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Factors Influencing the Performance of a Public Private Partnership in the Digital Services Sector: Evidence from Bangladesh

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Abstract: This paper empirically investigates the performance of a Public-Private-Partnership initiative to spread public digital services in Bangladesh. The government established digital centers, known as Union Digitial Centers (UDCs) run by two-member private entrepreneurial teams in unions, the lowest administrative tier, throughout the country starting in 2007. The paper utilizes a unique census data on the UDCs to examine three performance indicators, namely public service delivery measured by number of public services offered, outreach measured by number of citizens seeking services and financial sustainability measured by annual income. We find that private investment, cooperation from the local political representative and public official and location of the UDC are important determinants of all the performance indicators. Among others, the gender composition of the team and internet usage of the entrepreneurs significantly affect public service delivery and income, but not outreach. Whereas government promotions are important for public service delivery, private promotion are important for both public services and outreach.

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1. Introduction

The public-private partnership (PPP) model as a method of public service delivery has become fairly well established in recent times. This has come about at least partly due to the ascendancy of free-market ideals over statist concepts and is thought to rectify the lack of dynamism and efficiency embodied in state controlled enterprises (Jamali, 2004). The nexus between public and private agents as service providers encompasses a broad range of sectors including energy, telecommunications, transport and, more recently, e-services and information technology. The developing world, in particular, has seen a rise in this particular mode of service provision in recent times.

According to the PPP Group of the World Bank and the Private Participation in Infrastructure (PPI) Database, the total investment in infrastructure, comprising energy, transport, water and natural gas transmission projects, was US$ 51.2 billion in the first half of 2014 compared to US$ 41.7 billion in the first half of 2013, a 23% increase. However, according to the same sources, without Brazil, total investment would have been US$21.9 billion, which is 32% lower, in the first half of 2014 than in the corresponding period in 2013 (US$ 32.1 billion). This serves to highlight the variability encountered in the amount of investment, which is sensitive to outliers represented by instances of high volume investments in specific countries and projects. Nonetheless, the magnitude of the investments serves to point out the importance of the PPP model as a mode of public service delivery.

In recent years, successive governments in Bangladesh have emphasized the important role which information technology can play as a facilitator of socio-economic development. As such, governments themselves have become involved in the process in collaboration with the private

sector through PPP. The objective of this research effort is to examine the impact and efficacy of such a partnership using a unique dataset on the Bangladesh government's Access to Information (a2i) program which was instigated in 2007. a2i aims to improve access to public information and to provide electronic services to the broader public, especially those living outside of major urban centers. The interesting feature of a2i is its propagation mechanism. It has been accomplished by the setting up of Union Digital Centers (UDC) in nearly all of the over 4500 unions (administrative units) across Bangladesh. Run by local entrepreneurs, these centers, in addition to providing a one-stop electronic access window to government information and public services (such as downloading government forms), also offer private electronic-services (e-mail, scanning etc.) at nominal cost, with the profits retained by the entrepreneur.

A well-documented instance of the adoption of PPP as a method of service delivery in the e-services sector of a developing country can be found in Malaysia (Kaliannan et al 2010). However, a theoretical underpinning of PPPs and probably the best known microeconomic treatment of the modality is that of Hart (2003) who utilized an incomplete contracting model as the framework of his analysis. He concluded that the choice between PPPs and conventional provision actually depended on whether it was easier to write contracts on service provision than on building provision, as opposed to financing issues. Much conventional thinking identifies the apparent ease with which funding can be obtained in the private sector for the appeal of PPPs, though it is the public sector, with its powers of taxation, which actually has an advantage. Hart's model thus shifts attention away from financing issues to the central issue: relative contracting costs.

Dewatripont et al. (2005) critically examine the implications of contract design and risk transfer on the provision of public services under PPPs. They find that the touted

advantage of PPPs over conventional public procurement in delivering infrastructure projects on budget may not necessarily be true, the reason being that the avoidance of cost overruns may itself be costly and that cost overruns themselves could be seen as equilibrium phenomena. Furthermore, the use of external or third-party finance in PPPs could mean that some of the return on efforts exerted by the private-sector party goes to outside investors, thereby negating the beneficial impacts generated as a result of bundling the construction and operation (an identifying characteristic of PPPs).

Auriol et al. (2009) study the impact of the government budget constraint on regulation of natural monopolies in adverse selection contexts. They propose government outsourcing as an alternative to the regulation of firms freely entering the market and go on to show that the government can make ex-post contracts with private firms which allows for greater flexibility than regulation, in particular where governments commit to both investment and operation cash flows. Their work bears special relevance to the case of high-tech industries.

Meanwhile, Zang et al. (2009) use incomplete contract theory to study the allocation of control rights in PPPs between pharmaceutical enterprises and non-profit organizations with a focus on how the allocation influences cooperative efficiency. They empirically test their mathematical model and find that a proper allocation provides incentives for firms to make fewer self-interested and more public-interested investments which, in turn, improves the cooperation efficiency of PPPs.

Desrieux (2009) addresses the issue of efficient organizational choice for the provision of public services. In a departure from the property rights literature, she distinguishes between ownership, the right to make residual decisions and the right to receive residual benefits. She finds that such

rights can be temporarily given to a private firm even if ownership remains public and that there is always a degree of private involvement that is socially efficient.

Building on Hart, Iossa et al. (2015) analyze the main incentive issues in PPPs and the nature of optimal contracts in various contexts. They conclude that PPPs are beneficial when resultant infrastructure quality leads to cost reductions and enhances the quality of service delivery, provided the latter is stable and easy to forecast. As such, the PPP arrangement is best suited for projects where infrastructure quality is central and which have relatively stable demands such as transport and water. On the other hand, the PPP modality may actually be *unsuitable* for the IT sector where demand quickly evolves over time.

In their examination of public-private technology partnerships, Audretsch et al. (2002) evaluated the US Department of Defense's Small Business Innovation Research initiative (SBIR). They found that SBIR stimulated research and development (R&D) *as well as* efforts to commercialize the fruits of research that *would not otherwise* have taken place. They also found that the net social benefits associated with the program's sponsored research were substantial. However, they also cautioned that if a market failure argument was used to justify government support for R&D, policy makers needed to establish that improvement in R&D performance would not be impeded by any failure on the part of the government.

To the best of our knowledge, no prior empirical studies exist on PPPs in Bangladesh. Furthermore, the public-private arrangement in the provision of public digital services which is the subject of this paper has certain features which distinguish it from the more traditional PPPs. The present study therefore represents a first step in what we hope would be a new line of research.

