Quality of Life in Urban Neighborhoods in Metropolitan Lima, Peru

by

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Abstract[*]

This paper presents the results of the estimations of a quality of life (QoL) index focusing on three dimensions: individual factors, urban factors, and civil society. The study was mainly based on information collected through a survey applied in three districts of Lima: La Victoria, Los Olivos and Villa El Salvador. These districts are relatively similar in terms of income, although Villa El Salvador has a larger percentage of poor households. The results show that various indicators have different impacts on QoL. Two findings stand out. First, variables related to participation in civil society are statistically significant in all specifications used. Second, in La Victoria and Los Olivos, QoL is determined largely by indicators in the individual sphere, while the civil society sphere is more important in Villa El Salvador. These results are consistent with the collective action tradition of the Villa El Salvador district and with the market pattern of growth of Los Olivos.

1. Introduction

The subject of Quality of Life (QoL) has attracted a great deal of attention in the economic literature, both from theoretical and empirical perspectives. It has increasingly been treated using a multidimensional approach that considers social and political variables that, besides consumption, may have an effect on an individual's level of satisfaction. So far this literature has focused mainly on cities in developed countries, particularly the United States and Europe.

During recent decades many Latin American cities have experienced a process of very rapid growth that has been accompanied by the appearance of social problems such as lack of basic services, poor provision of public goods, increase in the rate of crime and drug consumption and dealing, lack of urban planning and organization, and transportation problems, among others. These issues are now public policy priorities for the authorities of these urban centers. In this context, measuring the QoL of individuals living in Latin American cities represents both an interesting challenge from an academic point of view and a crucial input for action from a policymaking perspective.

The particular case of Lima, capital city of Peru, offers an interesting opportunity to address the abovementioned issues. Lima has faced a process of very rapid, chaotic and unequal growth, mainly through multiple migration waves. Its population has grown almost tenfold in about 50 years, and its current population density is 219 individuals per km^2, compared to a national average of only 15.

This study is driven by two main objectives: (i) to provide estimates of QoL indicators and indexes for urban neighborhoods of Metropolitan Lima, including multidimensional aspects, income and other socio-economic indicators, urban variables such as crime and safety issues, green areas, transportation conditions and access to public goods, and aspects related to amenities and social capital; and (ii) tTo analyze the behavior of these QoL indicators across three districts of Lima and identify their main driving forces (socio-economic versus other urban and social capital dimensions).

The specific questions that this study tries to answer are

- Do we find important disparities in QoL across districts?
- What are the main driving forces pushing QoL down (or up) in the districts under study?
- How important are district/neighborhood issues for QoL?

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- How do different patterns of development across these districts influence QoL?
- Which of these indicators should represent priorities for local authorities?

The core information used for the study has been collected through a survey in three districts of Metropolitan Lima: La Victoria, Los Olivos and Villa El Salvador. As will be discussed in greater detail below, these districts were chosen for two main reasons. First, La Victoria, located at the center of the Metropolitan area, corresponds to the old Lima, while Los Olivos and Villa El Salvador, located at the north and south of Lima respectively, developed later as a consequence of migration waves and are representative of the periphery. On the other hand, Los Olivos and Villa El Salvador followed different development strategies since their creation (La Victoria, being old, does not represent a development model as it is more of a mixture). While Los Olivos grew substantially during the last 15 years following a model based on private competition and individual entrepreneurship, Villa El Salvador grew during the 1970s and 1980s due largely to collective action and central planning. These differences provide an interesting set-up for the study.

The collected data allows computing indexes of QoL combining multiple factors into a one dimensional measure. It does so by collecting information of an overall measure of QoL, on various dimensions of life satisfaction and of a large variety of objective indicators of QoL. We use this information to compute the weights to combine the objective indicators into a single measure of QoL. The detailed methodology is presented in Section 4. Once the overall QoL index is constructed, the contribution of different dimensions on the index is evaluated. We focus on three main spheres. First, we consider the individual dimension, variables that are mostly under individuals' control such as income, education, and dwelling characteristics. Second, we consider the urban sphere, factors representing the characteristics of the neighborhoods and that are partially under the control of the district-level government. These factors are related to crime and safety, transportation system, parks and green areas, and cleaning conditions of the streets, among others. Finally, a third sphere includes factors arising from social interactions in the neighborhood. This civil society/trust dimension is measured by variables such as trust in neighbors and sharing of recreational activities with neighbors. Determining which variables and

dimensions are more important for QoL is important since it opens the debate about what policy interventions at the district level could do to have an impact on the QoL of its citizens.

The paper is organized at follows. The next section provides the context in which the analysis of the selected three districts could be framed and introduces the description of these districts. Section 3 presents a brief description of the survey and the sample. Section 4 presents the methodology used to construct QoL indexes. The results are presented in Sections 5 and 6. In Section 5 we present results of the different specifications to estimate QoL indexes using the life satisfaction methodological approach. Previously, we present the results of regressions of QoL for each of the different dimensions considered in the survey. Section 6 presents the computation of the QoL indexes for the sample as well as the estimation of the relative importance of each sphere (the individual, the urban and the civil society sphere). It also presents the indexes for different demographic characteristics. The conclusions and policy recommendations of this study are presented in Section 7.

2. Context

Lima, the capital city of Peru, has undergone years a long period of intensive growth. Its population represented 13 percent of the total Peruvian population in 1940 and by 2005 represented 30 percent, with almost eight and a half million inhabitants. The city has also expanded in terms of area, developing a very large periphery. The territory of Lima in 1940 occupied only 3.8 percent of its current area. Despite the territorial expansion, the population density in Lima is 219 individuals per km^2, while the average density for Peru is 15 individuals per km^2 (Capeco, 2006).

The large growth of the city was mainly due to migration from rural areas, starting in 1920 (Gonzales de Olarte, 1992). Arellano and Burgos (2007) estimate that 36.2 percent of Lima's population in Lima is made up of direct immigrants (mainly located in the peripheral areas), while 43.5 percent have parents and grandparents from provinces. Moreover, it is possible to find some relationship between the location of migrants in the city and their place of origin. The population of districts such as San Martín de Porres, Independencia and Los Olivos, in the north of Lima, are mainly from La Libertad, Ancash and Cajamarca, geographical regions in the north of the country. Meanwhile, most of the population of districts like Villa María del Triunfo

and Villa El Salvador, located more toward the southern portion of Lima, are mainly immigrants from the southern highlands, particularly Ayacucho and Apurímac.

The Metropolitan Area of Lima is composed of 43 districts in a territory of 2800 km^2. However, some of the districts in the peripheral area of Lima are predominantly rural, and some districts located near the coast are mostly seasonal residence districts. The urban agglomeration of these districts is not articulated with the complexity of Metropolitan Lima. For this reason, in what follows we describe the context of the study using only information from the 33 districts forming the conurbation of Lima.

The average population in the districts belonging to the conurbation of Metropolitan Lima is 203,473 inhabitants. The extremes are San Juan de Lurigancho, with 889,410 inhabitants and Barranco, with 38,612 inhabitants. In the three districts where the QoL survey was applied this figure is above average and relatively similar. In Villa El Salvador, in the South, the number of inhabitants is 402,140, compared to 208,184 in La Victoria 313,613 in Los Olivos.

We can obtain an idea of how the districts are ordered in terms of socioeconomic conditions by considering how many individuals in each district belong to the different socioeconomic levels (SELs). For example, the districts with the highest percentage of population in the highest SELs, A and B, are San Isidro (98.5 percent) and San Borja (97.5 percent). At the other extreme is Villa El Salvador, the district with the lowest percentage of individuals in those SELs (0.1 percent). This figure in Los Olivos is 20.7 percent, and in La Victoria it is 32.6 percent. Concerning the lowest SELs, D and E, the districts with the highest proportion of population in those SELs are Puente Piedra and San Juan de Lurigancho (93.7 percent and 71.0 percent, respectively), closely followed by Villa El Salvador (68.3 percent). Meanwhile, in Miraflores and San Isidro, there are no individuals in these two categories. Such individuals make up 14.0 percent of La Victoria's population and 37.4 percent of the population of Los Olivos.

Another related indicator is average income per capita. Metropolitan Lima as a whole has an average income per capita of S/. 688 per month (approximately US$ 230). The highest levels of family per capita income are found in districts like San Isidro (US$ 423) and Miraflores (US$ 384), while the lowest are in San Juan de Lurigancho (US$ 192) and in Puente Piedra (US$ 179). In Villa El Salvador and in Los Olivos the amount is lower than the average in Lima (US$ 203 and US$ 219, respectively), while it is higher in La Victoria. (US$ 281).

It is interesting to see how income inequality and income levels correlate spatially. Map 1 (presented in Appendix 1) shows two figures. The left-hand side shows the districts of Lima according to the SEL of greatest importance; the darker the district, the higher the proportion of the highest SELs. The right-hand presents the income mean absolute deviation index, which is a measure of inequality.[1] Higher values of this index mean more inequality. In general, districts in the periphery of Lima are poorer. However, the situation is not similar in terms of inequality. As we can see on the right hand side map, while districts in the extreme north and south are more equal, districts on the east side of Lima are more unequal. There is no clear pattern in the center. Regarding the three districts of analysis, we can see that although Villa El Salvador is the poorest of the three, it is also the most equal, while Los Olivos and La Victoria are in the top distribution of the inequality index.

The educational structure of Lima can be seen by analyzing the highest level of education (primary, secondary or superior education) attained by the head of the households. As expected, the level of educational attainment is positively correlated with the level of wealth in the districts. For example, in the richest districts, like San Isidro and San Borja, the percentage of heads of household with higher education is almost 80 percent, while in poor districts like San Juan de Lurigancho and Puente Piedra the comparable figure is 24 percent and 18 percent, respectively. In the three districts under analysis, the percentage of heads of household with higher education is 43 percent in Los Olivos, 34 percent in La Victoria and 21 percent in Villa El Salvador.

Regarding other QoL dimensions, we can observe some indicators of crime constructed using data coming from a survey administrated by the National System of Civilian Safety (SINASEC) in 2006. For example, regarding violent robbery in Lima City, we construct an indicator measuring the number of these events that happened in a certain district, independently of the victim's district of residence. We then compute the number of violent robberies that happened in each district as a proportion of the total number of reported thefts according to the SINASEC survey. It is thus found that the greatest share of thefts (nearly 14 percent) occurred in Lima Cercado. La Victoria and San Juan de Miraflores follow, each with 11 percent of total robberies reported. At the other extreme, Breña, Jesús María and Magdalena represent less than 1

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[1] It is computed as the average of the distance from average income for each SEL weighted by the number of household per SEL in each district

percent of the total. It should additionally be noted that 17 percent of the city's security guards and policemen work in Lima Cercado, while only 1 to 3 percent work in the districts with the lowest robbery rates.

Indicators of district-level characteristics were constructed using data from the National Register of Municipalities (RENAMU). One indicator of district-level wealth is district-level executed income per capita (2006). The data for this indicator show that Lima Cercado is the district with the highest per capita income (S/.2,571), followed by San Isidro (S/. 2,032). On the other end, the districts with the lowest values are San Martín de Porres (S/. 74) and San Juan de Lurigancho (S/. 73). These values show great disparities in wealth across districts. Also, with the exception of Lima Cercado (which has the richest district-level government, but not the wealthiest population), district-level wealth is somewhat correlated with the socioeconomic conditions of the district's population. The three districts under analysis present values below the average (S/. 379), with the highest found in La Victoria (S/. 195) and the lowest in Villa El Salvador, where district-level government spending per capital is only S/. 91.

The number of health centers (including those managed by private initiative, district-level governments and other institutions) per thousand inhabitants is used as an indicator of supply of health services. San Isidro (7.2) is again in first place, followed by Jesús María (6.5). Even though Los Olivos holds the fifth position, it displays a notably lower level (1.8). In La Victoria there is less than one center per thousand inhabitants and in Villa El Salvador, the district with the fewest health centers per thousand, the ratio is only 0.02.

Finally, the oldest and largest social organization in Lima is the "Glass of milk committees program" (GMC), a social program oriented to improve nutrition of the poor. We calculated the number of beneficiaries of this program per thousand inhabitants using data from RENAMU. The district with the highest number of GMC beneficiaries is Comas, with 306 per 1,000 inhabitants, followed by El Agustino (228) and Villa El Salvador (225). Los Olivos has 126, still over the average of 104. La Victoria is below average (88). The lowest values are found in La Molina and San Borja (12 and 9, respectively).

The overview of all these indicators shows that in Lima there is a highly unequal distribution of wealth among districts. In general, districts in the modern area (part of the center), such as San Isidro and San Borja are significantly richer than districts in the periphery, such as Puente Piedra, San Juan de Lurigancho and Villa El Salvador. However, it is not the case that all

districts in the center are rich in terms of income, as the case of La Victoria shows. On the other hand, although most variables related to wealth and income are highly correlated among the districts of Lima (level of education, health services), some indicators, such as crime rates, are not.

2.1 The Districts under Analysis: Los Olivos, La Victoria and Villa El Salvador

The districts that will be analyzed in this study are representative of Lima in many ways. Villa El Salvador and Los Olivos, like most of the districts of the periphery, were established and developed as a consequence of migration waves of Andean population towards the capital city, while La Victoria is one of Lima's oldest districts. In addition, their growth dynamics as individual cities represent clear examples of the different development strategies that are characteristic of different parts of Lima. While Villa El Salvador grew substantially starting in the 1970s and during the 1980s on the basis of collective action and civil participation, Los Olivos is one of the districts that grew more in the 1990s, mainly due to entrepreneurial activities, becoming an important commercial area of Lima.

According to the socio-economic profiles of Lima produced by Ipsos-Apoyo, of the three districts under analysis, La Victoria is characterized bys the highest percentage of families in SELs A, B and C. In Los Olivos most families belong to SELs C and D. The poorest district is Villa El Salvador, with 20 percent of families in SEL E, while the rest are primarily in SELs C and D. Thus, Villa El Salvador seems to be somewhat poorer than the other two. However, as shown in a previous section, this district is much more homogeneous than the others.

Table 1. Socioeconomic Levels in Districts of Analysis

Indicators	Lima	Los Olivos	La Victoria	Villa el Salvador
% SEL A	3.4	0.1	0.3	0
% SEL B	12.5	20.6	32.3	0.1
% SEL C	35.3	41.8	53.4	31.6
% SEL D	30.6	31.1	11.9	48
% SEL E	18.2	6.3	2.1	20.3
Population 2005	7'691,333	313,613	208,184	402,140

Source: Ipsos-Apoyo Opinion y Mercado and Peruvian Census 2005.

