

## Berichte

### Housing and Housing Policies in Western Europe\*

At the end of World War II, the stock of housing in most Western European countries was far below the pre-war level. War damage, deferred maintenance, increased urbanization and rising population combined to produce an excess demand for housing raising the price of available housing and the rate of use of the existing stock. Many governments adopted housing policies or increased expenditure on housing programs to stimulate production and reduce excess demand. Programs that started or expanded to ameliorate the housing problem of the immediate postwar were continued in many cases, long after the immediate postwar problem was resolved.

The housing policies of Western European governments cover nearly the entire spectrum of government intervention. In Sweden almost all housing has been publicly assisted and much of it is built by governmental or nonprofit organizations. Switzerland lies near the opposite extreme; there, most housing is built without assistance or support by profit seeking builders in response to market forces. Comparison of the results achieved under various programs or types of programs is made easier by the decisions of some countries to change programs as Denmark did in the fifties.

Differences between countries offer an opportunity to compare the results achieved by government policies and to compare the effectiveness of different policies that seek to increase the quality or quantity of available housing services. Of course, government policies are not the only determinants of housing production. Differences in taste, in physical conditions, in the relative prices of housing and other goods and services affect the relative demand in the various countries. Moreover, war related damage was larger in the belligerent countries than in non-

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belligerent countries such as Sweden and Switzerland, and this difference contributed to the differences in excess demand at the beginning of the postwar period.

Government policies to assist housing differ in both purpose and procedure. Some are designed to encourage production; others seek to increase the stability of housing production by reducing the amplitude of cyclical changes; still others are intended to redistribute real income, to improve the physical surroundings or to implement a plan for regional or national development. Some countries give direct subsidies to consumers of housing services. Others attempt to improve the functioning of the market for mortgage credit. Sometimes the state takes on the role of lender; elsewhere there are complex systems of tax and interest rate incentives to those who save and purchase housing.

Complex systems of subsidy and assistance are difficult to evaluate empirically. The extent to which various programs achieve or even contribute to the ends they are supposed to serve cannot be determined in many cases. Data are often lacking on the size of subsidy payments, the beneficiaries and the extent of their benefits. Most difficult of all is to determine the extent to which government policies encourage the type of consumption they subsidize. A subsidy to mortgage credit has no effect on the demand for housing if the recipients substitute subsidized loans for non-subsidized loans or for equity in the form of a down payment. There is no easy way for the government to assure or for us to discover whether loans made for a specific purpose increase the real consumption of the particular good. There is good reason to expect that considerable substitution occurs. The problem is to determine its extent.

This study attempts to compare and evaluate national housing policies in a number of countries. Since comprehensive, uniform data are lacking, I rely on both cross-section analyses of several countries at a few points in time and developments over time within countries that have considerably different approaches or policies. Availability of data and differences in policies rather than random selection dictated the choice of countries. In the main, my study of both cross-section and time series evidence is limited to five countries — Denmark, Finland, France, Sweden, and the United Kingdom. For six other countries — Belgium, Italy, Netherlands, Norway, Switzerland and West Germany — my data permit either cross-section or times series analysis but not both and often provide fewer details. To avoid the confounding effects of differences in wartime damage and rate of recovery, I exclude data for the years prior to 1951.

### Cross-Section Analyses

Two main justifications for national housing policies or policies of assistance to housing are the desire to increase the growth rate of the housing stock and the quality of available housing services and the desire to reduce fluctuations in housing production. In this section, I attempt an assessment of the effectiveness of the policies used in several countries of Western Europe to achieve these ends. Because data are crude, and many items are not available, I begin with some relatively simple tests before developing and estimating a small model of housing.

Governments use a variety of measures to subsidize and encourage the production of housing. Since it is not an easy task to devise or implement efficient subsidies without substantial information about the determinants of the demand for or production of housing and the extent of substitution between housing services and other types of consumption, many programs are less effective than anticipated at the time of their adoption. Consumers often substitute grants or transfer payments for their planned expenditure and reallocate expenditure to other goods or services. The greater the substitution, the smaller the aggregate effect of subsidies and assistance.

If government programs of direct assistance, construction, low interest rate loans, reduced equity investment (or down payment) have an important effect on the production of housing, I expect the growth rate of the housing stock to increase with the size and extent of government programs. A crude type of evidence on the effectiveness of housing programs is a finding that the growth rate of housing is positively related to the size and extent of such programs. To test this proposition, I computed the growth rate of the real housing stock in ten countries for which I had at least nine years of data<sup>1</sup>. I then correlated the mean growth rates with the percentage of housing built *without* government assistance. A positive relation between the two requires one to reject the

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<sup>1</sup> The ten countries are: Belgium (1953 - 1968), Finland (data from 1956 - 1965), France (1951 - 1968), Italy (1951 - 1968), Netherlands (1960 - 1968), Sweden (1951 - 1968), Switzerland (1951 - 1968), United Kingdom (1951 - 1968), Denmark (1951 - 1959), Denmark (1960 - 1968). The reason for splitting Denmark in two parts is that, in the late 1950's, Denmark completely changed its housing program. See the discussion of that country below. In all of the countries except Sweden the log of real housing — gross domestic fixed asset formation in housing deflated by consumer prices — was regressed on time. The coefficient of time is the growth rate. In Sweden the regression of real housing on time explained more of the variance, and was used to compute the growth rate.

proposition that the growth rate of the housing stock increases with the percentage of housing assisted. There is no evidence of the negative relation required by the proposition. The correlation is positive but small, 0.10 and not significantly different from zero<sup>2</sup>. On the basis of these findings we must reject the proposition.

