

AGENCY FOR INTERNATIONAL DEVELOPMENT WASHINGTON, D. C. 20523 BIBLIOGRAPHIC INPUT SHEET		FOR AID USE ONLY <i>Batch 43</i>
1. SUBJECT CLASSIFICATION	A. PRIMARY	
	B. SECONDARY	
TEMPORARY		
2. TITLE AND SUBTITLE		
The relation of investment in housing to economic growth; quarterly report, Oct.-Dec., 1964		
3. AUTHOR(S)		
(101) Calif. Univ, Los Angeles. Graduate School of Business Administration		
4. DOCUMENT DATE	5. NUMBER OF PAGES	6. ARC NUMBER
1965	12p.	ARC
7. REFERENCE ORGANIZATION NAME AND ADDRESS		
Calif.--Los Angeles		
8. SUPPLEMENTARY NOTES (Sponsoring Organization, Publishers, Availability)		
(Research summary)		
9. ABSTRACT		
(HOUSING R & D)		
10. CONTROL NUMBER		11. PRICE OF DOCUMENT
PN-AAC-798		
12. DESCRIPTORS		13. PROJECT NUMBER
		14. CONTRACT NUMBER
		CSD-464 Res.
		15. TYPE OF DOCUMENT

CSD-464 RES.
PN-AAC-798

January 1, 1965

SECOND QUARTERLY REPORT

Submitted to the Agency for International Development, U. S. Department of State, Washington, D. C., by the Real Estate Research Program, Graduate School of Business Administration, University of California, Los Angeles, California.

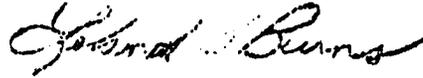
#464
ECON. C //

RE: Contract AID/csd-464, The Relation
of Investment in Housing to Economic
Growth

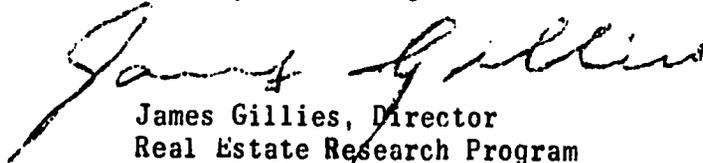
1. General. During the second quarter, October 1 - December 31, 1964, progress was made on the completion of Phase I, on the selection of test sites, and on the conceptualization of frameworks for measuring the effects of residential construction on price levels and the balance of payments in underdeveloped countries. Except for the hiring of consultants at later stages, staffing arrangements were completed. A paper outlining the project was prepared and delivered at a major scholarly meeting.
2. Paper. The project director delivered an invited paper, "Capital-Output Analysis of Housing Programs for Developing Nations," at the joint session of the American Economic Association and Industrial Relations Research Association, "Manpower and Welfare Programs: Benefit-Cost Analysis," in Chicago, December 27. A copy is appended to this Report. The paper will be published in the Annual Papers and Proceedings of one of the sponsoring organizations.
3. Phase I. The report of research findings on the pilot study, tentatively scheduled for submission with this report, is nearing completion. Two factors have delayed progress. First, contrary to expectations, control data desired but not required for measuring production levels of all employed whether rehoused or not, have not been made available. While the absence of control data will not prevent the productivity measurements, such data would have made possible the comparison of output levels between two groups housed under substantially different conditions. Available data in time-series will be used to compare output levels of workers before and after their transfer to superior housing. Second, unanticipated technical difficulties involving data processing were encountered but have been solved. The Phase I study will be completed shortly and submitted either with the third quarterly report or earlier.

4. Site selection. Reports on the availability of test sites suitable for hypothesis testing have been received from a number of missions in underdeveloped countries. Final determination of locations will be made when all reports have been reviewed and data sources explored.

Respectfully submitted,



Leland S. Burns
Principal Investigator



James Gillies, Director
Real Estate Research Program

LSB:mah

Encl.: 'Capital-Output Analysis of Housing Programs for Developing Nations'

CAPITAL-OUTPUT ANALYSIS OF HOUSING PROGRAMS FOR DEVELOPING NATIONS

**Leland S. Burns
University of California, Los Angeles**

Prepared for

**"Manpower and Welfare Programs:
Benefit-Cost Analysis"**

**Joint Session of the American
Economic Association and Industrial
Relations Research Association**

**Chicago, Illinois
December 29, 1964**

CAPITAL-OUTPUT ANALYSIS OF HOUSING PROGRAMS FOR DEVELOPING NATIONS

Leland S. Burns
University of California, Los Angeles

Housing is one of several unwanted step-children in many contemporary programs of economic development. Its justification as a component of development programs is based on grounds of social necessity or political expediency, or as an essential for shelter to accompany industrial development. The social argument is generally supported by a list of evils attendant to conditions of overcrowding or dilapidation which market forces are powerless to correct. Such conditions, it is also argued, are fertile grounds for breeding political ferment and civil strife. Pricing the social and political costs and risks is a difficult task often leading to results of doubtful validity. Development planners aware of these methodological problems are likely to reconcile housing as an ingredient of an overhead program justified in terms of social welfare rather than on the basis of more convincing economic criteria.