In section two we provide a description of the a2i program and Union Digital Centers, section three describes the data, the econometric methodology is discussed in section four, section five presents the results and section six concludes.

2. Description of the a2i program and Union Digital Centers

The a2iprogram, which receives support from the United Nations Development Program (UNDP) and the United States Agency for International Development (USAID) is based in the office of the Prime Minister of Bangladesh. The aim of the undertaking is to assist in building a "digital nation" through delivering services to citizens' doorsteps. The program aims to improve quality, widen access, and decentralize delivery of public services to ensure responsiveness and transparency(a2i.pmo.gov.bd). Several solutions offered by the project have been identified and include:

- A reduction in the need for long-distance travel in order to obtain government services which would also lessen potential corruption-ridden, face-to-face interaction and the need for intermediaries.
- Enhancing transparency and encouraging innovation in public service delivery.
- Very importantly, the project would be the genesis for an institutional framework which would sustain a nascent e-service network in Bangladesh that is expected to grow in the future. It would support the formulation of institutional norms, basic laws and standards as well as becoming a center of expertise in the field of e-governance and citizen e-service solutions. As such, the a2i project would influence Bangladesh's Information and Communications Technology for Development (ICT4D) policies and strategies.

Union Digital Centers or UDCs (formerly Union Information Service Centers) are one-stop electronic service outlets operating in all of Bangladesh's 4,547 Union Parishads (UPs) which

form the lowest tier of local government. They aim to provide government, livelihood and private related information and services, primarily to rural inhabitants. Operating under the PPP modality, these centers are run by local entrepreneurs, usually comprising two member teams consisting of one male and one female, but hosted by the UPs and supported by the central government. This symbiotic relationship represents a novel business model and an innovative way of service provision being a departure from more established models of partnership such as the Build, Own and Operate (BOO); Build, Own, Operate and Transfer (BOOT) or Build, Lease, Transfer (BLT) models.

Typically located within a short distance of a rural inhabitant's home, UDCs have enabled residents relatively easy and affordable access to livelihood information and services which affect their daily lives. For example, farmers in remote locations can obtain pricing information for their inputs and products, villagers can obtain information on legal resources, apply for land records or obtain banking services. The existence of UDCs has served to expand such services to hitherto excluded groups beyond urban areas.

Beginning operations in 2009, UDCs were fairly rapidly established in all UPs of Bangladesh by November 2010. Each UDC is operated by two young local entrepreneurs, a male and a female, under supervision of a local advisory body headed by the UP Chairman. The UP provides space and utilities for the center. The Local Government Division, an administrative branch of the Government of Bangladesh (GoB), coordinates with the Cabinet Division and the Bangladesh Computer Council to establish the basic ICT setup including computers, laptops, printers, multimedia projectors, digital cameras, webcams and solar panels. The entrepreneurs are free to install additional facilities to support business growth while at the same time ensuring that the

social sustainability of the center is achieved by delivering government information and services (a2i.pmo.gov.bd).

In addition to those mentioned above, other key services which may be availed at a UDC include accessing electronically published public examination results, downloading government, non-government, university or embassy forms, registering births and deaths, e-mail, internet browsing, video conferencing, electronic banking and general computer training. Furthermore, scanning, photocopying, electronic picture-taking and mobile phone services are also available.

Service partners include public and private banks, life insurance companies, telecommunication companies and non-government organizations. Some partners, such as the Bangladesh Computer Council, provide software and hardware troubleshooting support. These partnerships allow UDCs to sustain themselves economically while enabling them to increase the range and scope of the services they offer. Government agencies also benefit from UDC infrastructure and resources, using them for data collection, identification of social safety net beneficiaries and disbursement of allowances.

a2i conducted a comprehensive census on UDCs in 2013 in collaboration with Bangladesh Bureau of Statistics, the public agency for statistical records in Bangladesh. The census collected data not only from the UDCs but also from the UP Chairman, the UP Secretary, as well as two random citizens living in the union. From that standpoint, it is a comprehensive dataset, being collected from different stakeholders: the entrepreneurs, local politicians, local bureaucrats and the consumers of the services. Utilizing this dataset we aim to examine certain aspects of the performance of a developing country PPP in the digital services sector, the results of which are expected to be an addition to the literature.

Since the main impetus of the a2i program is to enhance access to public services, our primary aim is to investigate the extent to which this objective is fulfilled. Towards that end we identified two channels, or indicators, which would shed light on the success of the objective, namely the number of public services provided to customers and outreach, i.e., the extent to which the services of the UDC are availed of by the public. In addition, we also look at the income of UDCs in order to assess the financial stability of the establishments.

Since we do not have a panel dataset we carry out cross-sectional regressions to test some hypotheses in relation to the performance of UDCs based on certain indicators. We utilize the available data to assess efficacy in public service delivery measured by the number of public services provided, outreach measured by number of consumers served, and sustainability or financial performance measured by income.

3. Data

We use the census data on the performance of the UDCs conducted by the Bangladesh Bureau of Statistics, the national public agency responsible for statistics in collaboration with a2i. The census collected detailed performance related data from all the entrepreneurs in 4,547 unions. However, UDCs are not operational in 46 unions. Furthermore, there is missing data for a few variables. Excluding these observations, we are left with 4,478 observations. The census collected detailed information about characteristics of the entrepreneurs, performance indicators of the UDCs and different activities of the UDC entrepreneurs.

Summary statistics of relevant performance indicators and activities are presented in Table 1.We discuss the performance indicators before looking into the determinants of the performances. As mentioned earlier, we have looked into three performance indicators. First, the survey asked whether a UDC provides a particular service to their consumers. We use this information to

calculate the number of public services provided by a UDC. These services include birth and death registration, seeking information about a public service and paying bills of a public utility. On average, the number of public services provided by the UDCs is 7.42.About 29 consumers per day visit these UDCs seeking both these public services as well as a number of private services. The average monthly income is 9.3 thousand Taka per month.

