792	1833
1970	904	1937
1971	983	1893
1972	751	1985
1973	751	2345
1974	547	2845
1975	171	3083
1976	465	3346
1977	-105	3813
1978	-298	4673
1979	-613	6070
1980	824	7909
1981	4883	9876

The user cost index is computed using the data presented by Dougherty and Van Order, "Inflation Housing Costs and the Consumer Price Index," American Economic Review (March 1982): Table 1, p. 160. The user cost number equals ((1-t)i + d - ie)P where t is the marginal tax rate (0.25), i is the mortgage interest rate; d is the maintenance rate (0.01), ie is a measure of inflationary expectations constructed by Dougherty and Van Order, and P is the price of a constant-quality new house. The 1981 figure was generously provided by Dougherty and Van Order.

The numbers are calculated as 0.8 x P x i, where P and i are defined in the previous paragraph.

Table 2 presents additional information that is consistent with the Vickroy article. It contains the distribution of housing payments to income ratios for three large SMSA's in 1978. The three SMSA's are San Francisco (a high-cost area), Atlanta (a medium-cost area), and Kansas City (a low-cost area). We would expect the ratio of payments to income to be much higher than 0.25 if lenders adjust their traditional rule of thumb. Furthermore, we might expect exceptions to the old rule to be greater in markets where the nominal cost of housing is greater. The results in the table are completely consistent with these hypotheses.

Finally, table 3 presents data on the distribution of payments to income ratios for home buyers in 1981, 1979, and 1977, as taken from the recently released study done by the U.S. League of Savings Associations, Homeownership: The American Dream Adrift. The data clearly indicate a slow, but gradual change in the distribution of the payment to increase ratios allowed by lenders. Note, in particular, that 21.3 percent of buyers have ratios in excess of 30 percent in 1981 whereas only 14.5 percent did in 1977.

The conclusions of this section are twofold. First, housing has increased in cost over the past 2 years, according to two widely accepted measures of housing costs. Second, lender requirements have probably become more lenient in recent years, thus allowing some households to circumvent the severe tilt problems present in the 1970's. The policy implications of these conclusions are that stimulating housing demand to its 1970 levels is likely to be quite expensive. Not only has the cost of housing increased in real terms, but innovations in the mortgage market suggest that some of the kick that might have been expected by a major move to alternative mortgage instruments may already have happened.

ANALYSIS OF FOUR FAMILIES OF PROPOSALS

Four families of proposals have been suggested to stimulate housing investment by either reducing the cost of owner-occupied housing or altering the time stream of the costs. Each of these families is analyzed in this section in general terms and in terms of the non-linear programing model developed by Alm and Follain [1982a and b]. The model is used to determine the effect of each of the proposals on the housing demand of three groups of households, as well as the likely cost of each program.

The model is briefly discussed here (see Alm and Follain for a complete description of the model). The model seeks to characterize the life-cycle choices of a consumer. The household is assumed to maximize utility over some fixed period, subject to an intertemporal budget constraint and various liquidity constraints. Utility in any period depends upon the housing and non-housing consumption of the household. The objective function is then the sum of the present discounted value of utility in each period, with the discount rate equal to the rate of household time preference. A 10-year model is assumed, a period comparable to the average time a homeowner resides in a particular house. The consumer

Table 2

Mortgage Payment to Income Ratios for First-Time Home Buyers in Three SMSA's in 1978

Mortgage payment to income ratio	Distribution (percent)		
	San Francisco	Atlanta	Kansas City
Less than 10 percent	3.9	5.8	8.1
10 - 15 percent	5.5	23.5	18.0
15 - 20 percent	14.1	32.9	36.0
20 - 25 percent	28.9	19.3	23.4
25 - 30 percent	13.3	7.4	7.2
30 - 35 percent	12.5	6.2	3.6
Greater than 35 percent	21.9	4.9	3.6

Table 3

Housing Expense to Income Ratio for Home Buyers Nationwide

	All home buyers (percent)		
	1981	1979	1977
20 percent or less	30.6	28.5	33.8
20.1% - 25.0%	24.4	25.8	28.1
25.1% - 30.0%	23.6	24.3	23.6
30.1% or more	21.3	21.4	14.5
Median	24.1	24.3	22.0

	Repurchasers		First-time home buyers	
	1981	1979	1981	1979
20 percent or less	31.3	29.1	26.2	26.3
20.1% - 25.0%	24.1	25.0	26.7	28.6
25.1% - 30.0%	23.3	24.0	26.4	26.0
30.1% or more	21.3	21.8	20.7	19.1

SOURCE: U.S. League of Savings Association, Homeownership: The American Dream Adrift, 1982, Tables 1.11 and 2.11.

chooses consumption in each period, the size of the house (assumed constant over the entire period), and the initial loan-to-value ratio. The parameters of the utility function are chosen so that the price and income elasticities of housing demand are approximately unity.