A similar measure of the effectiveness of government policies is the average proportion of housing investment to capital formation. With saving rates relatively constant, a housing program may be designed to shift investment from other types of capital formation to housing. Housing policy is not the only, or even the most important, determinant of inter-country differences in this ratio, but if programs of assistance and encouragement to housing are introduced as a means of increasing the ratio it is of interest to see whether a gross relationship exists. I computed the correlation between this measure of housing policy and the percentage of housing unassisted for the ten countries<sup>3</sup>. The correlation between the ratio of housing to capital formation and percentage unassisted is positive small (.04) and not significantly different from zero. I interpret this as showing no evidence that the two are related. A by product of this test is the finding that the percentage of housing to capital formation and the growth rate of housing are positively related (correlation .84). That countries in which a larger share of real resources are devoted to housing have higher growth rates of housing is not surprising. A number of reasons can be suggested why we should look for additional evidence.

First, the data used in the test are extremely crude. The percentage of unassisted housing is a very imprecise measure of government housing policy. A house built by a local government has the same weight as a dollar of mortgage subsidy. Indirect assistance via incentives to saving or mortgage lending are difficult to measure and tend to be neglected. Tax advantages or disadvantages from the consumption of housing services or the purchase of housing are neglected entirely. To offset some of these deficiencies, I have omitted West Germany, where indirect incentives are particularly important, from the more detailed cross-section

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<sup>2</sup> In all the tests performed, the Spearman Rank Correlation Coefficient and the Pearson Correlation Coefficient were not significantly different. The Pearson Correlation Coefficients are reported.

<sup>3</sup> The mean value in post 1952 years of the ratio of housing to capital formation is used. The ten countries are: Belgium, Denmark (1951 - 1959), Denmark (1960 - 1968), Finland, France, Italy, Netherlands, United Kingdom, Sweden, and Switzerland.



tests reported below. And, I have used time series evidence for individual countries to supplement our cross-section studies. Many of these problems are less important within counties because types of housing policies generally remain in effect for considerable periods of time.

Second, government policies may affect the size of the housing stock by reducing the amplitude of cyclical downturns by more than they reduce the amplitude of upturns. Many housing programs, and particularly programs of mortgage lending and interest rate manipulation, are defended as a means of reducing fluctuations in the housing production. Such programs can increase the housing stock or simply damp fluctuations by smoothing production over time. To test this proposition, we need a measure of the cyclical stability or instability of the industry.

One available measure of the variability is the size of deviations from the trend growth rate. I regressed separately the real housing stock of the nine countries on time. The ratio of the standard deviation of these regressions to the respective mean housing stocks yields a measure of variability adjusted for size of housing stock<sup>4</sup>. The higher this ratio, the smaller the percentage of the variation in the growth rate explained by trend alone. The lower the ratio, the less variable a country's production of housing.

To test for the effect of government policy on variability, I computed the correlation between the proposed measure of stability and the percentage of unassisted housing production. A positive correlation between the two is evidence that increased government assistance reduces variability. The correlation is negative,  $-.34$ , but not significant, so the proposition is rejected.

A third reason for scepticism about our failure to find evidence of an effect of government policy on the growth rate of housing is a variant of the familiar argument that correlation does not show causation. Where the quantity and quality of housing services is relatively large, there is likely to be less demand for government assistance and less

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<sup>4</sup> Dwight M. Jaffee, in his paper, "The Relationship of Financing to Housing Production in Europe and the United States" (unpublished, December 1972) criticizes an earlier draft of this paper for the use of  $R^2$  from the regressions on time as a measure of stability. He correctly observes that the  $R^2$  is biased in favor of countries with growing housing stocks. The measure of stability recommended by Professor Jaffee is the one used in the main body of this paper. It is interesting that substituting Professor Jaffee's measure changed only one of my original conclusions — that growth rate and stability are positively correlated.

