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ABBREVIATIONS AND ACRONYMS

AACES	Addis Ababa Construction Enterprise Survey
IHDP	Integrated Housing Development Program
CWIQ	Core Welfare Indicator Questionnaire
HDPO	Housing Development Project Office
HICES	Household Income Consumption and Expenditure Survey
IHDP	Integrated Housing Development Programme
LFS	Labour Force Survey
MDG	Millennium Development Goal
MFIs	Micro-Finance Institutions
MOFED	Ministry of Finance and Economic Development
MSEs	Micro and Small Enterprises
PASDEP	Plan for Accelerated and Sustained Development to End Poverty
PRSP	Poverty Reduction Strategy Paper
TVET	Technical and Vocational Education and Training

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EXECUTIVE SUMMARY

1. Ethiopia's second Poverty Reduction Strategy, the Plan for Accelerated and Sustained Development to End Poverty (PASDEP), outlines a continued plan for increasing agricultural productivity but also incorporates a renewed emphasis on tackling urban development issues. Two of the key urban challenges facing Ethiopia are inadequate infrastructure, including housing, and insufficient creation of quality employment opportunities (as evidenced by a large cohort of working poor and significant levels of open unemployment). To address these challenges, in 2004, the city of Addis Ababa introduced the Integrated Housing Development Program (IHDP), an innovative program designed to provide low-cost and affordable housing while also generating employment and building human capital and entrepreneurship in the construction sector. The ultimate objective of the program was to create better quality employment opportunities and a competitive market structure in the construction sector. To have a sense of the scale of the program, consider that the program aims to create jobs for the equivalent of nearly one-fourth of the active population in its main beneficiary age group (i.e. 80,000 jobs over 4 years, relative to an active population of 350,000 25-34 year olds). As part of its urban development strategy, PASDEP envisions launching a national program based on the Addis Ababa initiative, and incorporating lessons learned from the experience with the IHDP.

2. It is therefore timely to conduct an assessment of the impact of the IHDP thus far. However, the aims of this study are more modest—it focuses exclusively on the employment creation side of the program, which has not been evaluated to date, taking as a given the demand for housing.[1] The study relies primarily on a purposely-designed quantitative survey of program beneficiaries and their counterparts outside the program, but also draws on administrative data and qualitative evidence. Although it is not a full impact evaluation, given the reliance on a survey conducted at a single point in time and the fact that program beneficiaries are not selected randomly, the study represents a first attempt to quantify the extent to which the assumptions behind the program design seem to hold.

3. The central question of the study is whether the IHDP has generated more jobs than would have been created if it had only been a housing program (and relied on hiring existing construction firms) rather than a housing *plus* employment creation program. The employment creation side of the program includes several major elements. First, the program actively stimulates the creation of Micro and Small Enterprises (MSEs) in the construction sector by screening qualified workers (via a skills test), teaching them how to form legal business enterprises, and allowing them to group themselves into new firms. Second, the program contracts these new MSEs to work on the housing projects, which incorporate innovative low-cost and labour-intensive technologies (most notably, pre-cast

[1] Other aspects of the program, such as its dynamic role in fostering entrepreneurship and the distributional aspects that such entrepreneurship might have are dealt with only indirectly, by looking at the profitability and sustainability of the MSEs created by the program.

beams and prefabricated hollow blocks) in order to build affordable housing. Third, the program provides wide-ranging support to the MSEs, including access to land, access to credit, input provision (e.g. re-bars, cement, and iron) on credit, machinery leases at favourable conditions, and skills training (though not all firms receive all types of support). This type of MSEs support is extended by the Municipality to other priority sectors as well, though the construction sector is the only one to benefit also from a source of guaranteed demand through the Housing program.

4. The program intends to accelerate employment creation in the construction sector by supporting the formation and development of MSEs, as described. The effectiveness of this approach is therefore predicated on two basic assumptions: 1) MSEs in the construction sector, and particularly MSEs in the IHDP, are more labour-intensive than larger firms; and 2) the creation and support offered by IHDP to MSEs in the program is needed to overcome market failures. The first assumption explains the program's focus on supporting MSEs rather than building the capacity of large contracting firms, while the second summarizes the rationale for an activist approach to growing the MSE sector. This study tests each of these assumptions to determine whether they reflect the reality in Addis, with an eye toward informing the scale-up of the program to other cities and towns. Given the program's long term objective of improving "the standard of living of citizens, especially low-income residents of the city through the creation of employment opportunities and the provision of decent and affordable housing" (IHDP 2006), this study also looks at the distributional effects of the program—i.e. whether the beneficiaries of the program are disproportionately drawn from relatively poor or vulnerable segments of the labour force. One limitation of our analysis is that, by focusing on the MSEs segment of the construction sector, we do not explicitly assess the jobs created by large-scale firms working as contractors on the structural works.[2]

5. The survey designed to enable this analysis was run in December 2006. It is representative of the construction sector in Addis, and the data allow comparisons of firms and workers inside and outside the program, as well as between large contractors and other firms in the sector, which are mostly MSEs. The survey enables a detailed look at questions of technology use, which are at the heart of the IHDP's design. It also allows us to consider a number of additional issues, such as the nature of constraints experienced by firms and the effectiveness of the type of support provided. The timing of the survey, which as mentioned intended to provide elements to inform the roll-out of the program to other cities, might imply that some of the findings reflect the specific experience of the first years of operation of the program. These years have been characterized by delays in implementation and by shortages of key inputs, particularly in the latter part of 2006. The influence of these transient factors is noted in the discussion of the findings.

[2] Note that one can assume that such additional demand for labour would be expressed by large contractors even if the program were designed as a housing program only, rather than as a housing and employment creation program. While our inability to control for employment creation by the large scale contractors means that we cannot assess the overall employment creation effects of the program, it does not seem to affect our ability to judge on whether the employment creation emphasis of the program has resulted in additional jobs than would have otherwise been created.

6. The analysis supports the notion that MSEs are more labour-intensive than large contractors, although among MSEs there does not appear to be a difference in labour intensity between firms that participate in the IHDP and those that do not. In other words, there is no systematic difference in the amount of capital per worker between program and non-program MSEs. However, at a fixed point in time (e.g. when the survey was fielded), program firms did have more workers than non-program firms—a median of 13 workers, versus 5 workers for non-participants. This does not necessarily mean that firms hire more workers as a result of being in the program, but the results do indicate that program firms are larger (in terms of number of workers) at start-up. This seems to be associated with the fact that program firms have better access to capital than their non-program counterparts. Once established, program firms do not grow more quickly than non-program firms overall—but program firms *do* grow faster than non-program firms that started at the same size.

7. Turning to the second assumption, there do appear to be significant market failures, particularly in terms of access to land and credit, as reported elsewhere in the literature. Moreover, although not all firms in the program receive support (85 percent receive some support, but very few receive all types of support), those that do receive support from the program perform better than those that do not, but not better than firms not working for the program. Access to credit seems to be the most effective type of support and is associated with significantly higher production. Also, the provision of a space to work is associated with significantly higher profitability.

8. A central element of the IHDP is providing a market for the MSEs that have been created through the program, and this demand does seem to be critical to their survival, since most are not working for non-IHDP clients. However, given shortages of key inputs (notably cement) in the construction sector as a whole, the IHDP's contracting system (*de facto* fixed bid with some *ad hoc* revisions of the terms of the contracts) puts some firms at risk—firms commit to delivering outputs at a given price but are not compensated for rising input prices, which threatens their profitability and sustainability (except when inputs are directly provided by the program). The Housing Development Programme Office has realized the importance of this issue and is currently considering how to put in place a system for a more systematic review of contractual terms.

9. In terms of the targeting of the program, the survey data do not reveal that workers in program firms come disproportionately from the ranks of the unemployed, or that women disproportionately benefit from jobs with program firms, despite the program's intention to target them. While this does not rule out a significant contribution of the program to reducing unemployment, it underscores that such effects are rather indirect, i.e. through a general increase in labour demand or by providing incumbent MSEs with a way of overcoming market failures. From a distributional point of view, program firms do pay workers on the lower end of the educational distribution a higher wage than non-program firms, so that the program does seem to have a positive distributional effect—even if the poorest workers are not its main beneficiaries. Further, the program provides opportunities for casual workers to become permanently employed.

10. Looking at the business environment more broadly, about three-fourths of firms believe that competition in the construction sector has increased in the past 3 years, and about

a third of those attribute the increase to the IHDP. Program firms are most concerned about competition from non-program firms, which raises concerns about their ability to compete in the larger market. As one of the ideas underpinning the program is the idea of fostering a more competitive market structure this can be seen as a success, though it also raises the question of how to ensure the growth of a good number of these newly born firms.

11. Note, however, that to the extent that the program has exerted upward pressure on input markets, there also may be some crowding out of non-program firms that are not able to secure key inputs. The direct impact of the program on labour markets (both in terms of absorption and driving up wages) seems to have been limited, even though the program offers the benefits of higher wages to lower skilled workers.

12. Overall, the study finds that the program has been successful in several respects; it has generated jobs and the support provided to MSEs seems to have enabled firms to grow more quickly than non-program firms of the same size. Yet, the study finds that program MSEs do not appear to be more labour intensive than non-program MSEs. This suggests that alternative modalities of delivering housing could be considered without affecting the employment creation potential of the program. The scaling up of the program to other urban areas offers the possibility of experimenting with alternative MSE-based arrangements for delivery which might offer advantages in terms of a simplified administration and coordination of the program, while retaining the dynamic benefits of the program itself (e.g. in terms of strengthening the skills of workers in the sector and introducing new technologies).

13. The scale-up of the program could also potentially benefit from addressing some of the issues that emerged from the analysis. The program supports firms growth mostly by addressing the technology and skills constraints. Possibly because those are addressed across the board, some other elements of support, such as facilitating access to credit and land, seem to be quite important to firms' success, and the program could be strengthened by expanding coverage to more firms. Current plans to introduce systematic mechanisms for reviewing contracts may also be critical to ensuring that firms continue to be interested in working for the program without the risks associated with fixed-prices. Further, policy reform could strengthen the program's ability to reach its own goals by addressing the constraints in factor markets and input provision (e.g. design, credit, materials) which affect the construction sector as a whole (and more generally urban development). For example, the development of a more robust mortgage market could allow the extension of commercial financing to a greater segment of the housing market. With a smaller supply gap in the provision of housing, public resources could be more effectively targeted to the provision of housing affordable for very low-income households. These possible developments seem in line with PASDEP vision of a national Integrated Housing Development Program that "integrates public and private sector investment with MSE development and the provision of basic services" (p. 163). Similarly, reform options for the way land is allocated could be considered. These are discussed in details in World Bank 2007, b.

14. The study also highlights the importance of strengthening the program's monitoring and evaluation system to guide further implementation and scale-up. Indicators being tracked (most importantly, number of job opportunities created) could be better defined to

allow for more precise measurements of program outputs. At the same time, measuring only the number of job opportunities (in full-time equivalents, for example) does not take into account the sustainability or profitability of the firms in question. Since existing firms appeared to have high levels of unused capacity, targets for firm creation may need to be adjusted. Capacity underutilization also reflects underlying issues (such as input shortages) that may need to be addressed through different kinds of interventions outside the purview of the IHDP and of labour market policies.

15. Finally, since the study reveals that some of the main groups of low-income residents targeted by the program (e.g. women) are not the main beneficiaries of the jobs created,[3] this study draws attention to the need for additional programs to support poverty reduction in urban areas. Related to the IHDP's key concerns is the ongoing TVET reform, intended to make TVET more responsive to market demand and the needs of employers and improve job prospects for new graduates. A well functioning TVET system can contribute to reducing the educational disadvantage of the most marginal groups. Further, more specific interventions might be needed to reach women, for example by addressing constraints in the legal and institutional environment faced by female entrepreneurs and facilitating their firms productivity growth, as highlighted for example in the recent Investment Climate Assessment findings. Furthermore, the international evidence on the effectiveness of active labour market policies, however limited with relation to developing countries, suggests that often they play the role of a safety net rather than providing sustainable employment creation. A closer look at the nature of vulnerability in urban areas and the specific challenges that marginal groups face might help inform the formulation of an urban safety net strategy appropriate to the needs of Ethiopia.

[3] Note however that vulnerable groups such as female headed households have been given priority in the allocation of the apartments – in two recent rounds of allocation of houses more than 50 percent of the beneficiaries were female headed households, a group particularly prevalent in urban Ethiopia.

1. INTRODUCTION

1.1 Ethiopia's second Poverty Reduction Strategy, the Plan for Accelerated and Sustained Development to End Poverty (PASDEP) outlines a strategy of complementing a continued strong focus on increasing agricultural productivity with an increased emphasis on urban development. In this context it highlights the importance of facilitating accelerated employment generation to address the issue of high levels of urban unemployment. The Addis Ababa experience with the Integrated Housing Development Program (IHDP) is singled out as an effective tool for employment creation and for addressing housing shortages in urban areas.

The Challenge of Unemployment in Ethiopia

1.2 Recent analysis (World Bank 2007) estimated urban unemployment rates at around 14 percent,[4] but also identified great heterogeneity in its concentration both geographically and across groups of people. Larger towns, including Addis, are characterized by lower employment rates and higher unemployment.[5] Further, women and young people face particular challenges in terms of labour market success. Despite some positive trends,[6] which are at least partly related to increases in secondary school enrolment, Ethiopian unemployment levels remain high relative to international comparators.

1.3 The challenge of reducing unemployment in Ethiopia today is characterized by a number of relatively new developments. These include: (i) a rising skills profile of the urban workforce—by 2005, three-quarters of youth had at least 4 years of education, while this was only true for half of the older cohort; (ii) changes in the educational composition of employment, with lower education levels accounting for a smaller share of employment; (iii) the overall growth in the labor supply in urban areas compounded by internal migration (which appears to be growing); and (iv) high levels of unemployment, which particularly affects the growing cohort of young people. According to evidence from an urban panel survey,[7] new entrants to the labour force constitute the main source of the newly unemployed with 17 percent of the inactive population (this would include students) in 2000 being unemployed in 2004.

[4] All indicators are for population 15+. Note that estimates of unemployment vary significantly depending on definition—while the standard international definition of unemployment requires active job search, Ethiopia (and some other countries where very long unemployment duration is common) relaxes this criterion. At 21 percent, the official unemployment rate is therefore higher than the one reported here (the official rate is also based on the population age 10+).

[5] In Addis the employment rate (15+) is 49 percent (40 for women) and the unemployment rate is 24 (34 for women).

[6] Comparisons of the 1999 and 2005 Labour Force Survey (LFS) reveal a reduction in unemployment over the period from 14.8 percent to 13.5 percent driven by decreases for youth and older males. The Government relaxes the "active search" criterion when measuring unemployment, on the grounds that long unemployment durations lead to large numbers of discouraged workers (i.e. those who would like a job, but are not actively looking for one because they believe a search would be unsuccessful). Between 1999 and 2005, passive unemployment declined even more than active unemployment (the share of population in passive unemployment declined by 38 percent, versus a decline of 9 percent in active unemployment), in favour of inactivity. The shift in passive unemployment was particularly visible among youth, which is consistent with higher school enrolment. Other positive developments over the period include the large reduction in the median duration of unemployment from more than 1.5 years to less than 1 year over the period, and increased dynamism of the labour markets. For more details see World Bank (2007).

[7] The Ethiopia Urban Household Socio-economic Survey, collected in 1995, 1997, 2000, and 2004.

These new developments imply that while on the one hand a more educated labour force has increased expectations in terms of jobs and remuneration, a significant segment of the population faces reduced economic opportunities due to their lack of skills.

Employment Creation through MSE Support in PASDEP: The IHDP

1.4 To tackle the challenge of unemployment, PASDEP's strategic emphasis is on the growth of labour-intensive sectors, and on facilitating the growth of Micro and Small Enterprises (MSEs). In particular the effort of employment creation through the growth of the MSE sector is seen to require integration of efforts to increase educational attainment, both via general education and TVET skills training, with the provision of capital for the unemployed (within a well-functioning financial system), and with "specialized programs to promote opportunities for self-employment" (MOFED 2007, p 54).

1.5 In this context PASDEP emphasizes that "the recent experience of the Addis Ababa City Administration in small and medium scale enterprise development linked with TVET and a low cost housing program is going to be scaled up and rolled out to other towns in the country" (*ibid.*) as it contains the key elements of the government's strategy to fight unemployment. The Addis Ababa Integrated Housing Program (IHDP), launched in 2003, integrates housing construction to address the housing shortage (see Box 1.1) with MSE support to create jobs.

Box 1.1: The Housing Shortage in Addis

Ethiopia's urban areas are characterized by an acute housing shortage, and Addis is no exception. Estimates of the housing shortage in Addis vary between 250,000 and 300,000 housing units, and the shortage is increasing by approximately 40,000 units each year. In addition, at least a third of the estimated total housing stock of 640,000 units is of very poor quality. For example, about 80 percent of the 150,000 housing units administered by the city administration are built with mud and straw and are older than their estimated lifetime of 30 years.

Housing demand has been increasing in Addis in the recent past as a result of population growth, migration to urban areas and the dilapidation of the existing housing stock due to poor maintenance. Other drivers of the demand for housing include progressively increasing diaspora demand for housing, a lack of alternative investment opportunities and speculation.

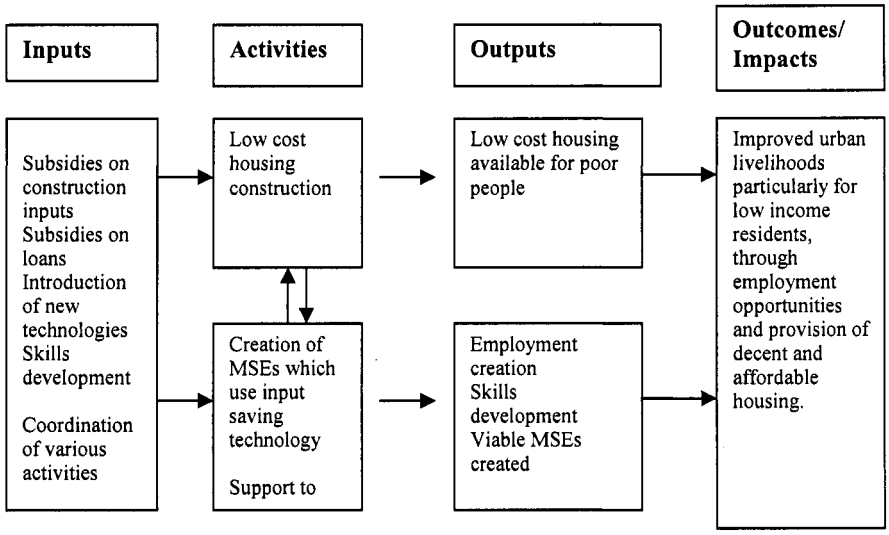
Recent reforms in the areas of customs, business regulation and registration have helped stimulate housing supply by relaxing financing constraints, alleviating the burden of bureaucratic procedures, and marginally increasing the availability of land. Despite the improvements, however, high and variable land prices, and difficulties in obtaining land, continue to pose a challenge to would-be developers. Several other key challenges also persist, such as obtaining finance, poor regulation, the absence of quality insurance, lack of technological know-how and adequate equipment, unpredictability of tax liabilities, and the vulnerability of bidding and tender procedures to corruption.

Sources: Addis Ababa City Administration Housing Development Project Office/HDPO, "Brief Project Profile," p 4., September 2004; "Addis Ababa Integrated Housing Development Program," (no author), March 2004; "Low Cost Housing: Would this be the Solution?" in *Construction Ahead: Bi-monthly interface with the construction industry,"* p 32., Butterfly Publishing, September-October 2005; World Bank (2004); World Bank 2007 b (the CEM); the "Integrated Value Chain Analysis for the Housing Construction Sector in Ethiopia" by Global Development Solutions, 8 June 2006.