Among the advantages of focusing the analysis on these three districts is that, although the three of them can be considered part of the conurbation of Lima, Los Olivos and Villa El Salvador are typically considered part of the periphery, while La Victoria clearly represents the center. Given these spatial characteristics, when we compare those districts we find differences in QoL related to the center-periphery relationship. This means that better access to public services, better access to transportation and a higher number of police officers and general hospitals should be found in La Victoria than in the other two peripheral districts. For example, the percentage of children not attending school is lower in La Victoria than in the other two districts (see Table 2). We observe these results even though La Victoria is very similar to Los Olivos in regard to its mix of SELs.

Table 2. Several Indicators of Districts under Analysis

Indicators	Los Olivos	La Victoria	Villa El Salvador
% Households with water supply	93	81	78
% Children not attending school	4.1	3.3	4.5
% Households with at least 1 unsatisfied basic need*	28.4	21.9	48.4
% Dwellings with infrastructure deficiencies	7	1.6	29.4

Source: National Statistical Institute (INEI). * This indicator is measured as the proportion of households in at least one of the following situations: the materials of walls, roofs and floors of the house are not of an appropriate material, there are more than 3 individuals per room, there is no sewage service, at least one child between 6-17 is not going to school and/or there are three non-income earners per each income earner (when head of households has complete primary education or less).

Another advantage is that Los Olivos and Villa El Salvador represent different schemes of urban development. Los Olivos belong to North Lima, an area of the city that during the last 15 years has come to be considered very important in terms of economic expansion, especially concerning financial and commercial services. In districts of North Lima, like Los Olivos, Independencia and Comas, economic expansion is driven mainly by the private investment and entrepreneurship of its residents. Commercial activity has notably increased, for example through the construction of Mega Plaza in the district of Los Olivos, the largest shopping mall located outside the center of Lima.

On the contrary, districts of the south, especially Villa El Salvador, have a tradition of collective action based on the organization of economic activities by state and local governments. Acording to Arellano and Burgos (2007), Villa El Salvador began in 1971 as a

squatter settlement made up of 200 migrant families. In less than a year the population swelled to 109,165. In 1974 the Peruvian Government, in line with its official policies of state planning and intervention of the economy, established the Villa El Salvador Industrial Park in an area of 382 hectares. In 1976, the park was placed under the jurisdiction of the Ministry of Housing, and four years later it was recognized as a district.

Throughout this process, several elements of government planning, collective action and social capital spread out across the district, and different groups of neighbors organized under the form of Community Self-Management Groups (CUAVES) with support from the district-level government. Their purpose was to obtain and benefit from social programs carried out by the Peruvian state (Ponce, Távara and Stecher, 1992). Arellano and Burgos (2007) note that the first public school was built and the first club of mothers (*clubes de madres*) established with state support only six months after the district was created, which illustrates the effectiveness of these organizations. The basic idea of community participation and collective strength is maintained even now, as shown in the Comprehensive Development Plan of Villa El Salvador,[2] drawn up by its local authority.

Therefore, these two districts present differences in terms of the forces driving economic expansion. Districts like Los Olivos are considered representative of the market model of development, while Villa El Salvador is considered representative of a model based on collective economy, where issues related to civil society and trust are considered key.

3. The Survey

The survey applied for this study has three main objectives: 1) to collect objective information on QoL indicators by measuring aspects related to urban neighborhood conditions, such as access to green areas, crime, public and social participation and access to public services; 2) to collect information on perceptions on uses and quality of public goods; and 3) to ask respondents to rank different characteristics and services (dimensions of QoL) in terms of their importance. The survey also collected information regarding the characteristics of the block coming from direct observation of the surveyor (such as conditions of the streets and sidewalks, cleaning conditions, availability of green areas, etc.).

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[2] Available at www.amigosdevilla.it/Documentos/pdf013.pdf.

The survey considers the following 10 topics (a table with descriptive statistics for some of the variables collected in the survey is presented in Appendix 2):

- Household income and socioeconomic conditions
- Housing characteristics
- Safety (including crime, drugs, police, etc.)
- Health care and health facilities
- Education and education facilities
- Green areas
- Cleaning and conditions of streets
- Commuting and transportation
- Recreational activities
- Public participation and social interaction

Regarding the sample design, four important features are worth mentioning:

- The universe of the study was composed of heads of households (or partners) of both sexes that reside in the districts of La Victoria, Los Olivos and Villa El Salvador (see Section 2.2 for a description and advantages of the selection of these three districts).
- The sampling method considered stratification by SEL levels with computer random selection of blocks and systematic selection of housings within each block.
- The sample size was 604 surveys distributed evenly among the three districts.
- The margin of error is ± 4, assuming a confidence level of 95 percent, the greatest dispersion of results (p=0.5) and a complete probabilistic selection of interviewees.

Table 3. Characteristics of Sample

	Total	Percentage
Total number of surveys	**604**	**100%**
By district		
Surveys in La Victoria	201	33%
Surveys in Los Olivos	201	33%
Surveys in Villa El Salvador	202	33%
By Socioeconomic Level		
Surveys in SEL A/B	85	14%
Surveys in SEL C	267	44%
Surveys in SEL D	252	42%
By gender		
Surveys of males	228	38%
Surveys of females	376	62%

As shown in Table 3, since these three districts are relatively poor, most of the individuals surveyed individuals belong to SELs C (44 percent) and D (42 percent). Of the total sample, 54 stated that they were the head of the household, and 38 percent of the sample consisted of males. Finally, the average age of the respondent was 43, the minimum being 18 years and the maximum 86 years.

4. Methodology

QoL is a concept that needs to be measured using indicators on a variety of dimensions besides income and socioeconomic conditions. Once objectives measures of indicators on different dimensions are available, a key issue is how to combine these indicators into a single index of QoL. The approach adopted by this study is to assume that QoL is a linear combination of these objective indicators. In other words, it can be approximated by a weighted average of these indicators.

In particular, let there be K indicators representing the individual sphere, J indicators representing the urban sphere, and N indicators representing the civil society/trust sphere. Let H_k be the kth indicator of the individual sphere, where $k=1, \ldots, K$; let D_j be the jth indicator of the urban sphere ($j = 1, \ldots J$) and T_n the nth indicator of the civil society/trust sphere, with $n=1, \ldots, N$.

The aggregated QoL index will be:

$$QoL = \sum_{k=1}^{K} \hat{\alpha}_k H_k + \sum_{j=1}^{J} \hat{\beta}_j D_j + \sum_{n=1}^{N} \hat{\phi}_n T_n \qquad (1)$$

Key components in equation (1) are the weights $\hat{\alpha}_k$, $\hat{\beta}_j$ and $\hat{\phi}_n$ for k=1, …, K, j=1, …J and n=1, …, N respectively. They are critical to be able to compute QoL as the weighted average of the indicators.

The computation of the weights is based on the methodological insights provided by the literature on life satisfaction. This literature is based upon empirical studies focusing on the measurement of wellbeing and happiness and their relationship with utility (Baker and Palmer, 2006; Frey and Stutzer, 2002; Oswald, 1997; Tiliouine, Cummins and Davern, 2006; Van Praag, Fritjers and Ferrer-i-Carbonell, 2003; Van Praag and Baarsma, 2005; and Van Praag and Ferrer-i-Carbonell, 2007) and different economic and social indicators (Cattaneo et al., 2007; Di Tella and MacCulloch, 2006; Easterlin, 1974; and Frey, Luechinger and Stutzer, 2004). Intuitively, the idea is to exploit the association between a measure of utility (Frey, Luechinger and Stutze,r 2004), and indicators at the household and district levels. The statistical influence of each indicator on life satisfaction will be computed by means of regression analysis, as equation (3) shows:

$$s_{id} = c + \delta X_{id} + \sum_{j=1}^{J} \hat{\beta}_{jd} D_{jd} + \sum_{n=1}^{N} \hat{\phi}_{nd} T_{jd} + \sum_{k=1}^{K} \hat{\alpha}_{ki} H_{ki} + v_{id} \qquad (2)$$

where life satisfaction, denoted by s_{id}, it is the measure of indirect utility, and X_{id} is a list of control variables. The rest of variables are similar to those used in regression (2). As in the previous method, computing this regression we will obtain the weights needed for equation (1).

Five notes specific to this study's methodology are important to mention:

i. Regarding the Life Satisfaction Approach, in regression (2) we used as the dependent variable a categorical variable taking only integer values between 1 and 10 (responses to the question asking the for a ranking of overall satisfaction with QoL). Thus, an ordered logit specification is methodologically appropriate. However, in Section 5, we also present OLS estimates given that results are easier to interpret and weights can be obtained directly, since there is only one potential outcome to predict. In the case of the

ordered logit specification, given that there are 10 categories there are 10 possible outcomes and we would have to compute 10 outcome-specific sets of weights.

ii. An alternative method for dealing with the categorical dependent variable is based on taking advantage of its implicit cardinality properties. This is obtained by transforming the categorical variable assuming that it follows a standard normal distribution and estimating the resulting model by OLS. This method, called COLS (Cardinal Ordinary Least Squares) is presented in detail in Van Praag and Ferrer-i-Carbonell (2007). The alternative estimates found through this method are presented also in Section 5.

iii. A second dependent variable is used when applying the Life Satisfaction Approach. It is a measure of quality of life constructed using respondents evaluation of their satisfaction with different dimensions considered important (income, house infrastructure, crime and safety, etc.) weighted by the sample average of the importance that these dimensions have for QoL (according to responses to the survey). The difference between this measure of QoL and the self-declared overall measure is that the "computed quality of life" has less variability coming from subjective aspects of QoL for which the researcher cannot control (emotional aspects, health shocks, etc.). Thus, the computed QoL refers specifically to aspects considered by the analysis. We show in Section 5 the relation between this computed QoL and the self-reported QoL.

iv. Regarding the explanatory variables—the QoL indicators—given the wide scope of this study there is a large number of indicators that are conceptually important to consider. However, including so many explanatory variables in the regression may not be desirable given that most of these indicators may be highly correlated. Three alternative approaches were used to deal with this issue. First, we selected only the objective variables that have a statistically significant association between the dimensions to which they belong and the dimension-specific level of satisfaction (around 20 objective variables). Second, we computed dimension-specific regressions (presented in Section 5)

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and then used the estimated dimension-specific predicted values as independent variables in the overall QoL regression: this method yields 10 indicators, one for each dimension. Third, using principal component analysis we reduced all the indicators of each dimension to one variable (the principal component of the dimension-specific indicators). Then, we used these variables in the overall QoL regressions as explanatory variables. It should be mentioned that for each dimension we obtained the principal component of all indicators, not only those that were statistically significant in the dimension-specific regressions.

5. Quality of Life Regressions

5.1 Overview of Dependent Variables

5.1.1 Self-Reported Quality of Life

The first measure of QoL provided by the survey is given by the direct answers to the question: *On a scale from 1 to 10, where 1 is totally unsatisfied and 10 is totally satisfied, how satisfied are you with your overall quality of life?* We will call this measure Self Reported QoL. The mean value of the self reported QoL is 6.05 (with standard deviation of 2.10). When it is conditioned by district, as shown in the upper panel of Figure 1, we observe that the district with the highest QoL is Villa El Salvador (6.27), followed by La Victoria (6.17) and Los Olivos (5.73). This is somewhat surprising since, as we have seen in Section 2, Villa El Salvador is a district that has the most unmet needs and the great percentage of poor inhabitants.

The lower panel of Figure 1 shows the distribution of the self reported QoL in the overall sample and in each district. We can observe that there is more dispersion in the self-reported QoL in Villa El Salvador. This means that, although there is a peak in the self reported satisfaction of Villa El Salvador at the value 8 (while in Los Olivos and La Victoria the peak is around 5-6), there are also more people self reporting lower levels of satisfaction. In Los Olivos there is also an important accumulation of frequencies below the middle of the scale (5), while La Victoria has a distribution function more skewed towards the higher portion of the scale.

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Figure 1. Self-Reported QOL by District (means and distribution)

Satisfaction with Overall Quality of Life by District

(1 low satisfaction, 10 high satisfaction)
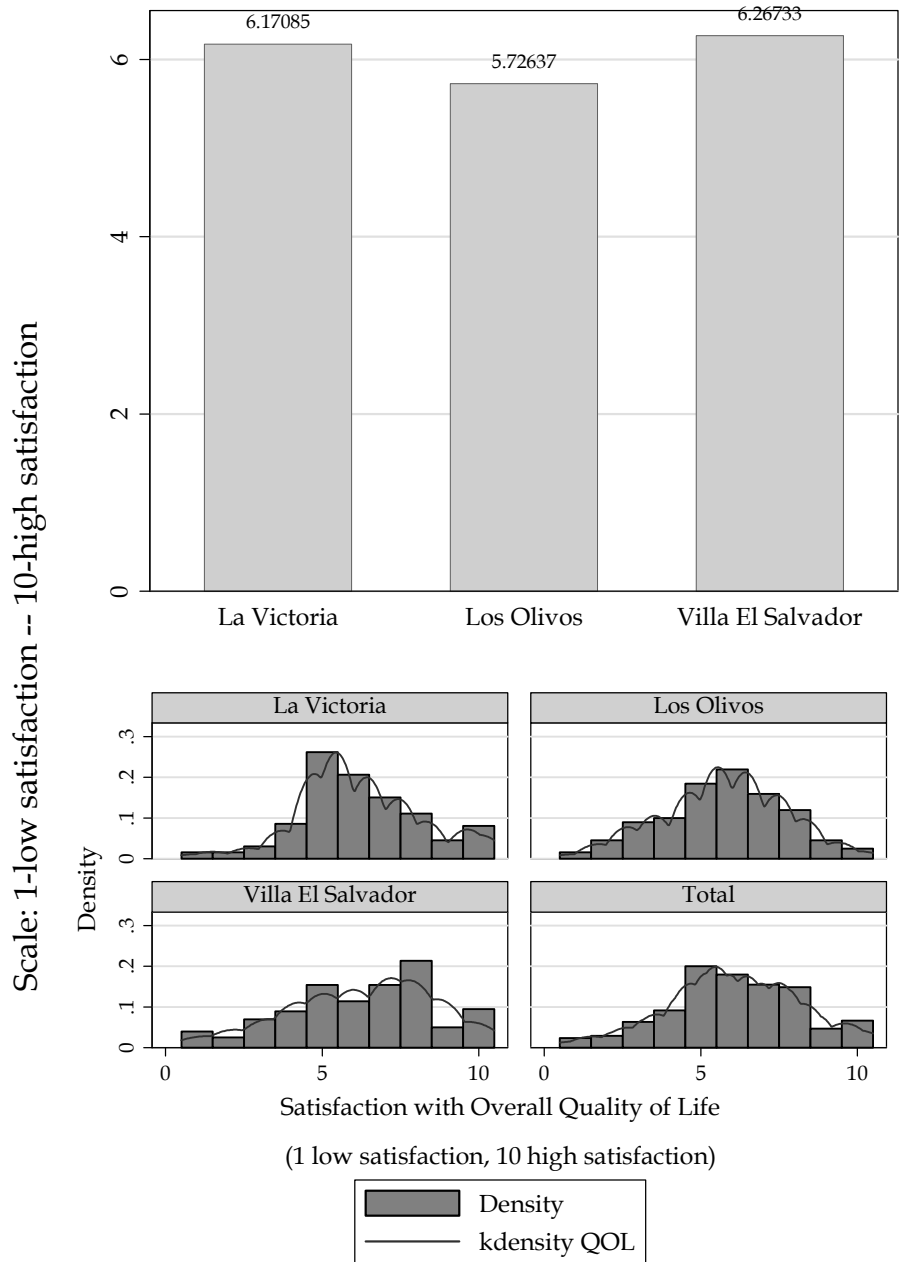
Graphs by ubigeo distrito

Figure 2 shows self-reported QoL conditioned on socioeconomic level (SEL). Clearly, belonging to higher SELs is associated with greater QoL. It should be noted that there appears to be an inconsistency between this finding and the aforementioned results by district. If self-reported QoL is positively correlated with higher SELs, then we could expect the self-reported QoL to be lower in Villa El Salvador. One interpretation of this apparent inconsistency is to acknowledge that the self-reported QoL, although correlated with SEL, is a subjective measure of QoL that considers many aspects of life that are not necessarily related to income or socioeconomic levels, for example issues related to trust in neighbors or recreational activities. Even more, it could be the case that this subjective measure of QoL is related partially to aspects of daily life not even considered in the priors of the researcher and not observed here.