Table 1

Country	Percent- age of Housing to Capital  %	Growth <sup>a)</sup> Rate (Percent)  %	In- stability <sup>b)</sup>  1	Percent- age of Housing Unas- sisted  %	Persons per Room
(1)	(2)	(3)	(4)	(5)	
Sweden .....	24.7	8	.32	8	.83
Denmark .....	14.8	7	.158	35	.69
1951 - 59 .....	17.6	2	.098	11	.62
1960 - 68 .....	19.2	9	.071	60	
Belgium .....	26.0	7	.14	15	
Finland .....	21.3	6	.11	53	1.31
Norway .....	15.6	6	.19	n. a.	.77
France .....	25.8	10	.12	12	1.01
Italy .....	27.9	9	.082	45	1.14
Netherlands .....	18.7	11	.085	26	.76
United Kingdom .....	20.3	4	.11	43	.68
West Germany .....	18.6	8	.083	n. a.	n. a.
Switzerland .....	25.5	8	.14	89	.69

a) From a regression of the log of  $H/p$  on time.

b) Standard error from the regression divided by mean housing stock.

welfare and political gain from reallocating resources toward housing. To test for the relation between the quantity and quality of the existing housing stock and the extent of government assistance, I computed the correlation between the percentage of unassisted housing and the number of persons per room, a measure of the quality and quantity of housing services, for the nine countries for which both variables could be obtained<sup>5</sup>. The correlation is small, positive and not significant, .07. More persons per room, low housing quality and relatively large percentage of housing unassisted are positively related contrary to the conjecture, but the relation is weak.

A fourth reason for scepticism is the simplicity of the relations examined. The tests I have used are crude, perhaps too crude to isolate the effects for which they attempt to test. The association between government policy, the growth of housing stock or the stability of the

<sup>5</sup> The nine countries are: Belgium, Denmark (1951 - 1968), Finland, France, Italy, Netherlands, Sweden, Switzerland and United Kingdom. All data are for 1960.

housing sector may remain hidden. I have, therefore, undertaken a somewhat more searching examination of cross-section and time series data for a number of different countries using a simple model of the demand and supply for housing and the availability of data to guide my work.

In a recent study of the demand and supply for housing in the United States for the years 1915-68<sup>6</sup>, the demand for housing was found to depend mainly on the relative costs of renting and buying, the real value of the existing housing stock, expected income, interest rates, wealth and the monetary base. The latter is the net amount of money — bank reserves and currency — issued by the central bank. The supply of housing depended on the net returns from building housing.

Ideally, one would like to retest the equations used for the U.S. on data for Western European countries, but only three of the variables — market interest rates, the monetary base, and the amount of real consumption (a measure of expected income)<sup>7</sup> — are available for the seven countries, and substitutes had to be selected. For the cross-section analysis I assumed that the demand and supply functions for housing are adequately represented by the following equations.

$$(1) \quad H_d = d(PPR, i, B/p, C/p) \quad d_1, d_3, d_4 > 0; d_2 < 0$$

$$(2) \quad H_s = s(PHU, B/p, i) \quad s_1 = 0; \quad s_2 > 0; s_3 < 0$$

$H_d$  and  $H_s$  are the supply and demand for new housing;  $PPR$  is the number of persons per room, an inverse measure of the size and quality of the existing housing stock;  $i$  is the interest rate on long-term government debt;  $B/p$  is the real stock of base money outstanding;  $C/p$  is a measure of real income; and  $PHU$  is the percentage of housing that receives no assistance from government. An appendix lists the sources of data.

The expected effect of each variable is shown. My earlier findings lead me to expect that government policy has no effect on the amount of housing produced, so I tentatively set  $s_1 = 0$ . The expected signs of other variables require little comment.

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<sup>6</sup> Francisco Arcelus and Allan Meltzer, "The Demand for Housing and Housing Services", *Journal of Money, Credit and Banking*, (forthcoming).

<sup>7</sup> Milton Friedman, *A Theory of the Consumption Function*, Princeton: Princeton University Press for the National Bureau of Economic Research, 1957.

I assume that the housing market clears each period in each country, so  $H = \frac{H_s + H_d}{2}$ . All of the signs remain as before. To increase the number of degrees of freedom, I used data for the seven countries for as many of the years 1952, 1956, 1960, 1964 and 1968 as were available<sup>8</sup>. In all, there were 27 observations<sup>9</sup>. To retain comparability, all prices were converted to pounds sterling using fixed exchange rates. No adjustment for size was made. Real consumption and the real stock of base money adjust at least partially for differences in real housing production due to differences in size of country, population or its growth rate.

On remaining problem particularly important for a cross-section study is the differences in the rate of saving in different countries. Countries with high saving rates have high rates of capital formation, including capital formation in housing. To take account of this effect, capital formation in housing ( $H$ ) was deflated by total capital formation ( $I$ ). Since this procedure removes differences in housing production resulting from differences in size of country from the dependent variable, I used per capita real consumption and per capita real base money in the regression on  $H/I$  to remove the effect of size from these independent variables.

Deflating  $H$  by  $I$  also changes the expected signs of some of the coefficients. The effect of interest rates on  $H/I$  remains negative only if the negative effect of high interest on capital formation in housing exceeds the negative effect of high interest rates on total capital formation. If the two effects are the same, the expected coefficient is zero. Also the expected signs of expected real per capita income (consumption) and real per capita base money depend on the relative responses of  $H$  and  $I$ .

