

Evaluation Approach

Housing Finance Impact Evaluation

Loan 1632-SRI: Urban Development and Low-Income Housing Project

October 2010

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I. INTRODUCTION

1. Housing is generally considered the most important family asset and low-income housing solutions critical to reducing poverty and making the poor less vulnerable.¹ It is estimated that in 2010 there are 505 million slum dwellers in Asia and 827 million worldwide.² In Asia and the Pacific, because of rapid population growth, disproportionate urbanization and increasing flows of farmers to urban areas, the problem is particularly acute for urban development authorities. With nearly 60% of its people living in slums, South Asia has the highest proportion of urban residents in slums compared with other regions in Asia.³ Although forecasts are difficult, with the present pace of the shift from agrarian to urban-based economies, it is generally agreed that the world's urban population living in slums could greatly increase in coming years if appropriate slum upgrading and housing policies and interventions were not in place. According to UN-Habitat a "do-nothing" approach will further increase slum populations, reaching nearly 900 million world-wide by 2020. Governments and donors are therefore making efforts to increase the provision of housing for the poor. The Strategy 2020 of the Asian Development Bank (ADB) highlights the bank's strategic agendas in inclusive growth, environmentally sustainable growth, and regional integration, continuing support in the urban infrastructure sector developing livable cities and improving access to basic and secondary education.⁴

2. Generally, one of the major objectives of low-income urban housing (LIUH) operations is to improve the housing conditions and thereby quality of life of low and, sometimes, middle income households through the provision of low-cost housing and municipal services. Economic development produces improvements in a wide variety of welfare indicators. Improved housing conditions help achieving the Millennium Development Goals (MDGs) in poverty reduction, education for children, and improved health. Most importantly, improved housing conditions raise worker productivity; residential activities provide job opportunities and increase income; appropriate housing locations lower absenteeism from school and increase educational productivity; secure tenure contributes to household stability and provides the family with peaceful atmosphere to participate in labor markets; good housing and related services reduce the risk of diseases among children; and good housing brings comfort, reduces overcrowding

¹ ADB. 2008. *Managing Asian Cities*. Manila.

² UN-Habitat. 2010. *State of the World's Cities 2010/2011: Bridging the Urban Divide*. Earthscan. London-Washington.

³ Wong, S. 2008. *Poor Living Conditions in Asia*. <http://www.helium.com/items/81472-backgroundthere-billion-people-living,4/9/2009> (site visited 13 August 2010).

⁴ ADB. 2008. *Strategy 2020. The Long-Term Strategic Framework of the Asian Development Bank 2008–2020*. Manila.

and limits the transmission of communicable diseases, among others. See Appendix 1 for more detail.⁵

3. Given the importance of LIUH in achieving the MDGs (Appendix 1) and the level of effort by governments and donors in the sector, it is important that housing programs are assessed critically based on factual evidence with respect to what works and what does not in the project design and implementation.⁶ Funds are scarce and should be allocated where they can be used most effectively. It is therefore critical to know with credibility the extent of welfare change of the program beneficiaries as a result from improved housing conditions. This knowledge will provide feedback to help improve the effectiveness of housing projects, policies and practices and the resources that go to implementing them.

4. The proposed impact evaluation in this evaluation approach paper (EAP) will be an attempt to empirically assess the development effectiveness of LIUH interventions, to both provide hard evidence for ADB's future policy actions and fill in the evaluation information gap in the literature of the low-income housing subsector. It will use rigorous impact evaluation methods based on statistical and econometric analyses of quantitative data from household and community living standards surveys, both existing and to be conducted by the study. The counterfactuals will be drawn from non-participants using household profiles and existing household surveys. In addition, it will also collect qualitative information by interviewing concerned government officials, executing and implementing agencies, beneficiaries, and other related sources to provide additional insights on non-quantifiable variables and to cross-check outcomes of the quantitative analyses.

II. OVERVIEW OF ADB ASSISTANCE IN THE SECTOR

5. The ADB provided its first loan for urban housing improvements in 1977. Since then, ADB's approach to supporting LIUH in its developing member countries (DMCs) has evolved to expand from traditional slum upgrading or integrated urban sector development projects to include stand alone housing finance operations. The loan and grant amounts approved increased gradually from slightly below \$100 million in the 70s to about \$270 million in the 80s and reached the peak of over \$600 million in the 90s. The amount then dropped during the 2000s to slightly below \$350 million as the urban development sector focused more on urban infrastructure and services provision and involved less in housing. Most housing operations in the late 2000s were small grants in the finance sector sourced from the Japan Fund for Poverty Reduction (JFPR).⁷ In total, 12 countries borrowed or received grants from ADB for LIUH in a total of 39 projects of over \$1.3 billion to date (Table 1).⁸ A detailed list all ADB's LIUH loans and grants are in Appendixes 2 and 3, respectively.⁹

⁵ Appendix 1 was provided by Florian Steinberg, Sr. Urban Development Specialist, Southeast Asia Regional Department.

⁶ The ADB Urban COP noted that during the recent UN Habitat's World Urban Forum 5 in Rio de Janeiro (22- 26 March 2010), there were some trends to revive ODA investments in slum upgrading, inclusive urban management, land and housing. These sectors had received less attention in the last decade or so. Building on to the success under the umbrella of National Social Reform, the current administration of the Brazilian government is promoting this concept, and World Bank seems to have shown some interests in this movement. According to Urban COP, India government is also keen, and is in the discussion with World Bank and ADB for potential partnerships.

⁷ The last loan was approved in 2003 and the last grant was approved in 2007.

⁸ A quick review with regional departments on potential future housing programs showed that 2 loans are scheduled for 2010, one for Kyrgyzstan (\$25 million) and one for Pakistan (amount to be determined). For 2011, there will be one loan of \$30 million for Uzbekistan. In addition, the Private Sector Operations Department (PSOD) has also scheduled 2 investments in 2010 (amount was not disclosed due to the confidential nature).

⁹ In addition to loans and grants, ADB also provided technical assistances (TAs) in the LIUH subsector. See Appendix 4 for information. Also, from end 90s ADB started providing non-sovereign operations (NSOs) in the LIUH subsector. To date, ADB financed 9 NSOs for housing finance in total of \$94.94 million (comprising \$24.44 million investment and \$70.5 million in loans). See Appendix 5 for detail.

Table 1: Loan and Grant Approvals for Housing
(up to 30 June 2010)

Year of Approval	LIUH Loan and Grant Approvals			All ADB Loans and Grants	
	Number	Amount \$ million	% of All ADB Loans and Grants	Number	Amount (\$ million)
1966–1969	-	-	-	21	99.68
1970–1979	4	98.8	2.45	239	4,040.57
1980–1989	7	269.6	2.41	262	11,206.53
1990–1999	9	612.0	1.92	323	31,915.58
2000–2010	19	346.3	0.34	2,046	94,250.85
Total	39	1,326.7	0.94	2,891	141,513.21

Data include stand alone loans and grants for housing and urban development projects with housing components. For the latter, the full amount of loan was used.

Source: Staff calculations based on ADB database.

6. Of the 30 completed loans, 22 have been post-evaluated through a project completion report (PCR) by the user's department, and of these 14 have been re-evaluated through a PCR validation report (PVR) or a project performance evaluation report (PPER) by the Independent Evaluation Department (IED). Table 2 below shows the ratings.¹⁰ Overall, 4.5% of projects were rated highly successful, about 60% successful, 18% partly successful, 4.5% unsuccessful, and 3 projects (13.6%) during the early 80s were not rated.

Table 2: Project Performance Ratings

	Number	Percent
Highly Successful	1	4.5
Successful	13	59.1
Partly Successful	4	18.2
Unsuccessful	1	4.5
Not Rated	3	13.6
Total	22	100.0

Source: ADB loan databases.

7. The PCRs, PPERs, and special studies on ADB's urban sector development operations have highlighted several important lessons and recommendations for the LIUH subsector. Among the key factors contributing to the success and failure of a LIUH project included: (i) the time frame for complex, integrated projects should be adequate to allow periodic reviews of master plans and effective changes if needed; (ii) a modest scope with high quality were preferable to large integrated projects; (iii) project design should incorporate specific targets for low-income groups; and (iv) improved analytical framework and monitoring and evaluation systems helped ensure a successful project. Regarding efficiency, the reports pointed out that evaluation of housing projects based on a conventional project cost-benefit analysis may result in relatively low economic internal rates of return (EIRR).¹¹ Generally, ADB experience showed that public sector-provided housing is more expensive and less efficiently provided than that

¹⁰ Post-evaluations are power ordered with PPER being the highest, followed by PVR and PCR. The ratings reported in Table 2 are of the highest ordered report available.

¹¹ ADB. 1995. *Sector Synthesis of Postevaluation Findings in the Urban Development and Housing Sector*. Manila.

built by individuals or through non-governmental organizations (NGOs).¹² Regarding project impacts, none of the PCRs and PPERs attempted to assess the project socio-economic impacts on the beneficiaries. At best, they reported improvements in physical conditions such as house constructions, access to services, and loan disbursements and uses. On sustainability, they mostly reported improvements in related institutions and/or policies and sources of revenue to run those institutions and/or policies. For the former, most projects received a *likely* rating, while for the latter they appeared mixed.

III. THE CASE STUDY PROJECT

8. We will use ADB's Loan 1632-SRI: Urban Development and Low-Income Housing Project in Sri Lanka as the study case.¹³ The loan was approved by the ADB Board in 1998 and completed in 2005. The project was designed to promote economic growth and human resources management, stimulate investment in secondary towns, and upgrade living conditions for urban residents. The project had four components: (i) urban infrastructure; (ii) community development; (iii) housing finance; and (iv) institutional development.¹⁴ Of the project total cost of \$102.99 million, \$26.93 million went to the housing finance component. Table 3 shows the actual expenditure for each component.

Table 3: Loan 1632-SRI: Actual Expenditure

Expenditure Component	Amount (\$ million)		Total	
	ADB	Govt	Amount (\$ million)	Percent
A. Urban Infrastructure	40.28	23.60	63.88	62.0
B. Community Development	1.41	1.60	3.01	2.9
C. Housing Finance	19.93	7.00	26.93	26.1
D. Institutional Development	3.53	3.77	7.30	7.1
E. Imprest Account/Interest and Charges	1.87	0.00	1.87	1.8
Total	67.02	35.97	102.99	100.0

Source: Project Completion Report, 23 October 2006.