The budget constraint of the household equates the present value of all expenditures on housing (including capital gains) and non-housing goods to the present value of income plus initial wealth less taxes. The income tax is assumed to be progressive, and the tax payments fully reflect all the benefits levied to homeowners by the Federal income tax system.

Several types of liquidity or financial market constraints are present. The first requires the mortgage payment in the first year to be less than some fraction of the income of the household in the first year; however, the parameters and assumptions are such that this constraint is never binding. A second constraint requires that the downpayment not exhaust the wealth of the household. It also is never binding. A third set of constraints requires that the household always have positive net worth. Some of these constraints are binding. The final constraint in the model limits the loan-to-value ratio to be less than or equal to 90 percent, and it is always binding.

The model has several advantages over econometric models. It can model the effect on housing demand of variations in the stream of housing costs, as well as analyze the effect of decreases in the present value of the cost of homeownership. The model is also able to model more precisely the role of taxes in the household's decisionmaking process. Since many of the proposals involve tax considerations and adjust the stream of housing costs, these advantages are important.

A disadvantage of the model is that it is designed to analyze the choices of a representative household. It is not designed to identify the aggregate effects of the various proposals upon aggregate housing activity. In order to do this, the model must be solved for a variety of household types; then the results for each household type can be multiplied by the number of such households in the economy. Such an aggregation procedure is difficult in practice since there are so many different types of households and since the kind of data needed to do the aggregation--income and wealth distributions--are not available. An alternative is to determine how much additional housing demand would be stimulated by a proposal of a given size, such as a $3.5 billion Lugar plan. This is done in the latter part of this section.

As indicated above, a number of simplifying assumptions are needed in order to compute the solution to the model. Some are very technical and are described in Alm and Follain [1982a and b]. Others are more relevant to the analysis at hand. These are described below on the next page.

1. Three income groups are analyzed--$15,000, $22,500, and $30,000. The initial wealth of each household is assumed to be one-third the income of the household, and the marginal income tax rates for the three income groups are 0.16, 0.19, and 0.22, respectively. The tax system parameters are indexed.

2. Real income is assumed to grow by 2 percent per year. Household wealth at the end of the 10th year is assumed to be $5,000 plus 10 percent of the present value of gross income.

3. The model is analyzed for three rates of inflation--7, 10, and 13 percent. The real rate of interest is assumed to equal 5 percent. The lending and borrowing rates facing the household are assumed equal, and the rate of time preference is assumed to be 4 percent. The nominal mortgage and lending rates are assumed equal to the real rate plus the rate of anticipated inflation plus the product of these two rates. Thus, for example, with a 10 percent inflation rate and a 5 percent real rate, the nominal mortgage rate is 15.5 percent.

The standard for comparison

The model is solved for each of the household types and for a variety of proposals to be discussed in detail below. In order to have some standard of comparison, however, the model first is solved under the assumption that only the SFPM is available to the household. The results of this set of simulations are contained in table 4. Note first that housing demand actually declines as inflation moves from 7 to 13 percent. This is because the liquidity constraints in the mortgage market become binding as inflation increases. Note also the tax expenditures associated with homeownership which are equal to the marginal tax rate of the household times the opportunity cost of the owner's equity plus interest expenses plus property taxes. These numbers prove valuable in computing the incremental cost of the various proposals to stimulate housing. Of course, they are interesting in their own right since they indicate that the subsidy to homeownership is already quite substantial.

Micro analysis of the three families of proposals

The Lugar proposals: According to the Lugar proposal a household is to receive a subsidy from the Government during the first 5 years of the mortgage. The size of the subsidy--paid to the lender --equals the lesser of two quantities: (1) the difference between mortgage payments on a loan at the market interest rate and a loan and a loan at 400 basis points below the market rate, (2) the difference between mortgage payments on a loan at the market interest rate and a loan at 11 percent. The household is to repay the subsidy payments at the time of sale or some other specified time. In a variant of the Lugar proposal the household's payments are required to grow each of the first 5 years by an amount equal to 0.0075 of the original mortgage, with this additional payment to be

Table 4

Housing Demand With the Standard Fixed Payment Mortgage

	Value of House	Tax Expenditure
Income		
$15,000		
Inflation		
.07	$30,163	$5,615
.10	28,523	6,475
.13	27,223	7,295
Income		
$22,500		
Inflation		
.07	44,142	9,758
.10	41,759	11,258
.13	39,980	12,718
Income		
$30,000		
Inflation		
.07	58,274	14,916
.10	55,252	17,247
.13	52,982	19,515

used by the borrower to reduce the size of the mortgage balance. This feature is referred to as the graduated equity mortgage. In neither version does the household repay the subsidy with interest; that is, there is no recapture.