To date, the application of traditional tools of investment scheduling, such as capital-output ratios, have accorded social overhead projects, such as housing programs, low positions in development schemes. With a high capital-output ratio estimated (for the U. S.) at 7.1, housing can scarcely compete for limited capital resources with alternative ratios running as low as 3.2 for railroad transportation and 1.6 for iron

mining.¹ As a consequence, heavy industry and basic overhead projects in transport and power, for example, and other alternatives yielding quicker and more readily measured pay-offs have pre-empted the high ranks on investment priority lists. In this context, capital allocations to residential construction have been based on the need for worker housing merely as a necessary element of industrial growth, rather than one recognized as contributing of itself to growth.

This paper outlines a framework structured on economic criteria for allocating capital to housing and considers the effects of housing investment on income and output, employment, prices, the balance of payments and sub-national migration.² Many questions are raised by

¹Robert N. Grosse, "The Structure of Capital," in Wassily Leontief and others, Studies in the Structure of the American Economy (New York: Oxford University Press, 1953), Table 8, pp. 220-221. The relative distribution of gross capital formation between wealthier and poorer nations indicates the emphasis on primary industry in nations in the early stages of development. According to estimates by Kuznets, the proportion allocated to agriculture, forestry, and fishing industries during the 1950's averaged 25.8 percent for the poorest nations compared to 7.8 percent for the richest. In contrast, the shares in housing averaged 13.9 and 21.5 percent respectively. Simon Kuznets, "Quantitative Aspects of the Economic Growth of Nations: V. Capital Formation Proportions: International Comparisons for Recent Years," Economic Development and Cultural Change, Vol. VIII, No. 4, Part II (July 1960).

²Early attempts at formulating such a rationale are apparent in papers by Leo Grebler and Max F. Millikan published in Eurnham Kelly (ed.), Housing and Economic Development, Report of a Conference Sponsored at the Massachusetts Institute of Technology by the Albert Farwell Lemis Foundations on April 30 and May 1 and 2, 1953 (Cambridge: The Massachusetts Institute of Technology, 1955), processed. More recent efforts at spelling out the rationale in greater detail are Leo H. Klaassen and Leland S. Burns, "The Position of Housing in National Economic and Social Policy," Capital Formation for Housing in Latin America (Washington: The Pan American Union, 1963); and Leo Grebler, "The Role of Housing and Community Facilities in Economic Development," United States Papers Prepared for the United Nations Conference on the Application of Science and Technology for the Benefit of the Less Developed Areas (Washington: U. S. Government Printing Office, 1963), Vol. VII. Portions of this paper are based on the substance of the last two references.

implication and few are answered explicitly, yet the considerations outlined are the sort that must be taken into account in systematic planning for the growth and development of emerging nations. A major study structured on these questions has been initiated recently and hopefully will yield results of relevance to planners charged with responsibility for making efficient capital allocation decisions.³ The framework proposes reclassifying housing as a tool for economic development rather than as a political or social welfare target.

Several initial assumptions are in order. First, maximum increase in real income over time is set as the primary target of economic development. Second, the direct returns generated from investment in housing are chiefly in the form of interest charges and rents, actual and imputed. Third, to facilitate the development of the rationale proposed in this paper, the capital-output ratio for housing is assumed to remain constant regardless of the investment decision. Finally, it must be assumed that capital resources are available for investment in limited quantity, and that an increase in investment in any one sector is at the expense of another.

Considering housing as a tool for economic growth and development, rather than as a target strictly of social or political policy, requires tracing through the linkages between improvements in the quality of housing and hypothesized increases in national income or product. Specifically called for is empirical testing of an important hypothesis:

³This study is sponsored by the Agency for International Development under the contract with the Real Estate Research Program, Graduate School of Business Administration, University of California, Los Angeles.

investment in housing contributes to economic growth by increasing productivity through improved living conditions. The precise linkages between the investment and output are subtle and complex, but may be reduced to two interrelated basics: the physiological and psychological response to a changed living environment.