<sup>8</sup> The years of each country used in the regression were: Belgium — 1957, 1960; Denmark — 1952, 1956, 1960, 1964, 1968; France — 1956, 1960, 1964, 1968; Netherlands — 1960, 1964, 1968; Sweden — 1952, 1956, 1960, 1964, 1968; Switzerland 1956, 1960, 1964, 1968; United Kingdom — 1952, 1956, 1960, 1964, 1968. The data from Belgium for 1957 were treated as if they were from 1956.

<sup>9</sup> The figures for PPR were obtained from census data and were available only once for each country. The years are: 1961 for Belgium, 1960 for Denmark, 1962 for France, 1960 for Netherlands, 1960 for Sweden, 1960 for Switzerland, 1961 for the United Kingdom. The coefficients in our regressions are, therefore, biased. Although a years production of housing is a small percentage of housing stock, having only one figure per country is unfortunate since the time span is long enough for production to be a significant part of stock. Hopefully the use of dummy variables for the years decreases the bias.



Table 2 shows the results. Most of the variables in the  $H/p$  equation have the expected effect. The interest elasticity of the housing formation is  $-0.65$  at the mean interest rate of  $5.1\%$ ; a one percentage point change in interest rates changes housing by  $13\%$  on the average in the seven countries. The response of housing production to interest rates, expected real income and real base money are smaller than those that have been found using data for a longer period in the United States<sup>10</sup>.

The coefficient of the  $PHU$  variable is small in both regressions and, is in the correlations above, there is no evidence of any significant effect of housing policy on capital formation in housing. However, there is evidence of a trend in the production of housing. The effects of the (dummy) variables on  $H/p$  in each of the years is negative, but the coefficients become steadily less negative as time passes, an indication that the amount of housing produced, at given values of the other variables, is larger in the later than in the earlier years. One plausible interpretation is that the trend represents the effect of housing policy.

Three pieces of evidence reject this interpretation. First, omitting the effects of time in the  $H/p$  regressions has no important effect on the coefficient of  $PHU$ . The coefficient remains  $-.002$  and insignificant. The principal change in the regression coefficients is a doubling of the coefficient of  $PPR$ , my measure of housing stock. This evidence suggests that my measures of expected income and housing stock do not fully explain the growth of housing<sup>11</sup>. Second, admittedly  $PHU$  is less than an ideal measure of housing policy. There is, however, no evidence that government assistance to housing in the seven countries increased at a faster rate than real income or the stock of base money: indeed several countries have reduced the size and scope of their housing policies. Without such evidence it is difficult to see why the trend should be interpreted as an effect of government housing policy. Third, the coefficients of the variables representing time trend in the  $H/I$  regression are positive, though not significant, and decline steadily. These data suggest that housing has grown less rapidly than other forms capital. Again, the principal effect of omitting the proxies for time and re-

<sup>10</sup> Arcelus and Meltzer, op. cit.

<sup>11</sup> The bias from using a single value of  $PPR$  for all years is, apparently not large. Recomputing the  $H/I$  regression for the years 1958 - 1962 reduces the effects of omitting changes in housing stock that would affect  $PPR$ . Our results show that most of the coefficients are approximately the same. The response of  $H/I$  to interest rates becomes negative,  $-.08$ , and the  $R^2$  rises to .97.

computing the coefficients is on *PPR*. The coefficient of *PPR* again doubles, and the coefficient of *PHU* remains small, negative and insignificant.

The *H/I* equation suggests that changes in expected real income have a larger effect on housing than on investment while changes in interest rates have a larger effect on investment than on housing. Neither effect is significant. The most important single determinant of the ratio of housing to capital formation is the monetary base. Expansive monetary policies increase the base and increase capital formation in housing relative to other forms of capital formation. Contractive monetary policies reduce the base and the ratio of housing to capital formation. However, reading the effects of the base an *H/p* and *H/I* together suggests that the principal effect comes by changing other forms of capital formation, and not principally by changing housing.

None of my cross-section evidence shows any powerful effect of housing policies on the production of housing. The simple correlations suggest that the effect of policies on growth and stability of the housing industry are either non-existent or perverse. The regression evidence denies that the effects are, on average, perverse but shows no evidence of any strong or powerful stimulus. If housing programs in the seven countries expand in proportion by enough to produce a twenty-five percent reduction in the percentage of housing unassisted — a reduction from the mean value from 37.3 % to 12.3 % — the ratio of housing to investment increases by less than 5 %.

The relatively small and statistically insignificant effects of housing policies shown by my data cast doubt on the effectiveness of government housing policies. The cross-section results suggest that a substantial reduction in the size and scope of government policies would have little effect on the amount invested in housing. However, my results are based on rather crude data, as has been noted a number of times. To reduce some of the difficulties in comparisons of countries with substantially different housing policies and institutional arrangements, I have supplemented the cross-section studies with some time series studies of particular countries.

### Some Time Series Evidence

Enough time series observations are available for five countries to test an equation similar to the equation used for the cross-section analysis.