The results for the Lugar proposal with the GEM are contained in table 5. (The results are not presented for the 7 percent inflation rate since the Lugar proposal is operative only if the mortgage rate is at least 12.5 percent.) There are several points to be made. First, housing demand is increased by the Lugar proposal relative to demand with the SFPM. Demand increases by 5.3 to 6.1 percent, the largest increase being for the lowest income group. Interestingly, the effect of the proposal does not vary much with inflation. A positive relationship might be expected given that the built-in subsidy to homeownership grows as the rate of inflation grows (see, for example, deLeeuw and Ozanne [1980], Diamond [1980], Dougherty and Van Order [1982], Hendershott and Hu [1981], and Villani [1981]).

The cost of the Lugar proposal per household can be represented in several ways. Consider first the total amount of the subsidy, the amount that would be important from an appropriations point of view. It is between $5,023 and $9,827. As one would expect, it is largest for the highest income household. Now consider the present value or the real economic cost of the subsidy to the Government before recapture. This amount varies between $3,096 and $6,511. The net cost to the Government is the difference between the present value of the subsidy payment and the present value of the repayment. This amount varies between $2,177 and $4,227.

The GEM feature of the Lugar proposal is probably not one recommended by most economists. The GEM feature forces the household to pay off the mortgage faster than it would have without the GEM. Consequently, it aggravates the tilt problem, causing cash-flow problems and hence decreasing demand. It is, therefore, interesting to analyze the Lugar bill without the GEM feature. The results of this set of simulations are presented in table 6.

The results indicate that the GEM feature very definitely reduces the stimulative effect of the straight Lugar proposal. Without the GEM feature, demand increases at all rates of inflation by between 11.5 and 12.8 percent. What is perhaps as interesting is the fact that the subsidy does not increase proportionately. So the bang for the buck is larger without the GEM feature.

Some additional stimulations were conducted to analyze the impact of the Lugar proposal for the case in which the market mortgage rate is less than 15 percent. Although such a situation is unlikely in the very near future, the results reveal a peculiar feature of the Lugar proposal with the GEM. That is, the Lugar bill passed by Congress in June 1982 contains the provision that the size of the payment made by the household grows at 0.0075 of

Table 5

Housing Demand With the Lugar Proposal

Income	GEM and no recapture								
	$15,000			$22,500			$30,000		
Rate of inflation	.07	.10	.13	.07	.10	.13	.07	.10	.13
Value of house	---	30,275	28,886	---	44,189	42,292	---	58,205	55,823
Percent difference between SFPM	---	6.1	6.1	---	5.8	5.8	---	5.3	5.4
Tax expenditures	---	6,217	7,139	---	10,776	12,412	---	16,435	18,969
Budgetary cost of Lugar subsidy (note a)	---	5,111	5,023	---	7,461	7,355	---	9,827	9,708
Present value of budgetary cost	---	3,387	3,096	---	4,943	4,533	---	6,511	5,983
Present value of repayment	---	1,210	908	---	1,766	1,330	---	2,326	1,756
Present value of budgetary cost - present value of repayment	---	2,177	2,188	---	3,177	3,203	---	4,185	4,227
Total subsidy to homeownership (note b)	---	8,394	9,327	---	13,953	15,615	---	20,620	23,196
	No GEM and no recapture								
Value of house	---	32,172	30,419	---	47,026	44,623	---	62,120	59,067
Percent difference between SFPM	---	12.8	11.7	---	12.6	11.6	---	12.4	11.5
Tax expenditures	---	6,598	7,509	---	11,452	13,082	---	17,516	20,050
Budgetary cost of Lugar subsidy	---	5,432	5,290	---	7,940	7,760	---	10,488	10,272
Present value of budgetary cost	---	3,5	3,260	---	5,261	4,783	---	6,949	6,331
Present value of repayment	---	1,286	957	---	1,879	1,403	---	2,482	1,858
Present value of budgetary cost - present value of repayment	---	2,313	2,303	---	3,382	3,380	---	4,467	4,473
Total subsidy to homeownership	---	8,911	9,812	---	14,834	16,462	---	21,983	24,523

a/The budgetary cost of the Lugar subsidy is computed as the reduction in mortgage payments due to the subsidized mortgage interest rate over the 5 years of the subsidy.

b/The total subsidy to homeownership is computed as tax expenditures plus the present value of the budgetary cost minus the present value of repayment.