Figure 2. Self-Reported QOL by Socioeconomic Levels

Satisfaction with Overall Quality of Life by SEL
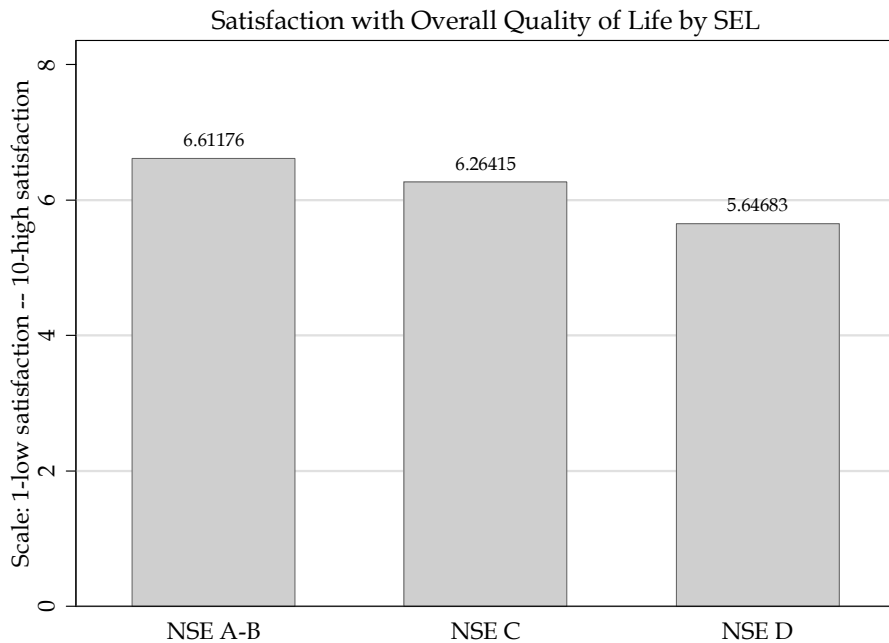
5.1.2 Computed Quality of Life

In order to obtain a relatively more objective and narrower measure of QoL we constructed an index based on answers to questions specific to the dimensions considered to be important for QoL in the study. The survey provides information regarding how satisfied individuals were in each of the following dimensions: (i) income, (ii) dwelling infrastructure, (iii) health services,

(iv) education services, (v) safety, (vi) cleaning conditions of streets, (vii) parks and green area, (viii) transportation system and traffic, (ix) amenities and recreational activities, and (x) social interaction and trust. The questions that were used read as follows: *On a scale from 1 to 10, where 1 is totally unsatisfied and 10 is totally satisfied, how satisfied are you with aspect _____?* One question was applied for each of the 10 QoL dimensions mentioned above. In addition, in the survey the following question was also included: *How would you rate the importance of the following aspects for your quality of life?* The respondent had to choose one of the following options *Very important*, *Important*, *Not important* and *Absolutely unimportant* for each of the dimensions mentioned in the previous paragraph.

We interpret the first question as the indirect utility or satisfaction in each of the dimensions, while the second one as the potential importance that each dimension has for QoL. Thus, it is possible to compute an overall index of QoL by taking the weighted average of satisfaction with each dimension using as weights the reported level of importance. To decrease the idiosyncratic bias in the weights and to rule out the portion of the weight that is due specifically to individual perceptions we used the average importance of each dimension for the whole sample. The weights are normalized to sum up to 1.

To obtain the computed QoL we take the weighted average of the satisfaction that individuals obtain from each domain using the weights according to the following formula (the value of the index is normalized to be between 1 and 10, but not restricted to take only integer values):

$$ComputedQol_i = \sum_{d \in D} \overline{w}_d \times s_{di} \qquad (3)$$

The mean computed QoL for the overall sample is 4.51 (versus more than 6 in the self-reported QoL),with a standard deviation of 1.13. The minimum value of this index is 1.34, while the maximum is 7.67.

Figure 3. Computed QOL by Districts and SELS

Satisfaction with Overall Quality of Life

By district

By SEL
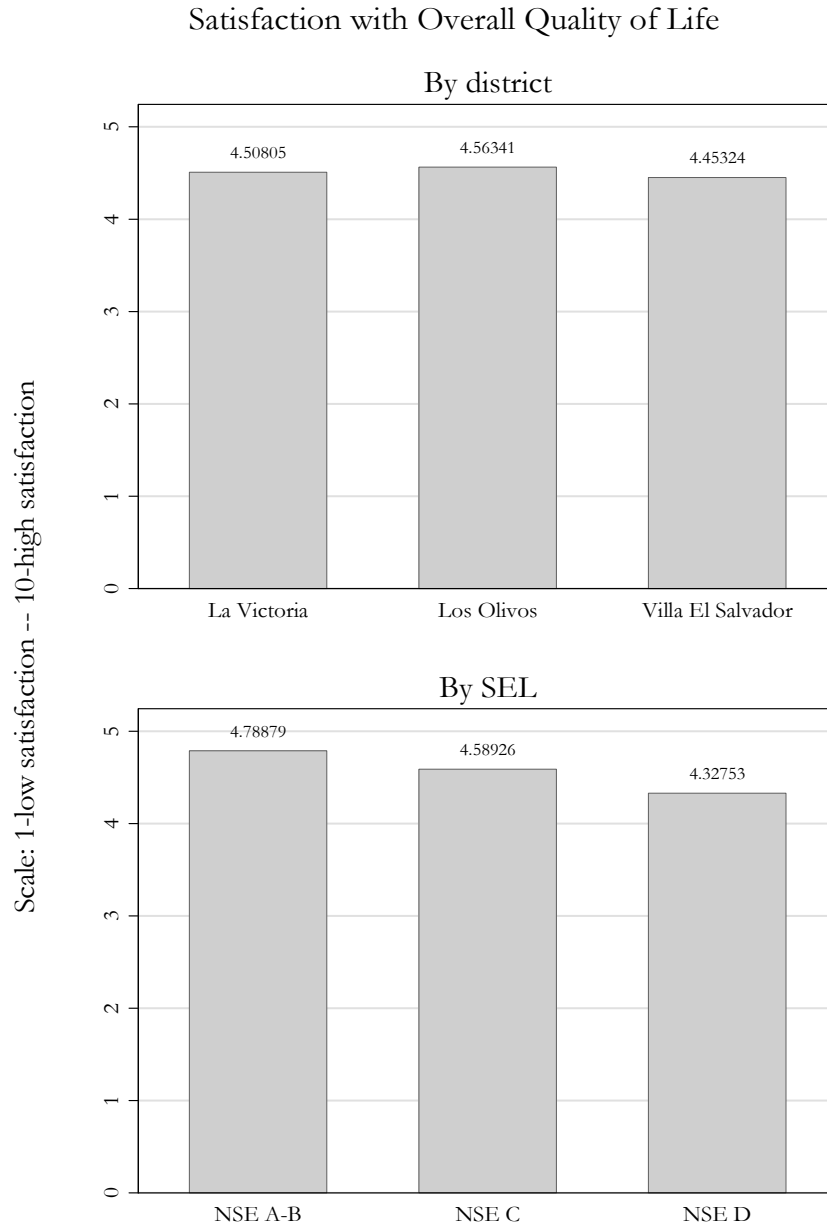
Figure 3 shows the mean of the computed QoL conditioned on districts (the upper panel) and on SELs (the lower panel). As opposed to the self-eported QoL, the district with the higher computed QoL is now Los Olivos followed by La Victoria and Villa El Salvador. In the case of the mean conditioned on SELs, SELs A and B have a higher QoL than SELs C and D.

Figure 4 below plots both measures of QoL, the self-reported QoL on the horizontal axis and the computed QoL on the vertical axis. A 45-degree line is added to the graph. Recall that the self-reported QoL only takes integer values between 1 and 10, while the computed QoL can take any value between 1 and 10. The graph shows that observations with lower levels of self-reported quality of life are associated with higher levels of computed QoL. In this case, all the dots are above the 45-degree line. On the contrary, for observations of higher values of self-reported QoL, the computed QoL yields lower levels of satisfaction. Starting at a self-reported QoL of 6 or higher, almost all the observations have lower levels of computed QoL. It is important to note that there are many observations showing a self-reported QoL of 10, but very few observations for which a computed QoL higher than 7 were found.

Figure 4. Comparing Self-Reported and Computed QOL
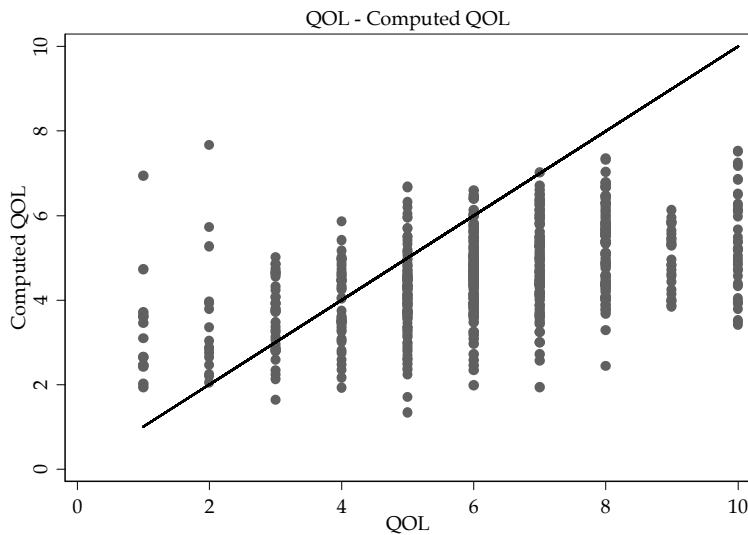
The lack of concentration of dots around the 45-degree line shows that the inclusion of subjective issues in the self-reported QoL tends to scale QoL up or down. Subjective QoL tends to underreport QoL for lower levels of life satisfaction, while it tends to overreport QoL for higher levels of life satisfaction in relation to the more objective measurement of QoL.

Given these results, it is worthwhile to use both measures of QoL in regressions geared toward finding weights to combine objective indicators into a one-dimensional QoL index. Using the self-reported QoL would yield the statistical influence of the objective indicators on a

subjective measure of QoL. It is desirable to use self-reported QoL since it will show how important the dimensions considered in the survey are for QoL in the presence of additional subjective and non-observable factors. On the other hand, because the computed QoL seems to be narrower, the results coming from regressions using it as a dependent variable should yield a better fit. Having both specifications will make it possible to obtain results that are robust to both specifications.

5.2 Explanatory Variables: Quality of Life Indicators

To choose the appropriate indicators to include in regression (4) we analyzed the statistical association between several indicators and the domain of QoL to which they are more relevant. This is possible to do since in the survey we asked for the level of satisfaction with each of the ten dimensions of QoL and we collected information on a wide range of indicators for each of these dimensions.

This section presents very briefly the main results regarding the statistical importance of objective indicators with each of the ten dimensions of QoL considered in this study. Each of these 10 tables considers different independent variables.[3] The tables present three specifications for each dimension according to the methodological section: column (1) presents the results using an ordered logit specification, column (2) use ordinary least squares (OLS) and column (3) uses cardinal ordinary least squares (COLS). On a later section, we will select some of these objective indicators to find their statistical association with the overall measures of QoL (the self reported and the computed).

5.2.1 The Individual Sphere

As mentioned above, there are some dimensions that are considered to be part of the individual sphere of action because they are mainly under the individual's control. Thus, this sub-section considers the income, housing infrastructure, education, and health dimensions.

Table 4 represents the results concerning the income dimension. The dependent variable is reported "satisfaction with family income." The independent variables are a set of seven control variables (sex of the respondent, age and age squared of the respondent, educational level, whether respondent has a partner, and the proportion of children among 0 and 5 and among

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[3] The definition and measurement of all objective indicators are presented in Appendix 2.

6 and 18 years old in his or her household) and a set of four objective indicators that are considered to affect satisfaction with family income. The first objective indicator is family income per capita. Other objective indicators included are the following: number of dependent workers, number of independent workers (since earnings/profits might be conditioned by labor situation and thus affect income satisfaction), and rate of economic dependence (number of contributors/number of non-contributors).[4]

As shown in Table 4, control variables traditionally associated with life satisfaction are statistically significant.[5] In particular, there is a non-linear relationship with the age of the respondent. Satisfaction with income decreases with age, and it does so at a positive rate. Also, having a partner is shown to be statistically positively correlated with satisfaction with income, and the proportion of children is negatively correlated with satisfaction with income. Specifically, the proportion of children between 6 and 18 years of age has a coefficient that is negative and statistically significant.

The four objective indicators are significant for all specifications. Family per capita income, being employed (either in an independent or dependent regime) and having proportionally more economically contributing members positively correlates with satisfaction with family income. Finally, the coefficients related to district effects are negative and statistically significant.

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[4] These four variables are measured in logs. See Appendix 2 for variable definitions.
[5] The same control variables considered here were included in all the regressions presented in this section (in all dimensions). However, they are only reported in Table 8. The results in later regressions regarding these control variables are very similar to those presented here.