Clear and ample evidence is available of the association between inferior housing and the incidence of disease, malnutrition, and other medical ills.⁴ Although it is uncertain whether poor housing is a causal or a reinforcing factor for poor health and disease, as well as for social disorder and disorganization, the correlations are impressively high and positive.⁵ Because most studies of these relationships have been confined to the more developed nations, extrapolations to emerging areas may be unjustified. Yet it may also be argued that with the even inferior housing conditions prevailing in the poorer nations, the correlations between similar indices are even more compelling. Further, a small improvement in housing quality may elicit a greater response than an identical improvement in a wealthier country. Investment in new residential

⁴The most detailed study for the United States is Daniel Wilner, Rosabelle Price Walkley, Thomas C. Pinkerton, and Matthew Tayback, The Housing Environment and Family Life: A Longitudinal Study of the Effects of Housing on Morbidity and Mental Health (Baltimore: The Johns Hopkins Press, 1962); for an extensive review of relevant literature, see Alvin L. Schorr, Slums and Social Insecurity: An Appraisal of the Effectiveness of Housing Policies in Helping to Eliminate Poverty in the United States, Research Report No. 1 (Washington: Division of Research and Statistics, Social Security Administration, U. S. Department of Health, Education, and Welfare, 1963).

⁵There is also the inescapable possibility that bad housing conditions partially result from the social ills themselves. However, in attempting to determine causal direction for the same relationships, Myrdal has asserted that "Any common sense evaluation will tell us that the causation, in part goes from poor housing to bad moral, mental and physical health," Gunnar Myrdal, The American Dilemma (New York: Harper & Bros., 1944), Vol. 1, p. 1290.

construction which raises housing standards on balance not only lowers many of the social costs of providing public services, but also reduces absenteeism and by so doing generates greater productive capacity in the labor force.⁶

The second linkage is the psychological connection between output and living conditions. Again, a substantial literature has emerged demonstrating the effect on worker productivity of various types of living environments (at home and at work).⁷ This reaction is evidenced by higher morale, improved work discipline, and increased ambition, all of which translate into increased output on the job. To the extent that better housing improves living conditions, thence employee attitudes, the benefits may be traced back to the cost of the housing program.

If the benefits attributed to housing are more than illusory, then the benefits in effect accrue to the economy in general rather than to housing in particular. More precisely, by increasing output, housing investment reduces the capital-output ratio of the economy's non-housing sector.⁸ This logic, taken with the initial set of assumptions, leads

⁶This point raises a tricky question. Surely reductions in absenteeism lead to increased output under conditions of full employment. However, in underdeveloped countries where unemployment and underemployment are the rule, it may be reasoned that the unemployed will be hired to substitute for hours lost as a result of absenteeism without impairing output. However, the substitution of newly-hired labor requiring training and tooling-up time is less productive than keeping the trained labor force on the job. Consequently, the "trade-off" is not equal.

⁷For example, Schorr, Ibid. For one of several reviews of the extensive literature on parallels between output and working conditions, see J. A. C. Brown, The Social Psychology of Industry (Laltimore: Penguin Books, 1954).

⁸A convenient term embracing all industries other than housing.

to a theoretical decision rule governing the allocation of capital between housing and all other sectors. Investment in housing is justified so long as the additions to output it generates exceed additions attributable to all other investments taken in the aggregate. The optimal division of capital occurs at the point where the marginal contribution of housing investments to total income equals the decrease in contribution of the non-housing sector resulting from an incremental investment in housing.⁹ This rule recasts housing in an economic framework where a high capital-output ratio alone does not relegate it to a necessarily inferior position in the competition for scarce capital.

The implementation of this decision rule assumes that the optimal distribution of capital between housing and non-housing is determined by relative impacts on income or product. At least two other effects are immediately relevant to national economic targets, the impacts on the level of prices and the balance of payments. While each is difficult to discuss in general terms due to unique circumstances in individual countries, issues can be raised to elicit responses for guiding policy.

The investment mix between housing and non-housing will bear differently on price levels depending on resource endowments. Relative scarcities in terms of sufficiently skilled labor for the construction sector, or of building materials of the proper type, will exert pressures on price levels. As a rule, the residential construction industry in many underdeveloped countries utilizes relatively low skills where transfers from other types of employment are accomplished with relative ease and

⁹The decision rule, and the model from which it spring, is delineated more precisely in Klaassen and Burns, op. cit., Mathematical Appendix.

without requiring the payment of necessarily higher wages. "Self-help housing," for instance, involves inputs of labor with only minimal skills. Inventories also indicate that indigenous materials, often of a very primitive nature, can be mobilized cheaply for house building.¹⁰ Still the finding that residential construction is inflationary relative to non-housing, calls for imposing a restriction on the decision rule. Such a constraint would operate to modify the optimal mix according to the inflationary pressures created by the mix as well as the amount of inflation tolerated.