Table 6

Housing Demand With the Home Buyer's Tax Credit

Income	$15,000			$22,500			$30,000		
Rate of inflation	.07	.10	.13	.07	.10	.13	.07	.10	.13
Value of house	32,289	30,346	28,918	47,208	44,540	42,555	62,444	59,043	56,499
Percent difference between SFPM	7.0	6.4	6.2	6.9	6.7	6.4	7.2	6.9	6.6
Tax credit	1,614	1,517	1,446	2,360	2,227	2,128	3,122	2,952	2,825
Tax expenditures	6,011	6,889	7,747	10,436	12,007	13,537	15,983	18,430	20,811
Total subsidy to homeownership (note a)	7,625	8,406	9,193	12,796	14,234	15,665	19,105	21,382	23,636

a/The total subsidy to homeownership equals the tax credit plus tax expenditures.

the original mortgage per year for 6 years regardless of the market rate.

A consequence of this provision is that it is possible that the payments would rise to a level above those which would be made if they were based upon the market rate. Although the household has the option of refinancing at the time the payments rise above the market rate based payments, it is not clear the household benefits from refinancing early on in the mortgage. The problem is that the household's annual savings from the Lugar proposal equals one minus its marginal tax rate times the annual subsidy payment, whereas the repayment equals the actual subsidy payment. Therefore, refinancing may result in the household repaying much more than it saved due to the subsidy.

Given that refinancing is not necessarily profitable, the household faces the possibility that its mortgage payments in the first 5 to 10 years of the mortgage are greater than those on an SFPM. This can only reduce the stimulative impact of the Lugar proposal; therefore, we recommend that the bill be changed to include some variant of the following sentence. "The payments shall not rise to a level above those that the household would pay at the market."

Finally, if the Government tries to completely recapture its costs by charging interest on the subsidy payments--the household repays the subsidy plus interest--will the stimulative effect of the proposal be greatly dampened? Some runs have been conducted to analyze this question. The full details of these simulations are available from the authors. The results thus far suggest that the stimulative effect is not greatly affected. Neither the charging of interest nor the elimination of the repayment changes housing demand by more than 1 percent. So, the Government could recoup its costs and still have a stimulative effect.

The home buyer tax credit (HBT): This proposal is quite simple in theory. If a household buys a house, then it receives a tax credit equal to 5 percent of the value of the house. Table 7 contains the simulation results for this proposal. The results indicate that the HBT is more stimulative than the Lugar proposal with GEM but not as stimulative as the Lugar without GEM. The impact of the HBT upon demand relative to the results with the SFPM ranges between 6.2 and 7.2 percent. Note that the variation in the impact by income class is not large. This is because the HBT is a tax credit and is not dependent upon the marginal tax rate of the household.

The cost of the HBT varies with income because higher income households buy larger and more expensive houses. Roughly, the size of the subsidy is 10 percent of annual household income, but there is some increase in the ratio as inflation increases.

Table 7

Housing Demand With an FHA Shallow Subsidy or a Tax-Exempt Mortgage Revenue Bond

Income	$15,000			$22,500			$30,000		
Rate of inflation	.07	.10	.13	.07	.10	.13	.07	.10	.13
Value of house	32,782	31,210	30,006	47,844	45,733	44,091	63,109	60,466	58,391
Percent difference between SFPM	8.7	9.4	10.2	8.4	9.5	10.3	8.3	9.4	10.2
Subsidy per year (note a)	498	619	733	726	907	1,077	958	1,199	1,426
Present value of subsidies	2,772	3,048	3,220	4,045	4,467	4,731	5,336	5,906	6,265
Tax expenditures	5,569	6,500	7,414	9,652	11,310	12,936	14,742	17,315	19,837
Total subsidy to homeownership (note b)	8,341	9,548	10,634	13,697	15,777	17,667	20,078	23,221	26,102

a/The subsidy per year equals the difference between the mortgage payment the household would have to make at the market mortgage interest rate and the actual mortgage payment made by the household.

b/The total subsidy to homeownership equals the present value of the subsidies plus tax expenditures.

Permanent interest rate subsidies: Two types of permanent interest rate subsidy proposals are analyzed. The first--the shallow subsidy plan--calls for the household payment to be based upon an interest rate equal to 85 percent of the market mortgage rate. This plan is comparable to the subsidy that would be associated with the tax-exempt mortgage revenue plan or a mild FHA 235(i) or (q) plan. The 85 percent rule of thumb is based upon two pieces of evidence. First, Peterson and Cooper [1979] report that the tax-exempt mortgage revenue bond program reduced rates for participants to 80 percent of the market rate. Second, the ratio of tax-exempt borrowing rates to comparable market rates has increased since the Peterson and Cooper study. Therefore, an 85 percent adjustment factor is used. The results of the analysis of the shallow subsidy plan are in table 7.