9. The housing finance component had three objectives: (i) to increase access of low-income households to market-based housing finance through the formal sector; (ii) to facilitate improvements of housing conditions and quality of life; and (iii) to promote formal banking sector interest in financing low-income housing market segment.¹⁵ The total loan amount of \$26.93 million comprised \$19.93 million from the ADB and \$7 million equivalent contribution from

¹² ADB. 2000. *Project Performance Audit Report: Low-Income Housing Development Project in the Republic of the Fiji Islands* (Loan 1005-FIJ). Manila.

¹³ ADB. 1998. *Report and Recommendation of the President to the Board of Directors: Proposed Loan to the Democratic Socialist Republic of Sri Lanka for the Urban Development and Low-income Housing (Sector) Project*. Manila.

¹⁴ The urban infrastructure component included 73 urban infrastructure subprojects in roads and traffic improvement, storm-water drainage, town center developments, water supply, and public sanitation. The community development component involved 8 low-income community areas, involving improvements of basic infrastructure and tenure regularization for existing residents. The institutional development component provided formal and on-the-job training to enhance staff skills in municipal financial management, management information systems, municipal engineering and environmental management, and computerization.

¹⁵ ADB. 1998. RRP. Cited previously.

participating credit institutions (PCIs).¹⁶ In total, the project provided 28,378 housing loans.¹⁷ The borrower selection criteria were households with monthly income below the 55th income percentile.¹⁸ Loans were lent at the prevailing market interest rates.

10. Nearly 99% of loans were used for construction of new houses, extension and renovation of existing houses, and purchase of land for new house construction. Almost three quarters of the loans were made to households with monthly incomes below SLRs10,000 (i.e., below the 2nd income quintile), and 26% went to those households with monthly incomes of SLRs10,001–12,500 (i.e., in the third income quintile). The maximum loan was SLRs100,000 originally but was increased to SLRs200,000 in 2000 to accommodate the increase in the price of building materials and construction costs. Likewise, the loan maturity was increased from 10 to 15 years. All the loans were disbursed through seven PCIs which were selected based on compliance with financial requirements set by the Central Bank of Sri Lanka (CBSL).¹⁹ Appendix 6 outlines the loan disbursements.

11. The PCR rated the project *partially successful* overall, and *relevant, effective, less efficient, less likely, and generally on target* on project's relevance, effectiveness, efficiency, sustainability, and impact, respectively.²⁰ For the housing component, the restrictive initial entry criteria (low NPL, high return on asset, etc.) prevented involvement of more experienced housing finance lending institutions and regional development banks.²¹ In addition, no housing revolving fund was established as originally planned, while the market interest rates dropped progressively from 16% per annum in 1999 to the range of 10% per annum in 2003 when the Government introduced its new low-income housing scheme. Without a housing revolving fund, the sustainability of the housing finance component was rated *less likely*. However, the component was rated *efficient* as loan disbursements exceeded the appraisal estimate at \$25 million. On the impact, the PCR found that low-income households benefited from improved access to affordable housing loans that enabled them to improve their housing and living conditions. However, the benefit monitoring evaluation showed no significant improved health conditions.

12. Loan 1632-SRI was selected for a rigorous impact evaluation of ADB's operations in the LIUH subsector for the following reasons. First, the ADB Strategy 2020 promotes inclusive growth, developing urban infrastructure with livable cities and access to basic and secondary education for children. Findings of this study will provide insights and lessons for the Urban

¹⁶ The total loan exceeded the \$25 million estimate at the appraisal because the PCIs' contributions exceeded the minimum requirement of 20% of the ADB funds (the actual contribution was about 26%).

¹⁷ The number of loans of 28,378 was lower than the appraisal estimate of 40,000 because in 2000 the maximum loan size increased from SLRs100,000 to SLRs200,000 in response to the increase in the price of building materials and other construction costs.

¹⁸ The income distribution was based on the Department of Census and Statistics (DCS)'s Household Income and Expenditure Survey (HIES) of 1990-1991. The survey had a sample of 25,000 households, of which 9,380 were urban. The households below the 55th percentile were considered low income. The cutoff was SLRs8,500 and in 1998 was updated to SLRs12,500 to reflect the present price level.

¹⁹ The seven PCIs were: Housing Development Finance Corporation (68.6%), three regional development banks (Kandurata Development Bank, Rajarata Development Bank, Ruhunu Development Bank, 27.9%), and three commercial banks (Commercial Bank of Ceylon, Hatton National Bank, and National Development Bank-Housing Bank, 3.5%). From May 2010, Kandurata Development Bank, Rajarata Development Bank and Ruhunu Development Bank were merged together with three other regional development banks to become the Regional Development Bank (RDB).

²⁰ ADB. 2006. *Completion Report: Urban Development and Low-Income Housing (Sector) Project in Sri Lanka*. Manila (Loan 1632-SRI, approved on 23 October 2006).

²¹ In 2000, the NPL requirement was relaxed from 10% to 15%.

Development Operations Guidelines being prepared by the Urban COP.²² Second, having a clear rule by which project participants are selected is one of the key determinants to the choice of the impact evaluation methodology to be used. In Loan 1632-SRI, the housing component required that only individuals with household income less or equal the 55th income percentile were eligible to borrow from the project, and this condition was strictly observed as found during the Reconnaissance Mission (22-27 August 2010) for this study. Lastly, in desk reviewing of ADB's completed housing projects, Loan 1632-SRI appeared the best in terms of the baseline data. Loan applicants were required to submit a detailed household profile with a certification of household income issued by the local government. Borrowers' household profiles are kept in the PCI client databases and can be accessed through the CBSL as the baseline data for the impact evaluation.²³

IV. THE PROPOSED IMPACT EVALUATION

A. Objectives and Scope of the Study

13. **Objectives.** The study is aimed to help improve the effectiveness of ADB future LIUH operations. Specifically, it has three objectives. First, to empirically assess the welfare change of the beneficiaries that can be attributed to the project in achieving the stated objectives, outcomes and impacts. Welfare effects will be evaluated at the household level to give an estimate of the project's direct impacts on the beneficiaries, and at a community level, to the extent possible, to show the project's aggregate and spill-over effects (see the evaluation framework section). Second, to identify factors (social, economic, project design and implementation) influencing the project outcomes. And third, to propose a sensible set of outcome indicators and benchmarks that can be used in future project design, monitoring and evaluation. In addition, the evaluation will also assess the housing component using the standard evaluation criteria to document the extent to which the component met its stated objectives in RRP.

14. **Scope and Activities.** The study will involve four steps: (i) preparation, (ii) data collection, (iii) data analysis, and (iv) reporting. The preparation step will include a thorough literature review of evaluation methodologies and impacts, including industry benchmarks, of low-income housing finance; finalization of the evaluation framework (impact indicators, determination of counterfactuals, and estimation methods); and preparation of quantitative and qualitative data collection instruments (identify existing primary data and information, design survey and interviews, and prepare questionnaires and pre-tests). In the data collection step, the evaluation team will collect existing primary and secondary data (household surveys, community profiles, etc.), and conduct a household and community survey, key informant interviews, and focus group discussions. The collected data will be prepared as clean working datasets in the STATA format. The data analysis step will undertake statistical and econometric analyses of both quantitative and qualitative data for estimating the project impacts and identifying influencing factors. Lastly, the evaluation team will draft a report based on the results of the data analyses. The draft report will follow the usual reviewing procedures (peer and inter-departmental reviews) and the finalized report will be submitted to the ADB's Development Effectiveness Committee (DEC).

²² For the recent Urban COP retreat, preparation for new Urban Development Operations Guidelines has been initiated. It is slated to be finalized in Q3 2011. Based on the Inclusive Growth under Strategy 2020, the COP is reviewing its strategic sub-sectors. Housing (together with slums upgrading) is one of areas for potential "re-strengthening". According to the COP, sub-sectors are discussed in line with the three strategic agendas (3E): equity, economic development, and environmental sustainability.

²³ This was verified with the CBSL and checked with four PCIs during the Reconnaissance Mission.

B. Evaluation Framework

15. **Hypothesis.** Appendix 7 presents a summarized review of literature on impact of housing projects. Governments and donors provide housing support based on the proposition that individuals must first be satisfied with basic needs, such as shelter, before they can progress to higher level needs, such as education, job training, or employment to improve their labor productivity, income and overall social well-being.²⁴ To this end, LIUH projects typically are ex-ante built around target impact indicators like improved access to affordable housing; increased employment opportunities; better school attendance of school-age children (e.g., increased number of hours spent studying rather than attending to household chores); and better health (e.g., reduced number of sick days, reduced morbidity and mortality); among others. Figure 1 shows a logic model linking project inputs and activities with outputs, outcomes and impacts on the project beneficiaries and community at large. It also includes other influencing factors throughout the project cycle. An evaluation matrix adopted from Field and Kremer (2006)²⁵ and an evaluation of social housing program in Canada conducted by Yukon Housing Cooperation (2004)²⁶ is presented in Appendix 8. The evaluation matrix sets out the key evaluation issues, principal questions, indicators, data sources, and methods to be used to address each question.

16. **Evaluation Question.** The principal question of this impact evaluation is to what extent the housing component really improved the quality of life for residents of the project towns, as this was stated as the project objective in the RRP.

17. **Impact Indicators.** Since the DMF did not explicitly specify the expected outcomes, to answer the evaluation question, the study will follow the IADB study by Marcano and Ruprah (2008) and Field and Kremer (2006) using income and non-income outcome indicators at both the household and community levels. The Reconnaissance Mission confirmed the feasibility of these outcome indicators. In particular:

- i. Household-level outcomes:
 - Housing quality index (HQI),²⁷
 - Per capita household consumption expenditure (per year),
 - Household completeness (presence of spouse and formally married),
 - Occupation ratio (percent of working household members),
 - School attendance (of school age children), and
 - Nourishment ratio (percent of children under 6 who are not under-nourished).
- ii. Community-level outcomes:
 - Poverty rate (percent of households below the poverty line),
 - Housing shortage (percent of households without a house),
 - Loan default ratio,
 - Crime rates, and
 - Net migration (difference between migration in and out).

²⁴ Maslow, A. H. 1943. *A Theory of Human Motivation*. Psychological Review, 50(4) (1943): 370-96.