Table 4. Satisfaction with Income

	(1) Ordered Logit	(2) OLS	(3) COLS
Sex of respondent	0.22775	0.21047	0.06720
	(0.15990)	(0.18446)	(0.06025)
Age of respondent	-0.08579***	-0.08826**	-0.03039**
	(0.03192)	(0.03610)	(0.01179)
Age of respondent^2	0.00084**	0.00086**	0.00030**
	(0.00034)	(0.00039)	(0.00013)
Completed secondary education	0.17654	0.15481	0.03107
	(0.17771)	(0.20448)	(0.06679)
Proportion of children between 0 and 5	-1.11930	-1.22699	-0.41128
	(0.78140)	(0.90451)	(0.29543)
Proportion of children between 6 and 18	-1.47101**	-1.70863**	-0.56502**
	(0.61661)	(0.70570)	(0.23049)
Respondent has a partner	0.33866*	0.40049*	0.12213*
	(0.18074)	(0.20861)	(0.06814)
Familiar income per capita	0.92986***	1.05737***	0.33078***
	(0.14707)	(0.16535)	(0.05400)
Number of independent workers	0.80298***	0.90868***	0.30491***
	(0.24747)	(0.28779)	(0.09400)
Number of dependent workers	1.07971***	1.16616***	0.39378***
	(0.23321)	(0.26187)	(0.08553)
Rate of economic dependence	0.55901**	0.64470**	0.21294**
	(0.25536)	(0.29657)	(0.09686)
La Victoria	--	--	--
Los Olivos	-0.52557***	-0.67699***	-0.21389***
	(0.18124)	(0.21126)	(0.06900)
Villa El Salvador	-0.32987*	-0.42366**	-0.11557*
	(0.18274)	(0.21214)	(0.06929)
Constant		0.41911	-1.22429***
		(1.30597)	(0.42655)
Observations	582	582	582
R-squared		0.16	0.15

Standard errors in parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%

Table 5 shows regressions where satisfaction with dwelling infrastructure is regressed against different indicators associated with this dimension. Although they are not reported, the set of control variables included in Table 4 is also used in this regression. An additional control variable is included: a dummy variable representing whether the property is owned by the respondent (fully paid or still paying for it). Home ownership is significant and, according to OLS results, associated with around 0.76 additional points on the scale (from 1 to 10).

Variables indicating whether the household has minimum infrastructure conditions are included as objective indicators. Whether the source of water comes from a public network, or if the house has adequate materials of roof and walls might increase satisfaction with dwelling conditions. Indeed, according to Table 5, all of the indicators are positively correlated with satisfaction with house infrastructure and are statistically significant. In this case, the coefficients of the districts effects are not significant.

Table 5. Satisfaction with House Infrastructure

	(1) Ordered Logit	(2) OLS	(3) COLS
Owns his house	0.60779***	0.77098***	0.27810***
	(0.16891)	(0.20582)	(0.07311)
Water from public network in the house	0.81272***	1.06210***	0.37165***
	(0.25904)	(0.31780)	(0.11289)
Roof is made of appropriate material	0.57944***	0.70730***	0.25199***
	(0.18885)	(0.23186)	(0.08236)
Walls are made of appropriate material	0.86503***	1.05463***	0.34146***
	(0.18906)	(0.22959)	(0.08155)
La Victoria	--	--	--
Los Olivos	0.08543	0.07758	0.01975
	(0.18461)	(0.23010)	(0.08174)
Villa El Salvador	0.24165	0.23570	0.09416
	(0.20084)	(0.24548)	(0.08720)
Constant		3.79742***	-0.22478
		(0.91192)	(0.32393)
Observations	604	604	604
R-squared		0.20	0.18

Standard errors in parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%.
The following control variables were included in the regression but their results are not reported: sex, age, age squared, educational level, whether respondent has a partner, proportion of children among 0 and 5 and among 6 and 18 years old and whether the respondent is employed.

The results regarding health are presented in Table 6. A very important infrastructure feature related to sanitary conditions, namely source of water, is included given that a public network inside the house avoids contagion and proliferation of diseases in the neighborhood. Other objective indicators considered are the time needed to get to the health center and its location (i.e., whether it is in the district). The intuition for the first is that a nearer health center

allows the user to receive attention more quickly, while the second one allows for an assessment of the range of health supply in the district. District effects are also included in the regression.

The only significant variable is the one related to location of health centre in the district of respondent, which shows a positive sign. This is an interesting result since it suggests that it is not the distance of the services that and individual uses but the general availability of services what matters for satisfaction in this dimension.

Table 6. Satisfaction with Health

	(1) Ordered Logit	(2) OLS	(3) COLS
Water from public network in the house	0.28552	0.34492	0.11051
	(0.25974)	(0.29170)	(0.09406)
Time to the nearest health center	-0.14583	-0.16879	-0.06744*
	(0.10909)	(0.12410)	(0.04002)
Attends health center in the district	1.32303***	1.46801***	0.41419***
	(0.30698)	(0.35264)	(0.11372)
La Victoria	--	--	--
Los Olivos	0.10637	0.03097	-0.01244
	(0.18535)	(0.21195)	(0.06835)
Villa El Salvador	-0.06616	-0.07134	-0.01118
	(0.18478)	(0.20996)	(0.06771)
Constant		6.11381***	0.54302*
		(0.97123)	(0.31319)
Observations	584	584	584
R-squared		0.08	0.07

Standard errors in parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%
The following control variables were included in the regression but their results are not reported:
sex, age, age squared, educational level, whether respondent has a partner, proportion of children among 0 and 5 and among 6 and 18 years old and whether the respondent is employed.

The correlation between objective variables in the area of education and the respondent's satisfaction with the quality of education of their children is reported in Table 7. Number of family members at school is included as an additional control variable. Concerning the quality of education, number of children in public schools might depict perceptions of these kinds of institutions as opposed to private schools. Variables related to the accessibility of schools were also taken into consideration (e.g., average transportation time to get to school for school members, and number of family members studying in the district).

The most important results in this dimension are as follows. First, the additional control variable (number of members in the school) seems to be important since it is positively and significantly correlated with satisfaction with quality of education. Second, the number of children in the household attending public schools is significant and negatively correlated with satisfaction in this area. This result may reflect the extremely low quality of the Peruvian public education system. Finally, the variable related to number of children who study in the district is significant for only one specification, and there it decreases satisfaction.

Table 7. Satisfaction with Quality of Education

	(1) Ordered Logit	(2) OLS	(3) COLS
Log of children at school	1.07448*	1.31359**	0.52791**
	(0.56158)	(0.63134)	(0.23583)
Log of children in public school	-1.10569***	-1.25825***	-0.45840***
	(0.24268)	(0.26839)	(0.10025)
Time to get to school	-0.15634	-0.09682	-0.06541
	(0.16526)	(0.18664)	(0.06972)
Number of family members studying in the district	-0.57868*	-0.49698	-0.21744
	(0.32450)	(0.35861)	(0.13396)
La Victoria	--	--	--
Los Olivos	-0.30716	-0.39485	-0.19188**
	(0.22367)	(0.25392)	(0.09485)
Villa El Salvador	0.06859	0.12387	0.03929
	(0.22963)	(0.25582)	(0.09556)
Constant		8.37474***	1.48478***
		(1.27203)	(0.47515)
Observations	396	396	396
R-squared		0.12	0.12

Standard errors in parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%
The following control variables were included in the regression but their results are not reported: sex, age, age squared, educational level, whether respondent has a partner, proportion of children among 0 and 5 and among 6 and 18 years old and whether the respondent is employed.

5.2.2 The Urban Sphere

The dimensions considered to be part of the urban sphere are those where the district-level government may have an important degree of control and where the control by the individual is small and not direct. The dimensions considered in the urban sphere are: crime and safety, cleaning conditions of the streets, parks and green areas, and transportation system.

Table 8 shows regression results where the dependent variable is the level of satisfaction with safety against crime. As before, control variables are included but not reported. Concerning the frequency of robbery situations, two dummy variables are included. The first indicates whether the respondent has been victim of a robbery, while the second indicates whether the respondent has been a victim of an *attempted* of robbery (in both cases during the last year). Another variable measuring exposure to risk of crime is a dummy variable taking the value of 1 if, according to the respondent, there are gangs in his/her neighborhood.

Table 8. Satisfaction with Safety Conditions of Neighborhood

	(1) Ordered Logit	(2) OLS	(3) COLS
Victim of a theft	-0.50432**	-0.50790**	-0.13149*
	(0.23260)	(0.25818)	(0.07856)
Victim of attempt of robbery	-1.26640***	-1.27504***	-0.38466***
	(0.27306)	(0.29518)	(0.08982)
Gangs present in neighborhood	-0.70142***	-0.92205***	-0.31419***
	(0.22881)	(0.25142)	(0.07650)
La Victoria	--	--	--
Los Olivos	0.14725	0.13458	0.02735
	(0.18105)	(0.20203)	(0.06147)
Villa El Salvador	0.28197	0.29535	0.08029
	(0.18464)	(0.20234)	(0.06157)
Constant		6.05591***	0.44619*
		(0.79170)	(0.24089)
Observations	588	588	588
R-squared		0.10	0.10

Standard errors in parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%
The following control variables were included in the regression but their results are not reported: sex, age, age squared, educational level, whether respondent has a partner, proportion of children among 0 and 5 and among 6 and 18 years old and whether the respondent is employed.

As the table shows, these three objective indicators are negatively correlated with satisfaction with safety conditions of the neighborhood, and the associated coefficients are statistically significant. District effects are not statistically correlated with the dependent variable in this domain. These results are robust to the different specifications.

Regarding the cleaning conditions of the streets, three objective measures were included: two variables referring to the frequency of street cleaning and frequency of trash collection, respectively, and the variable *cleaning condition (observation)*, a dummy variable taking the

value of 1 if the surveyor assesses the cleaning conditions of the street in front of the house as good or very good, and taking the value of 0 if she/he assesses it as bad or very bad.

Results point out that whether streets are cleaned on a daily basis influence positively on satisfaction with this QoL dimension. In addition, the variable based on observation by the surveyor has a positive and significant influence. These results suggest that beyond the specific service of thrash collection, how clean streets are kept is an important factor in satisfaction in this dimension.

Table 9. Satisfaction with Cleaning Conditions of the Street

	(1) Ordered Logit	(2) OLS	(3) COLS
Trash is picked upon a daily basis	0.63546	1.00950	0.31674
	(0.50942)	(0.64174)	(0.20520)
Streets are cleaned on a daily basis	2.33181***	3.06455***	0.94824***
	(0.36529)	(0.43095)	(0.13780)
Good cleaning condition (observation)	0.30732*	0.48393**	0.15678**
	(0.16109)	(0.19114)	(0.06112)
La Victoria	--	--	--
Los Olivos	1.44802***	1.87579***	0.55957***
	(0.33942)	(0.42218)	(0.13499)
Villa El Salvador	0.12536	0.42992	0.14536
	(0.34219)	(0.42990)	(0.13746)
Constant		3.21112***	-0.37260
		(0.95177)	(0.30433)
Observations	601	601	601
R-squared		0.21	0.19

Standard errors in parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%
The following control variables were included in the regression but their results are not reported: sex, age, age squared, educational level, whether respondent has a partner, proportion of children among 0 and 5 and among 6 and 18 years old and whether the respondent is employed.

It should also be noted that the coefficient associated with the dummy Los Olivos is statistically significant. Thus, certain characteristics at the district level influence satisfaction in this domain positively and importantly with respect to what happens in La Victoria (the excluded dummy). The same is not true for Villa El Salvador.

Results regarding the satisfaction with parks and green areas are shown in Table 10. If the use of parks is important, then an indicator concerning the time that takes to go to the park (interacted with the dummy variable indicating whether the respondent goes to the park) might

affect satisfaction. Similarly, an observational dummy variable taking the value 1 if the surveyor observes that the nearest green area is in good condition (0 otherwise) must also be important. District effects have been included, since district-level governments are responsible for maintaining green areas in good condition.

As can be seen, most of the variables are significant. Green areas in good condition have a positive impact on satisfaction. The highest coefficient corresponds to perception of the interviewer about these areas, which is positive and statistically significant. The coefficient of time to go the park is positive, which may be interpreted as incorrect, since it means that living farther from the park increases satisfaction. However, it should be noted that going to the park and selecting which park to visit are choice variables, and this variable may therefore be related to the characteristics of the process of going to the specific park visited by respondents.

Table 10. Satisfaction with Parks and Green Areas

	(1) Ordered Logit	(2) OLS	(3) COLS
Time to go the park	0.43336***	0.50829***	0.15634***
	(0.07120)	(0.08268)	(0.02578)
Green areas in good condition (observation)	1.43738***	1.68509***	0.50098***
	(0.23948)	(0.27349)	(0.08527)
La Victoria	--	--	--
Los Olivos	0.58382***	0.65929***	0.18914***
	(0.17911)	(0.21285)	(0.06637)
Villa El Salvador	-0.32250*	-0.40560*	-0.12446*
	(0.18766)	(0.21992)	(0.06857)
Constant		3.36132***	-0.27790
		(0.84099)	(0.26221)
Observations	603	603	603
R-squared		0.20	0.19

Standard errors in parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%
The following control variables were included in the regression but their results are not reported: sex, age, age squared, educational level, whether respondent has a partner, proportion of children among 0 and 5 and among 6 and 18 years old and whether the respondent is employed.

For the analysis in the dimension of public transportation we included a variable measuring the time that it takes for the respondent or nearest working member of the family to go to his/her job. Since bus travel seems to be the most widespread transportation alternative in the districts selected, a variable measuring the time to get to the nearest bus stop is also included. In addition, an observational variable related to the condition of the roads around the house is

included under the assumption that it is correlated with the level and difficulty of traffic near home. District effects are also included.

Table 11 shows that only the coefficients of the district effects are significant. These coefficients tell that living in Los Olivos and Villa El Salvador positively influences satisfaction with transportation as compared to living in La Victoria. The fact that none of the other variables is significant may be explained because, transportation being mostly a district-level phenomenon, the other indicators lose their power once district effects are included. In fact, for this dimension we performed an additional exercise, estimating the model by OLS but excluding district effects from the specification for comparison purposes. The results, presented in column 4, show that the quality of roads becomes statistically significant. In addition, time to commute to work is also significant, although with an unexpected sign. It may be the case that something similar to the case of the park-and-green areas dimension is happening: some correlation with the process of choosing where (and commuting to) work may be driving this result. In any event, the overall conclusion is that once district effects are included the statistical influence of specific indicators vanishes out. This finding implies that transportation is influenced mainly by characteristics of the district.