Balance of payments considerations are closely allied. Two possible impacts are relevant. It seems probable that materials requirements for house construction may create demands for imports in excess of exports resulting in a loss of scarce foreign exchange, a situation which may be tolerable in the short run but hardly over an extended period. Such losses would not occur where indigenous materials are available in adequate supply and form to satisfy domestic demands, and in the absence of exports of building materials the effect would be neutral. An important exception must be noted, however. Even with a neutral direct impact on the payments balance, it may be argued that by displacing funds that otherwise might be invested in export industries, house construction operates counter to a favorable trade balance. On the positive side, housing built for employees in export-oriented industries, or built to attract additional employment to these activities, would make an indirect contribution to a favorable balance.

¹⁰Walter D. Harris, Hans. A. Hossé, and Associates, Housing in Peru (Washington: Pan American Union, 1963), Chapter IV; and Marcia N. Koth, Julio A. Silva, and Albert G. H. Dietz, Housing in Latin America (Cambridge: Massachusetts Institute of Technology, 1964), Section II, Chapter 3.

The balance of payments and price level restrictions are not independent. A "tolerable" level of price increases must take account of secondary effects on the demand for exports. From domestic price increases follow deteriorating trade positions (ceteris paribus) as domestic production fares less well in the competition for world trade shares. Consequently, alternative investments must be reckoned in terms of the world response, as well as domestic reaction, to increased prices.

Again, such considerations depend on a variety of forces which differ in nature among countries. Such forces as the demand elasticities of exports and their share in the national economy, relative endowments of resources and their substitutability, the power of instruments of monetary and fiscal policy for regulating activity selectively and across-the-board, and the price and magnitude of capital transfers into the nation, are among these unique characteristics. Consequently, generalization is dangerous but the enunciation of cautious principles would seem to be in order.

While the major distributional problem concerns the division of investment between housing and non-housing, other distributional considerations are no less relevant. These questions relate to housing for whom and where. Distributional considerations affecting the location of new housing and the nature of its occupancy may rest on objectives other than strictly economic, but still highly interdependent with primary economic targets.

Experience in countries with more centralized economies has demonstrated the power of housing for attracting labor into particularly "critical" occupations. In similar fashion, with productivity changes

the major criterion, occupancy priorities for new quarters may be predicated on labor-capital ratios, with first preference assigned where the proportion is highest and changes in productivity are measured most readily. Similar rules may govern workers employed in export industries in order to stimulate the growth of foreign trade. Still other criteria may also influence the arrangement of occupancy schedules.

The distribution of housing among a nation's regions has important implications for rates of urbanization and industrialization. The problems associated with burgeoning primate cities growing as a result of rural-urban migration are well documented.¹¹ Programs calling for spatial decentralization of new housing and community facilities can serve to discourage urbanization and reduce the inefficiencies of congestion and the higher social and economic costs of cities expanded beyond optimal size.

In the same context, housing may provide incentive for the decentralization of industry, a goal pursued in the regional development programs of many developed and underdeveloped countries. Providing more adequate shelter in less urbanized places may attract industry as well as rechannel the migration of labor. A complementary policy for housing would facilitate the realization of new towns in areas evidencing economic potential. One potential would be a labor pool qualified for employment by industries seeking locations for new plants at diversified points.

Space limitations have precluded an intensive discussion of the points alluded to briefly in this paper, or even an enumeration of the

¹¹For one such analysis of many, see Philip M. Hauser (ed.), Urbanization in Latin America (Paris: UNESCO, 1961).

many other components of decisions concerning housing investment. Further alternatives to the criterion of productivity or to the assumed target of maximum economic growth have been omitted. The chosen mandate has been the formulation of an analytical structure for placing housing within the context of a nation's economic life.

In sum, the framework proposed here for analyzing the position of housing in economic development asserts the need for an examination of the relative productivity of housing as one investment alternative in a spectrum of many. In strict terms, housing is warranted when it makes a measurable contribution to output in excess of alternate investments. Such a contribution is measured by the change in alternative output rates attributable to an investment in new residential construction. Making the necessary measurements for developing this framework is a formidable task indeed,¹² but one that must be undertaken if housing is to make its bid for capital resources on the basis of economic criteria.

¹²To isolate housing effects, considerable discretion is being exercised in the choice of test sites for testing the hypothesis central to the study cited in footnote 3. Consideration is limited to non-urban areas of underdeveloped countries. Further, the site must include an industry, preferably with a high labor component and little or no factor substitution over time, located in an area where a fairly substantial improvement has been made in the quality of housing, but with minimal other investment. Time-series data on output per worker would be used to compare before and after effects attributable to the housing investment. Alternatively, two separate but proximate sites could be selected for cross-sectional measurements. In this less desirable case, the areas should be highly homogeneous, particularly with respect to the nature of employment, but diverse in terms of housing quality.