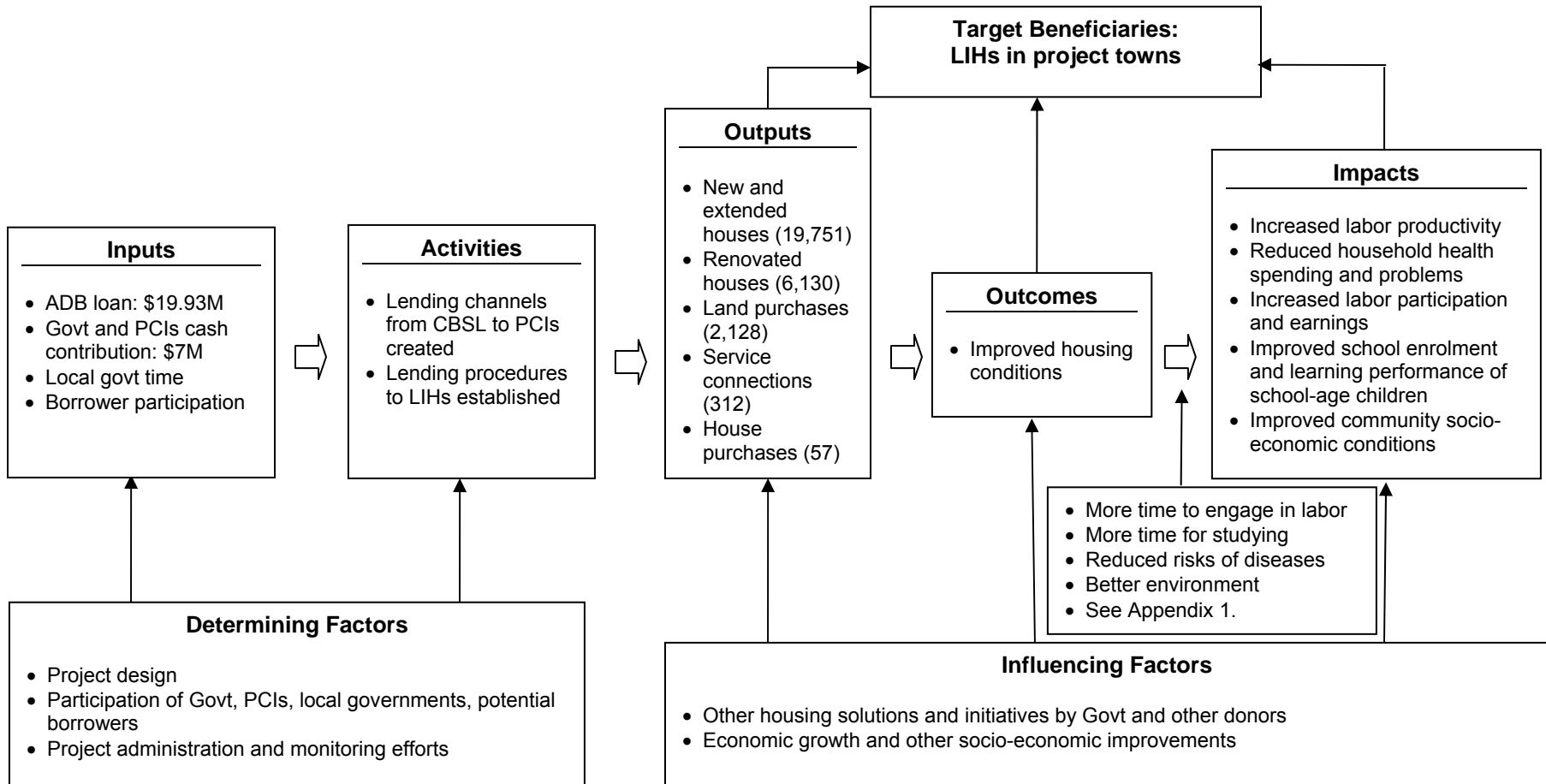
²⁵ Field, E. and M. Kremer. 2006. *Impact Evaluation for Slum Upgrading Interventions*. Doing Impact Evaluation. No. 3. The World Bank. Washington, DC.

²⁶ Yukon Housing Cooperation. Evaluation of the Social Housing Program. 20 September 2004.

²⁷ $HQI = \sum_i \frac{a_i}{7}$, where a_i equals unity if the house has condition i , and zero otherwise; and i runs through the seven

dwelling quality indicators: potable water access, sewage connection, electricity connection, walls, floors, ceilings, and overcrowding problems (more than 2 persons living per room).

Figure 1: Logic Model



CBSL = Central Bank of Sri Lanka, LIH = low-income household, PCI = participating credit institution.

18. **Estimation Methods.**²⁸ The housing component in Loan 1632-SRI used the 55th income percentile as the cutoff for participation: households with income below the 55th income percentile were eligible to borrow, and not otherwise. This assignment rule presents the possibility for the use of a regression discontinuity design (RDD) method to estimate the project effect (i.e., the effect of borrowing a housing loan). A brief technical presentation of the RDD method is provided in Appendix 9. The Reconnaissance Mission found that the eligibility condition was strictly enforced during the project implementation. Salaried applicants were required to submit latest payment slips and self-employed applicants were required to submit income certificates from the local government (issued by village head and verified by district authority).²⁹ However, not every eligible household actually borrowed. This means that the probability that a household borrows does not jump discretely from 0 to 1 as the household's income crosses the cutoff. To accommodate this feature of the project participation, we will therefore consider the method of fuzzy RDD (FRDD).

19. The project's impact then can be estimated by the average treatment effect as:

$$\text{Impact} = \frac{\lim_{x \uparrow x^*} E(Y_i | X_i = x) - \lim_{x \downarrow x^*} E(Y_i | X_i = x)}{\lim_{x \uparrow x^*} E(W_i | X_i = x) - \lim_{x \downarrow x^*} E(W_i | X_i = x)},$$

where $E(.)$ is the expectation operation; x^* is the cutoff (i.e., the 55th income percentile); Y_i and X_i are the outcome and forcing (treatment-determining) variable of household i , respectively; and $W_i = I[X_i \leq x^*]$ is the assignment variable with $I[.]$ being the index function taking value 1 if the condition in the square brackets is correct, and zero otherwise. The denominator represents the jump in borrowing probability due to treatment assignment.

20. Imbens and Lemieux (2008)³⁰ and van der Klaauw (2002)³¹ discuss parametric and non-parametric estimation methods that are analogous to the methods described for the SRDD. We will follow their recommendation to use the local linear regression estimation method, where both the difference in the outcome (numerator) and the difference in the borrowing probability (denominator) will be estimated by the fitted values of Y and W at both sides of the cutoff.

21. The RDD estimator gives an unbiased estimate of the project impact. However, it only estimates the project effect near the cutoff. If the project effect is constant, this poses no problem. To give an estimate of the overall average treatment effect, we will also use the propensity score matching (PSM) method combined with a double/single difference estimator, pending data availability and quality, as presented in ADB (2006).³²

22. In addition, we will assess the equity of the project impact, with the objective to examine whether the project was affordable to low-income households, whether the borrower selection was fair, and whether the loan conditions, amounts and terms were attractive to the poor. For this purpose, following Keare and Jimenez (1983),³³ we will apply the income decile analysis method to calculate the number of housing loan borrowers in each income range to determine

²⁸ These estimation methods are proposed based on the desk review of project documents and findings of the Reconnaissance Mission. The actual methods used will depend on actual data available.

²⁹ This is a norm accepted across the banking sector in Sri Lanka.

³⁰ Imbens, G. and T. Lemieux. 2008. Regression discontinuity designs: a guide to practice. *Journal of Econometrics*, vol. 142 (2): 615 – 635.

³¹ van der Klaauw, W. 2002. Estimating the effect of financial aid offers on college enrollment: a regression-discontinuity approach. *International Economic Review*, vol. 43 (4): 1249 – 1287.

³² ADB. 2006. *Impact Evaluation. Methodological and Operational Issues*. Manila.

³³ Keare, D. and E. Jimenez. 1983. *Progressive Development and Affordability in the Design of Urban Shelter Projects*. World Bank Staff Working Papers, No. 560. Washington, DC.

the extent to which the poorest could participate. Turnover analysis will also be used to compare income profiles of dropout families, with special attention paid to the degree of turnover due to inability to pay. Expenditure analysis of monthly housing costs and percentage of income spent on housing will assess the ability to repay the loan.

23. For community-level outcomes, the study will evaluate changes in the provision of neighborhood public goods. Since these cannot be easily measured directly, the study will follow Field and Kremer (2006) to examine changes in individual participation in local organizations and activities, measured in terms of households' time and money spent participating in community groups and the number of community groups they participate in. Housing data permitting, we may also evaluate the project effect on the local real estate markets using the hedonic pricing model, following, for example, S. Malpezzi (2002).³⁴

C. Survey Design

24. A sample of about 1,500 participating (treatment)—that is about 5% of total borrowers—and 1,500 non-participating households (comparison) will be surveyed. Given the information collected from the Reconnaissance Mission, participating households will be drawn from the list of borrowers to be provided by the CBSL, and non-participating households will be drawn from household profiles kept at the village statistics archives.³⁵ Table 4 presents the sample structure and data sources.

Table 4: Sample Structure and Data Sources

Time	Treatment Group	Comparison Group
1998	T0 = 1,500 households with income below the cutoff; households actually borrowed will be drawn from client profiles in PCIs' databases; households that did not borrow will be drawn from household profiles kept in the village statistics archives	C0 = 1,500 households with income above cutoff drawn from household profiles in the village statistics archives
2010	T1 = the same 1,500 households of T0 to be surveyed for the study	C1 = the same 1,500 households of C0 to be surveyed for the study

PCI = participating credit institution. Cutoff = SLRs12,500 per month.

25. Of the nine project provinces, the Northern and Eastern provinces had very few program borrowers. Combined they had only 383 borrowers or 1.3% of total borrowers.³⁶ Also, the North Western and UVA provinces had significantly lower numbers of borrowers, 5.8% and 5% respectively. For this reason, a survey sample will be drawn from the five remaining provinces, with the number of sample household units weighted against the number of housing loans in

³⁴ Malpezzi, S. 2002. *Hedonic Pricing Models: A Selective and Applied Review*. Center for Urban and Land Economics Research. University of Wisconsin.

³⁵ During the Reconnaissance Mission, the CBSL informed that it would provide the full list of borrowers with details upon ADB request. Also, Gampaha and Ja-Ela authorities showed household profiles with basic statistics including income, number of household members, house size, etc. The profiles are in hard format kept in paper.

³⁶ Part of the reason for low participation of these provinces is because of the civil conflict with the Tamil Tiger separatists.

each province.³⁷ In each province, the study will conduct survey of 5 participating and 5 non-participating communities.