Table 11. Satisfaction with Transportation System

	(1) Ordered Logit	(2) OLS	(3) COLS	(4) OLS
Time to commute to work	0.06747	0.08225	0.03000	0.18639**
	(0.05941)	(0.07494)	(0.02365)	(0.07903)
Time to the nearest bus stop	-0.18670	-0.27096	-0.09491	-0.26078
	(0.15696)	(0.18963)	(0.05985)	(0.20150)
Roads are in good condition	0.13249	0.28887	0.10597*	0.38560*
(observation)	(0.16333)	(0.19758)	(0.06236)	(0.20280)
La Victoria	--	--	--	--
Los Olivos	1.63900***	1.91341***	0.55959***	--
	(0.20295)	(0.23183)	(0.07317)	
Villa El Salvador	1.30518***	1.61268***	0.48057***	--
	(0.19287)	(0.23130)	(0.07300)	
Constant		5.45837***	0.44895	0.65308**
		(0.98590)	(0.31117)	(0.32803)
Observations	562	562	562	562
R-squared		0.16	0.15	0.04

Standard errors in parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%
The following control variables were included in the regression but their results are not reported: sex, age, age squared, educational level, whether respondent has a partner, proportion of children among 0 and 5 and among 6 and 18 years old and whether the respondent is employed.

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5.2.3 The Civil Society/Trust Sphere

The dimensions considered in the study that belong to the civil society/trust sphere are recreational activities and trust in neighbors. Objective indicators in these dimensions are neither under the complete control of the district-level governments, nor under the control of individual, although both actors may influence them. Indicators in these dimensions are mainly the result of social interactions that arise over time among members of a society or group.

Results for the first dimension, satisfaction with recreational activities, are presented in Table 12. Five indicators were included. These can be separated into those related to respondent habits and those related to the district's supply of amenities. The first group includes variables related to whether respondent goes to movies and engages in sports. The latter group refers to whether the district-level government provides the infrastructure for engaging in those activities. Because the district can provide opportunities for recreational activities beyond what the district-level government can do, we also included district effects.

Result shows that activities undertaken by the respondents have a significant impact on this dimension of QoL, given that respondents who attend movie shows or engage in sporting practices sport activities report greater satisfaction. District-level participation in offering recreational services, as approximated by three objective indicators, also shows a significant statistical association (the coefficients of two out of the three indicators are positive and statically significant).An interesting result arises when we consider the district effects. The coefficients for the included dummies are significant, but of a different sign. According to these coefficients, the district characteristics of Los Olivos positively influence satisfaction in this domain relative to La Victoria. On the contrary, the characteristics of Villa El Salvador negatively influence satisfaction with recreational activities relative to La Victoria.

Table 12. Satisfaction with Recreational Activities

	(1) Ordered Logit	(2) OLS	(3) COLS
Respondent goes to movie shows	0.61687**	0.42544*	0.09855
	(0.27351)	(0.24372)	(0.07235)
Respondent does sport activities	1.05002***	0.96778***	0.24786***
	(0.27643)	(0.23835)	(0.07099)
District-level government organizes sport activities	0.43079	0.28329	0.12731*
	(0.28013)	(0.25396)	(0.07559)
District-level government offers movie shows	0.90890**	0.95747**	0.33520***
	(0.41289)	(0.37089)	(0.11076)
District-level government offers sports activities	1.03495***	0.99478***	0.23964***
	(0.29269)	(0.25897)	(0.07677)
La Victoria	--	--	--
Los Olivos	0.54493***	0.45447**	0.12270**
	(0.20790)	(0.17783)	(0.05203)
Villa El Salvador	-0.56431***	-0.45667***	-0.13168***
	(0.19566)	(0.17277)	(0.05055)
Constant		4.28992***	-0.08849
		(0.67574)	(0.19773)
Observations	508	508	508
R-squared		0.19	0.19

Standard errors in parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%
The following control variables were included in the regression but their results are not reported:
sex, age, age squared, educational level, whether respondent has a partner, proportion of children
among 0 and 5 and among 6 and 18 years old and whether the respondent is employed.

Finally, regarding satisfaction with civil participation and trust, the number of times the individual shared a recreational activity with a neighbor was included as a determinant, as a proxy of interaction in the neighborhood. Also, the fact that the respondent participates in the participatory budget program is considered to influence positively this dimension of satisfaction, given that this may reflect that he or she perceives that the district-level government listens to its citizens.[6] Trust in neighbors is also expected to influence positively satisfaction in this area.

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[6] The participatory budget program is a policy and management instrument through which local authorities provide neighbors and local civil society organizations the opportunity to participate in the budgeting process of the local government. During the last years the central and local governments have been widely promoting the use of this instrument and the participation of civil society to increase transparency in public expenditure.

Table 13. Satisfaction with Civil Society/Trust

	(1) Ordered Logit	(2) OLS	(3) COLS
Recreational activities with neighbors	0.22447*	0.22992*	0.06244
	(0.12924)	(0.12854)	(0.03879)
Participates in participatory budgeting	0.16743	0.11155	0.04142
	(0.45217)	(0.45646)	(0.13776)
Trust in the neighbors	0.41215***	0.38543***	0.11463***
	(0.03938)	(0.03386)	(0.01022)
La Victoria	--	--	--
Los Olivos	-0.38227**	-0.41008**	-0.13111**
	(0.18280)	(0.18020)	(0.05438)
Villa El Salvador	0.24904*	0.27722*	0.06111*
	(0.12112)	(0.14090)	(0.03241)
Constant		2.33293***	-0.57530***
		(0.73410)	(0.22156)
Observations	586	586	586
R-squared		0.25	0.24

Standard errors in parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%
The following control variables were included in the regression but their results are not reported:
sex, age, age squared, educational level, whether respondent has a partner, proportion of children
among 0 and 5 and among 6 and 18 years old and whether the respondent is employed.

In Table 13 we can observe that only two variables have a positive impact. Participation in the budget program is not associated with satisfaction in this area, and trust in neighbors influences satisfaction positively. Finally, the variable related to the number of times that the respondent shared a recreational activity with a member of the neighborhood other than a relative is also significant, which suggests that social interaction is a key indicator. These results are robust to the different specifications.

It is interesting to see again an asymmetric result concerning district effects. The coefficients of the dummy indicating that the respondent lives in Los Olivos is negative and significant, while the coefficient of the variable Villa El Salvador (also a dummy) is positive and significant. In this case, then, living in the district of Villa El Salvador positively influences satisfaction in this dimension relative to La Victoria, while living in Los Olivos decreases it.

5.3 Regression Results Regarding Overall Quality of Life

This section presents the results of estimations of the statistical association between self-reported and computed QoL with a different set of explanatory variables, as explained in Section 4. First, objective indicators are used as regressors. Second, the predicted dependent variables for each dimension (computed using the regression results presented in the previous section) are used as indicators of life satisfaction in these areas. Third, for the set of objective indicators used per dimension, the vector representing the first principal component was computed, and then used as indicator of QoL in each of the dimensions.

5.3.1 Objective Indicators

Given the large number of indicators used in the 10 dimensions, a first step is to select which indicators will be included in the regressions to explain overall QoL.[7] Three main considerations were combined for the selection. First, from a statistical point of view, in most of the cases only those indicators that were statistically significant to explain satisfaction (see previous section) in their area of relevance were considered for the selection. Second, if two or more indicators were conceptually similar or if they were too collinear only one was chosen. Finally, as some indicators were measured with more reliability than others, the considered more reliable indicators were selected.

Two brief examples about how we proceed can be given by focusing on the civil society/trust and on transportation dimensions. The results presented in Table 14 show that, out of the three objective indicators used in that area, one was not statistically significant and thus was not included in the regression analysis. The other two were chosen for the overall QoL regressions because they are conceptually different. Trust in neighbors represents the result of a process of social interactions in a group over time. Sharing recreational activities is only one part of that process. In the second example, Table 15 shows that in terms of statistical significance, the three indicators were similar (not significant) when district effects were included. When the model was estimated without district dummies, time for commute to work and the observational variable declaring if roads were in good conditions became significant. Of these two, as was discussed above, the observational variable was a cleaner indicator in terms of its objectivity and

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[7] Including all of the objective indicators seems to be too demanding from a statistical point of view given the small sample size used for this study.

was therefore selected. Table 14 shows the final selected objective indicators for all the dimensions and their descriptive statistics.

Table 14. Descriptive Statistics of Objective Indicators and Control Variables

Variable	Obs	Mean	Std. Dev.
Sex of respondent	604	0.38	0.49
Age of respondent	604	42.76	14.24
Completed secondary education	604	0.72	0.45
Children between 0 and 5	604	0.11	0.15
Children between 6 and 18	604	0.20	0.19
Respondent has a partner	604	0.75	0.44
Family per capita income	604	224.12	202.10
Dependence rate	582	1.85	1.40
Roof is made of appropriate material	604	0.40	0.49
Walls are made of appropriate material	604	0.64	0.48
Attends health center in the district	604	0.74	0.44
Children in public school	604	0.87	1.14
Victim of attempt of robbery	604	0.21	0.40
Gangs in the neighborhood	589	0.66	0.47
Streets are cleaned on a daily basis	604	0.21	0.40
Green areas in good condition	604	0.29	0.34
Roads in good condition (observation)	604	0.39	0.49
Respondent goes to movie shows	604	0.24	0.43
District-level government organizes sport activities	540	0.36	0.48
Recreational activities with neighbors	586	0.80	2.24
Trust in neighbors	604	4.87	2.27

Table 15 presents results using objective indicators (of the different dimensions) as explanatory variables. Columns (1) and (2) show the results for the ordered logit estimation. In column (1) only control variables are included (the same set used for the results per dimension) to see how they correlates with life satisfaction before the inclusion of the objective indicators. Objective indicators are included in columns (2) to (5). Columns (3) and (4) use OLS and COLS estimators, respectively. In these cases the dependent variable is the self-reported QoL (to use the COLS method, the self reported has been transformed assuming that it follows a standard normal

distribution to exploit the implicit cardinality nature of the response). The fifth column shows OLS results for the Computed QoL.

Table 15. Self-Reported and Computed QoL with Objective Indicators

	(1) Self reported Ord. Logit	(2) Self- reported Ord. Logit	(3) Self reported OLS	(4) Self reported COLS	(5) Computed OLS
Sex of respondent	0.01795	-0.11157	-0.15971	-0.05628	0.16956*
	(0.15446)	(0.16795)	(0.19114)	(0.06750)	(0.09381)
Age of respondent	-0.06151**	-0.07304**	-0.07317**	-0.02716**	-0.03661**
	(0.03020)	(0.03376)	(0.03661)	(0.01293)	(0.01792)
Age of respondent^2	0.00058*	0.00076**	0.00074*	0.00027*	0.00042**
	(0.00032)	(0.00037)	(0.00040)	(0.00014)	(0.00019)
Completed secondary education	0.19327	-0.03627	-0.08216	-0.06470	-0.07382
	(0.17246)	(0.18888)	(0.21198)	(0.07486)	(0.10398)
Children between 0 and 5	-0.38909	-0.11103	-0.32329	-0.11939	1.83188***
	(0.68747)	(0.84294)	(0.93225)	(0.32920)	(0.45664)
Children between 6 and 18	-0.63802	-0.35755	-0.30687	-0.13172	1.48057***
	(0.51315)	(0.73568)	(0.82525)	(0.29142)	(0.40395)
Respondent has a partner	0.47784***	0.34700*	0.40171*	0.11861	-0.06146
	(0.17223)	(0.18545)	(0.20981)	(0.07409)	(0.10271)
Familiar income per capita	0.29055**	0.07302	0.08829	0.03464	0.02377
	(0.12881)	(0.15078)	(0.16694)	(0.05895)	(0.08168)
Rate of economic dependence		0.24832	0.27347	0.10596	-0.16476
		(0.19974)	(0.22726)	(0.08025)	(0.11150)
Roof is made of appropriate material		0.22133	0.29665	0.05042	0.12786
		(0.20082)	(0.22601)	(0.07981)	(0.11088)
Walls are made of appropriate material		0.19510	0.19198	0.07220	0.43274***
		(0.20312)	(0.22257)	(0.07860)	(0.10904)
Attends health center in the district		-0.06516	-0.09915	-0.06157	0.12403
		(0.18545)	(0.21295)	(0.07520)	(0.10456)
Number of children in public school		-0.25611	-0.27883	-0.09014	0.01944
		(0.20753)	(0.23347)	(0.08245)	(0.11425)

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Table 15., continued

	(1) Self reported Ord. Logit	(2) Self-reported Ord. Logit	(3) Self reported OLS	(4) Self reported COLS	(5) Computed OLS
Victim of attempt of robbery		-0.20482	-0.21041	-0.09860	-0.47642***
		(0.27136)	(0.31273)	(0.11043)	(0.15357)
Exist gangs in the neighborhood		0.02675	-0.00709	-0.01528	-0.14195
		(0.23907)	(0.26715)	(0.09434)	(0.13108)
Streets are cleaned on a daily basis		0.92827**	1.02108**	0.37074**	0.86263***
		(0.36420)	(0.41175)	(0.14540)	(0.20175)
Green areas in good condition (observation)		0.28393	0.32886	0.13621	0.19148
		(0.25790)	(0.29142)	(0.10291)	(0.14285)
Roads are in good condition (observation)		0.04979	0.04817	0.01993	0.26821***
		(0.17201)	(0.19316)	(0.06821)	(0.09482)
Respondent goes to movie shows		0.72046**	0.71116**	0.25490**	0.33392**
		(0.28267)	(0.31421)	(0.11096)	(0.15348)
District-level government organizes sport activities		-0.01345	0.02983	-0.02061	0.23883*
		(0.23800)	(0.26675)	(0.09420)	(0.13095)
Recreational activities with neighbors		0.45647***	0.48018***	0.16140***	0.11367
		(0.13717)	(0.14815)	(0.05231)	(0.07277)
Trust in neighbors		0.10107***	0.10496***	0.02967**	0.14416***
		(0.03765)	(0.04012)	(0.01417)	(0.01970)
La Victoria		--	--	--	--
Los Olivos		-0.03663	-0.06664	-0.03474	0.43312***
		(0.24695)	(0.28298)	(0.09993)	(0.13897)
Villa El Salvador		0.71998***	0.72041**	0.27698***	0.48658***
		(0.25967)	(0.28618)	(0.10106)	(0.14056)
Constant			5.63279***	0.48170	3.12815***
			(1.25601)	(0.44353)	(0.61605)
Observations	602	548	548	548	550
R-squared			0.14	0.13	0.31

Standard errors in parentheses *significant at 10%; ** significant at 5%; *** significant at 1%

The ordered logit specification with only controls (1) show that the independent variables that are statistically significant are age of respondent (age and age squared), whether the respondent has a partner, and family income per capita. Having a partner and family income per capita positively affect self-reported quality of life. In the case of age, the result is similar to that

found in previous sections: QoL decreases with age at a positive rate (recall that the sample includes individuals between 18 and 64). These results hold when we include objective variables in columns (2) to (5). They also hold for regressions in Tables 20 and 21, although they will not be reported.