Table 1: Descriptive Statistics on UDC performances and other factors

Variable	Mean	SD	N
Dependent Variables			
Income of UDC (Thousand Taka)	9.26	10.00	4478
Number of Public Services Provided	7.42	2.23	4478
Number of Consumers Served	29.35	38.72	4478
Independent Variables			
Investment (Thousand Taka)	39.25	72.63	4478
Proportion reporting UP Chair was Cooperative	0.84	0.36	4478
Proportion reporting UP Secretary was Cooperative	0.84	0.37	4478
Proportion reporting UNO was Cooperative	0.60	0.49	4478
Number of Government Arranged Promotions	2.09	1.38	4478
Number of Privately Arranged Promotions	5.64	1.75	4478
Proportion of UDCs located on second floor	0.23	0.42	4478

Proportion of UDCs located outside UP Compound	0.15	0.35	4478
Number of internet applications used by the Entrepreneur	9.01	2.39	4478
One Female-One Male Entrepreneur	0.54	0.49	4478
Two Female Entrepreneurs	0.02	0.13	4478
Two Male Entrepreneurs	0.20	0.40	4478
Operational Cost of UDC (Thousand Taka)	4.35	6.31	4478
Age of UDC (Years)	2.65	0.84	4478

Table 1 presents the summary statistics of performance determining factors. First, investment is an extremely important factor for a UDC to succeed. It turns out that the UDCs on an average invested about 39 thousand Taka aggregated since inception. Second, we look into how cooperative the local political representative and the public officials are. Table 1 indicates that on most occasions, the UP Chairperson (84% of the cases) and UP Secretary (84% of the cases) are cooperative, according to the respondents. The Upazila Nirbahi Officers (UNO) on the other hand are less so (60% of the cases), potentially because each UNO is responsible for a number of Unions (and hence, entrepreneurs) to work with and therefore can devote less time per Union and entrepreneur. Third, the entrepreneurs also report the number of promotional activities undertaken, some of which are done by the government. It turns out that on an average about 2 promotions are supported by the government whereas about 5.6 different promotions are undertaken by the entrepreneurs themselves. Fourth, the location of the UDC affects its visibility. There are three potential locations a UDC may be located at: the ground-floor, the floor above (referred to as the second floor) or outside the UP compound itself which is usually in the nearby

market. Whereas most UDCs are located on the ground floor, 23% of UDCs are located on the second floor, while 15% of UDCs are located outside the UP compound. We also consider the entrepreneur's knowledge of internet usage as it would have an effect on the quality and quantity of services provided. The census asked the respondents to report different ways they use the internet in their business and personal life, ranging from searching for product or service related information to simple downloading of a form or a multi-media file. From this, we calculate the number of ways an entrepreneur uses the internet. We find that an entrepreneur on an average uses the internet for nine different activities. We have also included the gender composition of teams in order to assess its effect on the dependent variables. This is in line with the deliberate government objective of encouraging female participation in entrepreneurial activity as reflected in the policy of having mixed gender entrepreneurial teams (www.a2i.pmo.gov.bd). We note, however, that only 54% of teams consist of one male and one female. This may possibly be because of females leaving the workplace after marriage, an issue which requires further investigation. Only 2% of all teams are exclusively female, while 24% of all teams are single male only. The next section outlines the econometric methodology adopted.

4. Econometric Methodology

In our regressions we consider three dependent variables, (i) the income earned by a UDC, (ii) the number of public services delivered by a UDC and (iii) outreach measured by the number of consumers served by a UDC. The impact of a number of factors on the dependent variables is then examined separately. With age and operational cost of the UDC as constant controls across all specifications, the covariates may be grouped into six categories, namely, investment, cooperation from officials who exercise administrative influence (UP Chair, UP Secretary and UNO), locational characteristics of the UDC (second floor or out-of-compound), promotional

activity (public or private), the degree of internet use by the entrepreneurs and the gender composition of the entrepreneurial teams. The second, third and fourth categories are measured using indicator variables and coded as follows.

Cooperation is coded 1 for cooperation, 0 otherwise. In the survey questionnaire a first (ground) floor location was coded 1, coded 2 for the floor above, while out-of-compound locations were coded 3. With the ground floor as the base, we created two dummy-variables, indicating locations on the floor above and outside the compound. We classified promotional activities into two categories, public and private. The questionnaire also collected information measuring the use of the internet for thirteen different purposes and is coded 1 if the internet was used, 2 otherwise. This information was used to calculate the total number of ways the internet was used by the entrepreneurs.

We estimate the following simple econometric model

$$Y_i = \beta_0 + \beta_1 X_{1i} + \beta_2 X_{2i} + \beta_3 X_{3i} + \beta_4 X_{4i} + \beta_5 X_{5i} + \beta_6 X_{6i} + \gamma Z_i + \varepsilon_i$$

Where the dependent variable Y_i represents the monthly income of the UDC, the number of public services delivered or the number of consumers served. Since the number of public services is a count variable, it is estimated using the negative binomial regression. X_1 is investment, X_2 is a vector representing cooperation from various officials, X_3 is a vector of dummy variables representing locational characteristics, X_4 is a vector representing the number of promotions by the government and entrepreneurs, X_5 is the number of internet applications used by the respondents and X_6 is a vector representing gender composition of the teams, Z is the

vector of control variables (operational cost and age) and ε_i is the error term clustered at the upazilla level. We retain the age and operational cost of UDCs as controls.

For each dependent variable, we consider one factor at a time and eventually build-up to the final specification shown above. To clarify matters let us, as an example, consider the first dependent variable mentioned under consideration, namely the income earned by a UDC. Say, we are interested in the effect of the gender composition of teams on the dependent variable. Keeping age and operational cost as controls, in our first specification we regress income on the number of teams consisting of one male and one female, two females and two males. We then sequentially control for investment, cooperation from officials, location, promotional activity and degree of internet usage, ending up with a specification that might be termed as a "full" model. The exercise is then repeated for the other covariates and covariate groupings. In a similar vein we analyze the impact of factors on public service delivery and outreach. Thus, six tables are generated for each dependent variable and we have a total of 18 tables. In the next section we present our results.

5. Results

Our results are presented in three subsections, each dealing with a separate dependent variable and with each dependent variable being regressed against the six covariate groups corresponding to our categorization mentioned above. In all the regressions ***, ** and * represent 1%, 5% and 10% levels of significance and standard errors (in parentheses) are clustered at the sub-district (upazilla) level. All specifications have operational cost and age of the UDC as control variables. We start with the income of a UDC.

5.1 Income of a UDC

In this section we examine how income responds to each of the chosen control variables. Table2 to Table 7 show the results of OLS regressions corresponding to the six model specifications.