1.6 The IHDP's long-term objective is "to improve the standard of living of citizens, especially low-income residents of the city, which are the majority, through the creation of

employment opportunities and the provision of decent and affordable housing."[8] From the employment creation point of view, the IHDP aims to stimulate labour demand by fostering the adoption of input-saving technologies by newly created MSEs, which the program itself supports and to which it provides a guaranteed market. Figure 1.1 below provides a schematic representation of the rationale of the program in addressing employment generation and construction of low-cost housing (more details on the program are provided in Chapter 2).

Figure 1.1: A Schematic Representation of the Rationale of the IHDP



1.7 While in the rest of the analysis we will focus specifically on the employment generation effects of the program through its MSE support component, it is worth drawing attention to other defining features of the IHDP which make it quite a unique program:

- **Direct provision of housing**. In current debates, the emphasis on state-built housing for sale or rent which characterized the period of the 1950s-1970s, has been replaced by a focus on the state as an enabler of low-income housing construction by ensuring favourable land legislation, efficient markets, and provision of urban infrastructure and services. Both the Ethiopian and international experience provide examples of alternative interventions for housing delivery (Box. 1.2).

- **Labour intensive methods**. Labour intensive methods for public works have become quite common, though the literature provides examples mostly focused on their application to roads construction and maintenance (with labour intensive methods for maintenance of federal roads used in Ethiopia, among other countries, ILO 2004) or on irrigation. For roads, absorption of up to 5 times as much labour, and cost savings in the range of 25-30 percent, have been found (Keddeman 1998). Yet, as in the case of other active labour market policies, the effects have been found to be mostly short term and

[8] Presentation by Ato Salomon Lemma, IHDP, at World Bank's planning meeting on this study, November 27, 2006.

related to the provision of some elements of a safety net. Longer term poverty reduction impacts appear more difficult to identify.

- **Building capacity in the housing construction sector**. An important element of the program is its emphasis on building capacity in the use of low-cost building technologies which were not widely available in the country. Yet a recent value chain study (GDS 2006) highlighted that several other challenges stifle the growth of the sector and its potential to increase the supply of housing. These have been identified as ranging from problems of design (due for example to the unavailability of adequate standards and norms, and lack of technology know-how and training), procurement (due for example to the lack of standard contract documents) and difficulties in accessing inputs (material inputs, infrastructure, and land) and equipment. While the program addresses some of these constraints, such as those on design and know-how, by adopting standardized designs and linking with the TVET system,[9] a broader set of interventions could strengthen the sector as a whole and reduce the need for direct housing provision.

- **Joint pursuit of different goals**. The most salient feature of the IHDP is its joint pursuit of a variety of goals, including housing development, MSE support, sector development and employment creation. These are clearly all important goals for addressing urban development and poverty reduction. Yet, the choice of pursuing these goals jointly implies costs of coordination between different sets of activities, which, though hard to quantify (see also chapter 2) need to result in increased efficiency or strong dynamic benefits.

Box 1.2: Strategies to Improve Access to Low-Income Housing

The severe housing shortage in Addis Ababa has prompted the municipal government to adopt a range of strategies for improving the condition of existing housing, and facilitating new construction. Of these, the IHDP's construction of new condominiums is the most prominent. But initiatives also include: 1) infrastructure upgrading in kebeles; 2) a kebele "renewal" program that aims to move residents into the new condominiums, thus freeing up land for higher-value commercial use; 3) regularization of some illegal settlements (those in conformity with city regulations) and demolition of the remainder; 4) provision of incentives (e.g. free or subsidized land) for real estate developers, especially if they intend to build low-cost housing; and 5) implementing sites and services schemes to deliver serviced plots to housing cooperatives and individuals. There is some initial evidence that the different types of programs pursued may reach very populations, underscoring the importance of making affordability concerns central to the design of any housing program. This might have limited the IHDP ability to reach the poorest beneficiaries as compared, for example, to slum upgrading programs. (R. Fein, unpublished data; see also Lohnert and Fein 2006).

Additional insights into successful housing policies and programs can be gleaned from international experience.[10] Programs to stimulate housing demand by addressing liquidity issues, through housing microfinance programs for example, have recently gained traction. Since many of the poorest cannot access commercial finance, and mortgage finance is fairly uncommon in countries like Ethiopia, short-term loans can help families gradually improve their housing—which is consistent with the incremental process through which informal housing tends to be upgraded and enlarged over time. Mibanco of Peru, a well-regarded microfinance

[9] Contacts with the Engineering Capacity Building Program are currently being pursued, to explore possible collaborations on matters related to temporary training on the job, internships, the introduction of more advanced technologies and alternative construction materials (e.g. "agrostone" partition walls, sustainable scaffolding systems etc.) and the provision of advanced job opportunities for newly graduated engineers.

[10] This draws on Fay and Wellenstein, 2005.

agency, provides an example of successfully applying microfinance techniques to the housing sector. In 2000, it began the Micasa Program, which provides home improvement loans with lower interest rates, longer terms, and in larger amounts than typical microfinance loans for entrepreneurs. The program became profitable—boding well for sustainability—within the first year, accumulating 3,000 clients and an outstanding portfolio of $2.6 million.

Taking a housing program to scale requires cost-effective techniques. Slum upgrading programs (elements of which are underway in Addis) seem to be among the most sustainable in this respect, as they tend to be about one-tenth as expensive as programs aimed at demolishing slums and relocating their inhabitants. A large payoff can also result from regularizing tenure; $1 in government spending on average leads to about $7 in private investment (SIGUS 2001, cited in Fay and Wellenstein 2005). In Ethiopia, this could suggest significant potential benefits from accelerating efforts to regularize informal settlements and privatize kebele housing, which could lead to better living conditions for some of the city's most vulnerable residents. Other possibilities include promotion of low-cost rental housing through the private sector and cooperatives, or self-help housing programs (such as those undertaken in Botswana and Mexico) that provide standardized materials, credit, and technical assistance, but leave organization and labour to communities.

Source : Fay, Marianne, and Anna Wellenstein. 2005. "Keeping a Roof over One's Head: Improving Access to Safe and Decent Shelter." In The Urban Poor in Latin America, ed. Marianne Fay, 91-124. Washington, DC: World Bank.

Evidence on the Effectiveness of MSE Support and Employment Generation

1.8 Since 2006 the IHDP has been integrated into a "national integrated housing program" based on the lessons learnt from the Addis experience (*ibid,* p. 163). While PASDEP refers to the lessons learnt in implementing the Addis Ababa IHDP, no systematic assessment has been conducted on the MSE support component of the program and its effectiveness in creating jobs.

1.9 Some initial assessment has focused on the pilot site of Bole-Gerji (see Box 1.3 for their main findings). While the evidence that the housing component of the program has not been pro-poor has been disputed, it is worth noting that the different methods of assigning housing which have been introduced in the IHDP after the pilot experience are unlikely to have improved this distributional outcome, as they consist in a lottery, with a 10 percent of units reserved for people who have been displaced or otherwise affected by the program itself. Efforts to give priority to female headed households in the allocation, might have been more effective in addressing distributional concern though no systematic evidence on the pro-poor nature of the allocation has been collected as yet. Based on this initial evidence it can be expected that to date the main pro-poor effects of the programs have come from its employment creation effects.

Box 1.3: Existing Assessments of the IHDP Pilot

In March 2006, researchers from the University of Bayreuth conducted a survey of residents of IHDP condominiums in Bole-Gerji, the site of the IHDP pilot project (Lohnert and Fein 2006). The survey asked residents about their family situation, income, and living conditions, and found on the whole that residents (most of whom were owners) were generally satisfied with their experiences thus far and felt that living conditions were better than in their previous homes. Studio and mid-size apartments were renting for 600-800 Birr per month, though a limited number of large or furnished apartments had monthly rents of 1,000 Birr or more. A follow-up study in May 2007 revealed that rents had risen to 800-1300 Birr per month for studio and mid-sized apartments, and 1500 Birr (or much higher) for large or furnished apartments; additionally, the percentage of renter-occupied units had increased from 22 percent to 43 percent (R. Fein, unpublished data).

The survey revealed that most residents could be considered middle-income, and most apartments were occupied by families. However, there was a high level of heterogeneity, with some lower- and upper-income households present, and a wide range of household types. Although some apartments were inhabited by youth receiving financial support from their families, all other households had one or more members with a steady job (usually a civil servant), while informal sector work was generally found only as a secondary source of income (and typically in big households).

While the methodology of this study has been disputed, these findings raise concerns emphasized in a World Bank study of housing in Addis Ababa—namely that the IHDP condominiums would be unaffordable for the poor (which also means that they might not effectively draw from those currently living in the worst housing conditions) (World Bank 2005). According to the study, a one-bedroom unit would be unaffordable for 85 percent of the Addis Ababa population. As a result, costs would be expected either to be borne by the government—requiring an enormous public outlay—or the units would have to be sold mainly to the well-off. (Lohnert and Fein found that most beneficiaries were civil servants).

As mentioned in the text, following the pilot, the program has changed some of its allocation mechanisms, though no systematic monitoring of the pro-poor nature of the allocations has been undertaken as yet.

Sources: Loehnert and Fein, "Survey in the Condominium Apartment Houses of the Pilot Project in Bole-Gerji, First Findings, 2006; World Bank 2005.

1.10 The international literature provides some pointers on the types of impacts that the IHDP can be expected to have through its MSE support/employment creation component and the importance of program design features. A literature survey by Betcherman et al. (2004) finds that programs that provide support on a variety of fronts (mentoring and business counseling, financial aid, etc.,) are more effective than those that focus on only one aspect. Training for MSEs[11] can foster higher rates of capacity utilization and quality practices, as well as increased productivity growth, though these effects appeared to vary over time. Finally, MSEs/self-employment assistance programs can provide effective support for the small minority of unemployed workers who are interested in starting their own business" (*ibid.* p. 51).

1.11 An extensive literature exists (Biggs 2002; Halberg 2001) on the technology and factor proportion choices of MSEs, though mostly for firms in the manufacturing sector. The main rationale for promoting MSEs is that they are more labour intensive, i.e. they hire more workers per unit of investment than larger firms.[12] Evidence from the manufacturing sector in developing countries shows that this is indeed typically the case (Teal 2007, Bigsten and Soderbom 2006), though in many cases this pattern is violated. In particular it has been shown that the more disaggregated the data are in terms of productive activities, the less this pattern holds (Little and al. 1987).

1.12 Further arguments brought in defense of supporting MSEs include dynamic considerations as MSEs are thought to grow faster than large firms. The empirical evidence for this proposition is thin. For example, in the case of the manufacturing sector in Africa, Biggs and Shah (1998) find that small firms were not the main source of net job creation in countries

[11] E.g. Hong Tan, and Gladys Lopez Acevedo (2005) *Evaluating Training Programs for Small and Medium Enterprises. Lessons from Mexico.* World Bank Policy Research Working Paper 3760.

[12] Arguably there are trade offs in terms of benefits as more capital intensive and larger firms can offer higher wages. In contrast, however, it could be argued that fostering a plurality of specialized MSEs can offer a more diversified economic basis and thereby support the creation of a middle-class. This argument does not appear to have been formally tested in the empirical literature.

where net job additions took place. Only in Zambia, which experienced an overall net job loss, did small firms create more jobs than large firms.[13]

1.13 While the economic literature raises at least some doubts on whether supporting MSEs necessarily results in greater employment creation than relying on other types of firms, it is worth underscoring that while the scaling up of the IHDP is predicated on static arguments on employment creation, the program pursues a much broader set of objectives, including building capacity in the construction sector. These effects, though hard to quantify could result in increased productivity and greater employment creation in the sector as a whole. Furthermore, even if MSE in the construction sector in Ethiopia did not adopt more labour intensive technologies than larger firms, by introducing new input saving technologies the program could be helping to release input shortages (see Box 1.4) and could result in greater employment per unit of expenditure by the housing program.

Box 1.4: The Construction Boom and Input Shortages

Over the last ten years construction has accounted on average for 9.3 percent of non-agricultural GDP, and in the last five years the sector has been growing at 10 percent. Between 1999 and 2005 employment in the sector has been growing at 95 percent (based on MOFED national accounts data and National Labour Force Survey, Central Statistical Authority). Both private and public sector investment are driving construction activity, which is also enabled by favourable lending conditions allowing investors that meet collateral requirements to borrow as much as 70 percent of project costs.

Over 2006 particularly severe shortages of key construction inputs have been registered, triggering price escalations and delays in the delivery of buildings. As an example, the demand for cement was almost 60 percent higher than the available supply. High international fuel prices exacerbated the cement price increases, as fuel accounts for about half of the price of cement. The limited local supply of cement and the arrangements for its marketing and distribution have led to a segmented market—in June 2006, prices in the informal (secondary) market were about double the price offered by one of the two Ethiopian factories. These price increases have had significant repercussions on the costs of building, as cement represents about 23 percent of the total cost of building materials.

The price hike for inputs, while significant, appears to have been exacerbated by temporary factors. Starting in 2007 increased imports in fact have led to decreases in construction input prices.

1.14 Furthermore, the emphasis given to the IHDP within PASDEP also emphasizes its potential for contributing to the broader poverty reduction agenda through its progressive distributional impact. Indeed, recent findings point to the crucial role played by MSEs in absorbing particularly vulnerable categories of workers, such as the unemployed and the young.[14] The evidence points to small firms being a last resort employment option, characterized by low dynamism and facing significant constraints to expansion due to the perceived uncertainty of the regulatory environment and difficulties in accessing factor markets,

[13] Other advantages of promoting MSEs discussed in the literature include their contributions to competition, entrepreneurship and innovation, creation of products which are more suitable for the poor, as well as political and social dividends.

[14] For example, evidence from the urban panel reveals that self-employment is a residual or last resort option in that flows are largely from the ranks of the unemployed and new entrants. The 2005 LFS reveals that over 80 percent of employed youth work in the informal sector. Note that the definition of informal sector in the LFS is substantially overlapping with the one of MSE, as the former is defined as a firm with less than 10 workers or not having a license or not keeping books of accounts—where the latter two requirements are simplified for small firms.

particularly land and credit (World Bank 2007). Supporting this sector can therefore contribute to strengthening the livelihoods of workers who would otherwise find themselves with only dead end labour market options, offering inadequate remuneration to guarantee them a life out of poverty.

Aims and Organization of this Study

1.15 Against this background, this study aims to provide an assessment of the effects of the Addis Ababa Integrated Housing Development Program on employment creation. The novelty and complexity of program design suggest that much can be learnt from assessing the Addis experience, which can then contribute to both its scaling up to other cities and the setting up of appropriate monitoring and evaluation systems.

1.16 The approach of the study is very focused; we take as a given the housing construction element of the program and consider exclusively the employment creation effects of the program through its Micro and Small Enterprise component. The main question that we aim to address is whether the program has created more jobs than would have been created relying on existing firms.

1.17 As will be further discussed in Chapter 3, to perform such an analysis we test the two main assumptions at the heart of the economic rationale for the program:

(i) MSEs in the construction sector, and particularly MSEs in the program, are more labour intensive than larger firms.[15]

(ii) The creation and support offered by IHDP to MSEs in the program is needed to overcome market failures.

1.18 Other aspects which can contribute to strengthening the impact of the program will also be analyzed, including the profile of the program beneficiaries as compared with the stated objectives of the program in terms of targeting. Together with an analysis of the distributional consequences of the job creation, this helps in placing the program within the broader context of a poverty reduction strategy in urban areas. Furthermore, analyzing the distributive impact of the program helps in better understanding the trade-off between efficiency and equity that characterizes the program. This is particularly relevant since existing assessments of the program show that the housing component per se has not had so far a pro-poor impact, so it is the employment creation component that is expected to perform this role.[16]

1.19 This report is organized as follows. The next chapter provides more detailed background information on the program's operation and goals. Chapter 3 focuses on the methodology for this study, by articulating the key hypotheses tested in our analysis and identifying its limitations. The chapter also describes the main source of information for this

[15] The lower-cost technologies adopted by MSEs in the program should allow greater labour intensity per unit of investment than the technologies used by firms outside the program, though this is not explicitly addressed in the program documents.

[16] Existing studies of the distributional impact of the housing component were based on the Bole-Gerji pilot. While changes have been made to the mechanism adopted for the allocation of housing, it is not clear whether the current lottery mechanism effectively improves such distributional impact.

study, a purposively collected survey of firms and workers in the construction sector. Chapter 4 addresses the central issue of this report by providing a snapshot of the beneficiaries of the program, focusing both on firms and workers and reviewing the effects of the program in terms of employment creation, both in static and in dynamic terms. Chapter 5 provides evidence on the effectiveness of the support offered by the program, and provides some evidence on the general equilibrium effects of the program. Finally, Chapter 6 provides an assessment of the distributional effects of the program through its employment creation effects. Chapter 7 reviews the main conclusions emerging from the study and draws the policy implications for the program, particularly in light of its ongoing scaling up.

2. THE ADDIS ABABA INTEGRATED HOUSING DEVELOPMENT PROGRAM: A DESCRIPTION[17]

2.1 This chapter provides a brief overview of the main elements of the Integrated Housing Development Program (IHDP) as currently implemented in Addis Ababa, based on existing program documents and consultations with the IHDP office in Addis on earlier drafts.[18]

PROGRAM OBJECTIVES AND TARGETS

2.2 The IHDP was launched in light of the massive shortage of housing in Addis Ababa (estimated at 300,000 in 2004) and the relatively poor housing conditions across the board (70 percent of the urban population in Ethiopia live in slums/sub-standard living conditions, according to the 2004 Millennium Development Goals (MDG) Needs Assessment). The current program, launched in 2005, built on the experience of the Low Cost Housing Project, a pilot project conducted by GTZ, GTZ-IS and the Housing Development Program Office (HDPO) in 2004-05, in the Bole Gerji area.[19] The IHDP vision is to improve the living standards of Addis residents, especially low-income citizens, through the creation of employment opportunities and the provision of affordable housing. This vision translates into a number of more specific objectives: i) regenerating the slum areas of the city; ii) increasing the land delivery amount in the inner city as a process of densification; iii) promoting micro and small-scale enterprises, which can absorb more labour force and operate at a lower overhead cost; iv) promoting cost efficient housing construction technology; v) empowering citizens of the city through ownership of houses and tenure security; and vi) changing the image of the city.

2.3 The need for an integrated program emerges from the diagnosis that "[t]he market cannot deliver low-cost housing at the required quantity and reasonable price" (Project Profile, p1). On this basis, the program aims to promote low-cost and low-skill intensive technologies which can be deployed in a short period of time, by involving micro and small-scale enterprises (MSEs). As previously mentioned, this analysis focuses exclusively on the MSE support and employment generation aspects of the IHDP.

2.4 The program has set itself specific targets summarized in Table 2.1 below (the targets are revised periodically depending on circumstances—the table below shows the

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[17] Our special thanks go to the dedicated staff of the IHDP central office for helping in the compilation of the information in this chapter and in clarifying discrepancies between existing program documents and newer sources of information.

[18] These interactions have revealed how thinking on program design has evolved during implementation, particularly after the completion of the Bole Gerji pilot. For example there is now a greater emphasis on "affordable housing" for the lower middle classes than in earlier phases when the program was mostly characterized as based on "low cost" technology.

[19] Note that when in the text we refer to the IHDP as "low-cost housing" (as this is one of the aims of the project) we do not aim to refer specifically to the GTZ and GTZ-IS pilot.

original targets, and the targets as currently set). Over the period 2006/7-2009/10 the IHDP aims to construct 192,500 houses (in addition to the 32,000 units already underway from 2005/6), generate 80,000 job opportunities, support 1,300 existing MSEs and create another 1,000 new ones. In addition, the program aims to reduce slum areas by 50 percent and to strengthen the construction sector by developing 1,200 ha of land, promoting low-cost technologies,[20] changing training systems, ensuring minimum construction standards and developing the institutional capacity required to construct 50,000 houses each year.