The second permanent interest rate subsidy plan is called the deep subsidy plan. It is meant to characterize a version of the GNMA (Government National Mortgage Association) Tandem plan suggested by GAO staff. This plan is similar to the Lugar proposal in the way the size of the interest subsidy is calculated except that the interest subsidy is permanent. The mortgage rate upon which payments are based is reduced by the lesser of 4 percentage points or the difference between the market rate and 11 percent. In addition to this basic deep subsidy plan, a version is analyzed that allows the household to use the GPM. The results for both versions of the deep subsidy plan are in table 8. 1/

The effects of the shallow subsidy upon housing demand are to increase housing demand relative to the SFPM by 8.3 to 10.2 percent. These are more than those attained with the Lugar plan with GEM and the HBT, but less than those attained with Lugar without GEM. The increases are not obtained at a small cost, however. The present value of the subsidy assuming the household only receives the subsidy for 10 years varies between $2,772 and $6,265. The subsidy increases with inflation and the income of the household. The costs are usually double those with the HBT and about one-third to one-half more than those with the Lugar plans.

The deep subsidy plan lives up to its name. This is the most expensive plan considered to this point, and as one might expect, the most stimulative as well. The subsidies range from $1,985, when the interest rate subsidy is only 1.35 percentage points, to $10,763. The full subsidy is in operation when the inflation rate is 10 and 13 percent, and at these rates demand is increased by the subsidy by over 15 percent.

1/Time prevented us from analyzing a version of the Lugar bill with GPM; however, our intuition suggests the marginal effect of a GPM with a Lugar plan is comparable to the marginal effect of a GPM with the deep permanent subsidy plan.

Table 8

Housing Demand With a Deep FHA Subsidy or the Tandem Type In

Income	With standard fixed-payment mortgage					
	$15,000			$22,500		
Rate of inflation	.07	.10	.13	.07	.10	.13
Value of house	32,071	33,423	31,359	46,796	48,993	46,087
Percent difference between SFPM	6.3	17.2	15.2	6.0	17.3	15.3
Present value of subsidies (note a)	1,985	5,558	4,790	2,897	8,147	7,040
Tax expenditures	5,589	6,515	7,470	9,685	11,340	13,036
Total subsidy To homeownership (note b)	7,574	12,073	12,260	12,582	19,487	20,076
	With graduated payment mortgage					
Value of house	33,850	36,194	34,695	49,481	53,256	51,288
Percent difference between SFPM	12.2	26.9	27.4	12.1	27.5	28.3
Present value of subsidies	2,095	6,019	5,300	3,063	8,856	7,835
Tax expenditures	5,876	6,965	8,149	10,201	12,170	14,305
Total subsidy To homeownership	7,971	12,984	13,449	13,264	21,026	22,140

a/The present value of subsidies equals the present value of the annual di
mortgage payment the household would have to make at the market mortgage
mortgage payment made by the household.

b/The total subsidy to homeownership equals the present value of the subsi

Alternative mortgage instruments: Each of the plans considered so far requires some sort of congressional appropriation of funds in order to become operative. There is a way to stimulate demand without any further appropriations. This could be done by instituting on a large scale alternative mortgage instruments like the GPM and the PLAM. These two are analyzed in this section and the results of the analysis are contained in table 9.

The GPM analyzed has a 5-year graduation period and the rate of graduation equals the rate of inflation. The effect of the GPM upon housing demand ranges from 4.7 to 10.4 percent, and the size of the effect is strongly linked to inflation. The magnitude of the GPM is greater than that of the Lugar proposal with the GEM, but generally less than the shallow subsidy.

The effect of the PLAM is the largest of any plan considered in this paper. Indeed, the magnitude of the effect is 2 to 4 times larger than the effect of the deep interest permanent subsidy. The numbers are large because the severity of the tilt problem is large during times of rapid inflation and because the tax subsidy to homeownership is so strongly linked to the rate of inflation.

Can we expect the PLAM to be so stimulative in practice, or are the effects of the PLAM overstated? There are arguments that can be made on both sides. On the one hand, the fact that uncertainty about the income stream is not taken into account probably overstates the effect of the PLAM if, as seems likely, the variance of inflation is linked to the average rate. In addition, if people are finding ways of getting around liquidity constraints, e.g., borrowing from family, then the results overstate the stimulative effects of the PLAM. On the other hand, the tax parameters in the model probably understate the true marginal tax rates faced by households. Exactly which of these two offsetting factors is dominant is difficult to determine. It seems unlikely to us, however, that taking these additional factors into account would change the qualitative conclusion stated above--namely, the PLAM is the most stimulative of any program considered in this paper.