26. For qualitative information, the study will conduct interviews of key informants. At the project overall level, these will include concerned government officials, members of executing and implementing agencies, and mass associations. In total, it is envisaged that about 100 key informant interviews (KIIs) will be conducted. In addition, in each participating town, the study will also conduct five focus group discussions (FGDs) of 15–20 randomly selected members from housing loan borrowers and five focus group discussions of the similar numbers of households with no housing loans. The Table 5 shows a tentative survey sample.

Table 5: Survey Sample

Province	Treatment Households	Comparison Households	Community Surveys	FGDs	KIIs
Southern	495	495	10	10	
Central	420	420	10	10	
Western	300	300	10	10	
North Central	150	150	10	10	
Sabaragamuwa	135	135	10	10	
Total	1,500	1,500	50	50	100

Source: Author's calculations.

D. Staffing and Scheduling

27. The study will be conducted by an IED evaluation team of a senior evaluation specialist as Team Leader, a national evaluation officer, and an operations evaluation assistant. The IED team will be assisted by consultants comprising (i) an international consultant/surveys and statistics (ICSS); (ii) an international evaluation specialist/econometrician (IESE); and (iii) a national statistics assistant (NSA). In addition, a local survey team (LST) will be recruited for surveys and data collection in Sri Lanka.

28. The consultants will be working on an intermittent basis. The level of input from the ICSS and IESE is estimated at 2 and 1 person-months, respectively, and they will assist with: (i) finalizing the evaluation framework and estimation methods, including finalizing outcome indicators and their determinants and measurement; (ii) preparing survey design and questionnaires and finalizing them after pre-tests; (iii) supervising the conduct of surveys and interviews by the LST; (iv) undertaking quantitative and qualitative data analysis; and (v) providing inputs to the evaluation report and dissemination materials. The NSA will be required for 3 person-months on an intermittent basis, to assist with the data analysis and evaluation report preparation and finalization, working on project document reviews, data preparation, running regressions, and preparing descriptive statistics, tables and graphs, etc.

29. The evaluation team will undertake to disseminate the study's findings through presentations in ADB, such as Urban COP brown-bag seminars, and elsewhere including Sri Lanka and international conferences/forums, and publications, as appropriate. Brief dissemination materials will be prepared in accordance with the IED guidelines.

³⁷ Also, due to their location and transportation conditions, having these provinces in the sample would increase survey efforts, time and resources substantially more than the potential additional information they could give.

30. The study will be carried out from October 2010 to September 2011 according to the following schedule and output milestones:

<u>Activities</u>	<u>Expected Completion Date</u>
Evaluation Approach Paper Approval	I Oct 2010
Preparations ³⁸	IV Oct 2010
Survey Training/Pre-testing Mission	IV Nov 2010
Conduct Survey and Input Data	IV Jan 2011
Data Analysis	Feb – Mar 2011
Draft Report for Peer Review	II Jun 2011
Interdepartmental Review	II Jul 2011
Editing	I Aug 2011
Advisor, IED	III Aug 2011
Report Approval by DG, IED	II Sep 2011
Report Submission to DEC	IV Sep 2011

attachments: Appendix 1: Housing and Millennium Development Goals
 Appendix 2: List of Housing Finance Loans and Components
 Appendix 3: List of Housing Finance Grants
 Appendix 4: List of Housing Finance Technical Assistance
 Appendix 5: Nonsovereign Loan and Grant Approvals for Housing
 Appendix 6: Housing Finance Loan
 Appendix 7: Summarized Literature Review
 Appendix 8: Evaluation Matrix
 Appendix 9: Estimation Methodology: Regression Discontinuity Design

³⁸ Preparations include recruitment of consultants; refinement of evaluation methodology, impact indicators and measurement, and field data collection instruments; and finalization of survey design, sample selection and questionnaires.

The Importance of Housing for Achieving the Millennium Development Goals

Millennium Development Goals (MDGs)	Role of Housing in Achieving MDGs
Goal 1: Eradicate extreme poverty and hunger	<ul style="list-style-type: none"> • Residential activities can provide job opportunities and income and thereby allow urban poor to invest in food and other basic needs. • Improved housing conditions raise worker productivity. • Residential activities improve a nation's wealth (e.g. taxes and savings) and allow governments and agencies to invest in social oriented programs to reduce poverty.
Goal 2: Achieve universal primary education	<ul style="list-style-type: none"> • Improved, and access to, housing in appropriate locations lowers absenteeism from school. • Improved, and access to, housing increases educational productivity. • Secure tenure allows parents to engage in income-generation activities allowing them to cater for educational expenses.
Goal 3: Promote gender equality and empower women	<ul style="list-style-type: none"> • Secure tenure contributes to household stability and provides women with peaceful atmosphere to engage in economic-generating activities. • Good housing reduces stress and contributes to women's productivity.
Goal 4: Reduce child mortality Goal 5: Improve maternal health	<ul style="list-style-type: none"> • Good housing and related services (e.g. water, electricity, and sanitation) reduces the risk of diseases among children. • Improved housing lowers the need for health services for women. • Secure tenure reduces stress among slum dwellers, especially women. • Safeguard procreation and nurturing of the young.
Goal 6: Combat HIV/AIDS, malaria and other diseases	<ul style="list-style-type: none"> • Access to housing reduces homelessness and risks of social vices associated with street people. • Good housing brings comfort, reduces overcrowding and limits the transmission of communicable diseases (e.g. tuberculosis), it facilitates and enhances care-giving. • Health conditions depend largely on good living environment.
Goal 7: Ensure environmental sustainability Goal 8: Develop a global partnership for development	<ul style="list-style-type: none"> • Good housing conditions and related services contribute to a good environment. • Use of environmentally friendly building materials, including energy-efficient materials, contributes to environmental protection. • Good housing and urban design are cornerstones for mitigating ecological footprints of settlements and reducing vulnerability to climate change. • Partnership between national government and international development agencies creates synergy and reduces duplication of programs. • Partnership between national government and international development agencies for housing ensures realistic policies and programs, and sharing of best practices. • Programs that involve partnerships among national governments, international development agencies, local communities and slum dwellers have a better chance of long-term sustenance.

Source: Tibaijuka, Ana Kajumulo, "Building Prosperity: Housing and Economic Development", UN-Habitat and Earthscan, London and Sterling, Virginia, 2009.

LIST OF HOUSING FINANCE LOANS AND COMPONENTS
(approved 1966–2010)

Loan No.	DMC	Title	SECT	Fund	Amount (\$M)	Approval Date	Completion Date	Closing Date	Performance Rating	
									PCR	VR/PPER
297	HKG	Sha Tin Urban Development (Housing)	SUH	OCR	20.5	14-Apr-77	Feb 82	31 Dec 81	NR	NR
344	MAL	Trengganu Tengah Township Development	USD	OCR	16	29-Jun-78	26 Aug 84	6 Jun 83	NR	NR
400	INO	Bandung Urban Development	USD	OCR	32.3	29-May-79	Dec 87	26 Feb 88	NR	GS
424	KOR	Low Cost Urban Housing	SUH	OCR	30	23-Nov-79	Apr 82	8 Jun 82	GS	GS
481	THA	Bang Plee New Town	USD	ADF	20	18-Nov-80	Dec 88	13 Feb 89	NR	PS
538	KOR	Second Low-Income Urban Housing	SUH	OCR	60	12-Nov-81	May 83	30 Jun 83	NR	NR
550	INO	Medan Urban Development	USD	OCR	39.3	26-Nov-81	Jun 89	11 Oct 89	NR	GS
629	INO	Small Towns Urban Development Sector	USD	OCR	36.7	09-Jun-83	Jun 90	18 Dec 90	NR	GS
736	THA	Shelter Sector	SUH	OCR	38	23-Apr-85	Sep 90	18 Jul 90	NR	GS
1004	PAK	Second Urban Development	USD	ADF	66	19-Dec-89	Aug 00	26 Nov 02	S	
1005	FIJ	Low Income Housing Development	HF	OCR	9.6	21-Dec-89	Mar 96	14 Mar 96	PS	US
1096	SRI	Low-Income Housing	HF	ADF	20	29-Aug-91	Dec-97	13-Feb-98	GS	
1204	SRI	Urban Development Sector	USD	ADF	27	08-Dec-92	Aug-99	09-Nov-99	S	
1415	IND	Karnataka Urban Infrastructure Development	USD	OCR	85	14-Dec-95	30-Jun-04	07-Dec-04	S	S
1416	IND	Karnataka Urban Infrastructure Development	USD	OCR	20	14-Dec-95		26-Jan-01	HS	
1549	IND	Housing Finance (National Housing Bank)	HF	OCR	100	25-Sep-97		23-Dec-99	S	
1550	IND	Housing Finance (Housing and Urban Development Corporation)	HF	OCR	100	25-Sep-97		06-Dec-99	S	
1551	IND	Housing Finance (Housing Development Finance Corporation)	HF	OCR	100	25-Sep-97		26-Jan-01	S	
1632	SRI	Urban Development and Low Income Housing	USD	ADF	70	24-Sep-98	Jan-05	26-Dec-07	PS	
1719	IND	Urban and Environmental Infrastructure Facility (HUDCO)	USD	OCR	90	17-Dec-99		02-Jul-01		
1758	IND	Housing Finance II - Housing and Urban Development Corporation	HF	OCR	0	21-Sep-00		07-Sep-01		
1759	IND	Housing Finance II - National Housing Bank	HF	OCR	40	21-Sep-00		30-Jun-07	US	PS
1760	IND	Housing Finance II - Housing Development Finance Corporation	HF	OCR	0	21-Sep-00		08-Oct-01		
1761	IND	Housing Finance II - ICICI	HF	OCR	80	21-Sep-00		10-Oct-07	S	PS
1847	MON	Housing Finance (Sector)	HF	ADF	15	18-Oct-01	Dec-07	24-Aug-08	S	S
1907	MON	Integrated Development of Basic Urban Services in Provincial Towns	USD	ADF	20.1	06-Aug-02		18-Nov-09		
1990	VIE	Housing Finance Development of Poor Urban Communities Sector	HF	ADF	30	20-Dec-02		31-Aug-11		
2063	PHI	Neighborhood Upgrading and Shelter Sector	USD	OCR	30.5	18-Dec-03		30-Apr-10		
2072	INO	Neighborhood Upgrading and Shelter Sector	SUH	OCR	68.6	19-Dec-03		31-Dec-10		
2073	INO	Neighborhood Upgrading and Shelter Sector	SUH	ADF	20	19-Dec-03		31-Dec-10		

ADF = Asian Development Fund; GS = generally successful; HF = Housing Finance; OCR = ordinary capital resources; PCR = project completion report; PPER = project performance evaluation report; PS = partly successful; S = successful; SUH = Slum Upgrading and Housing; US = unsuccessful; USD = Urban Sector Development; VR=PCR validation report.