Table 2. *Effect of Investment on Income of a UDC*

Dependent Variable: Income earned by a UDC						
VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
Investment (Thousand Taka)	0.0196***	0.0191***	0.0194***	0.0206***	0.0201***	0.0193***
	(0.0028)	(0.0028)	(0.0028)	(0.0029)	(0.0029)	(0.0028)
Constant	3.7585***	2.7220***	1.3393*	1.7204**	0.8277	-1.2456
	(0.6062)	(0.5945)	(0.7807)	(0.8010)	(0.9432)	(1.0117)
Observations	4,478	4,478	4,478	4,478	4,478	4,478
R-squared	0.1907	0.1960	0.1992	0.2012	0.2031	0.2104

Note: In Specifications 2 – 6, team composition variables have been additionally controlled for. In specifications 3 – 6, three additional control variables, the degree of cooperation from the UP Chair, UP Secretary and UNO are considered. Location (two dummy variables) of the UDC is additionally controlled for in specifications 4 – 6. The number of govt. and self-initiated promotions are additionally controlled for in specifications 5 – 6. Column 6 has the degree of internet usage as an additional control variable.

Table 2 indicates that, as may be expected, the impact of investment is positive overall though it is slightly declining across all specifications.

Table 3: *Effect of cooperation from the local political representative and public officials on income of a UDC*

Dependent Variable: Income earned by a UDC

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
Cooperation by UP Chair	0.1326	0.1473	0.2832	0.2538	0.0790	0.0833
	(0.5182)	(0.5203)	(0.5105)	(0.5096)	(0.5102)	(0.5097)
Cooperation by UP Secretary	0.9468**	0.8373**	1.0726***	1.0030**	0.9155**	0.8823**
	(0.4198)	(0.4198)	(0.4065)	(0.4031)	(0.4017)	(0.4020)
Cooperation by UNO	0.8214**	0.7525**	0.5757*	0.5800*	0.4826	0.4162
	(0.3413)	(0.3367)	(0.3332)	(0.3327)	(0.3347)	(0.3320)
Constant	2.9343***	1.9489**	1.3393*	1.7204**	0.8277	-1.2456
	(0.7768)	(0.7729)	(0.7807)	(0.8010)	(0.9432)	(1.0117)
Observations	4,478	4,478	4,478	4,478	4,478	4,478
R-squared	0.1747	0.1804	0.1992	0.2012	0.2031	0.2104

Note: In Specifications 2 – 6, team composition variables have been additionally controlled for. In specifications 3 – 6 the amount of investment is additionally considered. Location (two dummy variables) of the UDC is additionally controlled for in specifications 4 – 6. The number of govt. and self-initiated promotions are additionally controlled for in 5 – 6. Column 6 has the degree of internet usage as an additional control variable.

Table 3 shows that cooperation from the UP Chair, an elected official, seems to have no effect on the income of a UDC, while cooperation from the UP Secretary, an appointed civil servant, has a positive impact across all specifications. Cooperation from the UNO, also an appointed civil servant, is positive and significant until we control for government and self-initiated promotions and remains insignificant after controlling for the degree of internet usage. The positive influence of the UP secretary may be understood in light of the fact that, as an executive functionary, he or she occupies a position which facilitates action taking that has a direct bearing upon UDC operations as opposed to the passive, political representative role which the UP chair plays.

Table 4: *Effect of promotion on Income of a UDC*

Dependent Variable: Income earned by a UDC						
VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
Number of Govt.	0.2031*	0.1991*	0.2209*	0.1731	0.1706	0.1033
Promotions	(0.1187)	(0.1177)	(0.1178)	(0.1204)	(0.1206)	(0.1217)
Number of Pvt.	0.3202***	0.2719***	0.2014**	0.1750*	0.1778*	-0.0158
Promotions	(0.0966)	(0.0965)	(0.0963)	(0.0947)	(0.0943)	(0.0981)
Constant	2.2191***	1.4438*	1.3559*	0.4513	0.8277	-1.2456
	(0.7960)	(0.7900)	(0.7901)	(0.9253)	(0.9432)	(1.0117)
Observations	4,478	4,478	4,478	4,478	4,478	4,478
R-squared	0.1765	0.1817	0.1990	0.2011	0.2031	0.2104

Note: In specifications 2 – 6, team composition variables have been additionally controlled for. In specifications 3 – 6 the amount of investment is additionally considered. Three additional control variables, the degree of cooperation from the UP Chair, UP Secretary and UNO are controlled for in specifications 4 – 6. . Location (two dummy variables) of the UDC is additionally controlled for in specifications 5 – 6. Column 6 has degree of internet usage as an additional control variable.

Table 4, which examines the effect of promotional activity on UDC income, shows that the effect of promotions, both government and privately initiated, remain positive and statistically significant until specification 3, while the impact of the former becomes insignificant once cooperation from officials and location are controlled for. However, in the final specification, neither is significant. It seems that the income of a UDC is sensitive to promotional activity but only up to a certain extent, with cooperation from public officials seemingly rendering it superfluous.

Table 5: *Effect of location of UDC on its Income*

Dependent Variable: Income earned by a UDC						
VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
Second floor UDC location	-0.5817*	-0.5877*	-0.5262	-0.5172	-0.5446*	-0.5401*
	(0.3280)	(0.3272)	(0.3259)	(0.3268)	(0.3260)	(0.3259)
Outside compound UDC	-0.5480	-0.4957	-1.3831***	-1.2846***	-1.2787***	-1.2654***
Location	(0.4728)	(0.4715)	(0.4666)	(0.4632)	(0.4644)	(0.4581)
Constant	4.4972***	3.3268***	3.0431***	1.7204**	0.8277	-1.2456
	(0.6212)	(0.6064)	(0.6097)	(0.8010)	(0.9432)	(1.0117)
Observations	4,478	4,478	4,478	4,478	4,478	4,478
R-squared	0.1721	0.1784	0.1983	0.2012	0.2031	0.2104

Note: The base outcome is whether the UDC is located on the ground floor of the UP building. In specifications 2 – 6, team composition variables have been additionally controlled for. In specifications 3 – 6 the amount of investment is additionally considered. Three additional control variables, the degree of cooperation from the UP Chair, UP Secretary and UNO are controlled for in specifications 4 – 6. The number of govt. and self-initiated promotions are additionally controlled for in 5 – 6. Column 6 has the degree of internet usage as an additional control variable.

Turning to locational effects (Table 5), we see that a second floor or outside compound location has a negative impact on UDC income with the magnitude of the outside compound location being nearly twice as great. We note that the effect of a second floor location is statistically insignificant under the third and fourth specifications but becomes significant again when promotional activity and internet usage are introduced as controls.

Whereas the sign of the coefficients make sense in light of the base outcome, which is a first (ground) floor location of the UDC within the UP building, the magnitude of the coefficient associated with the out-of-compound location is quite striking. It may suggest that the UDC clientele primarily require services of a public nature, which they naturally seek within the

premises of the UP compound. A UDC located out-of-compound is most likely not to be a standalone establishment but one which is embedded in a commercial cluster, such as a bazaar. If this cluster is not spatially contiguous with the UP compound itself, potential UDC clients may, either through lack of information or because of inconvenience, be dissuaded from travelling to the UDC.