Table 2

PHU	PPR	$\text{Log} \frac{C^a}{p}$	$\text{Log} \frac{B^a}{p}$	$i$	1952	1956	1960	1964	Intercept	$R^2$
Dependent Variable is $\text{Log} \frac{H}{p}$										
-.002 (0.86)	.89 (1.98)	.58 (3.62)	.34 (2.10)	-.13 (2.65)	-.88 (-5.78)	-.71 (-6.13)	-.52 (-4.72)	-.22 (-2.07)	- 1.50	.98
Dependent Variable is $H/I$										
-.058 (1.61)	1.30 (0.18)	3.77 (1.08)	9.66 (3.60)	.76 (.96)	3.08 (1.16)	3.15 (1.50)	2.46 (1.24)	1.78 (0.96)	141.1	.74
Means of Variables not in Logs										
37.3	0.75			5.10					$H/I$ 22.8	

t-statistics in parentheses. — a) Variable is in per capita terms in the  $\frac{H}{I}$  regression. — Symbols are defined in Appendix 1.

The principal change is the availability of data on the price of housing, an important missing element in my cross-section study. I postulate that the price of housing has a negative effect in the demand equation for housing and a positive effect on the supply equation. The effect on real investment in housing is the sum of the two. I will interpret a positive coefficient as evidence that the effect of price on supply dominates the effect on demand and conversely.

There are two additional, but minor, differences between the cross-section and time series equations. I do not have time series data on the number of persons per room (*PPR*), my measure of the stock of housing. I expect the response of housing to expected real income, or real consumption, to increase as a consequence. Also, the ratio of saving to income remains relatively constant as economies grow, so we are no longer concerned about the effect of differences in rates of saving and rates of growth. I restrict my discussion to the results for  $H/p$ <sup>12</sup>.

Table 3 shows the regression results for five countries during roughly comparable time periods. The tests show that the model gives very different results for different countries. The results for Switzerland, France and Denmark are most alike, the results for Sweden most unlike the others. Since Sweden is the Western European country that has gone farthest toward state control of housing, it is not surprising that market prices and expected income have very little effect on the amount of real investment in housing. More surprising is my finding that variation in the percentage of housing unassisted has no significant effect on the amount invested in housing. The obvious conjecture — that investment in housing is relatively stable because the government plays a large role — is false. The coefficient of variation of  $PHU$  is larger than the coefficient of variation of  $H/p$ . None of the measures of variability I have tried show Sweden to have a stable policy.

For Denmark, France and Switzerland, the principal determinant of housing is expected real income. Real investment in housing fluctuates

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<sup>12</sup> Using housing/investment as a dependent variable changes few signs. More coefficients are insignificant compared to the regressions using real housing, suggesting that the effects on investment are in the same direction but of smaller magnitude. The following years were used for each country: Denmark 1951 - 1968, France 1953 - 1967, Sweden 1951 - 1968, Switzerland 1955 to 1968, United Kingdom 1951 - 1968. The source of data are the same as in the cross section regressions. Please note that real housing is the dependent variable only for Sweden. In the other countries using the log of real housing worked better.



much more than real income, and a considerable part of the fluctuation appears to be induced by changes in real income. Since data on the size and quality of the stock of housing is not available, my equation may overstate the size of the response to real income. Moreover, the cyclical variability of housing is reduced a bit by changes in market interest rates. Market interest rates typically rise in periods of expansion and fall in contractions. But the response of housing investment to market rates is relatively small in the three countries. A rise in market rates of one percentage point reduces housing by no more than  $\frac{1}{3}\%$ . The effect of relative prices is positive in each of the countries suggesting that the effect on supply dominates the effect on demand.

Table 3

Country <sup>a)</sup> and Years	PHU	$\text{Log } \frac{C}{p}$	$\text{Log } \frac{B}{p}$	$\text{Log } i$	$\frac{p_h}{p}$	In- tercept	R <sup>2</sup>
Denmark .....	- 0.003	2.20	0.43	- 0.05	1.56	3.12	0.98
1951 - 68 .....	(1.13)	(4.14)	(1.24)	(0.83)	(1.52)		
France .....	0.02	1.88	- 0.30	- 0.30	1.20	- 12.68	0.98
1953 - 67 .....	(1.83)	(5.92)	(0.66)	(1.55)	(1.94)		
Sweden .....	- 0.15	- 8.03	6.95	6.55	12.15	- 6.62	0.22
1951 - 68 .....	(0.94)	(1.05)	(0.41)	(1.75)	(0.57)		
Switzerland .....	0.02	3.56	- 1.47	- 0.26	0.82	2.59	0.93
1955 - 68 .....	(1.21)	(1.86)	(1.00)	(2.22)	(0.62)		
United Kingdom ..	- 0.01	0.43	0.84	0.09	- 2.76	9.36	0.89
1951 - 68 .....	(1.89)	(.47)	(.80)	(1.42)	(3.24)	(3.33)	

t-statistics in parentheses. — <sup>a)</sup>  $\text{Log } \frac{H}{p}$  is the dependent variable. — Symbols are defined in Appendix 1.