Source: ADB loan database.

LIST OF HOUSING FINANCE GRANTS
(approved 1966–2010)

Grant No.	DMC	Grant Project Name	Sector	Fund Source	Amount (US\$)	Other Source	Project Type	Date of			Grant Status
								Approval	Completion	Closing	
9003	PHI	On-Site Urban Upgrading for Vulnerable Slum Communities of Payatas	USD	JFPR	1,000,000	-	Project	13-Dec-00	29-Feb-04	30-Jun-07	Closed
9004	PHI	Off-Site and Off-City Relocation of Vulnerable Slum Communities of Muntinlupa City	USD	JFPR	1,000,000	-	Project	21-Dec-00	31-Dec-04	30-Jun-07	Closed
9013	AZE	Integration of Internally Displaced Persons in Mingechevir Rayon	SUH	JFPR	2,500,000	-	Project	30-Jan-02	31-Dec-04	16-May-07	Closed
9015	MON	Improving the Living Environment of the Poor in Ger Areas of Mongolia's Cities	SUH	JFPR	2,200,000	-	Project	07-May-02	31-Aug-07	23-Feb-08	Closed
9021	IND	Rainwater Harvesting and Slum Development in Rajasthan	USD	JFPR	1,900,000	-	Project	24-Sep-02	31-Jan-08	31-Mar-09	Closed
9024	AFG	Road Employment Project for Settlement and Integration of Returning Refugees and Displaced	SUH	JFPR	15,000,000	-	Project	03-Oct-02	31-Dec-08	16-Nov-09	Closed
9024	AFG	Road Employment Project for Settlement and Integration of Returning Refugees and Displaced	SUH	Others	15,000,000	KUW	Project	26-May-03	31-Dec-08	16-Nov-09	Closed
9074	INO	Seismically Upgraded Housing in Nanggroe Aceh Darussalam and North Sumatera	SUH	JFPR	2,000,000	-	Project	06-Sep-05	14-Jul-09		Active
9106	MON	Community-Driven Development for Urban Poor in Ger Areas	SUH	JFPR	1,500,000	-	Project	02-Mar-07	30-Jun-11		Active

AFG = Afghanistan, AZE = Azerbaijan, IND = India, INO = Indonesia, MON = Mongolia, PHI = Philippines.

LIST OF HOUSING FINANCE TECHNICAL ASSISTANCE
(approved 1966–2010)

Table A4.1: Detailed Data

TA No.	DMC	TA Name	Sector	Fund Source	Amount (US\$)	Other Source	TA Type	Date of		TA Status	
								Approval	Completion		Closing
444	MAL	Public Low Cost Housing	SUH	TASF	500,000	UNDP	PP	23-Dec-81		2 Nov 84	Cancelled
675	THA	Shelter Sector	SUH	Others	576,000	SWI	AD	23-Apr-85		31 Jul 90	Closed
942	PAK	House Building Finance Corporation	HF	TASF	318,000		AD	08-Jan-88		31 Mar 90	Closed
976	FIJ	Fiji Housing Authority	SUH	TASF	96,000		AD	09-May-88		31 Mar 89	Closed
979	BHU	Low-Income Housing Finance	HF	TASF	96,000		PP	05-May-88		31 Oct 89	Closed
981	PAK	Low-Income Housing	HF	TASF	100,000		PP	07-Jun-88		31 Dec 90	Closed
1100	SRI	Housing Development Finance Corporation	HF	TASF	295,000		AD	05-Jan-89		31 Mar 91	Closed
1103	BAN	Institutional Strengthening of the Housing and Settlement Directorate	SUH	JSF	440,000		AD	12-Jan-89		31 Dec 92	Closed
1252	FIJ	Housing Authority Manpower Training	HF	TASF	202,000		AD	21-Dec-89		31 Aug 99	Closed
1253	FIJ	Strengthening the Department of Town Country Planning (DTCP)	HF	TASF	340,000		AD	21-Dec-89		31 Mar 95	Closed
1254	FIJ	Housing Sector Resource Mobilization Study	HF	TASF	199,000		AD	21-Dec-89		31 Mar 94	Closed
1293	SRI	Low-Income Housing Development	HF	TASF	108,000		PP	26-Apr-90		31 Mar 91	Closed
1332	SAM	Housing Sector Study	HF	TASF	350,000		AD	06-Jul-90		31 Dec 93	Closed
1555	SRI	Institutional Support to HDFC and SMIB	HF	TASF	630,000		AD	29-Aug-91		30 Jun 98	Closed
1556	SRI	Housing Sector Development	HF	TASF	680,000		AD	29-Aug-91		31 Mar 95	Closed
1670	BAN	Housing Sector Institutional Strengthening	HF	TASF	600,000		AD	04-Feb-92	9 Nov 93	31 Dec 93	Closed**
2245	FIJ	Restructuring of the Housing Authority	SUH	JSF	450,000		AD	19-Dec-94		30 Nov 99	Closed**
2586	INO	Secondary Mortgage Facility (SMF)	HF	TASF	96,000		AD	13-Jun-96		30 Apr 00	Closed
2700	IND	Housing Finance Facility	HF	TASF	100,000		PP	05-Dec-96		30 Apr 98	Closed
2708	SAM	Assistance to Housing Sector	SUH	TASF	100,000		AD	12-Dec-96		31 May 98	Closed
2833	IND	Strengthening Housing Finance Institutions	HF	JSF	600,000		AD	24-Jul-97		30 Sep 00	Closed**
2890	MON	Housing Sector Policy	SUH	JSF	150,000		AD	08-Oct-97		31 May 99	Closed**
2890	MON	Housing Sector Policy (Supplementary)	SUH	JSF	60,000		AD	26-Mar-98		31 May 99	Closed**
3019	PRC	Policies and Regulatory Framework for the Construction Industry	SUH	TASF	570,000		AD	20-May-98	30 Jun 01	31 Dec 02	Closed***
3067	IND	Restructuring State-Level Housing Institutions	HF	TASF	500,000		AD	11-Sep-98		31 Dec 01	Closed
3090	MON	Institutional Strengthening of the Housing Sector	SUH		800,000		AD	19-Oct-98	30 Sep 01	31 Jul 03	Closed*
3288	IND	Housing Finance II	HF	TASF	405,000		PP	08-Nov-99		30 Sep 03	Closed
3406	MON	Housing Sector Finance	HF	JSF	600,000		PP	02-Mar-00		31 May 03	Closed
3487	VIE	Low Income Housing and Secondary Towns Urban Development Needs Assessment Study	SUH	JSF	500,000		AD	30-Aug-00	31 Oct 01	30 Apr 03	Closed**
3586	IND	Building HUDCO's Capacity for Lending to Community-Based Finance Institutions	HF	TASF	150,000		AD	15-Dec-00		31 Dec 02	Closed
3732	IND	Assessing the Role of Mortgaged-Backed Securities	HF	TASF	150,000		AD	02-Oct-01		31 Jul 03	Closed
3853	VIE	Housing Finance	HF	TASF	400,000		PP	05-Apr-02		27 Mar 04	Closed
3895	INO	Shelter Sector Project	SUH	TASF	1,000,000		PP	11-Jul-02		29 Oct 04	Closed
4042	BHU	Housing Sector Reform	SUH	TASF	500,000		AD	18-Dec-02	2 Aug 04	13 Oct 04	Closed**
4293	PHI	Capacity Building for Housing Microfinance	HF	TASF	1,500,000		AD	18-Dec-03		Aug 10	Active

TA No.	DMC	TA Name	Sector	Fund Source	Amount (US\$)	Other Source	TA Type	Date of			TA Status
								Approval	Completion	Closing	
4293	PHI	Capacity Building for Housing Microfinance (Supplementary)	HF		500,000	EAKPF	AD	27-Jun-08		Aug 10	Active
4366	INO	Institutionalization of Participatory Approaches to Shelter Provision	SUH		50,000	UKG	PP	02-Aug-04		29 Aug 05	Closed
4368	INO	Financing Integrated Settlements Development	HF		800,000	UKG	PP	03-Aug-04		21 Apr 08	Closed
4569	IND	A Study on the Development of an Agency to Facilitate Issuance of Residential Mortgage-Back	HF		250,000	SWI	AD	25-Feb-05		13 Mar 09	Closed
4715	INO	Secondary Mortgage Facility	HF	JSF	600,000		AD	06-Dec-05		12 Mar 09	Closed
7469	REG	Housing Finance Capacity Development in South and Southeast Asia	HF	TASF	1,300,000		CD	22-Dec-09		Dec 12	Active

AD = advisory, CD = capacity development, HF = housing finance, JFPR = Japan Fund for Poverty Reduction, JSF = Japan Special Fund, PP = project preparatory, REG = regional, SUH = slum upgrading and housing, TASF = Technical Assistance Special Fund, TA = technical assistance, UNDP = United Nations Development Programme.

Note: For TA completion report (TCR) rated TAs – * = highly successful; ** = generally successful/successful; ** = partly successful

Source: ADB grant and TA database.

Table A4.2: Summary Table of TA Approvals for Housing
(up to 30 June 2010)

Year of Approval	TA Approvals			All TAs	
	Number	Amount		Number	Amount (\$ million)
		\$ million	% of All TAs		
1966–1969	-	-	-	24	3.54
1970–1979	-	-	-	307	58.75
1980–1989	11	3.16	1.09	940	289.48
1990–1999	16	6.20	0.59	2,186	1,053.42
2000–2010	14	8.30	0.52	2,318	1,597.85
Total	41	17.66	0.59	5,775	3,003.05

Source: Staff calculations based on ADB database.

NSOVEREIGN OPERATIONS APPROVALS FOR HOUSING

(up to 30 June 2010)

Year of Approval	NSO Approvals			All NSOs	
	Number	Amount		Number	Amount (\$ million)
		\$ million	% of All NSOs		
1966–1969	-	-	-	-	-
1970–1979	-	-	-	-	-
1980–1989	-	-	-	50	297.32
1990–1999	1 ^a	-	-	105	1,316.05
2000–2010	8	94.94	1.68	152	5,666.76
Total	9	94.94	1.30	307	7,280.13

NSO = nonsovereign operation.

^a Includes cancelled Investment Operation number 7148-INO.

Source: Staff calculations from ADB project database.