The most important question is whether PLAM's will be accepted in the market. So far they have not. The depressed state of the savings and loan industry probably will keep the industry from offering them because of the undesirable cash-flow aspects of the PLAM from the lender's point of view. Besides, the Federal Home Loan Bank Board has not yet issued regulations allowing the industry to offer a large number of PLAM's.

What can be done to stimulate the acceptance of PLAM's by lenders? One possibility is to subsidize lenders who make such loans. Alternatively, the Government could agree to insure such loans. There are many questions that must be answered about PLAM's, but if the goal is to stimulate housing demand, then the idea of how best to increase the supply of PLAM's is certainly worthy of further study.

Table 9

Housing Demand With Alternative Mortgage Instruments

Income	Graduated payment mortgage								
	$15,000			$22,500			$30,000		
Rate of inflation	.07	.10	.13	.07	.10	.13	.07	.10	.13
Value of house	31,576	30,600	29,695	46,561	44,957	43,839	61,650	59,756	58,484
Percent difference between SFPM	4.7	7.3	9.0	5.5	7.7	9.7	5.8	8.2	10.4
	5,878	6,947	7,955	10,293	12,120	13,946	15,780	18,653	21,542
	Price-level adjusted mortgage								
Value of house	34,323	37,423	41,085	53,213	59,225	66,403	73,663	83,703	95,906
Percent difference between SFPM	13.8	31.2	50.9	20.5	41.8	66.1	26.4	51.5	81.0
Tax expenditures	6,389	8,496	11,006	11,763	15,966	21,124	18,855	26,128	35,326

Some comparisons of program costs and stimulus potential

The programs analyzed in this paper all have the same goal of stimulating housing demand, but they differ in many other respects. One of the most important differences is the cost per household of each program. This is a very important aspect of a program, since it directly affects the stimulus potential of the program. The larger the subsidies, all else equal, the larger the effect on demand. Furthermore, the larger the subsidy per household, the fewer the number of households that can receive the subsidy, given that the size of the programs is usually limited by statute. This, of course, raises equity issues. Is a program that is quite effective in serving only a few households preferable to one that serves many households but not nearly as well?

Table 10 summarizes the information regarding the incremental cost of each program. Incremental cost is calculated as the difference between the total subsidy to homeownership of each program and the tax expenditures associated with the SFPM case. Thus, the concept of cost takes into account not only the direct subsidy costs of each plan, but also the change in tax expenditures that occurs if the program becomes operative. This concept is used because it represents the net cost to the Government of instituting a particular program, as opposed to the net appropriations or budgetary cost of the program in any particular year, a much less general concept.

Table 10 indicates that the most expensive programs are the Tandem (deep interest subsidy) and the PLAM. The Tandem program is the most expensive except at 7-percent inflation--where the subsidy is much less--and at 13-percent inflation for the $30,000 income household--where the combination of a high marginal tax rate and a high rate of inflation combine to make the tax expenditures of a PLAM quite large. Program costs increase with income because higher income households demand more housing due to their higher incomes and higher marginal tax rates (thus a smaller real after-tax cost of housing). For the most part there is a weak link between inflation and program costs except for those programs that directly address the tilt problem, i.e., the Tandem with GPM, the GPM, and the PLAM.

Another important aspect of a program is the stimulus potential of each program per dollar of subsidy; that is, if the size of a program is increased by $1, by how much is the demand for housing increased by those who were going to purchase a house already? These numbers are reported in table 11 and are computed as the ratio of the dollar change in the value of a house purchased under each program to the incremental cost of each program (table 10).

The first point to note about table 11 is that there is sizable variation in the stimulus potential of each program. The most stimulative--the GPM and the PLAM--result in increases in housing

Table 10

Incremental Cost of Progr
(dollars per household

Income	$15,000			$22,500		
Rate of inflation	.07	.10	.13	.07	.10	.13
Lugar - GEM and no recapture a/	---	1,919	2,092	---	2,695	2,8
Lugar - no GEM and no recapture a/	---	2,436	2,517	---	3,576	3,7
Home buyer's tax credit a/	2,010	1,931	1,898	3,038	2,976	2,9
Shallow interest subsidy a/	2,726	3,073	3,339	3,939	4,519	4,9
Tandem a/	1,959	5,498	4,965	2,824	8,229	7,3
Tandem with GPM a/	2,356	6,509	6,154	3,506	9,768	9,4
GPM b/	263	472	660	535	862	1,2
PLAM b/	774	2,021	3,711	2,005	4,708	8,4

a/The incremental cost of each proposal is computed as the difference betwee
the total subsidy to homeownership under the proposal and the tax expendit

b/The incremental cost of the GPM and the PLAM is computed as the difference
between the GPM or PLAM and the SFPM.