In the ordered logit specification (column (2)), the variable representing whether streets are cleaned on a daily basis shows a positive and significant coefficient. In addition, indicators of civil participation and trust are also positively and significantly related to self-reported QoL and statistically significant. Finally, of the district effects, the dummy variable indicating that the respondent lives in Villa El Salvador is significant and positive. As the reference is La Victoria, this result suggests that there are other district characteristics that raises QoL in Villa El Salvador relative to La Victoria. These results hold for columns (3) and (4).

When we replace self-reported QoL with computed QoL (column (5)), a broader set of variables becomes significant. In addition, this specification shows a higher R-squared than the previous three estimations. Among the control variables, the sex of respondent and the proportion of children (for both age groups) become significant. Regarding the objective indicators, more of them are significantly correlated with this measure of QoL. When considering variables related to the individual sphere, walls made of appropriate material is significant and positive. When considering indicators in the urban sphere, whether a person was a victim of a robbery attempt is significant and negative, while cleaning conditions of the streets and roads in good condition significantly increases self-reported QoL. It is interesting to note that most of those indicators that become significant belong to the urban sphere, which suggests that interventions at that level are important for improving the objective side of QoL.

5.3.2 Predicted Satisfaction per Dimension

Table 16 shows results where we instrument the satisfaction that individuals obtain in each of the 10 dimensions and then use the predicted values of the satisfaction in each dimension as explanatory variables. We only present four columns, given that the specification with only control variables would be similar to column (1) in Table 15. Thus, in columns (1) to (3) the self-reported measure of QoL is used as dependent variable using ordered logit, OLS and COLS, respectively. In column (4) the dependent variable is the computed QoL.

Regarding the individual sphere and self-reported QoL, predicted satisfaction with income is significant and positively correlated with self-reported QoL in column (3). In addition, predicted satisfaction with the infrastructure of the house is significant and positively correlated with life satisfaction in columns (1) to (3). A noticeable result is that satisfaction with education is significant and positive in columns (1) and (2). In column (4), when computed QoL is used, predicted satisfaction with income is not significant, but the other three predicted satisfactions are. The coefficients associated with satisfaction with house infrastructure, as well as with satisfaction with health and education, become significant and positively correlated with QoL.

In the urban sphere, in columns (1) to (3) the only area that appears to be statistically significant is predicted satisfaction with cleaning conditions of the street. In column (4), where computed QoL is used as dependent variable, in addition to predicted satisfaction with cleaning conditions, the following variables showed a statistically significant and positive correlation with QoL: predicted satisfaction with safety conditions in the neighborhood and predicted satisfaction with the transportation system.

Lastly, in the civil society/trust sphere, the level of trust in neighbors is significant in all specifications (except column (3)). In columns (1) to (3), predicted satisfaction with recreational activities is positive but not statistically significant, and in column (4) it becomes significantly associated with QoL.

Table 16. Self-Reported and Computed QoL with Predicted Satisfaction by Domain

	(1) Self reported Ord. Logit	(2) Self reported OLS	(3) Self reported COLS	(4) Computed OLS
Income[1]	0.22000	0.26365	0.09700*	0.07778
	(0.14862)	(0.16544)	(0.05850)	(0.07748)
Dwelling characteristics[1]	0.24636**	0.30338***	0.09228**	0.26252***
	(0.09901)	(0.11095)	(0.03923)	(0.05198)
Health[1]	0.09178	0.06741	-0.00308	0.18838**
	(0.16644)	(0.19170)	(0.06779)	(0.08990)
Education[1]	0.36166*	0.38622*	0.11721	0.20436*
	(0.19979)	(0.23162)	(0.08191)	(0.10859)
Crime and safety[1]	0.23275	0.24158	0.09738	0.28351***
	(0.15498)	(0.17923)	(0.06338)	(0.08396)
Cleaning conditions[1]	0.20334*	0.25235*	0.11440**	0.18034***
	(0.11502)	(0.13275)	(0.04694)	(0.06205)
Parks and green areas[1]	0.18518	0.21364	0.07759	0.08604
	(0.12292)	(0.14195)	(0.05020)	(0.06637)
Transportation system[1]	0.17601	0.13480	0.04299	0.49525***
	(0.34003)	(0.39621)	(0.14011)	(0.18571)
Recreational activities[1]	0.24134	0.28140	0.09830	0.35224***
	(0.15596)	(0.17516)	(0.06194)	(0.08211)
Civil society - trust1	0.17698*	0.20059*	0.05099	0.29411***
	(0.10042)	(0.11139)	(0.03939)	(0.05222)
Los Olivos	-0.56119	-0.53537	-0.20840	-1.01212***
	(0.71204)	(0.82339)	(0.29118)	(0.38594)
Villa El Salvador	0.48858	0.62660	0.28162	-0.48926
	(0.61394)	(0.70584)	(0.24961)	(0.33094)
Constant		-5.61879	-3.24304**	-8.35438***
		(3.81954)	(1.35071)	(1.79120)
Observations	449	449	449	451
R-squared		0.14	0.14	0.33

Standard errors in parentheses *significant at 10%; ** significant at 5%; *** significant at 1%
The following control variables were included in the regression but their results are not reported: sex, age, age squared, educational level, whether respondent has a partner, proportion of children among 0 and 5 and among 6 and 18 years old and whether the respondent is employed.
[1] Explanatory variables are the predicted values that result of the estimation of the satisfaction that individuals obtain in each of the 10 dimensions.

5.3.3 Principal Components

Table 17 shows regression results considering principal components of objective indicators by dimension as explanatory variables. Control variables were also included, but results are not reported in the table. Very briefly, for all the four specifications, age and age squared of respondent are jointly significant, being the first negative and the second positive, which is consistent with previous results.

Table 17. Self-Reported and Computed QoL with Principal Components by Domain

	(1) Self reported Ord. Logit	(2) Self reported OLS	(3) Self reported COLS	(4) Computed OLS
Income[1]	0.10188	0.18011	0.10811*	-0.06678
	(0.15471)	(0.17564)	(0.06225)	(0.08308)
Dwelling characteristics[1]	0.47661***	0.58421***	0.16485**	0.50874***
	(0.16547)	(0.18626)	(0.06602)	(0.08813)
Health[1]	0.11266	0.14899	0.06258	-0.02338
	(0.12390)	(0.14184)	(0.05028)	(0.06712)
Education[1]	-0.10098	-0.12487	-0.03630	0.14330**
	(0.13205)	(0.15455)	(0.05478)	(0.07256)
Safety against crime[1]	-0.49264**	-0.54615*	-0.19821*	-0.53084***
	(0.24771)	(0.28896)	(0.10242)	(0.13662)
Cleaning conditions[1]	0.36128	0.48857	0.22313	0.58913***
	(0.40579)	(0.47757)	(0.16927)	(0.22522)
Parks and green areas[1]	0.15946	0.18266	0.06750	0.07374
	(0.11502)	(0.13380)	(0.04743)	(0.06310)
Transportation system[1]	0.08666	0.11625	0.03667	0.00637
	(0.08592)	(0.10017)	(0.03550)	(0.04728)
Recreational Activities[1]	0.16795	0.21911	0.04819	0.49520***
	(0.22896)	(0.25979)	(0.09208)	(0.12284)
Civil society/trust[1]	0.17515***	0.19960***	0.05923**	0.20619***
	(0.06477)	(0.07247)	(0.02569)	(0.03431)
Los Olivos	0.00310	-0.01490	0.01706	0.40133**
	(0.34211)	(0.40952)	(0.14515)	(0.19382)
Villa El Salvador	0.70706**	0.77234*	0.30663**	0.55146***
	(0.36025)	(0.42339)	(0.15007)	(0.20032)
Constant		5.48240***	0.33124	3.70316***
		(1.15797)	(0.41043)	(0.54744)
Observations	449	449	449	451
R-squared		0.13	0.12	0.31

Standard errors in parentheses *significant at 10%; ** significant at 5%; *** significant at 1%

[1] Principal components of objective indicators by dimension are considered as explanatory variables
The following control variables were included in the regression but their results are not reported: sex, age, age squared, educational level, whether respondent has a partner, proportion of children among 0 and 5 and among 6 and 18 years old and whether the respondent is employed.

Focusing on the individual sphere, the principal component of the objective indicators associated with income is statistically significant in column (3) where cardinal OLS is used. In the case of dwelling characteristics, the coefficient is positive and statistically significant for all specifications, including both specifications with self-reported QoL and the specification of computed QoL as dependent variables. In addition, in column (4), the principal component of the variables related to education is positively associated with quality of life.

In the case of the urban sphere, the only component that is significant in columns (1) to (3) is that of exposure to crime that is negatively associated with QoL. In column (4) in addition to the principal component of variable related to exposure to crime, the coefficient of cleaning conditions of the streets is also significant (and positive).

Finally, regarding the civil society/trust sphere, it is noteworthy that the principal component of civil/society trust is significant in the four specifications, while the principal component of recreational activities becomes significant in column (4). It should be noted that Table 17 shows that the coefficient of the Villa El Salvador dummy is significant and positive, which means that relative to La Victoria, there are some characteristics in that district raising QoL.

To conclude this section, a few ideas may be outlined. First, it is clear that the determinants of QoL include indicators from the three spheres considered: the individual sphere, the urban sphere and the civil/society trust sphere. This finding is in accordance with the basic idea of the study: quality of life is a multidimensional phenomenon, not only related to income, but also to several other areas of life. Second, regarding the use of self-reported QoL and computed QoL, for most of the cases the indicators that correlate significantly with self-reported QoL also show a statistically significant correlation with computed QOL. In this last case, there are *additional* indicators that are important from a statistical point of view. The combined results combined suggest that, because more subjective issues are included in self-reported QoL, the statistical influence of some indicators vanishes out, but still they are critical for objective aspects of QoL. In line with this, a third remark is that policymakers with the capacity to intervene in variables of the urban sphere have a wide variety of areas of action to improve QoL: safety conditions, transportation system and cleaning conditions of the streets, for example, are shown to be strongly correlated with computed QoL. Finally, it is noteworthy that the sphere related to civil society/trust turned out to be very important for QoL. Regardless of the measure of QoL used or the specification, the variable trust in neighbors shows a coefficient statistically different from zero. The coefficient associated with recreational activities was also significant in some specifications.

6. The Indexes of Quality of Life

6.1 Computing the Indexes

Table 18 presents descriptive statistics for the three QoL indexes estimated. These indexes correspond to the specifications where objective indicators, predicted domains and principal components were used as regressors and the self-reported QoL as dependent variables (results of columns (3) of Table 15, column (2) of Table 16 and column (2) of Table 17). To compute the indexes, we normalized the coefficients of each of the OLS regressions to represent a 1 percent change over the mean and to sum up to 1. We then computed the weighted average of the indicators, as described in Section 4. Because not all the indicators are available for the whole sample, the resulting number of observations varies for each index.

Table 18. Quality of Life Indexes under Different Specifications

	Obs.	Mean	Std. Dev.	Min	Max
Self-reported - objective variables	550	6.09	0.77	4.01	8.97
Self-reported - predicted domains	461	6.15	0.81	4.15	8.33
Self-reported - principal components	461	6.15	0.76	4.18	8.82

As we can see in Table 19, the mean values oscillate between 6.09 and 6.15, and the standard deviations are of the same magnitude (around 0.8). The mean estimates are of a similar magnitude to the mean of the self-reported QoL directly observed from the survey responses (6.05). Each of the previous estimated indexes can be computed conditioned on the district of residence and on socioeconomic levels, as shown in Tables 19 and 20. Table 19 shows that the QoL index is higher in Villa El Salvador, followed by La Victoria and lastly Los Olivos. This holds regardless of the set of regressors, weights and indicators used to compute the index. Regarding socioeconomic levels, Table 20 shows a positive correlation between the QoL index and higher SELs.

Table 19. Quality of Life Indexes under Different Specifications by District

	Obs.	Mean	Std. Dev.	Min	Max
District: La Victoria					
Self-reported – objective variables	185	6.20	0.77	4.55	8.17
Self-reported – predicted domains	144	6.25	0.79	4.27	8.10
Self-reported – principal components	144	6.25	0.70	4.59	7.93
District: Los Olivos					
Self-reported – objective variables	184	5.75	0.79	4.01	8.97
Self-reported – predicted domains	144	5.79	0.83	4.15	7.85
Self-reported – principal components	144	5.79	0.77	4.18	8.07
District: Villa El Salvador					
Self-reported – objective variables	181	6.31	0.64	5.11	8.46
Self-reported – predicted domains	162	6.38	0.69	4.69	8.33
Self-reported – principal components	162	6.38	0.70	4.85	8.82

Table 20. Quality of Life Indexes under Different Specifications by Socioeconomic Level

	Obs.	Mean	Std. Dev.	Min	Max
SEL: A/B					
Self-reported - objective variables	76	6.43	0.75	5.03	8.97
Self reported - predicted domains	61	6.53	0.70	5.12	8.05
Self reported - principal components	61	6.40	0.68	4.95	8.07
SEL: C					
Self-reported - objective variables	245	6.17	0.77	4.01	8.46
Self-reported - predicted domains	204	6.26	0.80	4.38	8.33
Self-reported - principal components	204	6.25	0.78	4.19	8.82
SEL: D					
Self-reported – objective variables	229	5.88	0.73	4.12	7.99
Self-reported – predicted domains	186	5.91	0.78	4.15	7.79
Self-reported - principal components	186	5.96	0.74	4.18	8.16

6.2 The Shares of the Individual, Urban and Civil Society Spheres

A different exercise is presented in Figures 5, 6 and 7. The figure shows the shares of the individual, urban and civil society/trust sphere in the QoL index. To create these figures we used the predicted QoL index computed using the self-reported measure as dependent variable and objective indicators as explanatory variables. Then the influence of the control variables both at the individual and household levels were removed, together with the district effects. From the remaining value of the indexes the shares of the individual sphere (income, house infrastructure, education, education and active recreational activities), the urban sphere (crime and security, cleaning conditions, parks and green areas, transportation) and the civil society and trust sphere are computed.

Formally, starting from expression (3) in the methodological section, remove the effect of control variables on quality of life and compute the shares of the individual, urban and civil society/trust spheres using formulae (4), (5) and (6), respectively:[8]

$$\frac{\sum_{k=1}^{K} \hat{\alpha}_k H_k}{Q \hat\delta L - \hat{c} - \hat\delta X_{id}} \quad (4)$$

$$\frac{\sum_{j=1}^{J} \hat{\beta}_j D_j}{Q \hat\delta L - \hat{c} - \hat\delta X_{id}} \quad (5)$$

$$\frac{\sum_{n=1}^{N} \hat{\phi}_n T_n}{Q \hat\delta L - \hat{c} - \hat\delta X_{id}} \quad (6)$$

Figure 5 presents the results of this exercise for the overall sample. As can be observed, the main contributor to the QoL index is the individual sphere: 42.41 percent of the value of the index is explained by individual variables. Second in importance are indicators in the civil society/trust sphere (37.75 percent). The third place corresponds to variables in the urban sphere (19.84 percent). This result is interesting since it shows that social interaction, trust in neighbors and recreational activities, indicators that are under neither individual control nor that of

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[8] In practice we are subtracting from the predicted index the constant term as well as the effects of the control variables, including district effects. Thus, the remaining sum of the individual, urban and civil society/trust spheres no longer has to belong to the interval [1, 10].

policymakers, represent a large share of QoL. However, QoL is also importantly determined by the urban sphere.