2.5 It is commendable that such specific targets have been specified, as this allows regular monitoring of progress. Sub-cities are in charge of the monitoring by collecting data on each building site, and on participating MSEs. They report monthly to the central IHDP office on the number of MSEs created; the number of jobs created; the amount of production/service each MSE produces; and the contracts awarded and their recipient. The reports from the sub-cities are reviewed periodically by the central IHDP office.

2.6 It is worth noting, however, that not all these indicators are easy to measure. Particularly challenging is the "job opportunity" indicator mentioned in the program documents as such an indicator requires specifying and monitoring the duration of the job opportunity in question as well as its sustainability. The program has not yet identified specific indicators that would take into account both these dimensions (e.g. establishing how long a job should last)[21] or determined how these should be monitored (e.g. if a beneficiary works on two different housing sites, how to avoid double-counting this as two jobs).

[20] See GTZ & Ministry of Federal Affairs, "Low-Cost Housing: Technical Manual" Addis Ababa, 2005, p. 7 for a more detailed description of these cost-saving technologies.

[21] Note that even international statistical conventions offer little guidance on the minimum requirements for work duration to be considered a job (they establish that working for at least an hour a week is a minimum requirement, but that countries should refine such a concept based on local circumstances). In Annex 2, chapter 4, we discuss the idea of estimating full time equivalents as a measure of job creation. This might involve estimating the total number of months worked by workers and divide it by 12.

Table 2.1: Quantifiable and Non-Quantifiable Program Targets[22]

Quantifiable Program Targets:		
Type of goal	*Original Targets 2004-2008*	*Revised Targets 2006-2010*
Housing construction	Construction of 150-200,000 houses	Construction of 192,500 housing units in 4 years (32,000 units already underway by 2006)
Employment Creation	Create 60,000 job opportunities	Create 80,000 job opportunities
MSE promotion	Expand the development of up to 2,000 MSEs	▪ Strengthen the existing 1300 MSEs ▪ Increase the number of MSEs to 2300
Slum upgrading	Reduce slum and decaying areas of the city by 50%	Reduce slum and decaying areas of the city by 50%
Land development	Prepare and develop 1,200 ha of land required for housing development and related local development works	Prepare and develop 1,200 ha of land required for housing development and related local development works
Institutional Capacity	Build institutional capacity capable of building 50,000 houses per year	Build institutional capacity capable of building 50,000 houses per year
NON-QUANTIFIABLE PROGRAM TARGETS		
▪ Change the current training systems in the construction industry ▪ Ensure the fulfilment of minimum construction standards ▪ Develop and widely utilise low-cost construction		

PROGRAM ADMINISTRATION

2.7 The IHDP is managed by a Housing Development Project Office (HDPO) in charge of implementing and coordinating the program. The Project Office's responsibilities entail preparing land and ensuring the supply of infrastructure facilities, executing design works, procurement and distribution of major construction inputs, MSE support, human resource management, financial management, expansion of construction capacity, as well as co-ordination and supervision of the activities of the various institutions involved in project work. A number of these tasks are delegated to Sub-City Project Offices[23] which are set up to coordinate the program at Sub-City level. Administering construction sites, collecting and delivering construction materials and supervising their use, selecting and organizing MSEs, selecting and preparing land are tasks of the Sub-City Project Offices.

2.8 The Project Office works closely with other government offices such as the Department of Trade and Industry, the Ministry of Urban Works and Development and the City Administration MSE department, which in charge of MSE support to all the priority sectors (textile and garment, food and beverage, metal and wood work, construction and municipal services). It also cooperates with GTZ, which has been involved in the design of the housing program, for the provision of technical support and as an implementing partner.

[22] This table relies on two separate sources: the housing construction, employment creation and MSE promotion targets are from a presentation by IHDP to the World Bank in October 2006, while the targets for slum upgrading, land development and the non-quantifiable targets are taken from "Addis Ababa Integrated Housing Development Program" (no author), Addis Ababa, March 2004.

[23] Addis Ababa is divided into 10 Sub-City Administrations, with delegated responsibility for service delivery. The Sub-City Project Office refers to staff of the IHDP in charge of IHDP implementation who are located at the sub-city administration offices.

THE LOW COST TECHNOLOGY ADOPTED BY THE IHDP

2.9 The IHDP has developed a production process that deviates from the one conventionally used in the private sector. The low-cost aspect arises from homogeneous type of housing, using novel construction technologies, cheaper inputs, fixed-price contracts[24] and a standardized production procedure permitting greater specialization. The main features of this process are:

- **Standardization**. The condominiums constructed by the program are fairly standard 4 to 5-story apartment buildings (Ground-plus-3 or Ground-plus-4 levels). IHDP clients can only choose between a studio or a one-, two-, or three-bedroom apartment.[25]

- **Quality of housing provided.** The condominiums constructed by the program are less luxurious than housing units constructed by the private sector.

- **Introduction of new technologies** which call for different inputs. The two most prominent new inputs are pre-cast beams and ribslabs (prefabricated hollow blocks), which reduce material inputs and the need for formwork.

- Almost all inputs used in IHDP construction are produced by firms selected to participate in the program who sell their inputs at a **fixed price** below the market price.

- **Differences in terms of process** (Table 2.2) which allow savings on design costs and require support from sub-city staff for project supervision and procurement.

It is not possible, on the basis of project documents, to ascertain which elements account for the largest contribution to cost reduction. In particular, it is not possible to capture fully the importance of administrative costs (see below).

[24] Note that for specific activities ad hoc revisions of prices have been undertaken (e.g. since prices for the sanitary and installation activities have been revised 3 times). The HDPO is aware of the need to build the institutional capacity for the systematic revisions of contracts, and is getting organized for this purpose.
[25] GTZ has been making an effort to increase diversification in the design of condominium construction.

Table 2.2: A Comparison of Construction Processes: Private Sector and IHDP

Stage of Construction Process	Private Sector (Large Projects)	IHDP
Design	Consultant responsible for i) proposing a design ii) preparing the bill of quantities (document detailing all the inputs required for construction, thereby enabling the estimation of construction costs); and iii) supervision, coordination of construction activities and quality control NB design cost is approximately 4 percent of total construction cost in Ethiopia	▪ Design is uniform and therefore cheaper than in the conventional production process ▪ Program engineers check quality
Procurement	▪ Tender document based on the bill of quantities ▪ Bids for the tender are collected from contractors and a winner is selected to sign a contract with the client, making him responsible for the construction of the building.	▪ Procurement is largely taken care of by the sub-city project offices based on participating firms. ▪ Fixed price system ▪ Profit margins lower than in the private sector
Purchase of inputs	Purchase of material inputs is typically the responsibility of the contractor.	▪ Sub-city project office organizes the supply and distribution of almost all outputs (from production MSEs in the program) and purchases inputs such as cement, reinforcement bars and iron. ▪ (Key) inputs can usually be obtained on credit.
Construction i) sub-structure (excavation, foundational works, etc) ii) super-structure (walls, roofing, etc), iii) finishing (sanitary & electrical installation, carpentry, etc)	The contractor may either conduct each activity himself or subcontract some or all activities to third parties.	▪ Super-structure: by contractors with license grade 5 and lower, ▪ Program MSEs construct the sub-structure and do the finishing where possible; otherwise, done by non-program MSEs/SMEs and/or small contractors ▪ Supervisory activities are conducted by program engineers

Source: Global Development Solutions (2006) "Integrated Value Chain Analysis for the Housing Construction Sector in Ethiopia," and IHDP Program Office.

PROGRAM PARTICIPATION: PROCEDURES

2.10 The IHDP uses MSEs to produce construction inputs and build low cost housing. To this end, the program aims to support the development of MSEs capable of adopting low cost, labour and low skill intensive technologies (described above), to award them contracts and to provide them with a wide array of support interventions.

2.11 The MSEs participating in the program engage in both construction and production activities. Construction activities include block work or wall construction, electrical installation, sanitary installation, finishing (ceramics, tile laying, painting), and site works. The production activities include pre-cast beam production, hollow block production, metalwork, woodwork, stone work and gravel production (the latter known as aggregate production).

2.12 Prior to the introduction of the program, pre-cast beam production and prefabricated slab production had not yet been used in Ethiopia, nor were there MSEs which specialized exclusively in electrical and sanitary installation. Support to MSEs to specialize in these activities is in line with the program's aim to strengthen the construction sector by fostering specialization and stimulating diversification.

Creation of MSEs

2.13 The process of creating an MSE occurs in three steps discussed below in turn. This is a general process which affects all MSE support activities and is therefore not exclusive to IHDP participating MSEs only.

(i) **Registration of interested and eligible individuals**. Kebele (the smallest unit within the city administration) MSEs promotion offices in each sub-city announce that individuals interested in participating in the program can register to apply. Announcements for registration can be repeated as necessary and are not restricted to the IHDP—firms can register in any one of the growth sectors that are promoted under the city-wide MSE support program, which includes food processing, textiles, leather, etc., in addition to the construction industry. In order to be eligible to register, an individual has to have a valid identity card and have either graduated from a TVET college[26] or show proof of experience. For the IHDP, experience in the construction sector (formal or informal) is required, thus building on the capacity of the informal sector. According to the guidelines, men and women should be treated equally. Thus far, the total number of registered candidates for IHDP figures over 21,000.[27]

(ii) **Testing**. All eligible applicants are tested to verify that their skills meet the minimum standards. The test has a theoretical component which accounts for 20-30 percent of the score and a practical component accounting for 70-80 percent, thus placing a premium on practical skills. The pass rates vary between 50 percent and 68 percent. The tests are organized by the sub-city SME Development Office in collaboration with the Project Office. Test centers are TVET schools or other technical training

[26] Note that while the TVET system was founded long before the program started and is independent from the IHDP, there are a number of links between the two. The IHDP relies on the skills of TVET graduates, whilst providing a learning opportunity for both TVET students and instructors, as well as employment opportunities for TVET graduates. In addition, the design of the TVET curriculum is adjusted partly in response to the needs of the IHDP. Furthermore, the number of TVET graduates trained in construction-related activities is adjusted to meet the projected demands of the construction sector at large, and the IHDP in particular.

[27] According to the Project Office, registration was discontinued in early 2006 when it was determined that there were enough employees/firms to carry out the full program.

centers which provide relevant skills. The costs of the test are covered by the Project Office. Individuals who fail the test are allowed to take the test again at a later date. They may attempt to upgrade their skills by joining successful candidates on the job as assistants.

(iii) **Enterprise organization (MSEs).** Candidates who have passed the test are provided with a one-day orientation course which teaches them how to form a legal business enterprise, how contracts work, what the IHDP objectives are, and what is expected from IHDP program enterprises. Candidates then make groupings on their own, and identify the type of organization they would like to establish. They can choose between three different organizational structures: a cooperative, a trade association (share company, Plc or partnership) or sole ownership. A cooperative comprises a group of at least 10 people who jointly own the firm and share its profits. Most candidates choose to become a member of a cooperative, as this allows them to combine their skills, take on larger contracts, share the financial risk, and offers the advantage of exemption from profit tax (despite the potential disadvantage of free-riding that can arise because of profit sharing).

Awarding of Contracts

2.14 MSEs they register at the Kebele Micro and Small Scale Enterprise Promotion Office one-stop shops), and secure certificates to operate as business entities. Such **certification** allows the MSE to submit a job request to their respective sub-city project office. Depending on when they registered and the availability of work in their area, MSEs are awarded contracts and work under the supervision of engineers and foremen from the Project Office. MSEs registered in a given sub-city will have priority for construction works in that sub-city over others outside the sub-city. In the future, the IHDP also intends to make the offering of jobs dependent on past performance.

2.15 Only MSEs formed through this process are awarded IHDP jobs. However, when newly organized MSEs are unwilling or unable to complete certain works, pre-existing licensed MSEs are invited to take up the job. Anecdotal evidence suggests it is not very common for pre-existing SMEs to re-register in order to obtain IHDP work. It is only for foundation and structural works, which are generally beyond the capacity of MSEs that large contractors are usually hired.

PROGRAM PARTICIPATION: BENEFITS

2.16 The IHDP provides wide-ranging support to MSEs by providing, and in certain cases subsidizing, a place to work, facilitating access to credit, providing training and access to inputs (on credit) and subsidizing machinery for firms producing re-bars (reinforcement bars) or hollow blocks, more specifically:

- **Land Grant.** By enabling access to land and subsidizing certain types of land and sheds, the IHDP tries to ensure MSEs have a place to work. The program provides certain sites, such as TVET compounds, for free if the working shed is built with wood (80 percent of cases), while it charges full rent if the shed on the site was

constructed with metal (approximately 20 percent of all cases). In contrast, plots provided by the Bureau of Trade & Industry are not subsidized.

- **Access to credit without collateral (through a joint bank account).** The IHDP does not extend credit itself, but rather connects program firms with existing Micro-Finance Institutions (MFIs). The collateral requirements for program firms and non-program firms are different as firms in the program can open a bank-account together with the IHDP without providing the collateral which is normally required. The program's office signature provides the required collateral, even though the project office is not responsible for repayment in the case of default.[28] In all other respects (interest rates, repayment periods and grace-period) program firms face the same lending conditions.

- **Inputs on Credit.** The IHDP provides re-bars, iron and cement (when not available in the market) on credit. The costs of inputs are deducted from future payments for the outputs.

- **Subsidized Machinery-Lease.** Program firms producing re-bars and/or hollow blocks can purchase machinery with leases below market rates; the IHDP communicates to the MFIs which machineries to buy and to which MSEs to lease them out; upon completion of all payments, the program firms own the machine. Again, payments are not made upfront but deducted from each payment made to the MSE by IHDP.

- **Training.** Firms which engage in pre-cast beams and/or hollow block production are trained before deployment. The program also intends to provide training for firms which engage in other activities, but to date, no systematic training system has been set up for that purpose. In the future, the IHDP also wants to organize courses to teach business skills.

- **Demand.** Awarding work to new firms and shielding them from competition by non-program firms is perhaps the most important support the IHDP provides to program MSEs. Firms which have been created by the program are free to carry out jobs for clients other than the IHDP.

2.17 While the IHDP is aimed at sustaining program MSEs, other firms can also benefit from its contracts, most notably contractors. Large contractors (Grade 6 and above)[29] are hired for foundational and structural works, on a fixed price basis, at least in the past – a anecdotal evidence suggests that such fixed price system has been disincentive for large

[28] However, the program MSE needs to obtain permission from the IHDP every time it withdraws money from the shared bank account in which the loan has been deposited. The IHDP and the MFIs have a general agreement that the IHDP automatically repays the MFI once a firm completes a contract, which reduces the risk of default for the MFI. The IHDP deducts the repayments from the amount it pays out to the firm. Supervision by quality engineers is supposed to reduce the risk of default for the IHDP by ensuring that program firms successfully complete the contracts they have been awarded.

[29] Contractors are graded based on capital requirements and skills. Contractors of grade 7 and above have more than 500,000 Birr in capital and meet certain skill requirements.

firms and that many have been reluctant to register for these contracts.[30] The selection of contractors is in the order in which they registered with the Project Office, unless the number of registered contractors exceeds the number of available jobs (in which case a draw is held). Contractors who participate in the program do not enjoy any special benefits or support.

PROGRAM COSTS

2.18 It is difficult to obtain an accurate estimate of the full costs of the program due to price fluctuations, incomplete cost accounting, decentralized administration and delays in program implementation, despite the best efforts of the Project Office to collect this data. Given the ambition of the program, it is to be expected that its costs are large. However, it is believed that available estimates of costs are biased downward.

2.19 Some important elements emerge from Table 2.3.

- The cumulative administrative and MSE support cost incurred by 2006 are equivalent to 6,756 Birr per MSE created and 288 Birr per housing unit currently under construction.[31]
- The development of infrastructure has been the biggest expense in the provision of MSE support, while the provision of quality controls has been the highest administrative expense.
- Costs related to technology, such as testing and training are relatively modest. This partly reflects the limited implementation of the training component.
- The costs of site development have also been fairly modest thus far though this largely reflects the low administrative price of land. Lease prices for program firms are lower than for non-program firms, a subsidy value which is not reflected in these cost estimates.

2.20 Program costs appear to exceed the initial estimates, probably due to the shortages of building materials (especially cement) and high transportation costs (rising fuel prices). In 2004, the Project Office estimated the price of IHDP housing at 850-860 Birr per m2[32] or 30,000 Birr for an average unit sized 35m2 (excluding the cost of land and infrastructure development, which would add another 2,500 Birr per housing unit).[33] According to more recent data provided by the IHDP Project office, these estimates were too optimistic. At the end of 2006, the actual total cost of construction (excluding only land usage) was 42,645 Birr per 35 m2 apartment: i.e. 31 percent higher than the original estimate. The cost increase seems driven by increasing input costs, most notably the costs of cement and metal, but also by rising wages. It should be noted that a cumulative cost increase of 27 percent in three

[30] Contractors of lower grade (7-10) and SMEs/MSEs are not eligible for foundational and structural work because they do not posses the required construction machinery, equipment and/or skills.
[31] The total number of MSEs created thus far is 1,386; the total number of housing units is 32,495.
[32] "Addis Ababa Integrated Housing Development Program" (no author), Addis Ababa, March 2004.
[33] According to estimates made in 2004, about 50m2 of land per house needs to be prepared at an average cost of 50 Birr per m2, so that the average cost of land preparation per house amounts to 2,500 Birr.

years is broadly in line with aggregate inflation. [34] Thus at current prices the costs would be close to 9 billion birr (about US$1 billion), excluding the cost of administering the program.

Table 2.3: Program Costs

Description	Support & Administrative Costs Years			Cumulative Total
	2003/2004 (1996 E.C)	2004/2005 (1997 E.C)	2005/2006 (1998 E.C)	
Administrative Costs				
Salary of personnel directly involved to promote SMEs in IHDP	25,584.00	315,198.00	440,100.00	780,882.00
Management.	13,950.00	561,888.00	739,154.00	1,314,992.00
Quality control		191,537.00	1,294,475.00	1,486,012.00
Stationeries	625.00	33,682.00	33,483.00	67,790.00
Fuel	2,400.00	71,647.00	76,024.00	150,071.00
Utilities	1,410.00	33,914.00	55,359.00	90,683.00
Depreciation of Vehicles		59,536.00	71,912.00	131,448.00
Others (maintain)	1,120.00	4,480.00	2,240.00	7,840.00
Sub-Total	45,089.00	1,271,882.00	2,712,747.00	4,029,718.00
Support costs				
Trade testing	1,200.00	162,550.00	9,056.00	172,806.00
Training		84,657.00	22,235.00	106,892.00
Building of Production Sheds		796,549.96	123,876.00	920,425.96
Transportation Cost for production materials		99,588.00	6,813.00	106,401.00
Infrastructure		3,356,203.62	385,304.00	3,741,507.62
Installation of production materials		-	700.00	700.00
Site development		280,180.00	5,000.00	285,180.00
Sub-Total	1,200.00	4,779,728.58	552,984.00	5,333,912.58
Grand Total	46,289.00	6,051,610.58	3,265,731.00	9,363,630.58

Source: Project documents

2.21 The program is financed mostly through the sale of housing units on a lease basis with repayment periods of up to 20 years. To meet its immediate financial obligations the IHDP requires down payments varying from 7.5 percent for a studio to 30 percent for a three bedroom apartment. Reportedly, however initially beneficiaries have been chosen based on their ability to pay the entire price up front, rather than relying on a down payment system. A lottery is now used to allocate apartments, with a 10 percent of units reserved for those who have been displaced by the program. The Project Office sells the commercial facilities built in the context of the condominium's development on a market basis.