HOUSING FINANCE LOAN DISBURSEMENTS
Loan 1632-SRI: Urban Development and Low-Income Housing Project

Table A6.1. Housing Finance Loan Disbursement by Participating Credit Institutions

Participating Credit Institutions	Number of Loans	Loan Amount (SLRs million)	Interest Rate Applied (%)
Commercial Bank of Ceylon	296	36.2	10.50–16.00
Hatton National Bank	399	29.8	12.00–16.00
Kandurata Development Bank	5,170	324.1	11.50–16.00
Rajarata Development Bank	1,394	71.5	12.89–16.00
Ruhunu Development Bank	5,491	275.6	10.00–15.17
National Development Bank-Housing Bank	101	18.7	14.50–16.00
Housing Development Finance Corporation	15,527	1,652.3	10.50–15.90
Total	28,378	2,408.2	

Table A6.2. Housing Finance Loan Disbursement by Province

Province	Number of Loans	(%)	Loan Amount (SLRs million)	(%)
Western	5,097	18.0	604.6	25.1
Southern	8,109	28.6	561.2	23.3
Central	7,051	24.9	500.0	20.8
Sabaragamuwa	2,154	7.6	216.8	9.0
North Western	1,658	5.8	182.5	7.5
North Central	2,506	8.8	179.5	7.5
UVA	1,420	5.0	125.3	5.2
North and East	383	1.3	38.3	1.6
Total	28,378	100.0	2,408.2	100.0

Table A6.3. Housing Finance Loan Disbursement by Income Group

Income Group (SLRs per month)	Number of Loans	(%)	SLRs million	(%)
less than 2,500	362	1.3	12.6	0.5
2,501–5,000	4,198	14.8	219.6	9.1
5,001–7,500	9,630	33.9	719.6	29.9
7,501–10,000	8,948	31.5	825.8	34.3
10,001–12,500	5,240	18.5	630.6	26.2
Total	28,378	100.0	2,408.2	100.0

Table A6.4. Housing Finance Loan Disbursement by Purpose

Purpose	Number of Loans	(%)
Construction of New House and Extensions	19,751	69.6
Renovation of Existing Houses	6,130	21.6
Purchase of Land for New House Construction	2,128	7.5
Service Connections	312	1.1
Purchase of House	57	0.2
Total	28,378	100.0

Source: All tables are from the project completion report.

SUMMARIZED LITERATURE REVIEW

1. The theoretical underpinning of low-income housing policies and programs came from the theory of human motivation called “*Hierarchy of Needs*” proposed by A. H. Maslow in 1943.¹ According to this theory, individuals must first be satisfied with basic physiological needs, such as shelter, before they can progress to higher level needs. In other words, individuals who are homeless, at risk for homelessness, or live in unaffordable or substandard housing, face physiological barriers to improving their economic and social well-being. Only when their housing needs are met, can they pursue higher level needs, such as education, job training, or employment, and these will lead to their improved productivity, income and overall welfare over time. To this end, LIUH projects typically are ex-ante built around target impact indicators like improved access to affordable housing; increased employment opportunities; better school attendance of school-age children (e.g., increased number of hours spent studying rather than attending to household chores); and better health (e.g., reduced number of sick days, reduced morbidity and mortality); among others.

2. The empirical literature on household welfare impact of public-financed low-income housing programs is actually very thin. A search in preparing for this EAP came up with only three published impact evaluations of LIUH programs: one by the Inter-American Development Bank (IADB) in 2008,² one by the World Bank in 1982,³ and one by ADB in 1997.⁴ The World Bank in 2007 had a working paper on the impact of housing quality on the family health and happiness.⁵

3. The IADB study assessed the impact of Chile’s progressive housing program on housing conditions and household welfare. For the former, it used a composite housing quality index (HQI) as a non-weighted average of 7 dwelling quality indicators: potable water access, sewage connection, electricity connection, walls, floors, ceilings, and overcrowding problems (more than 2 persons living per room). For the latter, it used 6 welfare indicators: household completeness (i.e., presence of spouse and formally married), occupation ratio (working household members as percent of the household members), school attendance of children 6-14 years old, and under-nourishment of children below 6 years old, indigence, and poverty rates. To evaluate the project impact, the study used three estimation methods: (i) before-after comparison, (ii) pipeline method comparing beneficiaries with current applicants, and (iii) single difference based on propensity score matching. The evaluation found poor performance of the pro-poor targeting with high under-coverage and leakages, and the program’s sustainability questionable as many households slipped back into housing shortage over time. The evaluation showed significant positive effects on materiality conditions and improved accessibility (e.g., to water, sewage, and electricity) but no discernable positive effects on welfare indicators such as poverty rate, school attendance, occupation ratio, etc.

4. The World Bank paper presented the key findings of the evaluations of four pilot urban shelter programs in El Salvador, the Philippines, Senegal and Zambia the World Bank financed

¹ Maslow, A. H. 1943. *A Theory of Human Motivation*. Psychological Review, 50(4) (1943): 370-96.

² Marcano, L. and I. J. Ruprah. 2008. *An impact evaluation of Chile’s progressive housing program*. Inter-American Development Bank. Washington, DC.

³ Keare, D. H. and S. Parris. 1982. *Evaluation of shelter programs for the urban poor. Principal Findings*. World Bank staff working papers. Number 547. World Bank. Washington, DC.

⁴ ADB. 1997. *Impact evaluation study on the Bank assistance to the urban development and housing sector*. IES: REG 97019.

⁵ Cattaneo, M. D., S. Galliani, P. J. Gertner, S. Martinez, and R. Titiunik. *Housing, Health and Happiness*. World Bank Policy Research Working Paper 4214. April 2007.

from 1972-1981. At the time, the World Bank was experimenting with the progressive development approach, whereby housing improvements would be made at a pace dependent on the incomes and preferences of project households.⁶ The evaluations addressed policy issues of the World Bank's lending in the urban sector, focusing on the feasibility of mobilizing private savings for shelter investment, designing low-cost shelters affordable for low-income households, and influencing national shelter policies through the experience of pilot projects. The evaluations assessed the impacts of the projects in 6 areas: (i) achievement of physical objectives; (ii) accessibility to target populations; (iii) improvements to housing; (iv) access to services; (v) employment and income generation; and (vi) broader impacts on national urban housing policies and on urban areas. For the accessibility, the evaluations used the concept of affordability of the project to the poor (i.e., the household's propensity to pay the housing monthly cost) and measured it through the turnover rate (the proportion of targeted beneficiaries that turned over the project) and the default rate (i.e., the percent of households that could not meet the monthly housing payment). For improvements to housing, the evaluations used the hedonic pricing model to estimate the change in housing value. Among the key findings of the evaluations include: significant positive effects on the housing stock (the national housing stock increased by 50%); most beneficiaries were between 20th and 50th income percentiles rather than below, although many beneficiaries were as high as in the 70th percentile; and house constructions generated substantial amounts of employment and income.

5. The ADB study was a post-evaluation of 12 urban sector development loans that ADB approved between 1976 and 1989.⁷ It aimed to evaluate technical, financial, economic, social, institutional, and environmental impacts. It assessed whether the projects met the stated targets by comparing planned with actual achievements. The study found intended impacts of projects were not well defined, hence project inputs and activities were not well focused on attaining impacts. The study also pointed out that lack of baseline information made assessment of actual impacts difficult. As for the socio-economic impacts, the study found that 70% of the survey respondents were happy with improved housing conditions. However, income and consumption expenditure indicators appeared to be better in the comparison groups.⁸ The most critical shortcoming from a methodological viewpoint of this study is that it did not assess the project impact based on a counterfactual analysis, i.e., estimating the outcomes of the beneficiaries that would have prevailed in the absence of the project. In other words, by comparing the actual outcomes with the targeted outcomes, the study did not account for factors outside the project that could have influenced the outcomes of interest, and thus by using such a simple difference method it may have failed to provide an accurate estimate of the project impact. Not controlling for those other factors, the study by default may have falsely attributed the outcomes of interest to the project and may have given a counterfeit causal interpretation. Likewise, simply using a "with" and "with-out" comparison, the study did not to control for unobservable differences between the two groups and thus may be subject to selection biases.

⁶ The progressive development is a method of housing construction or upgrading achieved through (i) stage development in which the infrastructure and occasionally parts of the house are built by a contractor, and the rest of the house is completed by the household; (ii) flexibility in housing design, construction time, and material used; and (iii) self-help components with different ways the household can help itself or get other households help in constructing the house.

⁷ The 12 projects included two urban housing projects in Thailand (Loan 0481-THAI: Bang Plee New Town, and Loan 0736-THA: Shelter Sector Project); 7 integrated urban development projects in Indonesia and Pakistan (5 and 2, respectively); and 3 regional development projects in Malaysia.

⁸ The study used an area with comparable plot and house sizes and similar facilities in a new town built by the private sector.

6. The World Bank working paper evaluated the impact of a large scale housing program by the Mexican Government called Piso Firme (in English, firm floor) to replace dirt floors with cement floors for poor families. It examined one particular aspect of housing, floor quality, and its impact on the health of young children and the mental health and happiness of their mothers. To identify the effect, the evaluation used the geographic discontinuity in the program implementation. The program was first implemented as a local program in one state and was later adopted nationally and gradually extended to other states. The evaluation compared households residing near the border of early and later cities. To measure the child health, the study used height, weight of children below 6 years old, and indicators for language and communication skills development for children of 12-30 months, among others. To measure adult happiness, the study used indicators such as satisfaction with floor quality, overall housing quality and measures of depression and perceived stress for mothers of children below 6 years old. The study found a complete substitution of dirt floors by cement floors led to significant improvements in child health (78% reduction in parasitic infestations, 49% reduction in diarrhea, 81% reduction in anemia, and 36-96% improvement in cognitive development). As for adult happiness, significant increased satisfaction with housing and quality of life, as well as significantly lower rates of depression and perceived stress.