Table 6. *Effect of internet usage/knowledge of the entrepreneur on income of a UDC*

Dependent Variable: Income earned by a UDC						
VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
Number of internet usages	0.5074***	0.4786***	0.4302***	0.4099***	0.4095***	0.3999***
by the entrepreneur	(0.0633)	(0.0628)	(0.0619)	(0.0605)	(0.0604)	(0.0662)
Constant	-0.0002	-0.7138	-0.7002	-1.6586*	-1.2730	-1.2456
	(0.8075)	(0.8073)	(0.8158)	(0.9486)	(0.9612)	(1.0117)
Observations	4,478	4,478	4,478	4,478	4,478	4,478
R-squared	0.1858	0.1903	0.2062	0.2083	0.2103	0.2104

Note: In specifications 2 – 6, team composition variables have been additionally controlled for. In specifications 3 – 6 the amount of investment is additionally considered. Three additional control variables, the degree of cooperation from the UP Chair, UP Secretary and UNO are controlled for in specifications 4 – 6. Location (two dummy variables) of the UDC is additionally controlled for in specifications 5 – 6. Column 6 has the number of govt. and self-initiated promotions as additional control variables.

Looking at the effect of internet knowledge and use on the income of UDCs (Table 6) we see that the effect is positive and statistically significant, though declining, across all specifications which is an expected outcome.

Table 7.*Effect of team composition on income of a UDC*

Dependent Variable: Income earned by a UDC						
VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
One Female – One Male	1.6844***	1.5575***	1.4473***	1.4256***	1.3102***	1.2075***
	(0.3299)	(0.3254)	(0.3182)	(0.3169)	(0.3132)	(0.3130)
Two Females	3.5024***	3.6078***	3.4773***	3.3532***	3.2969***	3.2776***
	(1.1542)	(1.1641)	(1.1750)	(1.1718)	(1.1569)	(1.1587)
Two Males	1.9618***	1.6570***	1.5851***	1.5734***	1.4558***	1.2671***
	(0.4681)	(0.4636)	(0.4644)	(0.4645)	(0.4607)	(0.4609)
Constant	3.1235***	2.7220***	1.3393*	1.7204**	0.8277	-1.2456
	(0.5905)	(0.5945)	(0.7807)	(0.8010)	(0.9432)	(1.0117)
Observations	4,478	4,478	4,478	4,478	4,478	4,478
R-squared	0.1777	0.1960	0.1992	0.2012	0.2031	0.2104

Note: The base outcome is whether the UDC is run by a single male. In specifications 2 – 6, investment has been additionally controlled for. In specifications 3 – 6, three additional control variables, the degree of cooperation from the UP Chair, UP Secretary and UNO, are considered. Location (two dummy variables) of the UDC is additionally controlled for in specifications 4 – 6. The number of govt. and self-initiated promotions are controlled for in specifications 5 – 6. Column 6 has the degree of internet usage as an additional control variable.

Table 7 shows the results of the impact of team composition on the income of UDCs. Team composition has a positive and significant contribution to the income of a UDC across all specifications. We note that the marginal impact of an all-female team exceeds that of an all-male team as well as a mixed gender team. In fact, the effect of a mixed team is the lowest. In the Bangladeshi service or retail landscape, instances of mixed gender service provision teams are rare and the one male – one female team result could be an outcome of inefficiency caused by the gender mix. On the other hand, it is possible that a two-female team could cater to a mainly

female clientele and charge higher prices for a narrower range of services. However, since only about 2% of all teams comprise of two females, the results could well be just an artifact of this outlier.

In the next section we turn our attention to public services.

5.2 Number of Public Services offered by a UDC

In this section we look at how the independent variables affect the delivery of public services by UDCs. All regressions are negative binomial.

Table 8. *Effect of investment on public service delivery of a UDC*

Dependent Variable: Number of public services delivered by a UDC						
VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
Investment (Thousand Taka)	0.0004***	0.0003***	0.0004***	0.0004***	0.0003***	0.0002***
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0000)
Constant	1.8876***	1.8182***	1.7004***	1.7146***	1.5139***	1.2759***
	(0.0247)	(0.0284)	(0.0325)	(0.0331)	(0.0343)	(0.0371)
Observations	4,478	4,478	4,478	4,478	4,478	4,478

Note: In Specifications 2 – 6, team composition variables have been additionally controlled for. In specifications 3 – 6, three additional control variables, the degree of cooperation from the UP Chair, UP Secretary and UNO, are considered. Location (two dummy variables) of the UDC is additionally controlled for in specifications 4 – 6. The number of govt.- and self-initiated promotions are additionally controlled for in 5 – 6. Column 6 has the degree of internet usage as an additional control variable.

Table 9.*Effect of Cooperation from the local political representative and public officials on Public Service Delivery of a UDC*

Dependent Variable: Number of public services delivered by a UDC						
VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
Cooperation by UP Chair	0.0602***	0.0608***	0.0634***	0.0624***	0.0271*	0.0282**
	(0.0159)	(0.0156)	(0.0156)	(0.0156)	(0.0147)	(0.0133)
Cooperation by UP Secretary	0.0557***	0.0499***	0.0546***	0.0520***	0.0352**	0.0311**
	(0.0161)	(0.0159)	(0.0158)	(0.0157)	(0.0150)	(0.0144)
Cooperation by UNO	0.0470***	0.0426***	0.0391***	0.0393***	0.0196*	0.0114
	(0.0125)	(0.0122)	(0.0122)	(0.0121)	(0.0114)	(0.0107)
Constant	1.7742***	1.7125***	1.7004***	1.7146***	1.5139***	1.2759***
	(0.0299)	(0.0325)	(0.0325)	(0.0331)	(0.0343)	(0.0371)
Observations	4,478	4,478	4,478	4,478	4,478	4,478

Note: In specifications 2 – 6, team composition variables have been additionally controlled for. In specifications 3 – 6 the amount of investment is additionally considered. Location (two dummy variables) of the UDC is additionally controlled for in specifications 4 – 6. The number of govt. and self-initiated promotions are additionally controlled for in 5 – 6. Column 6 has degree of internet usage as additional control variable.

Table 8 indicates that, though small in magnitude, the impact of investment on public service delivery is positive and statistically significant across all specifications.