Denmark provides an interesting case study. The *PHU* variable has an insignificant coefficient. Yet when the data from Denmark is divided into the years 1951 - 1959 and 1960 - 1968 (Table 1) a very different picture appears. It was in the late 1950's that Denmark shifted from a program that emphasized the financing of housing to a reduced program that subsidized consumption of housing services and the production of housing. Government assistance to financing remained, but became less important. In addition rent controls were reduced on new and then on existing housing. Subsequently Denmark experienced a sharp increase in the production of housing and in the share of capital formation in housing, coupled with a more stable market.

The results for the United Kingdom differ from the others. The dominant effect of an increase in housing prices is a reduction in demand and in housing investment. Interest rates and real income appear to have very little effect. The U. K. has relied more heavily on variable rate mortgages than other countries. If one of the principal reasons for housing cycles is that borrowers postpone purchases of housing when interest rates rise and accelerate purchases when rates fall, the use of variable rate mortgages should reduce the size of the response to interest rate changes. The benefits of borrowing when rates are low are much smaller when mortgage rates are variable. But variable rate mortgages should not eliminate the entire effect of interest rates on the demand for housing.

The response of housing to *PHU* varies from country to country. In two countries, France and Switzerland, investment in housing increases as the percentage of housing assisted declines. The housing policies of these countries appear to have a perverse effect. In Denmark, the United Kingdom and Sweden, there is some evidence that housing policies stimulate investment in housing. None of these effects are significant. Although the effect is numerically small, my results show that the statistical significance of the percentage unassisted is greatest in the United Kingdom of the countries studied. Since much of the assistance takes the form of building by local authorities, I interpret the results as evidence that, at given prices, a decrease in the activity of the local authorities is not fully offset by increased production by the private sector.

## Conclusion

A comparison of the percentage of housing assisted by governments in a number of different countries and the growth rates of housing, the percentage of capital formation in housing, or the stability of housing sectors showed no evidence of any systematic relation. Nor did the time series or cross-sectional study provide much evidence that housing policies have any substantial effect on housing. The main conclusions of my analysis of the data are that I find evidence of a relation between housing investment, real resources and relative prices but little evidence of any effectiveness of housing policies.

This conclusion is not as peculiar as it may appear. In many countries housing policies are more concerned with the financing of housing than with the production of housing or the consumption of housing services. A dominant view is that additional mortgage credit, low down

payments and other types of credit for housing are an effective means of stimulating production and consumption. Studies in the United States indicate that such policies have little effect, and economic theory implies that the ability to borrow in a particular way has very little effect on real consumption. Moreover, attempts to increase housing production by lowering the cost of borrowing work only to the extent that borrowers are forced to purchase more housing. In Europe there are many opportunities to use credit obtained by mortgaging real estate to purchase goods and services other than housing, or to buy equities.

My failure to find any significant effects of the programs that lower the cost of borrowing and increase the amount of mortgage credit casts doubt on the effectiveness of these policies. However, the availability and reliability of data for the countries we have discussed must also be taken into account. A considerable part of my data is from Scandinavian countries. In these countries, credit programs have often been combined with rent controls. I found that removal of rent control and a reduction in the percentage of housing assisted was followed by an increase in the growth rate of housing. In France and Italy, where rent control was removed from new housing and the mortgage market is not well developed, the growth rate and stability of the housing sector are among the highest. Separating the effects of rent controls, mortgage credit and other factors to reach firm conclusions pushes us beyond the evidence I have obtained.

In summary, I find very little effect of many of the policies that attempt to increase the production of housing or the stability of the housing sector. The fact that several of the countries that have combined rent controls, mortgage lending and interest rate subsidies have changed their approach in recent years suggests that there is good reason to doubt the effectiveness of these programs.

### *Appendix*

#### **Brief Description of Variables and Data**

##### **Alphabetical List of Principal Symbols and Sources of Data**

- B/p* = the monetary base deflated by the price level. Data on the monetary base are from "reserve money" published by the International Monetary Fund (*IMF*); data on price levels for Denmark and Sweden are from *IMF*, other countries from Federal Reserve Bank of St. Louis (St. Louis).

- $C/p$  = private consumption expenditure deflated by price level. Data on consumption expenditure are from *IMF*; price data as above.
- $H/I$  = the ratio of gross fixed asset formation in housing to total expenditure for new capital from United Nations (*UN 1* and *UN 2*).
- $H/p$  = net investment in housing deflated by consumer price level. Housing data from *UN 2*, consumer prices from *IMF* and St. Louis.
- $i$  = interest rate from *IMF*.
- $P_h/p$  = ratio of housing price to consumer prices, the relative price of housing. Housing prices are from *UN 2*; consumer prices are from *IMF* and St. Louis.
- $PHU$  = the percentage of housing unassisted from *UN 1*.
- $PPR$  = the number of persons per room from *UN 1*.