EVALUATION MATRIX

Evaluation Issues and Guiding Questions	Indicators	Data Sources and Methods
1. Program Rationale and Objectives		
1.1. Was the program consistent with the objectives and priorities of the Government and beneficiaries?	<ul style="list-style-type: none"> • Project stated objectives and stated objectives and priorities of the Government programs and beneficiaries 	<ul style="list-style-type: none"> • Household and community survey (HCS) • Key informant interviews (KII) • Review of government documents
1.2. Is there still a need for the program?	<ul style="list-style-type: none"> • Number of low-income households (LIHs) lacking adequate housing 	<ul style="list-style-type: none"> • Data from village/district statistics and from household income and expenditure surveys (HIES) 1995-96, 2002, 2006-07 and 2009-10 by the Department of Census and Statistics (DCS) of Sri Lanka
1.3. Was the program serving the right mix of borrowers?	<ul style="list-style-type: none"> • Number of borrowers in each income group • Loans disbursed in each income group 	<ul style="list-style-type: none"> • Client profiles at participating credit institutions (PCIs) • HCS
1.4. Did the loans meet the need for housing of the borrowers?	<ul style="list-style-type: none"> • Loan sizes, conditions, terms, uses, disbursement, and repayment 	<ul style="list-style-type: none"> • PCIs' loan database • HCS
2. Impact on Housing and Living Conditions		
2.1. How satisfied are borrowers with their housing conditions?	<ul style="list-style-type: none"> • Housing quality index (HQI) • Number of borrowers satisfied/dissatisfied with the quality of their housing • Level of satisfaction of borrowers with the type and value of their housing 	<ul style="list-style-type: none"> • HCS, KII • Focused group discussion (FGD)
2.2. To what extent the housing needs of the borrowers have been met?	<ul style="list-style-type: none"> • Housing shortage (measured in terms of number of households with adequate housing) • Affordability (measured in terms of percent of income spent on housing) 	<ul style="list-style-type: none"> • HCS, KII • Data from village/district statistics • Borrower profiles at PCIs
2.3. What were the effects of the new housing on living standards of the borrowers	<ul style="list-style-type: none"> • Household consumption expenditures • Household completeness (presence of spouse and formally married) 	<ul style="list-style-type: none"> • HCS, KII, FGD
2.4. Did the program produce any unintended negative effects	<ul style="list-style-type: none"> • Number of negatives effects cited by participants • Subjective quality of life 	<ul style="list-style-type: none"> • HCS, KII, FGD • Village/District statistics
3. Health Impact		
3.1. To what extent did the program improve health conditions of the borrowers?	<ul style="list-style-type: none"> • Percent of children under 6 years old that are under-nourished 	<ul style="list-style-type: none"> • HCS • Village/District statistics

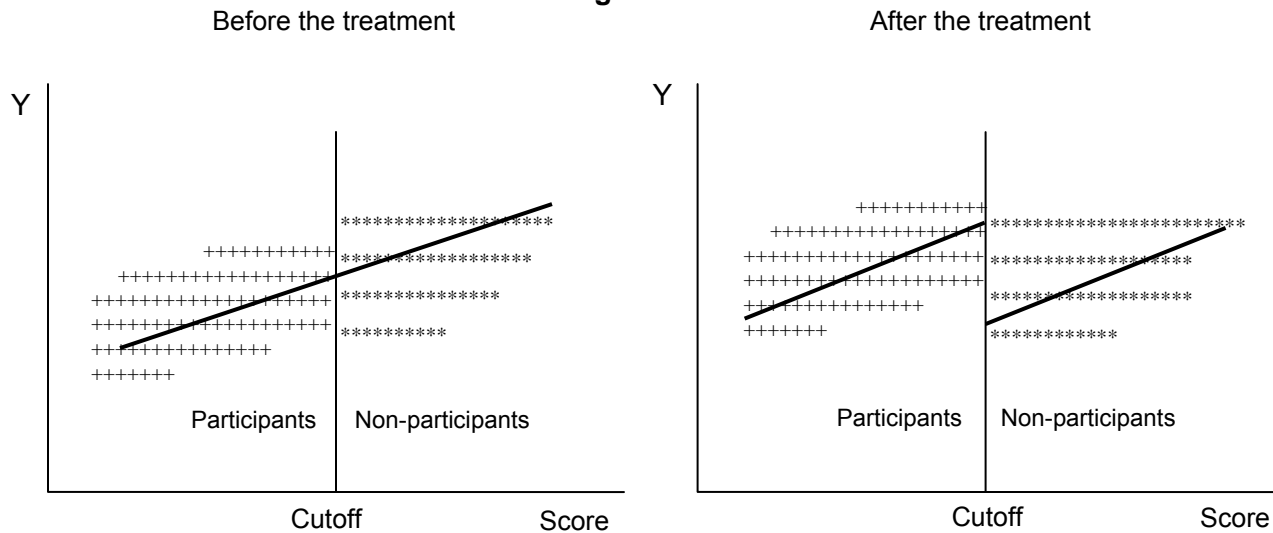
Evaluation Issues and Guiding Questions	Indicators	Data Sources and Methods
	<ul style="list-style-type: none"> • Number of hours household members are sick • Household expenditures on health (medicine, hospital bills) • Sick time of family members 	<ul style="list-style-type: none"> • HIES of Sri Lanka
<p>4. Labor Impact 4.1. To what extent did the program improve employment of the borrowers?</p>	<ul style="list-style-type: none"> • Occupation ratio (percent of working household members of working age) • Earnings from labor • Job changes (moving up, lateral, and down) 	<ul style="list-style-type: none"> • HCS, KII • Labor surveys by DCS of Sri Lanka
<p>5. Education Impact 5.1. To what extent did the program improve primary and secondary education of children of school ages?</p>	<ul style="list-style-type: none"> • School enrolment rates of children of school age • Student performance (attendance, test scores, dropout rates) • Educational attainment (graduates/completion rates at primary and secondary levels) • Percent of children going to college 	<ul style="list-style-type: none"> • HCS, KII • HIES of Sri Lanka
<p>6. Community Impact 6.1. Did the program improve poverty level in the project towns/communities? 6.2. Did the program improve housing situation in the project towns/communities? 6.3. Did the program improve the overall socio-economic conditions of the project towns/communities?</p>	<ul style="list-style-type: none"> • Poverty rates (percent of households below poverty line) • Housing shortages (percent of households without a house) • Community-level aggregate HQI • Local real estate markets (housing price, percent of household income spent on housing) • Crime rates • Net migration (between in and out) • Subjective quality of community life • Participation in public activities (household time and money spent in participating in community groups, number and nature and of community groups) 	<ul style="list-style-type: none"> • Village and districts statistics • HCS, KII, FGD • HIES of Sri Lanka • Village and districts statistics • HSC, KII, FGD • Village and districts statistics • HCS, KII, FGD

Note: The evaluation matrix provides a guiding principle and later will be fine tuned and finalized with the consultants and local survey team.

ESTIMATION METHODOLOGY: REGRESSION DISCONTINUITY DESIGN

1. Regression discontinuity design (RDD) is a statistical method for estimating the impact of a policy action. It was first introduced by Thistlethwaite and Campbell (1960). In a non-experimental setting, sometimes an assignment rule is used as an instrument to exogenously identify participants and non-participants. For instance, pension programs are targeted to populations above a certain age, scholarships are given to students with a high score on standardized tests, and so on. In the present case of Loan 1632-SRI, the 55th income percentile was used as the cutoff, whereby households with a monthly income below it were eligible to borrow, and not otherwise. In such cases, the cutoff establishes a discontinuity in program participation. By comparing the outcomes of units that are in a narrow band from below and above the cutoff, one can judge the program’s impact because the units below and above the cutoff are likely to be very similar to each other. Built on this assumption, and thus like a randomized experiment, RDD accounts for observed and unobserved heterogeneities and gives an unbiased estimate of the program’s effect. Figure A9.1 is a graphical presentation of the RDD concept adopted from Khandker et al. (2010). There are two types of RDD. Below is a brief discussion of them.

Figure A9.1



A. Sharp Regression Discontinuity Design

2. Sharp regression discontinuity design (SRDD) assumes units are assigned to treatment according to a strict rule. All units that meet the eligibility requirement receive the treatment; all units that do not meet the eligibility requirement do not receive the treatment. We aim to estimate the treatment effect: the change in the outcome variable that is due to treatment. This is an ex-post analysis and we are unable to observe the counterfactuals: we do not observe non-treatment outcomes for treated units, nor do we observe treatment outcomes for non-treated units.

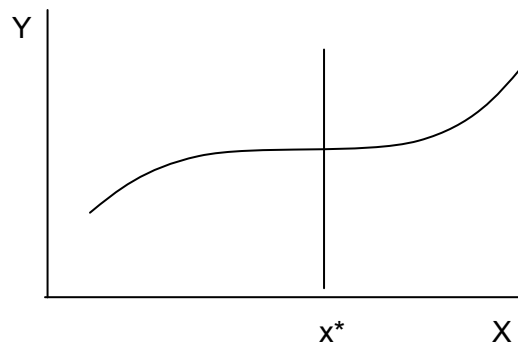
3. For illustration, assume the following:

- units of interest: households
- treatment: access to credit
- outcome variable: Y = household welfare indicator (i.e., home value)
- score variable: X = household’s position in the income distribution (percentile)
- eligibility: household’s income is below the 55th percentile

4. We compare outcomes for households that are very close to the cutoff from below with outcomes for households that are very close to the cutoff from above. Aside from eligibility for treatment these households should be “comparable” because they occupy similar positions in the income distribution.

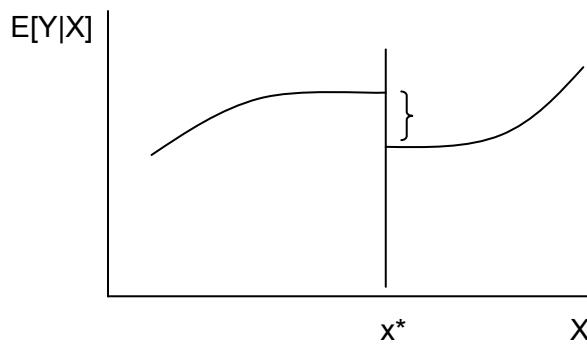
5. Suppose Y increases in X and in the absence of treatment we would observe the relationship shown in Figure A9.2 below (x^* is the cutoff point):

Figure A9.2



6. Now suppose households to the left of the cutoff enjoy a treatment that improves their Y -outcomes. The relationship between X and Y is re-drawn:

Figure A9.3



7. In Figure A9.3, the treatment effect is represented by the jump indicated by the curly bracket. If sufficient numbers of observations were clustered very close to the left and right of x^* , the treatment effect could be estimated by the difference in means $\bar{Y} \uparrow - \bar{Y} \downarrow$, where $\bar{Y} \uparrow$ is the sample mean approaching x^* from the left and $\bar{Y} \downarrow$ is the sample mean approaching x^* from the right.