When we look at the effect of cooperation on public service delivery by the UDCs (Table 9) we see that in contrast to their effect on income, cooperation from all elected and appointed officials do have a positive impact on public service delivery, with the effect of the UNO ceasing to be statistically significant only in the last specification. The results of these particular regressions lend support to the notion that assistance from representatives and public officials do indeed

positively influence the provision of public services by UDCs. It is to be noted that the effect of cooperation from the UP Secretary, an executive officer, remains the highest, as was the case when income was the dependent variable.

Table 10. *Effect of promotion on public service delivery of a UDC*

Dependent Variable: Number of public services delivered by a UDC						
VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
Number of Govt.	0.0327***	0.0327***	0.0330***	0.0303***	0.0302***	0.0228***
Promotions	(0.0051)	(0.0051)	(0.0051)	(0.0050)	(0.0049)	(0.0045)
Number of Pvt.	0.0453***	0.0426***	0.0416***	0.0402***	0.0404***	0.0196***
Promotions	(0.0037)	(0.0037)	(0.0036)	(0.0037)	(0.0036)	(0.0036)
Constant	1.5917***	1.5533***	1.5520***	1.4994***	1.5139***	1.2759***
	(0.0304)	(0.0326)	(0.0324)	(0.0326)	(0.0332)	(0.0370)
Observations	4,478	4,478	4,478	4,478	4,478	4,478

Note: In Specifications 2 – 6, team composition variables have been additionally controlled for. In specifications 3 – 6 the amount of investment is additionally considered. Three additional control variables, the degree of cooperation from the UP Chair, UP Secretary and UNO are additionally controlled for in specifications 4 – 6. . Location (two dummy variables) of the UDC is additionally controlled for in specifications 5 – 6. Column 6 has degree of internet usage as additional control variable.

Turning to Table 10, promotion, both government sponsored and privately initiated, have statistically significant positive impacts on the delivery of public services by a UDC. In conjunction with the results obtained vis-à-vis cooperation from elected and appointed officials,

we find evidence to support the contention that the delivery of public services by UDCs is positively driven by public support.

Table 11.*Effect of location of UDC on public service delivery of a UDC*

Dependent Variable: Number of public services delivered by a UDC						
VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
Second floor location of UDC	-0.0208*	-0.0226*	-0.0212*	-0.0207*	-0.0264**	-0.0251**
	(0.0119)	(0.0118)	(0.0118)	(0.0117)	(0.0110)	(0.0101)
Outside compound UDC	-0.0383*	-0.0364*	-0.0540***	-0.0461**	-0.0456***	-0.0442***
Location	(0.0196)	(0.0198)	(0.0201)	(0.0198)	(0.0175)	(0.0163)
Constant	1.9090***	1.8367***	1.8309***	1.7146***	1.5139***	1.2759***
	(0.0252)	(0.0302)	(0.0302)	(0.0336)	(0.0332)	(0.0370)
Observations	4,478	4,478	4,478	4,478	4,478	4,478

Note: The base outcome is whether the UDC is located on the ground floor of the UP building. In specifications 2 – 6, team composition variables have been additionally controlled for. In specifications 3 – 6 the amount of investment is additionally considered. Three additional control variables, the degree of cooperation from the UP Chair, UP Secretary and UNO are additionally controlled for in specifications 4 – 6. The number of govt. and self-initiated promotions are additionally controlled for in 5 – 6. Column 6 has the degree of internet usage as an additional control variable.

Table 11, which deals with location effects, indicates, as can be expected, that the effect of a non-first-floor location has a statistically significant negative impact on public service delivery of a UDC across all specifications, with a location outside of compound having a slightly greater negative effect.

Table 12. *Effect of internet usage/knowledge of the entrepreneur on public service delivery of a UDC*

Dependent Variable: Number of public services delivered by a UDC						
VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
Internet usages	0.0559***	0.0546***	0.0540***	0.0526***	0.0526***	0.0438***
by the entrepreneur	(0.0029)	(0.0029)	(0.0029)	(0.0028)	(0.0028)	(0.0030)
Constant	1.4134***	1.3745***	1.3745***	1.3017***	1.3162***	1.2759***
	(0.0339)	(0.0339)	(0.0337)	(0.0364)	(0.0368)	(0.0371)
Observations	4,478	4,478	4,478	4,478	4,478	4,478

Note: In Specifications 2 – 6, team composition variables have been additionally controlled for. In specifications 3 – 6 the amount of investment is additionally considered. Three additional control variables, the degree of cooperation from the UP Chair, UP Secretary and UNO are additionally controlled for in specifications 4 – 6. Location (two dummy variables) of the UDC is additionally controlled for in specifications 5 – 6. Column 6 has the number of govt. and self-initiated promotions as additional control variables.

Internet usage or knowledge thereof(Table 12) positively affects the delivery of public services by a UDC across all specifications.

Table 13. *Effect of team composition on public service delivery of a UDC*

Dependent Variable: Number of public services delivered by a UDC						
	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES						
One Female – One Male	0.1102***	0.1077***	0.1001***	0.0993***	0.0746***	0.0651***
	(0.0173)	(0.0172)	(0.0168)	(0.0168)	(0.0158)	(0.0144)
Two Females	0.0653*	0.0671*	0.0588	0.0541	0.0425	0.0409
	(0.0385)	(0.0383)	(0.0376)	(0.0376)	(0.0352)	(0.0331)
Two Males	0.1108***	0.1051***	0.1006***	0.1001***	0.0749***	0.0565***
	(0.0173)	(0.0173)	(0.0168)	(0.0168)	(0.0160)	(0.0147)
Constant	1.8259***	1.8182***	1.7004***	1.7146***	1.5139***	1.2759***
	(0.0283)	(0.0284)	(0.0325)	(0.0331)	(0.0343)	(0.0371)
Observations	4,478	4,478	4,478	4,478	4,478	4,478

Note: The base outcome is whether the UDC is run by a single male. In specifications 2 – 6, investment has been additionally controlled for. In specifications 3 – 6, three additional control variables, the degree of cooperation from the UP Chair, UP Secretary and UNO, are considered. Location (two dummy variables) of the UDC is additionally

controlled in specifications 4 – 6. The number of govt. and self-initiated promotions are additionally controlled for in 5 – 6. The final column 6 has the degree of internet usage as an additional control variable.

In contrast to the results seen for income, the effect of two-female teams on public service delivery ceases to be significant from specification 3 onwards (Table 13) whereas the effects of mixed gender and all male teams are positive and statistically significant. We recall though that percentagewise, the number of all female teams is very low.

We now turn our attention to outreach as measured by the number of consumers served.