2.22 Rising costs, delays in project implementation due to input shortages, and the events following the 2005 elections appear to have resulted in some financial strain for the

[34] The consumer price index in Ethiopia has been growing relatively fast over recent years: 8.6 percent in 2004, 6.80 percent in 2005 and 12.3 percent in 2006.

program. The original price structure for example, contained an element of cross-subsidization between larger and smaller units, in order to provide lower cost housing to the poorest. But this was affected by the rise in prices as subsidies have de facto been extended also to larger units.

ACHIEVEMENTS TO DATE

2.23 Despite the challenges provided by input shortages (particularly cement) and the events following the 2005 elections, the IHDP has delivered significant results (Table 2.4). However, the indicator currently used for monitoring the job opportunity objective could be more accurately refined to account for different durations of jobs and avoid double counting. A measure of "days-worked per year," would provide a more accurate description of what is currently possible to monitor. Further, a distinction between "jobs" for casual workers and those for permanent workers would be useful.

Table 2.4: Program Targets and Results as of October 2006

	Quantifiable Program Targets:	
Type of Goal	***Target***	***Accomplishments thus far***
Housing construction	Construction of 192,500 housing units in 4 years	32,495 housing units
Employment Creation	Create 80,000 job opportunities	52,600 job opportunities created
MSE promotion	▪ Strengthen the existing 1,300 MSEs ▪ Increase the number of MSEs to 2,300	1,386 MSEs developed ▪ 292 in construction trades ▪ 1071 in production trades
Slum upgrading	Reduce slum and decaying areas of the city by 50 percent	
Land development	Prepare and develop 1,200 ha of land required for housing development and related local development works	173.8 ha of land developed
Institutional Capacity	Build institutional capacity capable of building 50,000 houses per year	▪ 20,000 applicants tested ▪ 3,500 workers trained in new technologies ▪ 800 workers trained on the job

Sources: The housing construction, employment creation and SME promotion targets are IHDP (2006) and from the Project Description (No author, 2004, p. 3). Accomplishments are from IHDP (2006)

2.24 Other elements not reported in the table need to be considered in a technical evaluation of the IHDP effectiveness in generating employment. These include:

- The possibility of crowding out of existing firms and projects in an input supply-constrained market so job creation could be lower than expected;

- The need for more careful targeting of program support to enhance the likelihood of MSE survival (EDRI 2003, also note that evidence from other countries suggests low survival rates);

- Possible trade-offs between low costs due to high standardization of inputs (which favors efficiency and might be better exploited by larger firms) and employment generation via MSEs;

- The possible trade-offs between speed of implementation and quality standards, as well as between high level of coordination by the program and low cost; and

- The possibly distortionary effects of a fixed price system, which may result in inefficient production.

3. METHODOLOGY AND DATA SOURCES

3.1 The IHDP is a complex and innovative program and in this report we only assess its employment creation effects, taking as a given the demand for housing from the program. The question is whether the creation of support of MSES which use input saving technologies that are novel in Ethiopia creates more jobs than if the program had taken a different approach to constructing housing.

3.2 The identification of an appropriate counterfactual is key for this analysis. The typical practices outside the program constitute the natural counterfactual against which to compare the IHDP. Our analysis looks at the whole spectrum of firms in the construction sector in order to assess this counterfactual.[35]

3.3 The complexity of the program, its size as a significant player in input markets and its potential dynamic effects limit our assessment on the employment creation effects based on cross-sectional data. Yet, our assessment can provide very useful insights into whether the program is having the desired impact—at least in a static sense—and on the channels through which it has this impact. Further, this type of analysis can highlight potential discrepancies between expected results and what is occurring in practice, thereby identifying areas where corrective actions may be called for if the original goals are to be reached.

3.4 The next section reviews the analytical framework, both in terms of key hypotheses and analytical tools used to test them, in order to provide the methodological background for the analysis presented in the next chapters. This provides the background for the design of the survey discussed in the following sections.

KEY HYPOTHESES AND ANALYTICAL TOOLS

3.5 There seem to be are two main hypotheses which are relevant to the economic rationale for the program:

(i) **MSEs in the construction sector, and particularly MSEs in the program, are more labour-intensive than larger firms.**[36]

3.6 Testing this hypothesis requires examining in detail two related but theoretically separate issues. One is the technology[37] used per se, and the other is testing for differences in

[35] Our initial focus was on large contractors and MSEs. As discussed below, it has not been possible to sample non-contractors based on size. However, the vast majority of firms who are not contractors appear to be relatively small. For this reason, we refer to them more generally as MSEs.

[36] The lower-cost technologies adopted by MSEs in the program should allow greater labour intensity per unit of investment than the technologies used by firms outside the program, though this is not explicitly addressed in the program documents.

[37] Note that "technology" is used here in the economic sense. This concept refers to the way inputs are transformed into outputs when looked at in terms of value, rather than to the specific material technology used.

factor proportions[38] given the technology used, since technology and factor proportions jointly determine labour intensity. These two issues are explored through a production function framework, whereby the output of each firm is modeled as a function of the inputs as well as of firm characteristics (e.g., being a large contractor, being an MSE, participating in the program or not), and by direct modeling of factor proportions.

3.7 An important caveat is that differences in factor proportions and technologies do not tell us what would have happened if the program had not been implemented. The current choices made by non-program firms provide some indication as to factor proportion and technology choices of incumbents and potential entrants, had the program not been introduced. Yet, they are not perfect indications since the implementation of the program itself may have affected (the evolution of) (i) the prices and availability of inputs; (ii) the prices of and demand for outputs; and (iii) the available technologies.

(ii) **The creation and support offered by IHDP to MSEs in the program is needed to overcome market failures**

3.8 Ideally this would be tested with longitudinal data (information collected at different points in time for the same firms) and for a randomized assignment of program support. While our study, based on data collected at one point of time only, does not allow a full impact evaluation of the support provided by the program, it can provide some useful insights into effectiveness.

3.9 We compare whether support is effective in an expanded production function framework, contrasting firms which receive support with firms that do not. An assessment is also conducted of the impacts of program support on employment growth. Finally, we complement the analysis with firm managers' perceptions of the value of the support received, and their expectations of what would happen if program support were withdrawn. The combination of these findings provides detailed evidence on channels of impact.

3.10 In addition to testing the two main hypotheses, we also analyze the **effectiveness of program targeting, and its distributional consequences** based on a profile of beneficiaries and an analysis of the benefits they receive from the program. This seems particularly relevant in assessing whether the program is an effective way of targeting the urban poor, and its role in the context of an effective poverty reduction strategy. Furthermore, analyzing the distributive impact of the program helps in identifying trade-offs between efficiency and equity that characterizes this program. This is particularly important because existing assessments of the program suggest that the housing component per se has not had a pro-poor impact, meaning that it is the employment creation component that is expected to perform this role.

[38] Note that a given technology encompasses all the combinations of capital, labour and inputs which give a certain outputs. Given desired output levels, different firms could therefore decide to adopt different combinations of inputs (i.e. factor proportions) to attain that production level.

Limitations of the Analysis

3.11 The most serious limitation of this study is our reliance on cross-sectional data collected when the program had already been operating for at least two years. Any exceptional circumstances at the time of the survey would affect our results. In fact, late 2006 was the most acute phase of the input shortage which hampered the construction sector. To the extent that firms in and outside of the program were affected differently by the shortage, this could indeed cloud our comparisons. Given the emphasis of the program on facilitating access to inputs, it is unlikely that their access was worst than for non-program firms. This particular circumstance should not therefore bias negatively our assessment of effectiveness in supporting firms' performance. Furthermore, the indicators of firms' performance are based on recall of the last 12 months, a factor which should attenuate the effects of the peak of the shortage (as well as affect similarly both program and non-program firms). It is possible, however, that our assessments of capacity at which firms were operating might have been affected by such transitory factors.

3.12 It is not possible to assess the full impact of the support provided since the absence of randomization of program treatment implies that there may be something specific about the firms who received (or who did not receive) program support which drives both the performance of the firm, and whether support was received[39] cannot be eliminated.

3.13 The lack of longitudinal data means that we cannot account for the effects of the program on non-participants, though complementary information could shed some light on the issue. This applies in particular to assessing how the program has affected the likelihood of entry of non-participating firms into the construction sector and the evolution of input prices.

3.14 Our analysis cannot account for the dynamic effects of the program. Nevertheless we can estimate the relative importance of static and dynamic factors in driving the employment creation effects of the program, which can have important implications for the design of its scaling up.

3.15 Finally, we recognize that this assessment glosses over the specificities of the e program. For example, when looking at technology and factor proportion we focus on elements such as the capital/labour ratio rather than the specific nature of the equipment used in the different trades. This allows us to conduct an overall analysis which focuses on the main economic drivers of performance, but specific challenges faced in one particular activity or by a certain set of workers are not be addressed.

[39] For example, we cannot rule out the possibility that program support has been given to firms which otherwise would have been most likely to fail. If that is the case, an estimate of the effectiveness of the program would not be able to distinguish between the (say) negative effects of being a firm likely to fail as opposed to the positive effects of receiving support from the program.

THE ADDIS ABABA CONSTRUCTION ENTERPRISE SURVEY

3.16 In order to test the key hypotheses above a purposely-designed survey was conducted by the World Bank in collaboration with the Ethiopian Economic Association. The Addis Ababa Construction Enterprise Survey (AACES) included quantitative information on firms and their workers, and was complemented by qualitative evidence collected by means of in-depth interviews with respondents. The reminder of this chapter details the approach adopted in the development of the survey and sampling, and the challenges it posed.

3.17 The survey matches firms and workers in the construction sector in Addis Ababa, and covered 240 firms and 971 workers, 241 of whom were casual workers.[40] The sample is equally divided between program- and non-program firms, containing data on 120 in each category. A program firm fulfils at least one of three criteria: (i) having been created by the program; (ii) having received support from the program; or (iii) having worked for the program. In addition, a distinction can be drawn between MSEs and large contractors, where contractors are defined as firms which have a contracting license grade between 1 and 6. MSEs are all other firms, including small contractors, i.e. firms with a contracting license grade between 7 and 10, as well as some non-contracting firms which are relatively large. Yet, the majority of MSEs are small non-contracting firms. The differences between MSEs and large contractors will be shown to be considerable; large contractors tend to hire more workers, be more capital-intensive, use more inputs and have higher labour productivity. The sample distribution is shown in Table 3.1.

Table 3.1: Composition of the Sample

Type of Firm	Number of Firms
Non-Program MSE	109
Program MSE	103
Non-program Large Contractor	11
Program Large Contractor	17

Sampling Strategy—Firms

3.18 The main emphasis of this study is on construction firms, and in particular the MSEs. A stratum of contractors was added to the sample, in order to capture the employment creation effects of the structural works in the condominium construction, as well as to provide a counterfactual on an alternative mode of delivery of public housing. Specifics to note include:

- Given the heterogeneous nature of activities in the housing construction sector, the sub-samples of program and non-program firms had to be both comparable and representative. Program firms were sampled on the basis of their activities, with the

[40] The sample we ended up with differs slightly from the sample we intended to have, because it turned out to be impossible to trace the exact intended number of firms in each (program) activity. Moreover, firms can engage in different activities, a fact which was not taken into account in the sampling design.

sample frequency corresponding roughly to the population frequency as derived from the IHDP list, with a slight oversampling of firms in activities whose population frequency is low, and excluding marginal activities.

- The population of non-program firms engaging in comparable activities was identified. Again the sample frequency of firms engaging in different types of activities roughly corresponds to the observed population frequency.

- A distinction was made between contractors and non-contractors. Contractors with a license grade between 1 and 6 are considered large, as they are allowed to execute structural works. Large contractors were oversampled since there are relatively few of them. The sampling for non-contractors did not take the size of firms into account.[41]

3.19 A major challenge of this study was the identification of the construction sector universe from which to draw a sample. The Addis Ababa City Administration keeps a registry of all firms which have been licensed in the city. Firms categories were drawn mostly from the construction sector, but included also the manufacturing sub-sectors included in the program (e.g. hollow block construction and pre-cast beams).

3.20 The listing has several shortfalls for our purposes. In particular tracing firms proved to be very difficult; contact details were often conflicting, outdated, or missing altogether, and in half of the cases firms which could not be contacted had to be replaced with others from the same stratum.

3.21 The listings provided by the City Administration were integrated with those kept by the IHDP program administration. From the program listing a planned half of the sample was drawn. Tracing firms posed difficulties, as some of the firms on the list had exited and had to be replaced, while others had moved. [42] From the population registries offered by the various available listings, weights have been obtained to make the survey representative of the whole sector.

Sampling Strategy–Workers

3.22 A maximum of up to 4 workers (including the firm manager) were interviewed, stratified by occupational category. Women, particularly those not employed as casual workers, were oversampled and enumerators were instructed to attempt to sample one casual worker per firm.[43] The sample of workers contains disproportionately more workers from higher occupational echelons.[44]

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[41] Given the information at our disposal, it was not possible to sample firms on the basis of size.

[42] On the 1406 firms in the IHDP listing we attempted to contact by phone the 721 firms over which the program office had doubts whether they were fully in operation. Of those 721, 506 could not be contacted and of the remaining firms, only 66 were operating.

[43] Additional efforts were made to collect information from casual workers looking for work at usual gathering places. The quality of these data turned out to be very poor and therefore these data have been mostly disregarded for the purpose of analysis.

[44] Note that in the worker sample the definition is based on workers' own categorization; it could be that some workers categorize themselves as skilled labourers, while being categorised as unskilled by the firm.

3.23 One potential caveat is that the approval of the manager was needed in order to interview workers and thus the sampling of workers may not be entirely random.[45] In addition, response bias cannot be ruled out. Yet, most of our questions are factual in nature and most managers were cooperative. Our impression was that the assignment of workers for interviews was more due to chance, i.e., proximity at the time of our interview, than to strategic selection on the manager's part.

Survey Instruments

3.24 Two questionnaires were developed—one for firms and one for workers, with adjustments to differentiate between questionnaires for contractors and non-contractors and for casual and permanent workers. The survey was piloted on 10 firms and 39 workers and slight revisions were subsequently made.

- The *firm-level questionnaire* covers a rich set of characteristics, including their activities, age, size, capital stock, inputs, outputs, expenditure, revenues, organizational and occupational structure, program participation and support, access to finance, inputs and skilled personnel, constraints, expectations, the number and type of workers they employ, the wages paid and employment dynamics. Data on the volume and total costs of inputs and outputs, as well as on expenditure and revenues were collected; though appear to be quite noisy. Only 35 percent of firms in the sample keep complete books of account, while 32 percent do not keep any books at all.[46] While contractors and large firms are typically better at keeping books of account, they were less capable of providing accurate information on the precise amounts of different inputs used.

- The *worker-level questionnaire* gathers detailed information on earnings, employment history, experience, skills, educational background, program participation, job satisfaction, motivation for choosing their current activity and on a number of socio-demographic characteristics including household characteristics, parental background and household assets. Casual and permanent workers were administered slightly different questionnaires.

[45] The decision to oversample women was taken after piloting of the survey as the piloting revealed that women were the least likely to be assigned to give an interview.
[46] Program firms kept much better books of accounts than non-program firms.

4. THE EMPLOYMENT CREATION EFFECTS OF THE IHDP

4.1 This chapter draws on the AACES to present a fuller characterization of how the program operates. It starts by providing a profile of the beneficiary workers and of program firms. The next sections addresses the central issue of this report, i.e. the effectiveness of the program in generating jobs, particularly for the poor, first in the static, then in terms of dynamic effects.

A Profile of Project Beneficiaries: Workers[47]

4.2 To better understand who the program is reaching the profile of beneficiaries, both workers and firms, was analyzed. Highlights include:

- According to the AACES, workers in the construction sector are mostly men (72 percent), and about 30 years old. Many (47 percent) are migrants, and three quarters migrated as adults.[48] Overall education levels are high for Ethiopia, with an average education in the sector equal to 9.5 years of schooling.

- 41 percent of all workers in the housing construction sector in Addis are employed by a firm that works for the program (47 percent of all permanent workers and 40 percent of all casual workers).

- Permanent workers are older and better educated than casual workers, work more days per month and earn more.

- When asked why they choose to become casual workers, 94 percent of the casual workers answered they lacked alternative opportunities. Contrary to popular wisdom but in line with the argument made by Garrett (2003), there is no evidence that casual status is a product of income diversification; only 6 percent of casual workers had another income generating activity, compared to 12 percent of permanent workers. A much larger proportion of casual employees had an unemployment spell in the past, and fewer had an experience working as a government employee.

- The labour market position of women in the construction sector is particularly disadvantaged. While the average years of schooling are very similar, men earn more than twice as much as women on average (839 Birr vs. 439 Birr per month). This is partly explained by women being much less likely to occupy higher level positions (Table 4.1); they are much less likely to be employed as a manager, engineer, foremen or skilled labourer, but much more likely to be employed as casual workers. Yet, pay discrimination also occurs within occupations; when asked whether they rewarded

[47] We refer here to workers who are not currently students and only workers in registered enterprises.
[48] This is consistent with the argument made in World Bank (2007) on migrants being concentrated in sectors, such as construction, with low barriers to entry.

men and women differently for the same job, 40 percent of managers claimed they paid men more, while only 4 percent indicated paying women more. Thirty-eight percent of firm managers claimed men work harder than women, while 18 percent believe the opposite. Cultural factors thus seem to play an important role in determining pay differences. Some findings on hiring and wage setting from the supplementary qualitative interviews with firm managers and workers are discussed in Box 4.1.

Box 4.1: Qualitative Evidence on Hiring and Wages

In the process of conducting the AACES, supplementary qualitative evidence was gathered by asking some survey respondents additional questions covering a broad range of issues. These in-depth interviews were conducted with 3 contractors and 6 MSEs, and included both program and non-program firms. In 4 of the cases, more than 1 interview was conducted (e.g. workers were interviewed, in addition to the manager). The interviewed firms are not necessarily representative of the total population, and we must therefore be careful not to generalize based on their responses—the number of interviews was quite limited, and may reflect some selectivity bias, since certain types of firms (particularly large contractors) were reluctant to be interviewed. However, when used to complement the findings from the quantitative survey, the interviews are useful in providing a richer characterization of firm behaviour and perceptions of the program.

Some qualitative findings related to hiring practices and wage setting are reported here:

Social connections play a pivotal role in hiring. Typically, casual workers are recommended by peers and/or selected on the basis of their physical characteristics. Before being hired, both skilled workers and unskilled workers typically have to go through a tryout period. Workers who participate in the IHDP and set up a firm together have typically known each other for an extended period for time and in a context different from the IHDP alone. While some firms complain of difficulty in hiring skilled workers, others find it easy as long as the firm can afford to pay the going rate. Skilled workers for installation works, masonry and carpentry seem to be particularly sought after.

Women in the construction sector suffer several disadvantages in comparison with men. it is rare for women to occupy a managerial or a professional position, while the majority of daily labourers are women. Gender pay differentials do not seem to exist for professionals, yet female casual labourers arguably face pay discrimination. Of course, the pay differential may be due to productivity differentials or because women have different tasks than men, yet this does not seem to be the case—as illustrated by the answer of a firm manager to the question why women get paid less than men: '*Women get only 10 birr [per day, as opposed to 12 birr for men], but I prefer women; in fact, 75 percent of my daily labourers are women; they work hard and they do what I want them to do, and they don't complain. In fact, for the work they do, I would be willing to pay them 15 birr and men 10 birr.*'

Source: Interviews with workers and firm managers, Dec. 2006.

Table 4.1: Occupational Breakdown by Gender

	Women	Men	Total
% employed as Manager	4	10	8
% of all managers	**14**	**86**	
% employed as Engineer	0	9	6
% of all engineers	**0**	**100**	
% employed as Foreman	0	2	1
% of all foremen	**4**	**96**	
% employed as Skilled Labourer	26	52	44
% of all skilled labourers	**18**	**82**	
% employed as Unskilled Labourer	70	26	40
% of unskilled labourers	**53**	**47**	

- Workers in program and non-program firms have somewhat different profiles, as summarized in Table 4.2. Permanent workers in program firms are slightly older than in non-program firms, and a larger share has a TVET degree, which illustrates the linkages between the program and the TVET educational system.