Table 11

Stimulative Effects of the Programs Per Dollar of Subsidy

Income	$15,000			$22,000			$30,000		
Rate of inflation	.07	.10	.13	.07	.10	.13	.07	.10	.13
Lugar - GEM and no recapture	---	.91	.81	---	.90	.80	---	.88	.77
Lugar - no GEM and no recapture	---	1.50	1.16	---	1.47	1.24	---	1.45	1.22
Homebuyer's tax credit	1.06	.94	.89	1.01	.93	.87	1.00	.92	.85
Shallow interest subsidy	.96	.87	.83	.94	.88	.83	.94	.87	.82
Tandem	.97	.88	.83	.94	.88	.83	.94	.83	.82
Tandem with GPM	1.56	1.18	1.21	1.52	1.18	1.20	1.51	1.17	1.18
GPM	5.37	4.40	3.73	4.52	3.71	3.14	3.91	3.20	2.71
PLAM	5.37	4.40	3.73	4.52	3.71	3.14	3.91	3.20	2.71

demand by between $2.71 and $5.37 per dollar of additional subsidy, which in this case is an additional dollar of tax expenditure. GPM's and the PLAM's have identical ratios because the tax subsidy per unit of housing is identical for each program. The least stimulative programs--Lugar with GEM, the shallow interest subsidy, and the Tandem without GPM--increase housing demand by less than $1 per dollar of subsidy, usually between $0.80 to $0.90 per dollar of subsidy. Clearly, if there is a limit to how much money can be appropriated to stimulate housing, the program that is used makes a great deal of difference.

Note also that the stimulative impact of each program declines with the rate of inflation. This is probably related to the fact that the size of the subsidy to homeownership per unit of housing increases as inflation increases regardless of what happens to the level of housing demand. Thus, since liquidity constraints are more likely to restrict housing demand at higher rates of inflation, it is possible that demand increases less rapidly than tax expenditures. The result is that the ratio of the change in demand to the change in total subsidy costs declines as inflation increases.

Another way of interpreting the information in table 11 is to ask by how much would a program of a particular size increase the value of new construction put in place. Consider as one example the Lugar proposal. The bill sent to the President called for $3.5 billion in appropriations, $25 billion of which was targeted to new construction. According to table 11, this would have stimulated an additional $1.925 to $2.275 billion in amount of new residential construction. A Lugar bill without the GEM would have a much greater effect, between $2.9 and $3.75 billion. It must be kept in mind, however, that incremental cost is not always equal to appropriations because incremental cost includes changes in tax expenditures.

Finally, a few words are in order regarding the impact of the various programs upon housing starts. As stated in the introduction, the results in this paper tell us nothing about the effects of the housing programs upon the number of new housing starts. However, the results probably are a good indicator of the relative impact of the various programs upon starts. This follows because the impact of a program upon starts is via its impact on the cost of owner-occupied housing relative to renter-occupied housing. Since renter costs are unaffected by these programs, the results of this paper indicate relative changes in the ratio of the cost of owner- versus renter-occupied housing. The exact elasticity of housing starts with respect to the ratio of owner- to renter-occupied housing costs has been estimated in a few models, although variation in the estimates makes it hard to predict the effect on starts. It is quite reasonable to conclude, however, that the rankings of the various programs in terms of their impact upon housing starts is the same as the rankings of the programs in terms of their impact upon housing demand. Thus, the results of this paper suggest, for example, that the Lugar proposal without a GEM would stimulate more starts than the Lugar proposal with the GEM.

SUMMARY AND CONCLUSIONS

This paper is divided into two parts. The first consists of a general and largely qualitative discussion of trends in measures of the affordability of owner-occupied housing and changes in mortgage lender behavior that affect the affordability of housing. The discussion indicates that by any reasonable measure of the cost of owner-occupied housing--real after-tax user cost or monthly mortgage payment needed to buy a median-priced new home--the cost of housing has increased significantly during the first 3 years of this decade. Furthermore, lenders appear to have become more lenient in their lending behavior by permitting buyers to devote more of their income to mortgage payments. The traditional rule of thumb used to be 25 percent, but recent evidence suggest this has risen substantially. The implication of these findings is that restoring housing demand to its levels in the late 1970's is likely to be quite expensive. Simply put, the size of a subsidy necessary to restore demand to its levels of the 1970's would have to be large enough to offset the rise in housing costs of the last 3 years, and, given that the increase in costs has been so substantial, the subsidy needed to offset the rise would likewise have to be substantial. In addition, the fact that lenders appear to have adjusted somewhat their lending behavior to take inflation into account suggests that relatively inexpensive alternatives like the graduated payment mortgage will not be sufficient to restore demand to its previous levels. This does not mean alternative mortgage instruments like the graduated payment mortgage cannot be of significant benefit; rather it means that the graduated payment mortgage by itself is probably not sufficient to offset the rise in costs experienced in the last few years.