5.3 Outreach of a UDC

Table 14. *Effect of investment on outreach of a UDC*

Dependent Variable: Number of consumers served by the UDC						
VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
Investment (Thousand Taka)	0.0925***	0.0910***	0.0931***	0.0880***	0.0840***	0.0835***
	(0.0165)	(0.0166)	(0.0166)	(0.0173)	(0.0173)	(0.0173)
Constant	18.3125***	16.0489***	9.1009***	9.0080***	1.7027	0.2679
	(1.8661)	(1.9272)	(2.6577)	(2.6559)	(3.1178)	(3.3963)
Observations	4,478	4,478	4,478	4,478	4,478	4,478
R-squared	0.0647	0.0663	0.0710	0.0738	0.0807	0.0809

Note: All specifications are estimated by OLS. In Specifications 2 – 6, team composition variables have been additionally controlled for. In specifications 3 – 6, three additional control variables, the degree of cooperation from the UP Chair, UP Secretary and UNO, are considered. Location (two dummy variables) of the UDC is additionally controlled for in specifications 4 – 6. The number of govt. and self-initiated promotions are additionally controlled

for in 5 – 6. Column 6 has degree of internet usage as an additional control variable.

As expected, investment has a positive effect on the number of consumers served by the UDC (Table 14). If investment leads to an increase in the number and improvement of services provided, then it is normal to expect more consumers availing the services provided by UDCs, both public and private.

Table 15.*Effect of cooperation from the political representative and public officials on outreach of a UDC*

Dependent Variable: Number of consumers served by the UDC						
VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
Cooperation by UP Chair	4.7283***	4.7596***	5.4117***	5.5027***	4.4268***	4.4298***
	(1.6588)	(1.6662)	(1.6668)	(1.6635)	(1.7107)	(1.7075)
Cooperation by UP Secretary	1.4856	1.2685	2.3975	2.5353*	1.9299	1.9069
	(1.5805)	(1.5513)	(1.5344)	(1.5216)	(1.4951)	(1.4928)
Cooperation by UNO	2.0642*	1.9309	1.0829	1.1627	0.5002	0.4542
	(1.2381)	(1.2233)	(1.1903)	(1.1858)	(1.1630)	(1.1709)
Constant	14.4439***	12.0254***	9.1009***	9.0080***	1.7027	0.2679
	(2.6687)	(2.6803)	(2.6577)	(2.6559)	(3.1178)	(3.3963)
Observations	4,478	4,478	4,478	4,478	4,478	4,478

R-squared	0.0397	0.0422	0.0710	0.0738	0.0807	0.0809

Note: All specifications are estimated by OLS. In Specifications 2 – 6, team composition variables have been additionally controlled for. In specifications 3 – 6 the amount of investment is additionally considered. Location (two dummy variables) of the UDC is additionally controlled for in specifications 4 – 6. The number of govt. and self-initiated promotions are additionally controlled for in 5 – 6. Column 6 has the degree of internet usage as an additional control variable.

It is interesting to see that only cooperation by the UP Chair is significant in promoting outreach of a UDC (Table 15). It suggests that, when it comes to promotion, a politically elected representative, who may act as a mouthpiece for the PPP, is more effective than appointed officials. In particular, if we compare results with those for income we note that, when it came to income, cooperation from the UP secretary was more effective. The secretary, as an appointed executive whose actions may directly affect the functioning of a UDC has a greater impact on income earned rather than outreach.

Table 16. *Effect of promotion on outreach of a UDC*

Dependent Variable: Number of consumers served by a UDC						
VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
Number of Govt.	0.7520*	0.7629*	0.8652**	0.6151	0.6048	0.5581
Promotions	(0.4033)	(0.4018)	(0.3946)	(0.4146)	(0.4118)	(0.4143)
Number of Pvt.	2.1591***	2.0454***	1.7152***	1.6139***	1.6563***	1.5223***
Promotions	(0.3669)	(0.3669)	(0.3641)	(0.3593)	(0.3606)	(0.3970)
Constant	8.0554***	6.6439***	6.2323**	1.9159	1.7027	0.2679
	(2.4574)	(2.5551)	(2.5357)	(3.1528)	(3.1178)	(3.3963)

Observations	4,478	4,478	4,478	4,478	4,478	4,478
R-squared	0.0481	0.0496	0.0750	0.0776	0.0807	0.0809

Note: All specifications are estimated using negative binomial regression. In Specifications 2 – 6, team composition variables have been additionally controlled for. In specifications 3 – 6 the amount of investment is additionally considered. Three additional control variables, the degree of cooperation from the UP Chair, UP Secretary and UNO are additionally controlled for in specifications 4 – 6. Location (two dummy variables) of the UDC is additionally controlled for in specifications 5 – 6. Column 6 has degree of internet usage as an additional control variable.

Examining Table 16, which deals with promotions, we see that government promotions only have a statistically positive effect up to specification 3, but become statistically non significant once the cooperation variables, location dummies and degree of internet usage are controlled for. Private promotions have a significant positive effect across all specifications. These results tend to suggest that once the PPP is established, it is kept running through promotional activity at the level of the private entrepreneur.

Table 17.*Effect of location of UDC on outreach of a UDC*

Dependent Variable: Number of consumers served by a UDC						
VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
Second floor location of UDC	-3.6442***	-3.7059***	-3.4460***	-3.3675***	-3.6105***	-3.6074***
	(1.0688)	(1.0792)	(1.0611)	(1.0608)	(1.0509)	(1.0505)
Outside compound UDC	6.8133***	6.8256***	3.0751	3.5975	3.6337	3.6429
Location	(2.2890)	(2.2429)	(2.3346)	(2.3588)	(2.3753)	(2.3762)
Constant	20.4319***	17.4776***	16.2787***	9.0080***	1.7027	0.2679
	(2.0053)	(1.9727)	(1.8981)	(2.6559)	(3.1178)	(3.3963)

Observations	4,478	4,478	4,478	4,478	4,478	4,478
R-squared	0.0423	0.0451	0.0689	0.0738	0.0807	0.0809

Note: The base outcome is whether the UDC is located on the ground floor of the UP building. All specifications are estimated by OLS. In specifications 2 – 6, team composition variables have been additionally controlled for. In specifications 3 – 6 the amount of investment is additionally considered. Three additional control variables, the degree of cooperation from the UP Chair, UP Secretary and UNO are additionally controlled for in specifications 4 – 6. The number of govt. and self-initiated promotions are additionally controlled in for in 5 – 6. Column 6 has the degree of internet usage as an additional control variable.