- Interestingly, permanent workers in non-program firms are far more likely to be female, though they still only account for about a third of all workers. Less than a fifth of permanent workers in program firms are women—although women account for a larger share of casual workers in program firms relative to non-participating firms. Casual workers in program firms work more days than their non-program counterparts.

Table 4.2: Average Characteristics of Workers by Firm Participation and Employment Status

Workers	Non-program		Program	
Characteristics	Permanent	Casual	Permanent	Casual
Percent female	35	13	19	23
Age	30	27	32	26
Days worked per month	23	17	24	20
Years of schooling[49]	9.8	9.1	6.7	7.4
Percent with TVET degree	18	4	26	9
Percent prior activity is unemployment	29	33	27	22

- Workers hired by program firms differ from workers in non-program firms, at least in some respects (Table 4.3). Looking at their employment history, it seems that program firms do not draw disproportionately on the unemployed, students and inactive workers, although they are more likely to employ those whose prior activity was

[49] Note that permanent workers in non-program firms appear better educated than permanent workers in program firms. This result is not consistent with the information on the schooling of workers from the firm questionnaire, which suggests that the average educational attainment of workers in program firms is 9.4 yrs, while that of workers in non-program firms is 8.1.

casual labor. Finally, when comparing casual workers alone, the differences between program participants and non-program participants are much less notable.

Table 4.3: Mean Proportion of Workers with Different Types of Work Experience, by firm type (percent)

	Non-program		Program	
	Permanent	Casual	Permanent	Casual
Prior Activity				
Unemployed	29	33	27	22
Private sector firm	27	14	25	19
Self employed	4	4	4	2
Casual worker	19	13	26	29
Student	17	17	14	16
Government employee	3	3	2	3
Inactive	0	1	0	0
Employment History				
Government employee	9	10	17	9
Private sector firm	36	37	42	46
Domestic employee	7	13	9	9
Self-employed	5	4	3	6
Cooperative	1	1	12	7
Unemployed	42	70	71	84

SELECTION INTO THE PROGRAM

4.3 The initial insights offered by the description of program participants have been enriched by modeling the determinants of passing the IHDP test, and the determinants of working for a program firm. We focus in particular on the role of human capital and employment history variables.

4.4 Of permanent workers, 28 percent took the test. The probability of taking the test in itself is associated with their sub-city and to their employment history. Those who have experienced unemployment spells in the past are more likely to take the test, while those who have experience as employees were less likely to take the test.

4.5 Just over half—54 percent—of the workers who took the test passed. Modeling the determinants of passing the test shows that educational attainment is the best predictor; completing grade 10 and completing a TVET are both strongly positively correlated with passing the test. Having completed an apprenticeship in the past does not enhance the likelihood of passing the test. Gender, age, employment history do not affect the probability of passing the test. In light of the program's goal of women representing at least one third of beneficiaries it is notable that the test does not appear to discriminate against women, at least once other characteristics are taken into account (note however that women are less educated than men).

4.6 Running a similar kind of model for the probability of being hired by a program firm[50] shows that:

- Predicted household expenditure[51] is not a significant correlate of being hired by a program firm. This suggests that the workers employed by program firms are not on average poorer than workers hired by firms not working for the program.

- More educated workers are much more likely to be employed in program firms, especially if having a TVET degree.

- Having completed an apprenticeship is significant, though this may reflect the fact that those who do not pass the test can join the firms as apprentices.

- Age and gender are not correlated with the probability of being hired.

- There is strong geographical variation in the probability of participating in the program, as evidenced by the significance of some of the subcity dummies.

4.7 When controlling for the workers' prior activities to test whether program firms draw disproportionately on unemployed workers, casual workers and workers in otherwise marginal jobs suggest that this is not the case – these variables are not statistically significant. Workers in program firms are not more likely to have been unemployed, to have worked as a casual labourer or to have been active in an otherwise marginal activity immediately prior to obtaining their current jobs. Unemployment spells become however significant when considering having experienced a significant one (i.e. longer than three months) at some point in the past in the past. Other important elements of workers past employment history are: having experience working in a cooperative and having experience as a domestic employee.[52] Workers who have experience being employed as a casual worker are less likely to be employed in program firms.[53]

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[50] The determinants for participating in the program do not seem to differ between casual workers and permanent workers.
This may partly be due to the fact that the determinants of program participation for casual workers can be estimated only very imprecisely.

[51] Predicted household expenditure was constructed by using information on asset holdings collected by the AACES, using the methodology developed by the CWIQ surveys. In practice data from the 1999/2000 HICES survey were regressed on asset holdings for the subsample of Addis residents. The resulting parameter estimates were used to predict household expenditure using the information on asset holdings in the AACES. While this variable represented our best attempt at capturing monetary poverty, the variable appeared to suffer from a number of shortfalls, including the low predictive power of the HICES regression, the significant weights of outliers, the nature of the assets available (note that ownership of a radio and a TV are lumped into a single category and that the price of goods, particularly electronics, has changed over the years) and conceptual doubts on whether asset ownership was an appropriate predictor of welfare levels in this context, particularly given the high levels of migrants. In what follows, while testing for the significance of the variable, we rely on other long term indicators associated with long term welfare levels (such as education) to capture this dimension.

[52] There is anecdotal evidence that women in particularly are finding it more profitable to work on construction sites than as domestic workers.

[53] These effects are all significant at the 5 percent level.

PROJECT BENEFICIARIES: FIRMS

4.8 To create a profile of firms in the program, a two way classification is used to reflect both the nature of production and our interest in the employment creation effects. A distinction is drawn between program and non-program firms, and between large contractors, defined as firms which have a license grade between 1 and 6, and MSEs. The latter encompasses both small contractors, and non-contracting firms, few of which are relatively large. Box 4.2 summarizes our definitions of the four categories of firms.

4.9 Comparing large contractors and non-contractors provides insight into alternative modalities for delivering housing, such as awarding contracts to existing private sector firms. This distinction is also relevant as the program employment creation effects operate differently across the two groups. While the MSEs are the main vehicle for employment creation in the IHDP, the program's demand for structural works also creates job opportunities for large contractors (though they also engage in activities outside the program). The main focus of the analysis is on MSEs, since these benefit most from the program.

Box 4.2: Definition of Firm Types

Program Large Contractor: a contracting firm with a license grade between 1 and 6 which works for the program. Typically, these firms are hired to execute the structural works for the IHDP condominiums.

Non-Program Large Contractor: a contracting firm with a license grade between 1 and 6 which does not work for the IHDP.

Program MSE: any firm that works for the program that is not a large contractor. Note that this category also includes some relatively large firms which are not contractors. Yet, the bulk of program MSEs are made up by cooperatives, which tend to be relatively small.

Non-Program MSE: any firm that is not a large contractor but does not work for the program. This category also includes small contractors, those with license grade 7-10, as well as some relatively large firms which are not contractors.

- According to the AACES, almost one third of construction firms are in the program (Table 4.4). Program firms engage in fewer activities at the same time, suggesting that they might be more specialized than non-program firms.

- The differences in median and mean firm age between program and non-program firms are substantial (Annex 1, Table 4.9). The average age of a program MSE is 2.3 years, while the average age of a non-program MSE is 3.8 years.[54] Large contractors are typically much older than non-contractors. In addition, 91 percent of the program MSEs were created in the last three years, i.e. the period over which the program has been active.

- Overall, firms of 10 or fewer workers account for about 60 percent of employment, while firms of 20 or more workers account for only about 15 percent and only 1.5 percent of all firms employ more than 100 workers. Program firms employ significantly more workers than non-program firms—a median of 13 workers, compared to 5 workers for non-program MSE. Because firms participating in the program are generally larger than non-

[54] In contrast, program contractors are slightly younger than non-program contractors (with an average age of 6.2 years vs.7.8 years). Note that the age of the firm is strongly related to firm-size; firm (ρ=0.24).

program firms, they account for a disproportionate share of employment (43 percent of all workers in the construction sector in Addis). Some key descriptives are shown in Table 4.8.

- While the construction sector is booming, the AACES reveals that its MSE component is not operating at full capacity. On average firms operate 9 months per year and at 49 percent of capacity. Only 3 percent of firms report operating at full capacity. Program firms operate at similar capacity than non-program firms (48 percent vs. 49 percent, respectively). As already mentioned in chapter 3, this low level might reflect the acute shortage of inputs which was registered at the end of 2006, though firms were asked about their capacity utilization over the last 12 months.

Table 4.4: Characteristics of Firms by Size and Program Participation Status

	Non-program SME	Program SME	Non-program Large Contractor	Program Large Contractor
Share of Employment in the construction sector accounted for	33%	38%	25%	4%
Share of firms in the construction sector	59.7%	31.4%	7.6%	1.2%
Average number of months operated	9.0	7.1	8.9	9.6
Capacity utilization	49%	49%	55%	65%
Size at the 10th percentile	3	6	4	10
Size at the 25th percentile	4	10	8	12
Median Size	5	13	15	21
Size at 75th percentile	8	21	58	40
Size at the 90th percentile	15	32	102	122

- Firm specific price indexes for both outputs and inputs[55] summarize the relative prices faced by different types of firms. Program and non-program firms are found to face similar prices for inputs, but different prices for outputs.[56] These indexes will be used in chapter 7 to compare the productivity of program and non-program firms.

Table 4.5: Median Input and Output Prices by Firm Type

Firm Type	Median Output Price	Median Input Price
Non-Program MSE	1.08	1.00
Program MSE	.97	1.00
Large Contractor (Non-Program)	1.19	.74
Large contractor (Program)[57]	1.50	.90

[55] Such indexes are based on the deviation of the prices faced by each firm for each good (output or input) from the median price for that product. They are then aggregated based on the importance in the revenue and cost structure, respectively, for each firm.

[56] Note that this finding is based on the respondents' answers to the survey, despite the fact that the program subsidizes several inputs. As the price indexes take into account the cost structure of the firms, the finding that input prices are similar for program and non-program firms is likely to reflect the weight of other non-subsidised inputs or of inputs (such as cement) which were of limited availability through the program.

[57] Note that the prices for contractors are not very reliable. The reason is that only a select number of large contractors responded to the questions on inputs and outputs, which were used to construct firm-specific price indicators.

FIRM SELECTION

4.10 To obtain a richer characterization of program firms' characteristics such as factors of production used and the initial sources of financing, and of its manager, some simple models of program participation have been run. Key findings were:

- Firms in the program were significantly larger in terms of employment when they started, especially for firms created in the last 3 years. This is consistent with what we know about the majority of MSEs in the program being organized as cooperatives, which require a minimum of 10 workers.

- Firms in the program, particularly those created in the last 3 years are also more likely to have a better educated workforce.

- The age of the workforce is not correlated with program participation, other than for a negative correlation between age of the workforce and participation for older firms.

- When controlling for firm size and amount of capital per worker, the level of education of the workforce is even more correlated with program participation.

- The age of the firm is negatively correlated with participation, suggesting that firms established before the program launch are less likely to join.

- Firms in the program are more likely to have received a formal loan. To complement the quantitative analysis of the factors correlated with program participation, Box 4.3 presents some of the findings from the qualitative interviews.

4.11 These estimates provide a sense of multiple correlations between characteristics, rather than causality.[58] To understand what makes firms join the program, we also limited the analysis to firms who were in the program but did not receive support. In this way, one can eliminate the effects of the support of the program itself from the factors which might be driving the associations observed. The main findings on the size and average educational attainment of the labour force remain, though access to credit is not longer significant.

Box 4.3: Qualitative Evidence on the Decision to Participate in the IHDP

MSEs who joined the IHDP can be grouped into those founded prior to the inception of the programme and those who were newly created in response to the program. The former group typically responded to invitations by the project administration to join the programme and were often motivated by the opportunity to receive support and have additional demand for their work. Most of them report to have been operating below full capacity when the programme started. For some, receiving training and being exposed to new technologies were additional motivating factors.

Newly-created MSEs are typically composed of either workers with previous experience in the construction sector or of recent TVET graduates. Many respondents indicated that by working together they could accomplish more than by working as individuals; participating in the program is the least difficult way of

[58] For example, we are not claiming that firms hire more workers as a result of being in the program, only that firms currently in the program have more workers. It would therefore be wrong to see the association between size and program participation as causal.

setting up one's own company. Many respondents appear to be motivated by the opportunity to be their own boss and the belief that the exposure they would get by being a member or manager of a program firm would be more beneficial than being an employee in construction firms not partaking in program. As expressed by one MSE manager when he was asked why he joined the program: '*it is better to be your own boss than to work for someone else; the pay is better [than being an employee outside of the IHDP]. We get experience. also, we do not get any support from any other source.*' However, MSE workers did express concerns about the sustainability of their firms.

Existing MSEs that decided not to attempt to participate in the program typically believed that they would not benefit from being in the program, either because the payment was too low or because it would involve cooperating with less productive individuals. According to an MSE manager of a metal-working firm, *'I have much more experience than people in the program. If I had to co-operate with people who just graduated from TVET, the division of labour would be unequal.'*

Contractors' decisions to join the programme are overwhelmingly driven by a profit motive; contractors who did join the programme were motivated by the opportunity to be employed at a time when demand was slack, while contractors who did not join the programme were discouraged by the low price and the fixed price system. One contractor regretted the decision to join, saying that: 'I *am losing at least 15 percent instead of making a small profit of 5 percent. But what can I do now? I have signed a contract and I must complete the building. But then I will stop; I have invested all my own money and now it is wasted.*' As explained by a contractor who regarded the IHDP favourably, *'I am not in the program. They offered me to be in it, but I refused it. The main problem is that the price is fixed, it is too low.'*

Source: Interviews with workers and firm managers, Dec. 2006 (see Box 4.1 for more background information).

4.12 This profile both confirms and challenges what is commonly believed about the program. While the program aims to absorb young workers, participating firms are not on average different in this respect, even when taking into account the current size of operation and the type of technology used. That the educational structure of the workforce is strongly associated with program participation presents a policy challenge. While the program is explicitly targeted at TVET graduates and other skilled workers (to keep high quality standards and operate the new machinery that the program has introduced), poorer workers have typically lower levels of educational attainment. Since support offered by the program includes credit, it is not surprising that having received a formal loan is significantly associated with program participation by firms.

THE JOB CREATION IMPACT OF THE PROGRAM

4.13 The main target of the IHDP in terms of employment creation is the number of jobs created. As the program is large, a large number of workers are found in program firms. In October 2006 the number of jobs created by the program was estimated at 52,600 (IHDP 2006).[59]

4.14 The official estimate, however, is problematic. Is it enough to do any work (even if only for a day) to consider that 1 job has been created? Or should the measure incorporate some sense of duration (for example in terms of full-time equivalent) to be considered a job? Other complexities arise because any worker working for a firm contracted by the program is considered as a job created. However, program firms might have exited the market (in our

[59] To give a sense of the scale of this achievement consider that in 2005 according to the LFS there were 349,000 active individuals in the 25-34 age cohort (median age in the program is 30). The program would therefore be reaching the equivalent of one in six workers in this age group.

estimates this occurred to 22 percent of participating firms). Further, to the extent that casual workers move between different sites, there is the possibility of double counting. Finally to the extent that program firms also work in part for customers outside of the program, it is not clear to what extent all the jobs in program MSEs should be attributed to the program itself.

4.15 There is no unique answer to how jobs should be measured, but it is important to have clarity on what exactly different indicators capture. If exposure to the program even if for a very limited amount of time is the key indicator of interest (perhaps because of the impact on the workers' skills or productivity) then a very broad definition of jobs might be appropriate. If one is concerned about effective labour demand, then a more narrow definition is more appropriate. Annex 1 presents a rough estimate based on the AACES on the numbers of jobs in the program in 2006 which illustrates how all the different considerations made above can help making an estimate of the number of jobs created.

Net Employment Creation Effects: Differences in Technology

4.16 The true test of the IHDP's effectiveness in creating jobs is whether it has created more jobs than would otherwise have been created if, for example, the construction of condominiums had been tendered to existing firms (either MSEs or large contractors). We test whether MSEs are more labour intensive than larger firms, as well as whether MSEs in the program are indeed more labour intensive than non-program MSEs. If these hypotheses are disproven the employment benefits of the program must be found elsewhere—for example in terms of their dynamic effects. This issue is addressed via production function estimation, then factor proportion.[60]

4.17 Table 4.6 presents estimates of the production function used by construction firms. We use revenue, deflated by firm-specific price deflators, as our measure of output. Inputs are not deflated since input prices faced by different types of firms are very similar. Column 1 offers a basic model[61] where revenues are modeled as a function of capital, the number of workers and inputs.[62] Since large contractors might use a different technology we interact the different parameters of the production function with being a large contractor. With respect to contractors, our analysis for large contractors is not conclusive because the sample becomes very small (10). The results however support the commonly held view that large contractors use a different technology than MSEs.

[60] Note that the production function approach implies a number of assumptions, including full employment of resources which, given intermediate input constraints and the resulting excessive capacity in the construction sector in Addis at the time of the survey might not be appropriate. While there is some support for this concern in the high elasticity for intermediate inputs and the small or insignificant coefficient of capital, our estimates for the coefficient on capital are broadly in line with others found in the literature. We do not feel that these concerns, therefore, are such as to invalidate our analysis.

[61] Alternative regressions addressing the issue of potential endogeneity of input and output choices have been run also, but given the instruments available (input prices, output prices, initial capital and employment at startup) the hypothesis of endogeneity has been rejected.

[62] Note that due to the difficulties of collecting price and input data these regressions have been run on the subsample for which data were available, comprising 120 firms.

Table 4.6: Production Function: Deflated Revenue

	All	MSEs	Program MSEs	Non-program MSEs
	coef/sd	coef/sd	coef/sd	coef/sd
Labour(log)	0.488***	0.667***	0.425**	0.667***
	(0.135)	(0.214)	(0.193)	(0.225)
Capital(log)	0.099*	0.167**	0.007	0.167**
	(0.055)	(0.071)	(0.083)	(0.074)
Inputs(log)	0.496***	0.404***	0.569***	0.404***
	(0.059)	(0.093)	(0.071)	(0.097)
Largecontractor	3.940			
	(4.199)			
Largecontractor*Inputs	-0.867			
	(0.786)			
Largecontractor*Capital	0.655			
	(0.518)			
Largecontractor*Workers	0.077			
	(0.361)			
Program*Labour		-0.242		
		(0.294)		
Program*Inputs		0.165		
		(0.119)		
Program*Capital		-0.161		
		(0.112)		
Program_dummy		0.229		
		(1.387)		
Constant	4.117***	4.148***	4.377***	4.148***
	(0.656)	(0.959)	(0.963)	(1.007)
R2	0.714	0.630	0.634	0.574
Adjusted R2	0.696	0.604	0.615	0.544
Number of observations	120	110	62	48

Note: * significant at the 10 percent level, ** significant at the 5 percent level, *** significant at the 1 percent level.