### Description of Sources

- IMF* = International Financial Statistics, various issues.
- St. Louis* = *Rates of Change in Economic Data for Ten Industrial Countries*, Federal Reserve Bank of St. Louis, various issues.
- UN 1* = *The Housing Situation and Perspectives for Long-Term Housing Requirements in European Countries*. Prepared by the Secretariat of the Economic Commission for Europe, Geneva, 1968.
- UN 2* = Annual Bulletin of Housing and Building Statistics for Europe, various issues.

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### Zusammenfassung

#### Wohnungsbau und Wohnungsbaupolitik in Westeuropa

Während der ganzen Nachkriegsperiode haben die europäischen Regierungen weitläufige Wohnungsbauprogramme verfolgt. Für die beharrliche Fortsetzung dieser Programme können zwei Ziele maßgeblich gewesen sein: a) man wollte die Wachstumsrate des Wohnungsbestandes erhöhen, b) man wollte die Wohnungsbauindustrie stabilisieren. Es ist indessen nicht zu erkennen, daß eines dieser Ziele in den untersuchten Ländern erreicht worden ist. Die vorliegende Studie ist im wesentlichen sowohl bei der Querschnittsanalyse als auch bei den Zeitreihen begrenzt auf fünf Länder: Dänemark, Finnland, Frankreich, Schweden und Großbritannien. Für sechs andere Länder, nämlich Belgien, Italien, Holland, Norwegen, Schweiz und die Bundesrepublik erlauben die Daten entweder eine Querschnittsanalyse oder Zeitreihen, aber nicht beides zusammen, und oft fehlen wichtige Einzelangaben.

Wachstumsrate und Stabilisierung von Wohnungsbauinvestitionen während der Nachkriegszeit sind für diejenigen Länder errechnet worden, für welche ausreichende Daten erhältlich waren. Die Jahre vor 1951 wurden nicht mit einbezogen, weil die Kriegszerstörungen, die in den einzelnen Ländern sehr



unterschiedlich waren, die Studie so wenig wie möglich beeinflussen sollten. Als Maßstab für die Bedeutung der öffentlichen Wohnungsbauprogramme wurde der Prozentsatz des nicht geförderten Wohnungsbaues gewählt. Korrelationen des nicht geförderten Wohnungsbaues zur Stabilität und zum Wachstum sind in einer Querschnittsanalyse nicht signifikant. Diese groben Querschnittsanalysen wurden ergänzt durch die Berechnung eines Modells der Wohnungsbauinvestition, zu dem zusätzlich zur Querschnittsanalyse auch Zeitreihen herangezogen wurden. Hierbei hat die Größe der staatlichen Förderungsmittel keine signifikante Aussagekraft.

Da die Typen der Wohnungsbauprogramme sich zwischen den einzelnen Ländern außerordentlich unterscheiden, mag der Prozentsatz des nicht geförderten Wohnungsbaues kein ganz sicherer Maßstab für die Bedeutung der Wohnungsbauförderung sein. Deshalb wurde das Wohnungsbaumodell auch mit Zeitreihen für diejenigen Länder berechnet, für welche entsprechende Angaben vorliegen. Auch hierbei geben die Resultate wenig Auskunft für das Festhalten an den laufenden Wohnungsbauprogrammen. Die Koeffizienten variieren beträchtlich zwischen den Ländern, aber es gibt keinen sehr signifikanten positiven Koeffizienten für die staatlichen Unterstützungsmaßnahmen wie man das erwarten möchte. Dänemark liefert das auffällige Beispiel dafür, wie eine Kürzung der öffentlichen Programme mit einem beträchtlichen Anstieg des Wohnungsbaues zusammenfällt.

In den meisten untersuchten Ländern subventionieren oder unterstützen die Regierungen den Hypothekenmarkt. Jedoch führen Versuche, den Wohnungsbau durch eine Ermäßigung der Beleihungskosten zu fördern, nur zu dem Ergebnis, daß die Schuldner veranlaßt werden, mehr Wohnraum zu erwerben. In den untersuchten europäischen Ländern gibt es im übrigen viele Möglichkeiten, mit Hilfe des Grund- und Hypothekarkredits andere Güter und Dienstleistungen als Wohnraum zu kaufen.

Die am meisten signifikanten Variablen zur Beeinflussung der Wohnungsbauinvestitionen scheinen das Einkommen und die Qualität des bestehenden Wohnungsbestandes zu sein. Ein Anstieg der Wohnungsproduktion geht zusammen mit einem Anstieg des Bruttosozialprodukts. Versuche der Regierungen, Einkommen zugunsten der Wohnungswirtschaft umzuleiten, sind nicht bemerkenswert erfolgreich.

## Summary

### Housing and Housing Policies in Western Europe

During the post-war period European governments have maintained extensive housing support programs. Two possible goals could account for the continuance of these programs: a) to increase the rate of growth of housing stock, b) to stabilize the construction industry. There seems to be little

evidence that either of these goals have been achieved in the countries studied. In the main the study of both cross-section and time series evidence is limited to five countries — Denmark, Finland, France, Sweden, and the United Kingdom. For six other countries — Belgium, Italy, Netherlands, Norway, Switzerland and West Germany — the data permit either cross-section or times series analysis, but not both, and often provide fewer details.