Turning to Table 17, the main observation from these results is that, whereas a second floor location has a statistically significant negative impact on outreach, an out-of-compound location has no significant effect. However, we note that the sign of the out- of- compound coefficient is positive, and is statistically significant for the first two specifications. A UDC outside a UP compound is usually located in some sort of commercial cluster (such as a bazaar) where there is likely to be a far greater accumulation of people, automatically leading to greater outreach. Consequently, investment, official cooperation and promotional activity have marginally negligible impacts on out-of-compound locations.

Table 18.*Effect of internet usage/knowledge of the entrepreneur on outreach of a UDC*

Dependent Variable: Number of consumers served by a UDC						
VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
Internet usages	1.2011***	1.1127***	0.8728***	0.7716***	0.7836***	0.2768
by the entrepreneur	(0.2729)	(0.2739)	(0.2692)	(0.2709)	(0.2713)	(0.2978)
Constant	10.6596***	9.0383***	9.1056***	3.4578	3.2794	0.2679
	(2.8967)	(2.8537)	(2.7675)	(3.1952)	(3.2713)	(3.3963)

Observations	4,478	4,478	4,478	4,478	4,478	4,478
R-squared	0.0412	0.0431	0.0691	0.0731	0.0760	0.0809

Note: All specifications are estimated by negative binomial regression. In specifications 2 – 6, team composition variables have been additionally controlled for. In specifications 3 – 6 the amount of investment is additionally considered. Three additional control variables, the degree of cooperation from the UP Chair, UP Secretary and UNO are additionally controlled for in specifications 4 – 6. . Location (two dummy variables) of the UDC is additionally controlled for in specifications 5 – 6. Column 6 has the number of govt. and self-initiated promotions as additional control variables.

Knowledge of the internet (Table 18) has a statistically significant positive effect on outreach in the first five specifications but becomes insignificant once promotions are controlled for.

Table 19.*Effect of team composition on outreach of a UDC*

Dependent Variable: Number of consumers served by the UDC						
VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
Team Composition						
One Female – One Male	3.9733**	3.3693*	2.9852*	3.2030*	2.2677	2.1967
	(1.8168)	(1.7930)	(1.7751)	(1.7441)	(1.7508)	(1.7609)
Two Females	-0.2887	0.2127	-0.1945	-0.0373	-0.3472	-0.3605
	(2.6092)	(2.6817)	(2.6309)	(2.6287)	(2.6671)	(2.6696)
Two Males	5.6380**	4.1875*	3.9435*	3.9584*	3.0066	2.8759
	(2.3214)	(2.2776)	(2.2535)	(2.2430)	(2.2497)	(2.2463)
Constant	17.9598***	16.0489***	9.1009***	9.0080***	1.7027	0.2679
	(2.0138)	(1.9272)	(2.6577)	(2.6559)	(3.1178)	(3.3963)
Observations	4,478	4,478	4,478	4,478	4,478	4,478
R-squared	0.0386	0.0663	0.0710	0.0738	0.0807	0.0809

Note: All specifications are estimated by OLS. In specifications 2 – 6 investment has been additionally controlled for. In specifications 3 – 6, three additional control variables, the degree of cooperation from the UP Chair, UP Secretary and UNO, are considered. Location (two dummy variables) of the UDC is additionally controlled for in specifications 4 – 6. The number of govt. and self-initiated promotions are additionally controlled in for 5 – 6. Column 6 has the degree of internet usage as an additional control variable.

Looking at table 19, the results indicate that team composition does not have a statistically significant impact on outreach of the UDC. It would suggest that the government policy of encouraging women to become entrepreneurs does not translate into greater outreach and that the utilization of the services provided by UDCs is based on other considerations.

6. Conclusion

Through a number of regression exercises we tried to examine the success and efficacy of the UDC component of the Government of Bangladesh's Access to Information (a2i) program. The following table provides a snapshot of the main results. It shows the coefficients from the full models, i.e., specification 6 from all the tables. For the sake of brevity we have omitted standard errors.

Table 20: A summary of main results

	Public Services	**Outreach**	**Income**
Investments	0.002***	0.0835***	0.0193***
Coop. UP Chair	0.0282**	4.4298***	0.0833
Coop. UP Secretary	0.0311**	1.9069	0.8823**

Coop. UNO	0.0114	0.4542	0.4162
No. of Govt. Prom.	0.0228***	0.5581	0.1033
No. of Priv. Prom.	0.0196***	1.5223***	-0.0158
Second Floor Loc.	-0.0251**	-3.6074***	-0.5401*
Out of Comp. Loc.	-0.0442***	3.6429	-1.2654***
Internet Use/Knowl.	0.0438***	0.2768	0.3999***
One Female-One Male	0.0651***	2.1967	1.2075***
Two Females	0.0409	- 0.3605	3.2776***
Two Males	0.0565***	2.8759	1.2671***

Only investment has a statistically significant effect on all the dependent variables. Cooperation from the UP Chair positively affects the provision of public services and outreach, while cooperation from the UP Secretary has a statistically positive impact on public service provision and income but not on outreach. Cooperation from the UNO does not significantly affect any of the dependent variables. Since an Upazilla (sub-district) is comprised of a number of Unions, it is possible that the UNO's efforts are spread "too thin" to have any meaningful effect.

When we look at promotional activity we note that both government and privately initiated promotions positively affect the provision of public services but it is only private promotions which have a statistically positive effect on outreach. Neither have any effect on income.

A second floor location has a statistically negative effect on all three dependent variables but an out-of-compound location has no effect on outreach. It suggests that a first floor location within the Union compound itself is ideal.

Knowledge and/or use of the internet by the entrepreneur has a positive effect on income and the provision of public services but does not affect outreach. Since UDCs are probably availed by customers in the first place in order to access the internet itself, it makes sense that an absence of internet availability at home would prevent UDC entrepreneurs from reaching a bigger customer base.

Outreach is unaffected by the gender composition of teams implying that UDC services are sought irrespective of team composition. Female only teams have nearly twice the marginal impact on income as one female-one male and two-male teams. However, this result should be viewed in light of the fact that the number of two-female entrepreneur teams constitute only about two percent of all teams.

Overall, our results lend themselves to certain policy implications. First, since investment is an important determinant for all the performance indicators, the government may take steps to improve access to liquidity for entrepreneurs. Second, the UP Chair and UP Secretaries may be empowered to provide more direct assistance to UDC entrepreneurs for the betterment of performances. Third, the government may engage in more promotional activities if it would like to spread more of its services to citizens. Fourth, the UDCs should be allowed space on the ground floor of UP compounds since it is shown that other locations lead to poorer performances. Finally, the government should think more carefully about how to make the one female-one male teams more successful and encourage female entrepreneurs to stay in the workplace.

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