Figure 5. Shares of the Individual, Urban and Civil Society Spheres in the QOL Index
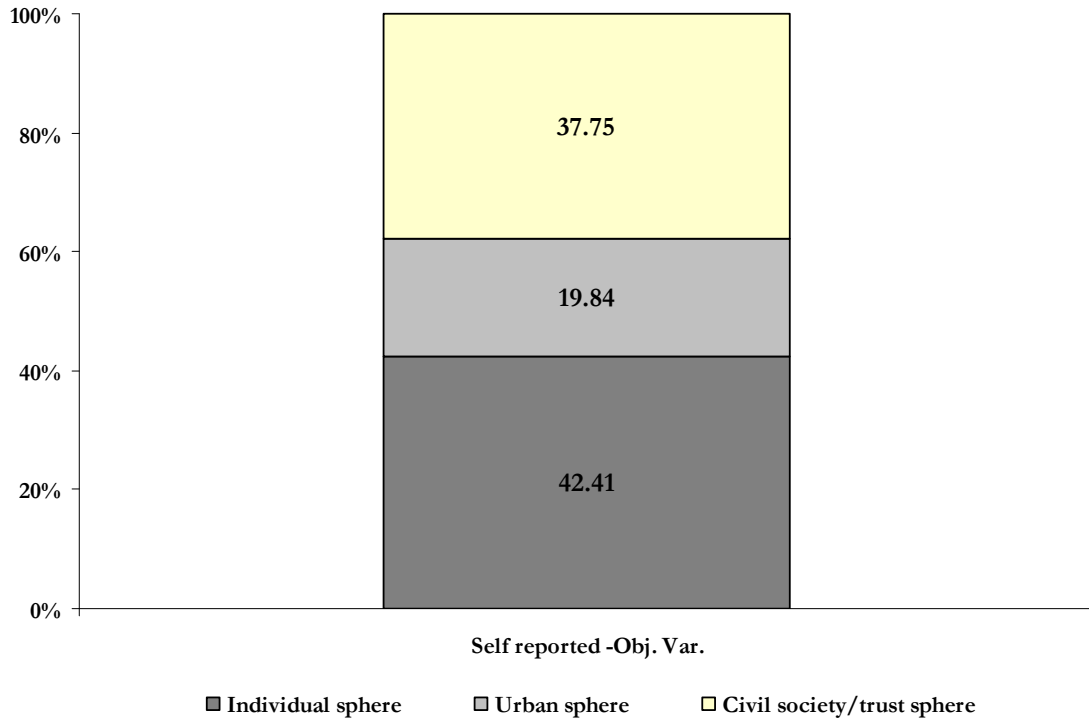

Figure 6 shows the composition of the QoL index among the contributions of the individual, urban and civil society/trust spheres by district. First, an interesting result presented in this figure is that, in the case of La Victoria and Los Olivos, the ranking of contributors remained in the same order as the one described for the overall sample (individual, civil society/ trust and urban spheres), but in the case of Villa El Salvador, the main contribution derives from the civil society/trust sphere (48.64 percent), followed by the individual sphere (41.30 percent) and the urban sphere (10.06 percent). As mentioned in previous sections, Villa El Salvador has a tradition of collective action that has been critical for the district's development.

Second, it is remarkable how the contribution of the urban sphere is more important in the case of La Victoria, a district in the center of Lima, than in the peripheral districts of Los Olivos and Villa El Salvador. In the first case, the contribution is 31.73 percent, while in Los Olivos it is 13.69 percent and in Villa El Salvador it is 10.06 percent. Third, it should also be

noticed that the individual sphere is slightly above 40 percent in the three districts. Therefore, the reduction in the contribution of the urban sphere is compensated for by an increase in the contribution of the civil society/trust sphere.

Figure 6. Shares of the lndividual, Urban and Civil Society Spheres in the QoL Index by District
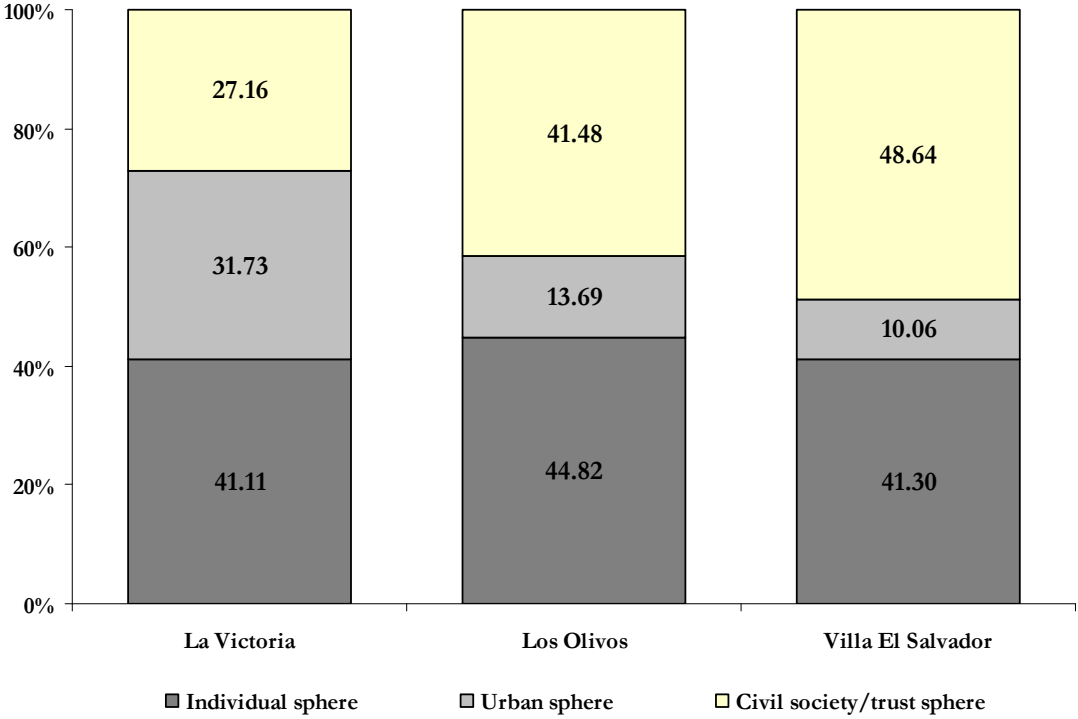
Figure 7 shows a similar exercise, except that now we focus on SELs. Three main findings are worth mentioning. First, when conditioned by SEL, the individual sphere is the most important contributor for SEL A/B and C, but in SEL D the most important is the civil society/trust sphere. Second, while, the shares of the individual and urban spheres are directly correlated with income, the opposite holds for the contribution of the civil society/trust sphere. Third, it is noteworthy that the contribution of the urban sphere decreases from 26.07 percent in SEL A/B to barely above 10 percent in SEL D.

Figure 7. Shares of the Individual, Urban and Civil Society Spheres in the QOL Index by Socioeconomic Level
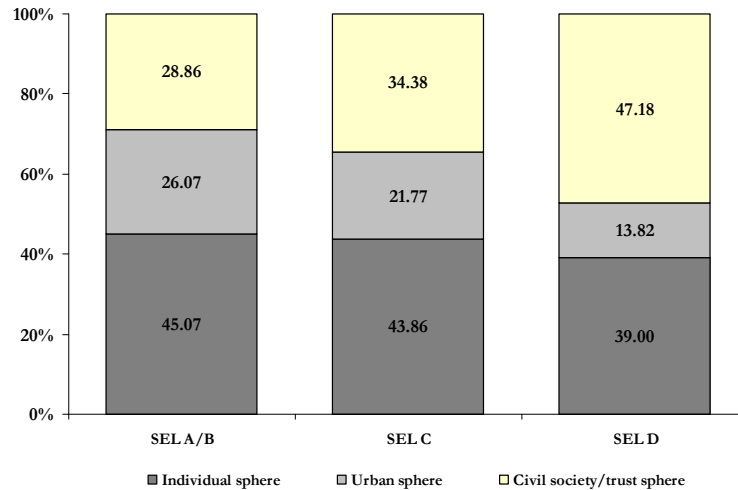
The analysis of shares of the three spheres shows two general findings. The first is the importance of the individual sphere. Variables related to income, dwelling characteristics, health and education are very important contributors to quality of life. Second, the analysis additionally shows the importance of the civil society/trust sphere. Indicators related to recreational activities and trust in neighbors are very important in magnitude, especially in districts of the periphery and for lower socioeconomic levels. Moreover, it appears that the civil society/trust sphere tends to be a more important source of QoL when the urban sphere decreases in importance. This result is clearly seen at the district level: Villa El Salvador has higher levels of the QoL index, mostly due to the civil society/trust sphere, given that the urban sphere has a lower contribution than in other districts.

7. Summary and Concluding Remarks

This paper presents the results of the analysis to obtain a QoL index that includes different dimensions, in addition to income and socio-economic indicators, considered important for life satisfaction. The paper first studies the determinants of life satisfaction considering indicators of three different spheres of influence: the individual sphere, comprised of indicators that are mostly the result of individual choices (income, house infrastructure, health and education services); the urban sphere, composed of indicators that are mostly under the control of local

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governments (safety conditions, parks and green areas, cleaning conditions of the streets); and the civil society/trust sphere, which includes indicators related to recreational activities and trust in neighbors, indicators not entirely under the control of individuals or local governments, which result from repeated social interactions over time.

The study focuses on three districts of Metropolitan Lima: La Victoria, Los Olivos and Villa El Salvador. These districts are relatively similar in terms of socioeconomic levels (with populations belonging mainly to SELs C and D), although Villa El Salvador has a larger percentage of poor households and lacks more urban services than the other two. The selection of these districts makes it possible to exploit two key differences among them. First, in terms of location and longevity, the district of La Victoria is located in the center of Lima and is an old historic district, while Los Olivos and Villa El Salvador are younger districts located at the periphery of the conurbation of Metropolitan Lima. Therefore, La Victoria is characterized by relatively more adequate coverage of public services and urban facilities. Second, Villa El Salvador and Los Olivos followed different patterns of development and economic growth. While Villa El Salvador has traditionally been considered a district where collective action and community organizations were key characteristics of the growth process, Los Olivos has grown greatly in the last 15 years through a market model of development.

The core information for the study has been collected through a survey applied in these three districts. The objective of the survey was to collect information to construct QoL indexes according to two approaches available in the literature: the hedonic price method and the life satisfaction approach. To use these methods, indicators for each of the aspects considered important for QoL were constructed from the survey results. Thus, the survey asks about availability, uses, perception of QoL and level of satisfaction with all these different aspects and about satisfaction with QoL in general.

To implement the life satisfaction approach we use alternative measurements of QoL as dependent variables in regressions where several indicators are included as explanatory variables. The two main indicators of QoL are self-declared satisfaction with quality of life, coming directly from a question in the survey, and a computed QoL indicator estimated using information about the respondents' satisfaction with different dimensions of quality of life weighted by the average importance that each of these dimensions has for the respondents of the survey. The main difference between computed QoL and self-reported QoL is that the latter may

consider additional factors affecting quality of life that are not observable for the researcher and that are not included in the 10 dimensions addressed by the survey and the study. The second indicator must therefore be considered a narrower measure of QoL, at least in that it is computed based upon the dimensions that *a priori* the researcher included in the survey.

Besides using these two alternative measures of QoL as the dependent variable, three different sets of explanatory variables are used. First, a subset of objective indicators of QoL for each of the dimensions is included in the regressions. Second, predicted satisfaction with each domain of QoL is used as an explanatory variable (coming from the 10 first-stage regressions presented in Section 5.2). Third, the principal components of different sets of objective indicators are used as independent indicators of QoL (one principal component variable for each dimension). In addition, we estimate different specifications in each case: ordered logit, OLS and cardinal OLS.

The results are interesting and generally consistent. It is shown, that different indicators of the individual sphere, urban sphere and civil society sphere are important for QoL. For example, an increase in income indicators, improvement in housing characteristics, availability of recreational activities, and frequency of street cleaning is associated with increases in QoL. On the other hand, a reduction in the indicator of level of crime is significantly associated with a decrease in QoL. Something to remark is that variables related to participation in civil society and trust showed to be statistically significant in all the specifications used. In general, the specifications where the computed QoL is used as dependent variable show more explanatory power, suggesting that more indicators significantly correlate with this variable than with self-reported QoL. As explained above, because more subjective issues may be considered in the self-reported QoL, the statistical correlation between this measure and some indicators vanishes out.

Using the coefficients of the regression analysis, indexes of QoL are constructed for the whole sample and for each district. Then, the contribution of indicators of the individual sphere, the district sphere and the civil society-trust sphere were estimated. The results show that for the whole sample, as well as for the districts of La Victoria and Los Olivos, indicators in the individual sphere represent the greatest contribution to the QoL index. However, in the case of Villa El Salvador the contribution of the indicators in the civil society/trust sphere is more important than the other two. Also, indicators belonging to the urban sphere are more important in La Victoria, the district located at the center, than in the other two districts (where the urban

sphere is more important in Los Olivos than in Villa El Salvador). In addition, indicators in the individual sphere are very important in the three districts (contributing more than 40 percent to QoL), which suggests that the role of the urban sphere may be partially fulfilled by the contribution of the civil society/trust sphere. These results are consistent with the collective action tradition of that district and with the individual/competitive pattern of growth of Los Olivos. They are also consistent with the center-periphery story, as the urban component is more important in La Victoria.

In terms of policy, some implications of the results summarized above are worth mentioning. First, although most of the indicators in the urban sphere are not consistently significant when self-reported QoL is used as dependent variable, these indicators are still important for objective aspects of QoL. Also, although the contribution of the urban sphere to the estimated QoL is not as important as the variables belonging to the individual sphere, urban variables still contribute nearly 20 percent, particularly in La Victoria. Therefore, there is an important space for local policymakers to intervene in aspects of the urban sphere to improve citizens' QoL. In particular, citizens seem to value the cleaning of streets and safety conditions in their neighborhoods. Although these improvements may not improve QoL from a subjective or general point of view, they are very important in increasing the objective side of quality of life.