4.18 In the other models we focus only on MSEs and find that in general program MSEs and non-program MSEs utilize rather similar technologies. None of the interactions between being in the program and the parameters of the production function is statistically significant (column 2). This is confirmed in Column 3 and 4 for the sub-sample of program and non-program MSEs respectively. It should be noted that the models presented in Table 4.6 seem to describe the data well, as judged by the R^2.[5]

4.19 We also explored whether the apparent similarity in technology between firms in and out of the program is in fact driven by differences in the labour they use. Table 4.7 presents human capital augmented production functions. The model suggests that given the overall

amounts of capital and inputs, the education of the workforce does not affect output significantly. The average age of the workforce is also found to be insignificant.[63]

Table 4.7: Human Capital Augmented Production Function: Deflated Output

	All SMEs coef/sd	All SMEs coef/sd
Labour(log)	0.672***	0.974**
	(0.217)	(0.388)
Capital(log)	0.165**	0.156
	(0.072)	(0.103)
Inputs(log)	0.407***	0.454**
	(0.094)	(0.190)
Program*Labour(log)	-0.242	-0.422
	(0.295)	(0.463)
Program*Capital(log)	0.163	0.078
	(0.120)	(0.217)
Program*Inputs(log)	-0.156	-0.179
	(0.115)	(0.165)
Program_dummie	0.176	1.618
	(1.413)	(2.446)
Average Education Workforce	0.007	
	(0.030)	
Average Age Workforce		0.022
		(0.019)
Constant	4.087***	2.415
	(0.999)	(2.051)
R2	0.630	0.684
Adjusted R2	0.601	0.628
Number of observations	110	54

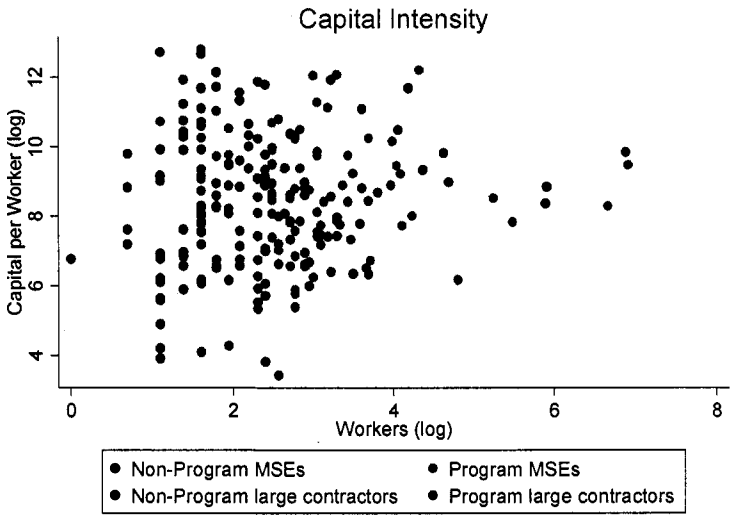
Note: * significant at the 10 percent level, ** significant at the 5 percent level, *** significant at the 1 percent level.

Net Employment Effects: Differences in Factor Proportions

4.20 Plotting the amount of capital per worker against the total number of workers for different types of firms (Figure 4.1) shows that capital intensity (defined as the amount of capital per worker) does not differ between program and non-program firms and does not vary systematically with firm size. MSEs thus do not seem to be less capital intensive than larger firms.

[63] These results are robust to estimating this specification on subsamples of contractors and non-contractors and using a measure of value-added as dependent variable. Note also that differences in productivity are not due to differences in the occupational structure.

Figure 4.1: Capital Intensity



4.21 Likewise, program firms are not systematically different in their use of capital per worker than non-program firms when capital intensity has been regressed on number of workers, program participation, and being a large contractor program, participation is not significant. A result which holds across alternative specifications, even when controlling for the activities firms engage in.[64]

4.22 Interestingly, large contractors are found to be significantly more capital-intensive than other firms, but their capital intensity of large contractors does not vary with their size. The higher capital intensity of contractors is at least partly due to the fact that these firms have been operating for longer thereby accumulating more capital, and to the activities they engage in.

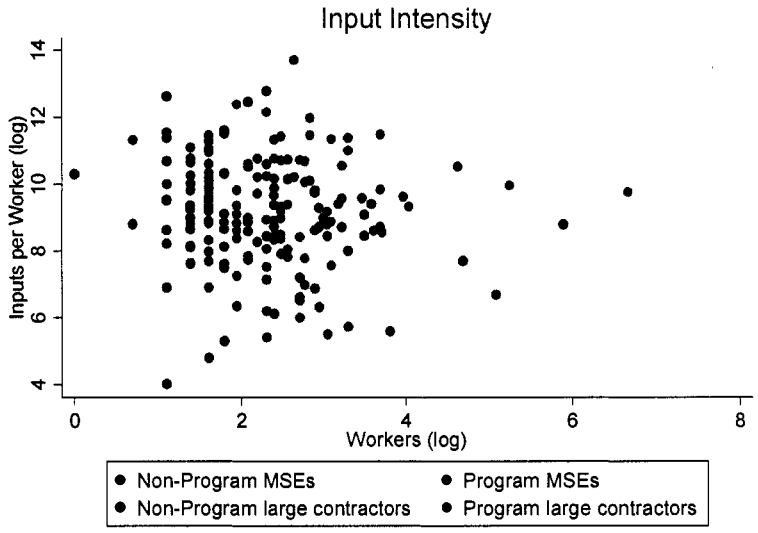
4.23 A similar analysis has been conducted for input intensity, defined as the total value of material inputs per worker. Figure 5.2 shows that input intensity does not seem to depend on program participation or on firm size. Regression analysis confirms the intuition from the graphs, that size variables and program participation have no impact on input intensity.[65] Capital intensity, in contrast, is significantly correlated with input intensity.[66]

[64] Firms in different activities differ in their capital requirements, with electrical installation requiring the least capital and firms engaging in structural works and wall construction possessing the most capital. In addition there is evidence that firms which have been around for longer have been able to accumulate more capital.

[65] Note that the results presented are based on inputs deflated by firm specific price indexes. The pattern of results remains the same if the value of input is not deflated.

[66] Model 5 which controls for different activities finds that firms engaging in gravel production or woodwork use significantly less input per workers than other firms.

Figure 4.2: Input Density



4.24 In sum, technology and factor proportion do not seem to vary with firm size nor with program participation. We do find differences, however, between large contractors and other firms. These findings suggest that the program has not created a more labour intensive supply chain for housing than would have otherwise existed.

THE IMPACT OF THE IHDP ON LABOUR DEMAND: DYNAMIC CONSIDERATIONS

4.25 The program might have significant dynamic effects on employment creation since program firms typically employ more workers than non-IHDP firms and typically employ more workers at startup. The question is whether the program MSEs are larger now because they started larger or because they grew faster.

4.26 To explore this hypothesis, in this section we compare survival and growth patterns of program and non-program firms. We examine this issue in the context of the AACES cross-sectional data which provides insights on the different channels of impacts of the program. These effects are particularly relevant given the IHDP's goal to create sustainable construction capacity. First we discuss the determinants of size and labour-intensity at startup, and then examine growth patterns.

Firm Characteristics at Start-up

4.27 Program firms on average employ more workers than non-program firms and this effect is strongest for firms younger than 3 years, suggesting that the IHDP creates firms which are on average larger than non-program firms. Once capital stock at startup is modeled as a function of characteristics of the manager and access to capital, program firms appear to start out larger because they tend to have better access to loans from micro-finance institutions (MFIs). Program participation is associated with a significantly higher size of the capital stock

even after conditioning on characteristics of the manager, yet the program participation becomes insignificant once obtaining credit from microfinance institutions is accounted for, an effect which holds both for young and older firms. Only one non-program firm in our sample relied on MFI credit to establish a firm, whereas such credit was the most important source of credit for over 30 percent of program non-contractors.

4.28 The capital labour ratio of program and non-program firms on average does not differ at startup, a conclusion valid for both young and older firms. Yet, disaggregating the analysis, program firms which obtained an MFI loan at startup are much more capital intensive than non-program firms, while program participants which did not receive credit from MFIs tended to start at lower capital intensity.[67] This suggests that the IHDP contributes to creating more capital intensive firms, though the effect is visible only for firms that receive access to credit.

Program Participation and Growth

4.29 We investigated whether program firms grow at a different pace than non-program firms and found that they do not. This finding on program firms' growth is surprising since they start up larger than other firms. Yet, program firms grow faster than non-program firms of the same size. The coefficient on the initial size of the firm is negative, consistent with our expectations.[68] In the longer run, program firms program firms will stay larger than non-program firms as they converge to a higher long term level of employment,[69] a finding which suggests a beneficial impact of program participation in firm growth.[70]

4.30 Another aspect of firms' growth is the growth of the capital stock.[71] We find that program firms on average do not expand their capital stock faster than non-program firms. While the initial capital stock is negatively associated with subsequent average annual growth of the capital stock, program participation has a significantly positive effect once capital stock at startup is controlled for. This provides further evidence against the hypothesis of

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[67] This may partly reflect the fact that firms which tend to receive support from an MFI to start tend to engage in more capital intensive activities such as pre-cast beam production, hollow-block production and wall construction. Trying to control for this by including controls for firm-activities only strengthens this effect.

[68] The negative coefficient on initial size can be explained in a number of ways. To start with, it may reflect survivor bias. Suppose for example that ability is the key determinant of survival and suppose furthermore that it is orthogonal to start-up size. Also assume that firms which entered large take a longer time to exit, for example because they shrink before quitting. Taken together, these assumption imply that a negative coefficient on the log of initial start-up size. Alternatively, one could interpret this coefficient as evidence of a tendency for firms to evolve towards the average size (regression to the mean), but the data do not support the idea that all firms converge to the same size in the long run; once the initial size at start-up is included, the program dummy becomes positively significant.

[69] Since this regression uses information on two points in time only it is a bit exaggerated to use the concept of long run. Yet, if the parameters are stable over time, program firms will converge to a larger size than non-program firms.

[70] Note that in the literature larger firms are found to grow more slowly, so program participation appears to contrast this effect.

[71] Growth in capital stock was estimated by comparing capital stock at startup to current capital stock. The survey question on initial capital was a multiple-choice question with 15 choices (ranges of capital, in birr), while the question on current capital stock was an open-ended question. In order to compare the two amounts, the data on current capital stock were recoded per the 15 categories.

convergence to one unique capital stock level. Further, it seems that program firms end up with a larger capital stock as, while not expanding their capital stock faster or slower than non-program firms, they start larger in terms of employment and maintain similar factor proportions.

4.31 In sum, the investigation of potential dynamic effects of the IHDP on employment suggests that firms created by the program start with more capital and more workers, yet are not on average more labour-intensive than non-program firms when they start. Program firms which obtain credit from an MFI start at a higher capital-intensity than non-program firms, because they start out with a much larger capital stock. Program firms which did not obtain such credit started out operating at lower capital intensity. These differences in size persist over time. Program firms exhibit growth rates which are similar to those of non-program firms. Compared to non-program firms which entered at a similar size, however, program firms have grown faster.

ANNEX 1: DESCRIPTIVES OF BENEFICIARIES

Table 4.8: Activities of Program vs. Non-Program Firms (percent)

Activity	Share of Program firms engaging in this activity	Share of Non-program Firms engaging in the activity
Pre-Cast Beam Production	1	26
Hollow/Concrete Block Production	29	43
Wood /Metal Works	21	44
Gravel production	3	8
Wall construction	14	14
Structural Works	9	4
Electrical installation	9	9
Sanitary works	11	9
Finishing	12	7
Site Works	4	5
Production of Construction Inputs	4	38
Other	4	2

Note that the columns do not add to 100 as firms engage in multiple activities.

Table 4.9: Age of Firms (percent and cumulative) by firm type

	Non-program SME		Program SME		Non-program large Contractor		Program Large Contractor	
Years	%	cum	%	Cum	%	cum	%	cum
0	14.77	14.77	3.37	3.37	1.75	1.75	10.65	10.65
1	27.27	42.04	71.91	75.28	7.14	8.89	21.43	32.09
2	19.22	61.26	13.48	88.76	1.75	10.64	11.36	43.44
3	14.48	75.74	2.25	91.01	14.29	24.93	7.14	50.59
4 and more	24.26	100	8.99	100	75.07	100	49.41	100

ANNEX 2: DERIVING ESTIMATES OF FULL TIME EQUIVALENT WORKERS FROM THE AACES

4.32 As already mentioned, quantifying the exact number of jobs created by the program, while important for monitoring performance, is not a good indicator of the effectiveness of the program at creating jobs. Nevertheless, we use the AACES to provide an order of magnitude on the jobs in the program and outside in 2006. Two characteristics of these estimates need to be underscored: one is that we see them as estimates of labour absorption over a given time period, rather than estimates of jobs created, as there is no satisfactory way of accounting for exit of program firms (and there are also doubts on whether having had briefly a job with a program firm has intrinsic benefits), even though we try.[72] The second one is that they should be taken as broad orders of magnitude as they are obtained from sample estimates. As there should be no inherent bias in how these calculations account for labour absorption in different type of firms, however, we believe that they are comparable across firm types.

4.33 The approach we adopt starts by estimating the work that is performed by firms of different types. This total amount of work is then allocated to full time equivalents which control for the fact that not all firms in the sample work year-round. This approach guarantees us comparability across different types of firms. At the same time, by construction, this approach focuses on the amount of work rather than on the number of beneficiaries of the program—a one year full time equivalent of work could be performed by different people (for example 4 casual workers working 4 months each).[73] Box 5.1 provides further details on the methods used to estimate the number of full-time equivalent workers.

4.34 As Table 4.10 illustrates, the program appears to have absorbed over 2006 almost 20,000 jobs. This is a major achievement considering that the program was certainly not operating at full capacity during the period. Furthermore, program firms appear to account for approximately 40 percent of full time equivalent jobs in the construction sector. And MSEs in the program cover some 8 percent more of full-time equivalent jobs than non-program MSEs. Yet, it is worth stressing that any type of public works and any form of construction will create employment. To analyze the effectiveness of the program at creating jobs it is therefore not sufficient to show that it provides employment for a very large share of workers in a given sector.

[72] The reason why we cannot estimate exit rates satisfactorily is that exit rates can only be estimated for non-contractors and not for contractors; we correct for exit of non-contractors, but not for exit of contractors.

[73] An analysis more oriented to the welfare effects of the program might need to focus more heavily on the number of beneficiaries, yet it would have to specify how the benefits of participation vary depending on the intensity of labour market attachment (e.g. benefits of working for one day vs. benefits of working for one year).

Box 4.4: Estimating full time equivalent workers

The first step is the estimate of total number of workers employed by firms of each type from our sample. This estimate takes into account the number of workers in each individual firm and how many workers in the population they represent (i.e. the weights of the sample design). Note that a similar sample estimate can be obtained for the total number of workers in the construction sector as a whole.

The total number of workers is then corrected to account for the share of the output that is bought by the program. A direct link between output and employment can be drawn because of constant returns to scale technology adopted by the firms and the findings that factor proportion do not vary by size. This step gives us an estimate of the "true number" of workers who can be accounted for by the program.

A further correction is introduced to account for the fact that not all firms work 12 months a year. This leads us to a full-time equivalent estimate which is comparable across firms type. Note that we do not specifically introduce further corrections for days and hours worked as variation across firm types is on average minimal.

In the case of program firms, **to arrive at our final estimates of full time equivalent workers in the program we consider that** 43 percent of all workers in the formal housing construction sector in Addis work in a firm which is participating in the program,[74] and that on average program firms sell 86 percent of their output to the IHDP. This leads us to an estimate of job opportunities provided by the program of 22,438 workers over the past year. Factoring in that firms were not operating all year we arrive at an estimate of labour absorption by the program of 17,138 full-time equivalent jobs for 2005/6.[75]

Table 4.10: Labour Absorption in 2006 by Firms by Size and Program Participation Status

	Non-program SME	Program SME	Non-program Large Contractor	Program Large Contractor
Survey estimate of Number of Workers	18149	19322	15918	3116
Survey based estimate of full-time equivalent workers[76]	13280	14378	14054	2760
Memo items:				
Average number of days each employee works each month	22.5	23.4	23.5	23.4
Average number of months operated	9.0	7.1	8.9	9.6

[74] Note that the total value of output produced for the IHDP is lower because of the fixed price system. This percentage was calculated by dividing the share of output produced for the IHDP as a percentage of total output, deflated by the relative price of program outputs.

[75] Note that variation in average number of days and hours worked turned out to be rather low across firms and was consequently not corrected for.

[76] Full-time equivalent obtained as (number of workers*months operated)/12. Note that the number of days worked per month does not differ drastically between different types of firms, on average, which is why we leave it out of the calculation.

5. THE IMPACT OF SUPPORT ON PROGRAM FIRMS

5.1 This chapter reviews how the support the program provides affects the performance of firms, complementing the findings on the impact of support already presented. A description of program support in alleviating firms' constraints and tackling market failures is followed by an analysis of the impact of program support on productivity and profitability trying to unpack the effect of individual types of support. In the last section we expand the analysis to discuss the possible effects of the program on non-beneficiaries.

CONSTRAINTS AND SUPPORT TO PROGRAM FIRMS' OPERATION

5.2 The AACES suggests that construction MSE components are far from operating at full capacity.[77] This suggests that the sector is already very competitive, one of the objectives that the program tries to address. Input constraints are the most frequently cited reason for capacity underutilization (see Box 5.1 for qualitative evidence on firms' constraints). Indeed, 75 percent of non-program MSEs and 86 percent of program MSEs report facing difficulties accessing inputs. All large contractors claim that they face input constraints, and 44 percent of all firms indicate they have had to refuse contracts because they lacked inputs. Cement is the scarcest input. Surprisingly, a larger proportion of program firms reports facing input constraints than non-program firms.

Box 5.1: Anecdotal Evidence on Firms' Key Constraints

At the time of the survey, virtually all firms, with the exception of MSEs engaged in electrical and sanitary installation, complained about the lack of inputs and the lack of demand, two issues which are closely related. Small firms tend to see finance as their biggest challenge, while large firms claim the lack of inputs as their major problem.

The shortage of cement is one of the most serious issues facing the construction sector as a whole and frequently causes construction delays. Some illustrative comments from interviews with managers and workers include the following:

'We have stopped working for 20 days now. Since starting the project 6 months ago, we have not been able to work 2 months because of cement shortage.'

'We are fortunate that we are constructing a building for the government; that makes it easier to get cement. yet, even they [the government entity that is paying for the building] have difficulty getting cement.'

'The price of cement used to be 60 birr, now it is 120 birr per quintile. On the black market the price is 250 birr per quintile.'

Fortunately, it seems that the government has recently been taking important steps to alleviate input constraints, for instance by allowing the import of cement.

Source: Interviews with workers and firm managers, Dec. 2006 (see Box 4.1 for more background information).

[77] On average firms operate 9 months per year and at 49 percent of their capacity. Only 3 percent of firms report operating at 100 percent of their capacity.

5.3 Credit is the most important obstacle to operating successfully on a day-to-day basis according to the majority of firm managers. Interestingly, program firms are as likely as non-program firms to cite credit constraints as their major problem, even though a much larger proportion of them managed to obtain formal credit.[78] Of non-program MSEs, 35 percent took out a loan from any source, while 77 percent of program MSEs took out a loan. The difference can be attributed to the better access program firms have to formal credit (65 percent vs. 13 percent). While interest rates for formal loans are similar, program firms are less likely to have to put up collateral for credit. Assuring access to credit seems a major achievement of the program. It is worth noting, however, that 53 percent of program firms that got a loan from a formal credit institution are currently in default on their loans, against only 11 percent of non-program firms (Table 5.1). This could suggest that the program is allocating credit inefficiently – yet, at the time of the survey the program had just started and input constraints were severe, which might explain why so many program firms were in default.

Table 5.1: Use of credit by firm type (percentage)

Type of Firm	Proportion out of firms that ever took a loan	Defaulting (as a percentage of all firms taking out a loan)	Recipient of a Formal Loan	Collateral required for this formal loan
Non-program MSE	35	11	14	78
Program MSE	77	53	65	43
Large Contractor (Non-Program)	54	18	54	100
Large contractor (Program)	55	12	39	78

5.4 Comparing sources of start-up capital confirms the importance of access to credit for firm operation. For 32 percent of program MSEs, an MFI constituted the major source of initial capital, whereas none of the non-program MSEs in the sample reported this. Own saving was the most important source of initial capital for 81 percent of the firms outside of the program and for 50 percent of firms in the program. The importance of access to credit is further evidenced by the fact that the 75 percent of the program firms that exited claimed it was because they could not obtain access to credit.