8. In general, observations will not be clustered at the cutoff but will be distributed along the range of X . Under those circumstances, the most common way to estimate the gap is to perform two regressions: one based on data to the left of the cutoff and one based on data to the right. The fitted values of the two regressions are calculated at x^* ; the difference estimates the treatment effect.

9. The regressions can be estimated by two methods that accommodate possible non-linearity of the relationship between Y and X : kernel regressions or local linear regressions on polynomials in X .

Imbens and Lemieux (2008) argue for the local linear regression approach because kernel regressions can perform poorly if data are sparse near the cutoff.

10. To be more precise, let's introduce some formality into our discussion. The following summarizes the presentation in Imbens and Lemieux (2008). The regression relationship expresses the conditional expectation of the dependent variable as a (possibly non-linear) function of the score variable: $E[Y_i | X_i = x] = f(x)$. Assignment to treatment is recorded by the assignment variable $W_i = 1[X_i \leq x^*]$, where W is the index function taking value 1 if the condition in the square brackets is correct, and zero otherwise. In the sharp regression discontinuity design (SRDD), assignment to treatment is deterministic in the score variable X : at $x = x^*$ the probability of treatment jumps from 0 to 1. The average causal effect of treatment is given by:

$$\lim_{x \uparrow x^*} E[Y_i | X_i = x] - \lim_{x \downarrow x^*} E[Y_i | X_i = x].$$

11. This expression involves a counterfactual that we cannot observe. For observational unit i we observe the outcome Y_i under treatment or under non-treatment but not both. Imbens and Lemieux (2008) review the assumptions under which $\lim_{x \uparrow x^*} E[Y_i | X_i = x]$ can be estimated using only data for the treatment group and $\lim_{x \downarrow x^*} E[Y_i | X_i = x]$ can be estimated using only data for the control group. Moreover, they note that because we do not have observations at $X = x^*$, extrapolation from observations in neighborhoods to the left and right of x^* is necessary and they assume a continuity in X at x^* to justify such extrapolation.

12. Extrapolation from observations near x^* to estimate the conditional expectation at x^* generally involves weighting observations closer to x^* more heavily in the required regressions. Nonparametric methods like the kernel regression are consistent but converge more slowly than parametric methods. For this reason we will focus on parametric local linear regressions; additional flexibility can be achieved using polynomials in the score variable. The basic idea is to choose regression parameters to minimize the sum of squared residuals for observations within a distance ε of the cutoff point. For the example under discussion we would use the least-squares method to minimize

$$\sum \{Y_i - \alpha_1 - \beta_1 \cdot (X_i - x^*)\}^2$$

for observations with $(x^* - \varepsilon) \leq X_i < x^*$. Then the value of $\lim_{x \uparrow x^*} E[Y_i | X_i = x]$ is estimated by the fitted value at x^* , i.e.,

$$\hat{\alpha}_1 + \hat{\beta}_1 \cdot (x^* - x^*) = \hat{\alpha}_1.$$

Symmetrically, the value of $\lim_{x \downarrow x^*} E[Y_i | X_i = x]$ would be estimated by

$$\hat{\alpha}_2 + \hat{\beta}_2 \cdot (x^* - x^*) = \hat{\alpha}_2,$$

where the least-squares method was implemented for observations with $x^* \leq X_i < x^* + \varepsilon$. The estimated treatment effect is then $\hat{\alpha}_1 - \hat{\alpha}_2$, i.e., the difference between the fitted value from below and above

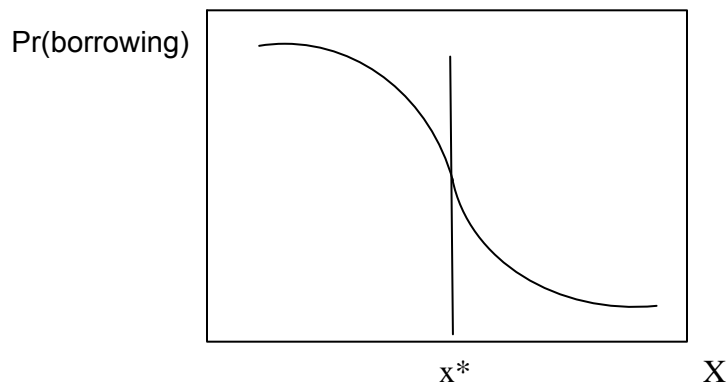
the cutoff point x^* . Recommendations for the size of the bandwidth ε are provided by Imbens and Lemieux (2008), as are extensions and refinements of the local linear regression method.

B. Fuzzy Regression Discontinuity Design

13. Fuzzy regression discontinuity design (FRDD) applies when the probability of program participation does not jump from 0 to 1 at the cutoff. In our case, suppose that the probability of obtaining housing credit declines gently as household income crosses the cutoff.¹ Then the mean outcome of the dependent variable, conditioned on X , is a weighted average of outcomes for borrowers and non-borrowers. The weights are the probabilities of borrowing and not-borrowing, respectively. Finally, suppose that the impact of the program is to increase the probability of obtaining credit for households that meet the eligibility criterion. This increases the weight of borrowers in the mean outcome of the dependent variable.

14. Figure A9.4 shows borrowing probability plotted against income percentile with no treatment.

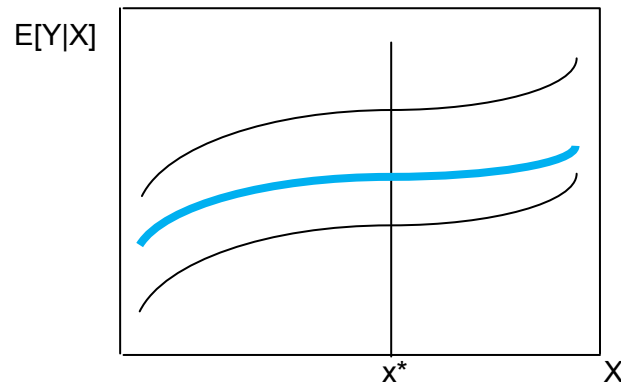
Figure A9.4



15. Figure A9.5 plots expected Y -outcomes (i.e., home value) against household income for households if they were to borrow (top curve) and if they were not to borrow (bottom curve). The pre-treatment overall expectation of Y , conditioned on X , is the weighted average of the two curves with weights given by the probabilities plotted in Figure A9.4; the overall expectation is represented by the bold middle line (blue line) in Figure A9.5. Notice that the weighted average is closer to the top line when the probability of borrowing is higher (lower incomes).

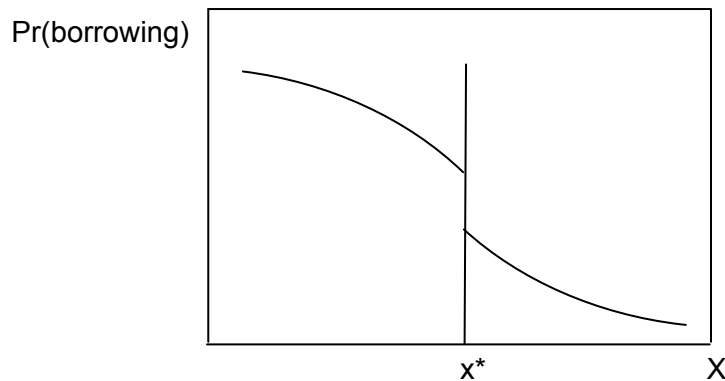
¹ It may be the case that high-income households in Sri Lanka finance home purchase, expansion, or renovation through savings rather than borrowing. We will be able to check this conjecture once we have data in hand. The key is not whether borrowing probability decreases or increases with income, but whether borrowing probability increases with program eligibility.

Figure A9.5



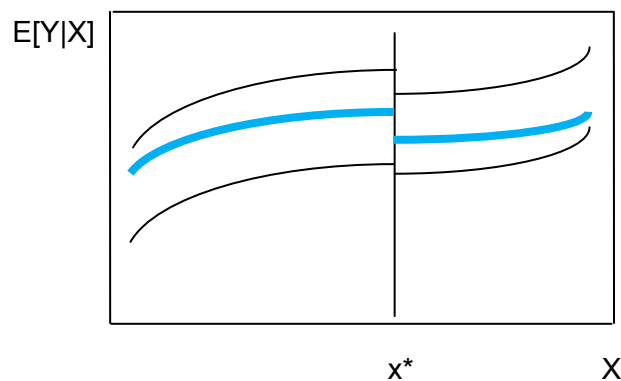
16. Now suppose a treatment becomes available that increases borrowing probability for households below the threshold. Figure A9.6 illustrates this development:

Figure A9.6



17. In Figure A9.7 the probability-weighted average of expected outcomes is again the bold middle line (blue curve). However, it now exhibits a jump driven by the jump in the probabilities shown in Figure A9.6.

Figure A9.7



18. Availability of the treatment increases the borrowing probability of households below the threshold. That will be reflected in an upward shift of the probability-weighted average of expected

outcomes, as shown in Figure A9.7. The discontinuity in the regression curve (the bold, middle line in blue color) is the treatment effect we aim to estimate.

19. In this design, the treatment effect $\lim_{x \uparrow x^*} E[Y_i | X_i = x] - \lim_{x \downarrow x^*} E[Y_i | X_i = x]$ is driven by a jump in probability less than 1. Thus the average treatment effect is:

$$\frac{\lim_{x \uparrow x^*} E[Y_i | X_i = x] - \lim_{x \downarrow x^*} E[Y_i | X_i = x]}{\lim_{x \uparrow x^*} E[W_i | X_i = x] - \lim_{x \downarrow x^*} E[W_i | X_i = x]},$$

where the denominator represents the jump in borrowing probability due to treatment assignment. Imbens and Lemieux (2008) and van der Klaauw (2002) discuss parametric and non-parametric estimation methods that are analogous to the methods described for the SRDD.

C. Graphical Analysis

20. Imbens and Lemieux (2007) recommend that graphical analyses should be an integral part of any RDD analysis. The first type of graph they recommend is a bar graph showing the averages of the outcome variable for observations for which the forcing variable falls within bins to the left and right of the cutoff. If our model is correct, the bars should show a jump at the cutoff value, but would not be expected to show jumps elsewhere.

21. To examine the possibility that a jump in the outcome variable is due to a covariate other than the forcing variable, a series of bar-charts like that described above is useful. Construct a bar-chart for averages of each covariate for observations for which the forcing variable falls within bins to the left and right of the cutoff. If one or more covariates show jumps at the cutoff the model should be examined for specification error.

22. Finally, it may be useful to examine the density of the forcing variable, in this case percentile, against the values of income to check for clustering of households near the cutoff threshold.

D. References

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