Growth rate and stability of housing investment in the post-war period were estimated for those countries for which sufficient data was available. Omission of the years before 1951 was necessary in order to minimize the effect of war related destruction which was highly variable between countries. As a measure of the magnitude of government housing programs, percentage of housing unassisted was chosen. Correlations of percentage housing unassisted to stability and growth are insignificant in cross-sections. These crude cross-section tests are supplemented by estimating a model of housing investment using pooled cross-section and time series data. Once again the magnitude of government subsidy does not have significant explanatory power.

As the types of housing programs differ greatly between the countries studied, percentage housing unassisted may not be an accurate measure of size of housing subsidy. Therefore the housing investment model is also estimated using time series data for those countries for which there is adequate data. Here too, the results give little support to the continuance of current housing programs. The coefficients vary greatly between countries, but never is there the large significant positive coefficient on government aid that one might expect. Denmark provides a dramatic example where a curtailment of government programs coincides with a large increase in housing production.

In most of the countries studied the governments support or supplement the mortgage market. However, attempts to increase housing production by lowering the cost of borrowing work only to the extent that borrowers are forced to purchase more housing. In Europe there exist many opportunities to use credit obtained by mortgaging real estate to purchase goods and services other than housing, or to buy equities.

The most significant variables affecting housing investment seem to be income and quality of existing housing stock. Growth in housing production is brought about by increasing gross national product. Attempts by the governments to reallocate income in favor of housing are not noticeably successful.

## Résumé

### Construction de logements et politique de construction de logements en Europe occidentale

Au cours de toute la période qui a suivi la dernière guerre, les gouvernements européens ont mis en oeuvre d'ambitieux programmes de construction de logements. Deux objectifs peuvent avoir conditionné la persévérance dans la réalisation de ces programmes: a) l'on entendait élever le taux de croissance du parc de logements; b) l'on voulait stabiliser l'industrie de la construction de logements. L'on n'est cependant pas parvenu à établir que l'un de ces objectifs a pu être atteint dans les pays soumis à examen. La présente étude se limite essentiellement pour l'analyse par coupe transversale comme pour l'examen dans le temps à cinq pays: Danemark, Finlande, France, Suède et Grande-Bretagne. Pour six autres pays, soit Belgique, Italie, Pays-Bas, Norvège et République fédérale d'Allemagne, les données permettent la coupe transversale ou l'étude fractionnée en périodes temporelles, mais pas les deux simultanément, et en outre d'importantes statistiques isolées font fréquemment défaut.

Les taux d'expansion et la stabilisation des investissements dans la construction de logements au cours de l'après-guerre furent calculés pour les pays offrant des données chiffrées suffisantes. L'on a cependant négligé les années précédant 1951 afin d'éviter dans toute la mesure du possible d'introduire dans l'étude des destructions de guerre qui furent très différentes de pays à pays. Le critère choisi pour mesurer l'importance des programmes publics de construction fut le pourcentage de la construction non assistée. Les corrélations entre d'une part la construction non assistée et d'autre part la stabilité et l'expansion ne sont pas significatives dans une coupe transversale. Ces grossières analyses par coupes transversales furent complétées par le calcul d'un modèle d'investissement en construction de logement, celui-ci comportant également une étude dans le temps. Mais ici encore, l'importance des moyens publics de promotion ne permettent pas de dégager des conclusions utilisables.

Comme les genres de programmes de construction diffèrent énormément d'un pays à l'autre, le pourcentage de la construction non assistée ne peut être un critère entièrement sûr de la mesure de l'aide à la construction de logements. C'est la raison pour laquelle le modèle a également été présenté en longue durée pour les pays disposant des données requises. Mais les résultats ne donnent encore une fois que peu d'informations sur la nécessité de poursuivre les programmes de construction en cours. Les coefficients varient de manière importante entre les pays, mais il n'est pas de coefficient positif significatif pour les mesures d'aide de l'Etat comme on aurait pu s'y attendre. Le Danemark présente l'exemple frappant d'une réduction des programmes publics allant de pair avec un accroissement sérieux de la construction.

Dans la plupart des pays étudiés, les gouvernements subventionnent ou soutiennent le marché hypothécaire. Néanmoins les tentatives de promouvoir la construction par une réduction des frais d'emprunts n'aboutissent qu'à inciter les débiteurs à acquérir une plus grande superficie de logement. Dans les pays étudiés, il existe d'ailleurs de nombreuses possibilités d'acquérir d'autres biens ou services qu'un logement par le moyen de prêts hypothécaires.

Les variables les plus significatives pour influencer les investissements dans le logement semblent être le revenu et la qualité du parc existant de logements. L'accroissement de la production de logements est simultanée à celui du produit national brut. Les mesures gouvernementales visant à orienter les revenus vers la construction de logements n'ont guère été couronnées de succès.