The second part of the paper is more specific and seeks to quantify the effects of housing demand of four families of proposals that have been made to aid the slumping housing market. The analysis makes use of a non-linear programing model that simulates the housing choices of a typical consumer over a 10-year period. The model is analyzed for three income groups and three inflation scenarios. An advantage of the model for this particular type of analysis is that it takes into account not only the level of housing costs, but the pattern of the stream of housing costs over time. Both affect housing demand, and many of the proposals being considered alter the level as well as the time pattern of the costs. Therefore, the model is particularly well suited for this kind of analysis. A disadvantage of the model is that it is not designed to analyze the aggregate or macro effects of the proposals upon housing starts. Nonetheless, the results do have some implications regarding which of the programs is likely to have the largest impact upon housing starts; that is, the results indicate the ranking of the proposals in terms of their effects on housing starts, but they are not able to indicate the exact amount of the impact.

The results of the simulation analysis indicate the effects of the various proposals upon the long-run housing demand of

households who would have purchased housing in the absence of the proposals. The results also indicate the likely cost of each program and the changes in tax expenditures that will result from the implementation of the proposals. A number of points are made within the text regarding the effects of the various proposals. Here, the five major conclusions of the simulation analysis are presented.

The most stimulative plan is the price level adjusted mortgage

Although the PLAM is not one of the proposals that is usually mentioned as a way of stimulating the housing sector, the analysis indicates it has enormous potential. For example, the PLAM is predicted to increase housing demand by about 40 percent for a household with an annual income of $22,500 and an initial wealth of $7,500 when inflation is 10 percent per year. Even larger impacts are realized at higher income levels and higher inflation rates. (The standard of comparison is the quantity of housing demanded by the same household in the same environment when only the standard fixed payment mortgage is available.) Although arguments can be made that the results overstate the exact quantitative impact of the PLAM, it is unlikely that the arguments are sufficient to reverse the qualitative conclusion that the PLAM is the most stimulative of the plans analyzed in this paper. The reason the PLAM is so stimulative is that it solves the tilt problem faced by households in an inflationary environment and allows the household to benefit from the already sizable and built-in subsidy to homeownership in the tax system, a subsidy that grows as the rate of inflation grows.

Plans that address the tilt problem are more stimulative than those that do not

This is essentially a corollary to the first conclusion in that plans that address the tilt problem allow households to benefit from the built-in subsidy to homeownership as inflation increases. In particular, it is found that a deep permanent interest plan like the GNMA Tandem plan would be much more effective if it includes a graduated payment feature. Roughly, the impact of the tandem type plan is twice as stimulative with a graduated payment mortgage than without.

The Lugar proposal is the least stimulative of all plans considered in this paper

The estimates in this paper suggest the Lugar proposal that was sent to the President in June of 1982 would increase housing demand by those who would have already purchased a home by about 6 percent. It is also found that the sensitivity of the impact of the proposal with respect to repayment with interest or no repayment at all is not great. Thus, the Government may want to consider having the participants in this program repay with

interest so the repayments can be used to fund an ongoing version of the Lugar bill, or some adaptation of it.

The graduated equity mortgage feature of the Lugar bill is highly undesirable if the goal is to stimulate housing demand

The Lugar bill that passed Congress requires that the household make payments that grow during the first 5 years of the mortgage with the payments used to reduce the size of the outstanding mortgage principal. The results in this paper suggest that the stimulative effects of the Lugar proposal could be doubled if this provision is dropped. The reason is that the GEM feature essentially aggrevates the tilt problem.

Changes in tax expenditures are associated with most of the plans analyzed, and sound budgetary procedure suggests these changes should be taken into account

The fact that there is a large subsidy to homeownership already built into the tax code that grows as inflation grows has both good news and bad news for those charged with the job of stimulating the housing sector during times of huge budget deficits. The good news is that the built-in subsidy represents a way in which housing can be stimulated without getting additional appropriations through Congress or the President. The PLAM, the GPM, and the Tandem with the GPM are excellent examples of this idea. The bad news is that if attention is focused solely upon new budgetary appropriations for housing without attention being devoted to changes in tax expenditures, it is possible that the incremental cost of some of the proposals to the Federal Government may be seriously underestimated.

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