5.5 Not all program firms received all types of direct support. Of MSEs in the program, 85 percent received some support, but only 6 firms received access to a place to work, a building, access to credit, machinery and training. Firms engaging in pre-cast beam production and/or hollow block production are supported the most. Of all firms which received support (MSEs or large contractors), 68 percent received a piece of land, 36 percent received buildings on their land, 31 percent received machinery and 50 percent received access to credit via the program.

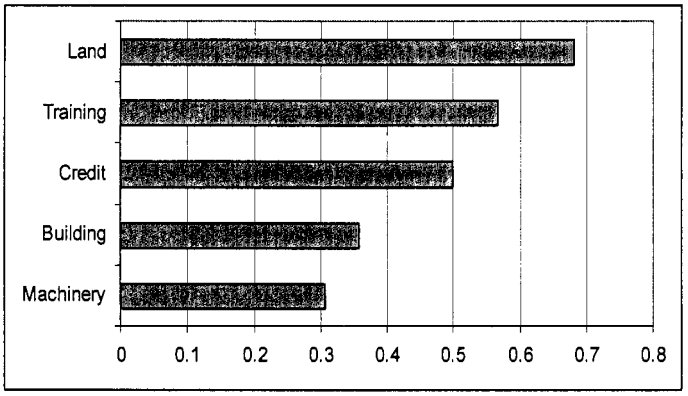
[78] It is a well-known limitation of this type of data that the interpretation of self-reported credit constraints are difficult to interpret as many of the respondents could be "bad risks" rather than suffering from a market failure. The difficulties of obtaining credit without collateral suggest however that credit constraints are likely to affect a significant number of MSEs.

Table 5.2: Distribution of Types of Support by Types of Firms (percent)

Number of types of support[79]	Program MSEs	MSEs PCB and HCB	PCB	HCB production
0	22	33	0	15
1	27	33	4	23
2	28	20	25	13
3	20	10	38	29
4	8	3	21	14
5	5	2	13	7

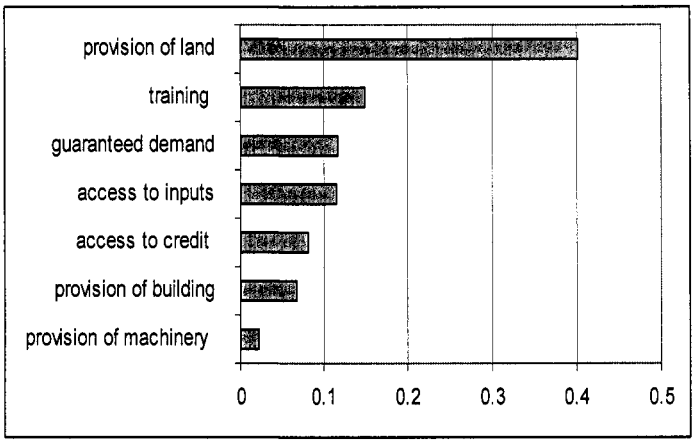
5.6 In general, different types of support are only loosely correlated, though there are some notable exceptions. For instance, firms which get access to a place to work typically also get access to credit (ρ=.35). In addition, firms which receive machinery are likely also to receive training (ρ=.14) and credit (ρ=.13). In contrast, training is negatively correlated with receiving a place to work (ρ=-.20). In other words, support seems to be packaged in different ways. The packaging of support is important since the literature on active labour market programs suggests that programs that provide assistance on multiple fronts produce better results than support programs that tackle single constraints. More analysis is needed to identify the most effective way of bundling different interventions in the case of Ethiopia.

Figure 5.1: Types of Support Received by (All) Program Firms



[79] Note that other support is excluded.

Figure 5.2: Rankings of Benefits of Program Participants



5.7 It is interesting to compare the types of support received with the perceptions of the main benefits of program participation by the managers of participating firms. Land is seen as the most valuable benefit by 42 percent of them, while access to inputs, demand and training are considered to be so by 12 percent, 12 percent and 16 percent of them, respectively.[80]

5.8 Note that the finding on the importance of land is in line with results from other firm-level research. For example, focus groups conducted by the World Bank in 2005 as a follow-up to the 2002 Investment Climate Survey found that firms consider access to land for construction to be the most severe investment climate constraint they face. Note however that access to land of good quality can remain a problem also for program firms: 42 percent of firms complain about problems with utilities and 45 percent about problems with market access (Table 5.3). For a fuller treatment of the issue of land regulation in urban areas see also World Bank 2007 b.

Table 5.3: Percent of Firms Reporting Problems with Utilities and Market Access

	Non-program MSE	Program MSE	Non-program Large Contractor	Program Large Contractor
Problems with Utilities	43	39	44	47
Problems with market access	45	52	47	40

PROGRAM SUPPORT AND FIRM PERFORMANCE

5.9 In the previous section we ascertained that not all firms receive support from the program and that not all those that receive support receive the same type of help from the program. It is interesting to analyze whether firms' perceptions of the types of support that they receive (see Box 5.2 for qualitative evidence on this) appear to be confirmed by the

[80] Note that the support provided by the program in terms of land is visible also in the low mean payments for land by firms; 3253 Birr for non-program MSEs versus 2644 Birr for program MSEs.

analysis of the impact of support on firm performance, both in terms of effect on productivity and of profitability, and then aiming to identify which elements of support appear to be driving those effects.

Box 5.2: Firms' Perceptions of the Effectiveness of Program Support

Program firms received support in terms of land provision and subsidization, training, access to credit, inputs and (subsidized) machinery on credit. Perhaps the most important form of support is the opportunity to have a job. Not all firms received each type of support. The common theme is that the support that was provided by the IHDP is appreciated, yet not sufficient[81] (although the program envisions that in the long run SMEs ought to be self-sustaining).

Land. Land is one of the types of support that is often not provided by the program, yet when it is provided, it is appreciated. Land is often highly subsidized. Some firms reported paying as little as 2 birr per m2, while market prices of over 2000 birr per m2 are not exceptional. Moreover, obtaining a piece of land in the restricted land market is otherwise difficult. Unfortunately, many of the plots used by construction firms, both in and outside of the program, are located at the outskirts of the city and lack essential infrastructural facilities such as access to water, electricity and all-season roads, leading to underutilization of capacity and high transportation and transaction costs. As expressed by one of the respondents: '*here is nothing, only electricity, not even a road; in the rainy season you won't see a single car here.*' Nevertheless, the value of having a piece of land should not be underestimated.[82]

Training. Not many respondents received training and those who did receive training had varying opinions about its usefulness. Some claimed it was the most important benefit provided by the program, while others claimed the training was practically irrelevant for their activities, for example by stating: *it [the training they had received] was very theoretical and there was no follow up; since it was not practical it was of little use to us.*'

Access to credit. Despite facilitating access to credit for a number of firms, many firms remain credit constrained. They have either not managed to obtain a loan, or would want to borrow a greater amount of money. Furthermore, many of the firms which are provided inputs and machinery on credit claim to have had to repay their loans much sooner than the agreed repayment arrangement specified, causing them difficulties.

Demand. Virtually all firms in the construction sector, with the exception of those in electrical installation, complained about not having enough work. Unsurprisingly therefore, the opportunity to obtain work through the programme is highly appreciated by all program participants. Yet, virtually all MSEs complain about a lack of demand. Many IHDP firms are out of work, including many firms which were set up with support of the IHDP yet have not yet had the opportunity to work for the IHDP. The problem of not getting program contracts is most serious for firms producing pre-cast beams, because there are limited alternative customers. The fact that many programme firms are struggling to survive on their own suggests that the support from the programme is critical and that sustainability may be a real issue. Furthermore, firms that could in theory complete assignments for clients other than the IHDP have complained about regulations preventing them from producing for such clients. Such rules, however, if they indeed exist, are incongruous with the program guidelines which stipulate that firms are allowed to serve clients other than the IHDP.

Source: Interviews with workers and firm managers, Dec. 2006 (see Box 4.1 for more background information).

5.10 In order to study the impact of program support on performance, the production functions already presented in Chapter 4 (see Table 4.6), have been re-run drawing a distinction between firms participating receiving support and those that did not receive

[81] Of course, one should be aware that it is not in the interest of respondents to claim the support they received was fully adequate; perhaps the knowledge that one was being interviewed by the World Bank made provided firms with a strategic incentive to try to ask for more support.

[82] It is perhaps telling that it was not uncommon for respondents to answer "yes" to both the questions "is your location good" and "would you like to move if you could?"

support, and exploring the effects of different types of support. This analysis reveals that from the point of view of productivity, access to credit is the most effective type of support as it is associated with significantly higher production. Access to a workplace and provision of a building appear also important.[83]

5.11 A similar analysis has been conducted for and profitability,[84] running regression of profits per worker on capital per worker and the number of workers. Program firms are on average much less profitable than non-program firms. However, this effect is driven by program participants who did not receive any type of support, as those firms are significantly less profitable than all other. Firms which receive a building from the program are significantly more profitable than program firms which do not receive such support, while other types of support do not appear to be significant.

5.12 In short, these findings suggest that when looking at the impact of program support on firm performance, credit is strongly related to productivity, while receipt of a building to work in is strongly related to profitability.

Broader Impacts of the IHDP

5.13 While we cannot draw conclusions on the overall impact of the entire IHDP, we can draw some inferences on the impact of the IHDP on the construction sector at large. Given the scale of the program and input constraints in the sector, it might have affected non-beneficiary firms by leading them to shed jobs, or stunting their growth. These effects, of course, would lower the employment creation effects of the program itself. We explore these issues by presenting descriptive statistics on entry and exit in the construction sector, and by reviewing the subjective assessments of the impact of the program made by managers of firms in the housing construction sector.

ENTRY AND EXIT

5.14 Analysis of entry and exit dynamics explores whether crowding out of non-program firms by the new entrants created by the program has occurred. In the AACES firm turnover is high, as reflected by the age distribution of firms; the average firm is in our sample is 3.2 years old, while the median age is 2 years. However, most firms that exit do so in the first few years of operation; 44 percent of firms that have exited have done so after less than a year of existing, while fewer than 10 percent of firms that exited had been operating for more than 3 years. This is consistent with the pattern of entry and exit in other countries and sectors (see e.g., Scarpetta et al., 2004).

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[83] However these dummies are not significant at conventional levels.

[84] Note that our profit measure is defined as revenues minus expenditure on material inputs and wages. It considers, therefore, only direct costs, while it is likely that program firms have substantially lower indirect costs. For instance, for some program firms capital and the place where they work are subsidized. In addition, because the majority of program firms are cooperatives they pay significantly less profit tax. Alternative profit measures, based on revenues and expenditures and self-reported profits have also been tried. Yet, these measures of profit do not overturn the pattern of results (while doubts can be raised on the quality of the indirect costs information collected). In addition, program MSEs pay higher wages.

5.15 In addition to the AACES a short phone interview was administered to a sub-sample of firms from the Addis Ababa City registry. Of firms in our sample, 21 percent started in 2006, suggesting that net entry rates are positive and substantial.

5.16 The evidence suggests that the program has had a limited impact on entry, though it might have exerted indirect pressures on some of the incumbents. More than three quarters of entrants into the construction sector over the past three years have not participated in the program. In addition, gross entry of non-participants in 2005 and 2006, the years for which the data are most reliable, are almost identical, despite variation in gross entry of program firms.

5.17 Estimates of exit rates from these data are much more difficult as there are strong suspicions that they might be biased by the deletion of firms who do not renew their license from the registry. [85] Our estimate is of an exit rate of 14 percent of firms in the registry in 2006.[86]

5.18 An interesting element emerging from these findings is that for program firms getting work from the IHDP is the key determinant of survival: 95 percent of program firms in the sample have ever completed a program assignment, while only 13 percent of program firms that perished claimed they were working for the program. In total, at least 22 percent of the firms supported by the IHDP have exited since the start of the program. The average exit rates of program firms are thus marginally lower than the typical exit rates of non-program firms.

Perceptions of Program Impact

5.19 The AACES includes a module with questions on perceptions by firm managers on the performance of the IHDP. These data offer some insights on the elements of the program which seem to be effective, and on its perceived impact on the sector as a whole. The main findings are:

- 54 percent of the managers claimed they did not join the program because they were not aware of it, 21 percent because participation would not have been beneficial (the rest either had no opportunity to register, or did not fulfill the criteria).

- With respect to the overall business environment, 77 percent of firms believe competition has increased over the past 3 years because of the program, while 11 percent believe it has decreased. Of those that believe competition increased, 35 percent (or 27 percent of all firms) believe it was because of the IHDP. Firms working

[85] Note that prior information from the AA trade and Licensing office suggested that firms who fail to renew their license are not deleted from the registry itself. Inspections of the data reveal that this is very unlikely; though it was not possible to identify with which regularity the registry is updated.

[86] Retrospective computation of survival rates of firms in previous years, suggest these have dropped from 96 percent in 2003 to 86 percent in 2006, hinting that the program may have contributed to higher exit rates. Note however that the size of the bias in underestimating exit rates tends to increase as time passes, since eventually all firms which have exited in any given year are removed.

for the IHDP are much more likely to indicate that competition increased because of the IHDP than non-participants (in total 15 percent vs. 38 percent).

- Only 10 percent of non-participating firms believe termination of the IHDP would improve their business, while 18 percent of IHDP participants indicate that termination of the IHDP would cause their company to go bankrupt, and another 33 percent fear their business would slow down should the program be terminated.

- The IHDP, on average, purchases 86 percent of the output produced by firms participating in the program, and only 56 percent of IHDP firms have ever completed contracts for clients other than the IHDP. For IHDP firms, support is considered very important.

- Firms are more concerned about competition from non-program firms than about competition from IHDP firms. 36 percent of all firms indicate that they experience competition from IHDP MSEs, while 48 percent of all firms report experiencing competition from non-program MSEs.

- Program contractors, who work for the program on a fixed-cost basis, are vulnerable to rising input prices. As program contracts are not indexed some firms claim they are struggling to adjust, which may lessen their willingness to participate in the program in the future.

- Regarding the impact of the IHDP on the labour market, 46 percent of managers believe that the program has not caused changes, or do not know about the program. 13 percent claimed the program had contributed to the shortage of skilled workers, while 9 percent contended that the program had sparked a general wage rise. 8 percent of employers took a more positive view and replied that the program had created employment and income.

- When asked about the impact of the IHDP on input markets, only 15 percent of managers claimed either that the program had not had an impact, or that they did not know of the program; 49 percent claimed that the program had contributed to increasing shortages of raw materials; and 23 percent argued along similar lines that the program had led to rising input prices.

- When asked about the impact of the IHDP on output, 54 percent of firm managers responded that the IHDP had not affected their level of output, while 12 percent claimed that the shortage of inputs resulting from the IHDP had forced them to delay certain projects.

5.20 In sum, the program seems to have contributed to competition in the housing construction sector and has exerted upward pressure on input markets, although this finding may be at least in part driven by the fact that the survey was conducted at a time when input shortages were particularly acute. The impact of the program on labour markets seems to have been limited, even though many of the interviewed managers complained about price escalations in recent years.

5.21 The fact that inputs used by the program are no longer available for non-program firms suggests that the program might have crowded out non-program firms. This would suggest that the net creation effect of the program would be lower than what discussed in Chapter 4. Yet, given market failures in both land and capital markets the extent to which firms outside the program might have really thrived is debatable.

6. THE BENEFITS OF PROGRAM PARTICIPATION: INCREASED EARNINGS

6.1 A crucial element of the pro-poor nature of the IHDP is the extent to which workers benefit from program participation. This chapter investigates this issue by comparing how much workers in program firms would have earned had they been working for a non-program firm.[87] This chapters starts by presenting an overview of the wages earned by workers in different occupations in different types of firms, before proceeding to analyze the impact of the program using an earnings functions framework.[88]

A DESCRIPTION OF EARNINGS

6.2 The median wage in the construction sector is 450 Birr a month, but there is significant variation (Table 6.1). Engineers, the best educated workers, earn the most with a median wage of 2000 Birr per month, while unskilled labourers, the least educated workers, are the worst off with a median monthly income of 300 Birr. Large firms pay higher wages than small firms for almost all occupations.

Table 6.1: Median Monthly Wages (in Birr)

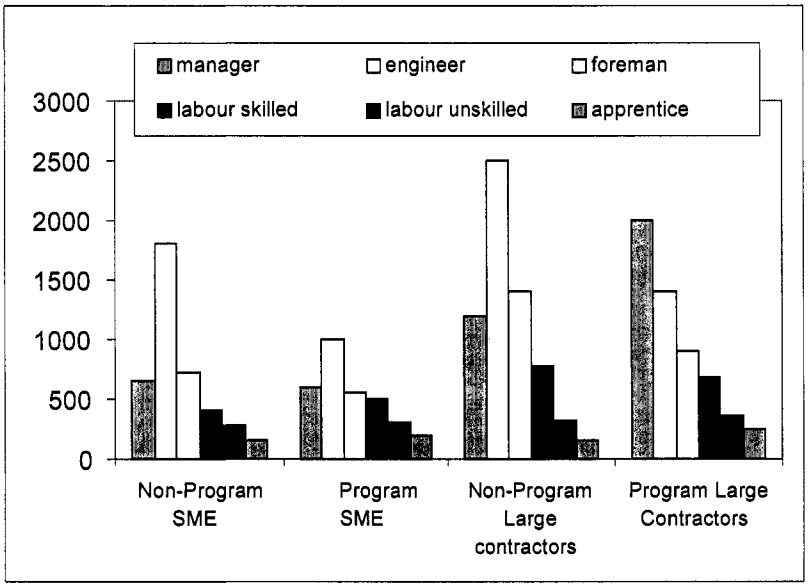
	Manager	Engineer	Foreman	Labour (skilled)	Labour (unskilled)	Apprentice
Non-Program SME	650	1800	720	400	273	150
Program SME	600	1000	550	500	312	200
Non-Program Large contractors	1200	2500	1400	780	320	150
Program Large Contractors	2000	1400	900	675	360	250

6.3 Program firms pay lower wages than non-program firms for more specialized jobs (foreman, engineer manager) but they do pay more than non program firms for skilled and unskilled labourers and for apprentices. Contractors pay more than SMEs for all jobs (except apprentices) and hire more skilled workers than SMEs outside the program. Figure 6.1 shows median monthly wages, in birr, by occupation, program participation, and size of firm.

[87] Clearly, other counterfactuals, such as being employed or working in another sector are possible. The one we choose for this analysis is however consistent with our overall methodological approach which takes the goal of housing construction as a given and our focus on the IHDP.

[88] As already mentioned in chapter 3, ideally analyzing this issue would require ideally the availability of panel data to analyze how program participation has influenced earnings and to consider potential dynamic benefits on the workers.

Figure 6.1: Median Wages by Occupation, Firm Size, and Program Participation Status



6.4 Regressions of earnings as a function of worker and firm specific characteristics have been run. The main findings are:

- Returns to schooling are higher for higher educational level, and progressively increasing with the level of educational attainment. In addition, having completed an apprenticeship is associated with higher earnings.

- Being a casual worker is related to lower earnings.[89] Women are paid about 30 percent less than men—this finding remains even when controlling for occupational variables, pointing therefore to unequal pay for the same types of occupations between women and men.[90]

- Program participation has a positive and significant effect on earnings suggesting that workers in program firms earn more than comparable worker in non-program firms. This program premium exists for workers in program MSEs only.

- The program premium seems to be related to the size at which firms operate, and, to the extent that differences in remuneration reflect differences in productivity, and the higher input intensity of their technology.

- Estimating the models for individuals in different ranges of the wage distribution (quantile regressions, with key coefficients summarized in Table 6.2.) show that the

[89] Interactions between education dummies and being a casual worker are not significant, suggesting that the returns to education are similar for both casual and permanent workers—these results are not shown.
[90] Women's disadvantage is compounded by the fact that they are less likely to complete their schooling – which indirectly further affects their earnings potential.

effect of program participation on earnings is strongest for those at the bottom of the earnings distribution.

Table 6.2: The Impact of Program Participation on Workers at Different Quantiles of the Earnings Distribution

	10%	25%	50%	75%
Individual Controls only	0.303*** (4.16)	0.160** (2.79)	0.0867 (1.28)	0.0688 (1.29)
Individual Controls and Firm Controls	0.150 (0.64)	0.0152 (0.58)	-0.0452 (-1.16)	-0.0220 (-0.26)

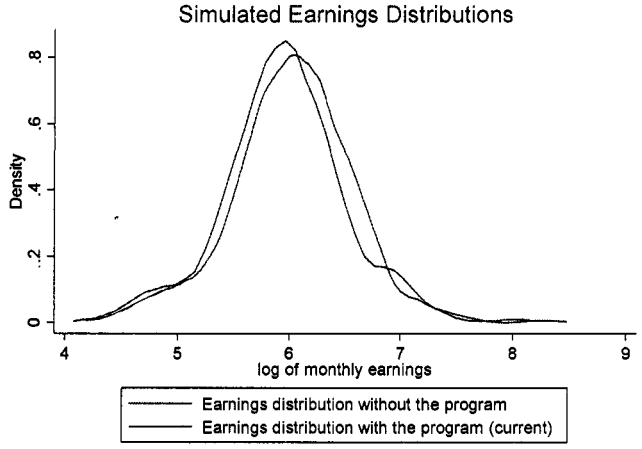
Note: * significant at the 10 percent level, ** significant at the 5 percent level, *** significant at the 1 percent level.

6.5 An important caveat of these results is that the size and direction of the program premium identified could be influenced by non-observable differences between workers in and out of the program. Several econometric techniques failed to identify this effect with the data available.

Simulated Distributional Impact

6.6 To provide an estimate of the aggregate effect of the program on monthly earnings, we simulated earnings distributions. Figure 6.2 contrasts the current distribution of earnings with the earnings predicted in the absence of the program. The figure suggests that the program has shifted the earnings distribution to the right. In addition, the earnings distribution without the program has thicker tails, suggesting that the program has contributed to a more egalitarian wage distribution/has led to wage compression. Yet, though the program premium is largest for those at the bottom of the distribution, as relatively fewer of them are in the program (e.g. 21 percent in the bottom quintile vs. 67 percent in the second lower and 52 in the third lowest), the shift in the distribution is most noticeable for those who are in higher deciles of the distribution.

Figure 6.2: Simulated Earnings Distributions



7. CONCLUSION

7.1 In this report we have provided a first look at the employment creation effect of the IHDP focusing on the central issue of whether the program has created more jobs than would have been created relying on existing firms. The centrality of this question is that if this is not the case, then investing in coordinating the MSE support with the housing program is only justified if there are other benefits to doing so, such as job creation for the poor, or strengthening capacity in the construction sector as a whole. This study also addresses some of these other potential benefits, although a complete assessment would require a comprehensive impact evaluation study.

7.2 The limitations of this analysis should be made clear. The employment creation impact of the program has been assessed conditional on the housing demand exerted by the IHDP—in other words, the analysis does not compare the employment effect of the program versus the absence of the program. The use of cross-sectional data does not permit us to assess adequately the dynamic benefits of the program. Last, the survey was undertaken in December 2006, at a time when there was a particularly severe shortage of material inputs such as cement and re-bars in the market. This situation may have biased some of the results (these effects are highlighted in the text).

7.3 It is also worth underscoring that our emphasis in this analysis is different from program documents which measure the success of the program in terms of the absolute numbers of jobs created. Nevertheless, some of the insights from this study point to the difficulties of calculating what is a job; particularly when sustainability and capacity utilization in the sector might be a concern.

7.4 Two main assumptions at the heart of the design of the program have been identified and tested: (i) that the MSEs in the construction sector, and particularly MSEs in the program, are more labour intensive than larger firms; and (ii) that the support offered by IHDP to MSEs in the program is needed to overcome the market failures which would otherwise hinder their establishment and sustainability.

7.5 With respect to the first assumption, our analysis shows that MSEs are indeed more labor intensive than large contractors, an effect which does not depend on the size of the firms bur rather of the activities they engage in. However, when comparing MSEs, labour demand is found to be similar among program and non-program MSEs. These findings suggest that the program has not created a more labour intensive supply chain for housing than would have been the case using existing MSEs, at least in static terms.

7.6 We also tested whether the employment creation effects of the program occur through dynamic effects by determining whether program firms grow faster than non-program firms. IHDP firms are found to employ typically more workers than non IHDP firms. Our analysis finds that the growth in employment in program firms is not faster than in non-program firms. Rather, they are larger because they started larger, employing more workers at startup. The finding is interesting as there is a large body of evidence showing that large firms tend to grow more slowly than smaller ones. The fact that program firms manage to stay

larger suggests that program participation helps firms grow faster than non-program firms which started with a similar size.

7.7 For what concerns the second hypothesis on the need of program support to overcome market failures, we find that MSEs report significant constraints particularly in terms of access to land and credit. Even if these constraints are self-reported, and as such not necessarily indicative of market failures per se, the existing literature confirms that the regulatory environment as well information asymmetry can seriously limit access to factor markets. Our findings show that not all firms in the program receive support, but those that receive support perform significantly better than those that do not. Access to credit seems to be the most effective type of support and is associated with significantly higher production. In addition, the provision of a space to work is associated with significantly higher profitability (suggesting that renting space might be expensive, and the provision of a working space significantly reduces costs). Both these elements of the program seem therefore to be having a positive impact, and it might be worth considering whether greater efforts need to be made to ensure that all firms in the program have access to them.

7.8 While ensuring greater coverage of support is within the program remit, it is worth underscoring that other broad ranging policy reforms could strengthen the program ability to reach its own goals. The development of a more robust mortgage market, for example, could allow the extension of commercial financing to a greater segment of the housing market. With a smaller supply gap in the provision of housing, public resources could be more effectively targeted to the provision of low income housing. These possible developments seem in line with PASDEP vision of a national Integrated Housing Development Program that "integrates public and private sector investment with MSE development and the provision of basic services" (p. 163). Similarly, reform options for the way land is allocated could be considered and prove to be beneficial to the development of the construction sector (and more generally of urban development). These are discussed in details in World Bank 2007, b.

7.9 One of the crucial elements of program support appears to be the guaranteed demand for the firms' products that it provides. However, there are signs that fixed price system de facto in vigor resulted in lower profits (as input prices are similar across program and non-program firms, but output prices are lower). Consistent with our diagnosis, options to introduce a system which would provide for a more systematic review of contractual terms, are currently being considered.

7.10 While this points to the positive impact of program interventions, the findings also raise some concerns about the sustainability of the jobs created. Despite signs of a construction boom, capacity utilization in the sector appears far from full. This is explained by IHDP staff as a result of the inability of the IHDP to build the total number of housing units according to the planned schedule. Nevertheless, this illustrates that MSEs created by the program might be unable to adjust to changing demand conditions. This highlights the possible lack of competitiveness of program firms in the wider market. This seems to be supported by the fact that when asked about their competitors, the majority of firms indicate that their greatest competition is from firms outside the program. A related concern is that the program might be encouraging an excessive specialization in products which would not be

demanded in the present extent (e.g. pre-cast beams) by construction systems different from the one currently adopted by the IHDP.

7.11 It is worth underscoring that the overall effect of the program on employment partly depends on how the program has affected non program firms. From the perspective of non-program firms, the program has increased the pressure on limited input markets, making it more difficult for non-program firms to compete. The direct impact of the program on labour markets (both in terms of absorption and driving up wages) seems to have been limited.

7.12 A further hypothesis that has been explored is whether program firms create employment which is more pro-poor. This aspect is particularly relevant because program documents emphasize its role in improving the livelihoods of low-income residents, while available evidence shows that such role is not fulfilled by the housing component of the program. Further, the program sets itself goals in terms of reaching particular groups such as women. Our analysis of the beneficiaries highlights that program firms do not significantly draw upon the low skilled workers or the unemployed, nor do they employ significantly more women than non-program firms, though it offers a possibility for casual workers to become permanently employed. These finding does not challenge the usefulness of creating jobs in urban areas. However, alternative programs or interventions may be necessary to specifically target the poorest and less skilled population in urban areas.

7.13 While the program is not particularly effective at reaching particularly vulnerable groups, program firms remunerate workers more, particularly those at the bottom of the wage distribution. Overall, therefore, the program seems to have a positive distributional effect, even though such effect is bounded by the program limited coverage of workers in the bottom decile – a finding which is not surprising given that participation in the program appears to require better skills than working in non-program MSEs. Further, while the program does not seem to reach particularly some of the groups it was meant to (e.g. women), and benefits others, for example migrants (a large proportion of workers in the sector appear to have migrated as adults), it might have contributed to reduce unemployment in other ways such as by increasing labour demand and removing market failures which would have prevented MSE developments.

7.14 The main implications of this study as the IHDP continues to be implemented in Addis Ababa and as it is being rolled out to other regions, can be summed up as follows:

- While the large absorption of labour by the program is unquestionable, the issue of whether the program is the most efficient way of creating jobs needs to be considered. We find evidence of possible significant dynamic benefits of the program (e.g. in terms of firm growth), which suggests that from the point of view of the employment creation effects of the program, elements such as the introduction of new technology to the sector, building skills which might make firms sustainable in the future, and building skills for specialized workers deserve to be strengthened.

- It is not clear that the complexity of coordinating the housing and the MSE support side of the program pays off in terms of benefits. Note that while the program aims to address mostly the constraints in terms of skills and technology, de facto its greatest

benefit in a very competitive environment such as the construction sector is the provision of demand. The program appears to have fostered the entry of a great number of firms, but at least in the short run the entry of these firms and their employment creation impact do not appear to have increased demand for labour more than if alternative MSE-based housing delivery options had been pursued. In light of the costs of coordinating the program, and in particular the supply of inputs and the construction side of this MSE based model, it is worth considering whether alternative MSE-based housing delivery options could free resources to focus on the more successful aspects of the program, such as for example by strengthening skills development.

- The high degree of capacity underutilization of MSEs deserves closer scrutiny to ascertain whether the targets in terms of firm creation are realistic. Setting appropriate targets for firm creation will be particularly important as the program is rolled out to other regions. Further, the extent to which underutilization might reflect excessive specialization in products used mostly by the IHDP should be assessed.

- Measures should be taken to strengthen and increase access to factors of production that are found to be critical for firm survival and growth – namely, the provision of credit and working spaces.

- The fixed price system can be detrimental to the survival of the firm if the prices are not regularly reviewed to take into account market prices of inputs not directly provided by the program. Current efforts to address this challenge are therefore very welcome.

7.15 The monitoring system of the program needs to be strengthened by clarifying the type of indicators to be collected by the program and their purpose. If the program's employment targets are to be measured primarily by the absolute number of jobs created, this needs to be better defined taking into account issues of capacity utilization and sustainability. In addition, as the program is rolled out to different urban areas and faces challenges specific to local conditions, it will be important to experiment with alternative design features and learn from those experiences, in the spirit of PASDEPs' emphasis on "seeking results through learning" (p. 224).

7.16 To increase the overall efficiency of the program, it might also be worth considering implementing the incentive system for rewarding good performance with repeated contracts, as originally planned by the program. Such system could contribute to the competitiveness of firms and thus their sustainability; and help improving the targeting of support.

7.17 Finally, it is worth noting that while the program appears to have an overall progressive impact, its employment generation component is not necessarily reaching some of the intended target groups (women) or the poorest. To the extent that these objectives are an important motivation for the program, other specific interventions with a strong pro-poor impact might also be needed.

APPENDICES

APPENDIX A: SAMPLE SCHEME

A.1 Sampling of Firms

In sampling firms a distinction was made between program and non-program firms, as well as between contractors and non-contractors.

Non-Contractors

Table A.1. presents an overview of the proportion of firms in the underlying population of interest, sorted by activity, and the corresponding proportion of firms in our sample. To ensure our sample was representative, we made sure that the proportion of firms in our sample roughly corresponds to the proportion of firms in the population engaging in a particular activity.[91] If only very few firms engaged in a particular activity, such as carpentry, that activity was typically not included in the sample, while firms in other relatively minor activities were marginally oversampled, at the expense of slightly undersampling firms engaging in popular activities. One problem was that firms can engage in different activities at the same time. Since it was difficult to establish which firms engaged in multiple activities, this was not taken into account when sampling firms. It turned out that 15 program non-contractors and 32 non-program non-contractors engaged in multiple activities.

One difficulty in sampling firms was that many were registered under the rather general headings of "Production & Sales of Unfabricated Building Materials" and "Production & Sales of Fabricated Building Materials"; while clearly relevant for the purposes of comparison, it was difficult to guess a priori to what extent these firms engaged in activities comparable to program firms.

Contractors

Contractors in Addis fall in two types: building contractors, which only focus on the construction and general contractors, firms which engage in a multitude of activities which may include building construction but also road construction and infrastructure development. The sample was confined to building contractors, since we wished to avoid comparing the incomparable. Contracting firms were sampled on the basis of their license grade, rather than on the basis of their activities. As can be seen in Table A.2 below, large contractors were oversampled to ensure they were represented in our sample. The table also reveals that the sampling frame provided by the list of program firms was not fully accurate as a number of firms had a license grade which was either higher or lower than the license grade listed in the list of program firms and the general registry of firms.

[91] Also note that for pre-cast beam production, and to a lesser extent for hollow block fabrications, there are no suitable counterparts for program firms, since firms engaging in these production activities use methods not previously applied in Ethiopia. In addition, electrical and sanitary installation was not practiced separately prior to the introduction of the program. Consequently, it was difficult to trace firms engaging in such activities amongst non-program participants.

Table A 1: Non-Contractors

	Program		Non-program	
	# in population 1418	# in sample 89	# in population 2395	# in sample 97
Activities engaged in by different firms[92]				
Pre-Cast Beams	186	24	1	1
Hollow Blocks	440	39	297	32
Wood and metal Work	408	41	461	25
Gravel	92	9	2	4
Wall	162	13	0	6
Electrical Installation	80	8	3	5
Sanitary Installation	32	8	0	7
Site work and Finishing	23	11	0	9
Other	0	2	61	5
Fabricated[93] Building Materials	0	0	1450	0
Un fabricated Building Materials	0	0	120	0

[92] Note that firms can engage in different activities.

[93] The categories "fabricated building materials" and "unfabricated building materials" comprise a multitude of activities which are comparable to the activities program firms engage in, which is why firms in these categories were selected for the control group.

Table A 2: Contractors

		Program		Non-program	
		# in population	# in sample	# in population	# in sample
License-grade	1				
License-grade	2				
License-grade	3				
License-grade	4	4	5	60	7
License-grade	5	7	7	141	4
License-grade	6	57	11	107	4
License-grade	7		3	82	4
License-grade	8			140	3
License-grade	9			40	1
License-grade	10			4	2
Total		**70**	**31**	**610**	**270**

A.2 Sampling of Workers

For each firm, up to 4 workers were interviewed. Enumerators were instructed to interview workers in different occupations, if possible. In addition, they were instructed to attempt to interview one casual worker and at least one woman per firm. In addition, they were instructed to attempt to sample women not engaging in unskilled tasks, if possible. High-skilled workers, casual workers and women are consequently overrepresented in our sample.[94]

Unfortunately, the manager's permission was required to be able to interview workers. As a result the sample of workers may not be entirely random, yet whether one was sampled does not seem to be determined by strategic considerations on the manager's part, but rather on random factors, such as being around at the time of the interview.

[94] In the descriptives this is corrected for by using sample weights; the regressions are typically unweighted, unless otherwise stated.

APPENDIX B: CONSTRUCTION OF KEY VARIABLES

Capital

The capital stock variable measures the value of all capital owned by the firm, including buildings, machineries, vehicles, tools, and other assets, at replacement cost. The measure does not account for rental capital.[95] Only 7 firms in our sample indicated to rent capital. Moreover, imputing the value of such rental capital and using the sum of rental capital and owned capital did not affect the results.

Inputs

Data on total inputs were obtained by adding up the expenses for individual inputs. The inputs variable measures the total value of all inputs, not the physical quantity of inputs.

Construction of the Welfare-indicator

The predicted welfare indicator is constructed by using information on asset holdings to predict household expenditure, using the CWIQ methodology. The model was calibrated using data from the 1999/2000 HECIS; household expenditure in that survey was regressed on asset holdings for the subsample of Addis residents. The resulting parameter estimates were used to predict household expenditure using the information on asset holdings in the AACES. Estimates of the predicted welfare expenditure turned out to be rather high, perhaps because ownership of a radio and a TV were lumped into a single category, or because the price of goods, particularly electronics, has changed over the years.

Imputing the Average Educational Attainment of the Workforce

Taking a weighted average of the typical educational attainments of workers in different occupational categories (from the firm-level questionnaire) yields an estimate of the average educational attainment of the workforce. Firm managers' responses to questions about the educational attainment of workers in different occupational categories (managers, engineers, foremen, skilled labourer, unskilled labourers and apprentices), were used to impute the educational attainment of workers in different occupations, while the weights correspond to the relative proportion of all employees of the firm within a certain occupation.

Unfortunately, firm managers only had to provide a coarse estimate of workers' educational attainment, forcing us to impute more specific numbers. The following imputations were used:

1) Never been to school—0 years of schooling;
2) Primary school incomplete—3 years of schooling;

[95] Imputing the value of such capital was difficult since the replacement cost of these items was not documented in the questionnaire; instead items were valued at the median value for each item, multiplied by the percentage deviation of the rental price from the median rental price.

3) Primary School complete—6 years of schooling;
4) Grade 10 complete—10 years of schooling;
5) Grade 12 complete—12 years of schooling;
6) College diploma—14 years of schooling; and
7) College degree—16 years of schooling.

Such imputations are inherently arbitrary and the measure of educational attainment constructed is noisy. Ideally, one would have observed the educational attainment of all workers in the firm, yet this was impossible since only 4 workers per firm were interviewed, which is why we rely on the managers' responses instead.

The Average Age of the Workforce

The procedure for constructing a variable representing the average age of the workforce is similar to that for imputing the average educational attainment of the workforce; a weighted average of the manager's responses to questions about the typical age of workers in different occupations, with weights proportional to the share of the workforce within any given occupation, were used to construct to construct a measure of the average age of the workforce. Again, coarseness in the response options for managers forces us to make arbitrary choices. The following imputations were used:

1) 15-20 years—17.5 years;
2) 20-25 years—22.5 years;
3) 26-35 years—30 years;
4) 36-50 years—43 years; and
5) Above 50 years—56 years.

Price-deflators

The data on the amount and costs of different inputs used and the amount and prices of different outputs produced allowed us to construct firm-specific input- and output prices. Collecting these input- and output data was arduous because firms, particularly large ones, simply do not keep track of the precise amounts and exact costs of (all of) the different inputs they use. The data on inputs and outputs consequently seem to contain a lot of measurement error and some severe outliers, which were dealt with by scaling down reported prices to appropriate orders of magnitude that is to the same order of magnitude as the median price. It should be noted that input and output data were missing for 30 contractors and for 49 firms in total.

To enable a price-comparison between firms using different inputs, input- and output price deflators were created as follows. Firstly, firm-specific inputs and output-prices were created for each in- and output by dividing quantity of input (output) used by the total amount of money paid (received) for the particular input (output). Secondly, these prices were divided by the median price for that input (output) for all firms, to arrive at a relative price. The input price-deflator is then constructed by taking the weighted average of these relative prices, with weights corresponding to the relative cost-share of the respective input in the total

costs of inputs (outputs). Similar deflators were constructed for program and non-program inputs and outputs separately, enabling us to compare the cost of program inputs with the costs of non-program inputs. The resulting price-deflators are reasonably well-behaved as they are symmetrically distributed around 1, although there are some implausible outliers, which are excluded by trimming values greater than 2 and smaller than 5.

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