Second, as the results show, the civil society/trust sphere is an important part of quality of life. It could be important for district-level governments to include these components more seriously in their plans, and not to give them less importance than other factors considered to be "problems" in the district. As noted above, mentioned the solution to problems like crime and safety, transportation systems, cleaning condition of the streets, are important to objectively increase quality of life, but activities in these dimensions should not reduce the scope of what district-level government can do to promote social interaction and trust. The provision of sports and cultural facilities and events and organization of sport tournaments or other recreational activities should become an important part of the local government's plan and policies. Moreover, the creation and promotion of neighborhood organizations could promote trust between neighbors and create social capital.

The results also show that it is important and feasible for the district-level government to monitor QoL. As this study has shown, factors for which information is very scarce are important for QoL. The monitoring system should include a baseline and follow-up surveys for a

representative sample of citizens of their districts. The type of indicators to be collected should be mainly of two types (that could be used simultaneously to complement each other): information on objective indicators such as number and places of robberies and attempted robberies, frequency of street cleaning, and the conditions of parks, among others; and subjective information, such as the level of satisfaction of neighbors with different services provided by the district-level governments. The objective should be to construct, once recognizing that QoL involves several areas besides income and socio-economic related indicators, an urban/district QoL index that provides the district-level governemnt's representatives an enormously useful policy instrument to guide their activities and select priorities and to monitor their interventions more closely in terms of the QoL that they could contribute to provide to their citizens. In addition, it would be very important that estimations of QoL are implemented in all district-level governments in order to use them for benchmarking purposes.

References

Arellano, R., and D. Burgos A. 2007. *Ciudad de los Reyes, de los Chavez, los Quispe.* Lima, Peru: Arellanomarketing.

Baker, D.A., and R.J. Palmer. 2006. "Examining the Effects of Perceptions of Community and Recreation Participation on Quality of Life." *Social Indicators Research* 75: 395-418.

Biaggi, B., D. Lambiri and V. Royuela. 2006. "Quality of Life in the Economic and Urban Economic Literature." CRENoS Working Paper 200610. Cagliari, Italy: University of Cagliari and Sassari, Center for North South Economic Research.

Buzai, G. and C. Baxendale 2006. *Análisis socioespacial con sistemas de información geográfica.* Buenos Aires, Argentina: Lugar Editorial.

Cámara Peruana de la Construcción (CAPECO). 2006. *El Mercado de Edificaciones Urbanas en Lima Metropolitana y el Callao.* Lima, Peru: CAPECO.

Cattaneo, M.D. et al. 2007. "Housing, Health and Happiness." World Bank Policy Research Working Paper 4214. Washington, DC, United States: World Bank.

Di Tella, R., and R. MacCulloch. 2006. "Some Uses of Happiness Data in Economics." *Journal of Economic Perspectives* 20(1): 25-46

Easterlin, R. 1974. "Does Economic Growth Improve the Human Lot? Some Empirical Evidence," in David, P and M. Reder, eds. *Nations and Households in Economic Growth: Essays in Honour of Moses Abramovitz.* London: Academic Press.

Efklides, A. et al. 2006. "Health Condition and Quality of Life in Older Adults: Adaptation of Qolie-89." *Social Indicators Research* 76: 35-53.

Frey, B.S, S. Luechinger and A. Stutzer. 2004. "Valuing Public Goods: The Life Satisfaction Approach." CESifo Working Paper 1158. Category 1: Public Finance. Munich, Germany: CESifo Group.

Frey, B.S., and A. Stutzer. 2002. *Happiness and Economics: How the Economy and the Insitutions Affect Well-Being.* Princeton, United States: Princeton University Press.

Gonzales de Olarte, E. 1992. *La economía regional de Lima: Crecimiento, urbanización y clases populares.* Lima: Instituto de Estudios Peruanos and Consorcio de Investigación Económica y Social.

Gyourko, J., M. Kahn and J. Tracy. 1999. "Quality of Life and Environmental Comparisons." In: P. Cheshire and E. Mills, editors. *Handbook of Regional and Urban Economics*. Volume 3. New York, United States: North-Holland.

Joyce, C.R.B., C.A. O'Boyle and H. McGee. 1999. *Individual Quality of Life: Approaches to Conceptualization and Assessment.* Amsteldijk, The Netherlands: Hardwood Academic Publishers.

Kahneman, D., and A.B. Krueger. 2006. "Developments in the Measurement of Subjective Well-Being," *Journal of Economic Perspectives* 20(1): 3-24

McDonell, J.R. 2007. "Neighborhood Characteristics, Parenting and Children's Safety." *Social Indicators Research* 83:177-199

Oswald, A. 1997. "Happiness and Economic Performance." *Economic Journal* 107: 1815-1831.

Ponce, R., J. Tavara and A. Stecher. 1992. *Asociados para Competir: La Construcción de un Parque Industrial en Villa El Salvador.* Lima, Peru: Organización de las Naciones Unidas para el Desarrollo Industrial (ONUDI) and Programa de las Naciones Unidas para el Desarrollo (PNUD).

Programa de las Naciones Unidas para el Desarrollo, Peru (PNUD). 2006. *Informe sobre el Desarrollo Humano/Peru 2006: Hacia una descentradescentralización con ciudadanía.* Lima, Peru: PNUD.

Sen, A. 1993. "Capability and Well Being." In: M.C. Nussbaum and A. Sen, editors. *The Quality of Life (Studies in development Economics*." New York, United States: Oxford University Press.

Sirgy, J.M. et al. 2006. "The Quality-of-Life (QOL) Research Movement: Past, Present, and Future." *Social Indicators Research* 76: 343-466.

Slottje, D. 1991. "Measuring the Quality of Life across Countries." *Review of Economics and Statistics* 73(4): 684-693.

Spellerberg, A., D. Huschka and R. Habich. 2007. "Quality of Life in Rural Areas: Processes of Divergence and Convergence." *Social Indicators Research* 83: 283-307.

Tiliouine, H., R.A. Cummins and M. Davern. 2006. "Measuring Wellbeing in Developing Countries: The Case of Algeria." *Social Indicators Research* 75: 1-30.

Van Praag, B. Frijters and A. Ferrer-i-Carbonell, A. 2003. "The Anatomy of Subjective Well-Being." *Journal of Economic Behavior & Organization* 51: 29-49.

Van Praag, B., and A. Ferrer-i-Carbonell. 2007. *Happiness Quantified: A Satisfaction Calculus Approach*. Oxford, United Kingdom: Oxford University Press.

Van Praag, B., and B.E. Baarsma. 2005. "Using Happiness Surveys to Value Intangibles: The Case of Airport Noise." *Economic Journal* 115: 224-246.

Wingo, L. 1973. "The Quality of Life: Toward a Microeconomic Definition." *Urban Studies* 10: 3-18.

APPENDIX 1: MAP 1
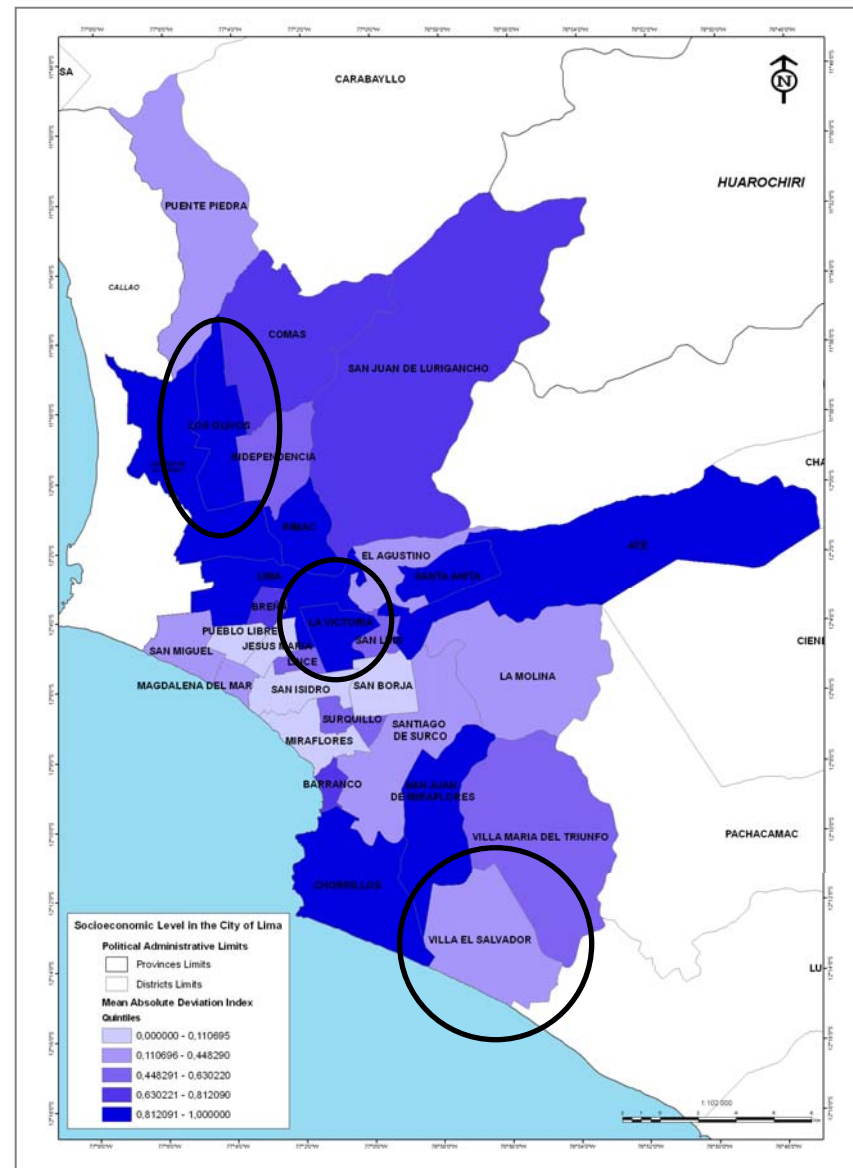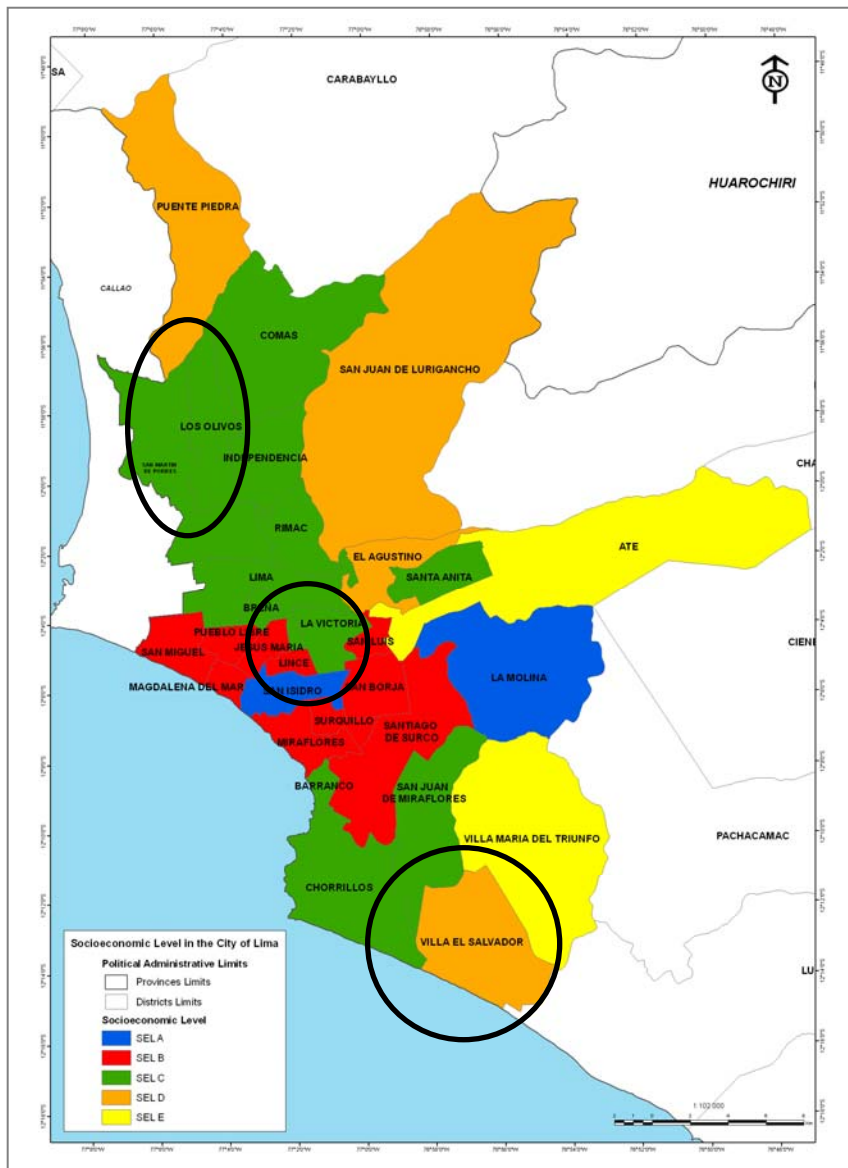
APPENDIX 2: DESCRIPTIVE STATISTICS

Descriptive statistics for some variables of the survey

	Total	La Victoria	Los Olivos	Villa El Salvador	NSE A-B	NSE C	NSE D
QOL dimensions							
Income	5.293	5.746	4.955	5.178	6.224	5.704	4.544
	(2.195)	(1.967)	(2.180)	(2.354)	(1.802)	(2.066)	(2.219)
Infrastructure	5.71	5.955	5.587	5.589	7.047	6.007	4.944
	(2.404)	(2.361)	(2.361)	(2.481)	(1.877)	(2.332)	(2.378)
Health	5.413	5.399	5.383	5.455	5.358	5.329	5.518
	(2.074)	(2.025)	(2.045)	(2.158)	(2.008)	(2.045)	(2.128)
Educational services	6.702	6.881	6.385	6.852	7.682	6.785	6.363
	(2.105)	(2.211)	(2.041)	(2.046)	(1.902)	(2.138)	(2.043)
Safety conditions of the neighborhood	3.837	3.801	3.766	3.945	4.200	3.678	3.884
	(2.033)	(2.147)	(1.849)	(2.096)	(2.214)	(2.006)	(1.988)
Cleaning conditions of the streets	3.819	4.254	4.365	2.835	4.200	3.880	3.622
	(2.367)	(2.362)	(2.347)	(2.076)	(2.334)	(2.352)	(2.383)
Parks and green areas	4.612	4.517	5.415	3.911	5.282	4.652	4.343
	(2.296)	(2.259)	(2.120)	(2.262)	(2.333)	(2.270)	(2.270)
Transportation system	4.978	3.766	5.751	5.416	4.447	4.858	5.286
	(2.307)	(2.090)	(2.249)	(2.079)	(2.265)	(2.291)	(2.302)
Recreational activities	3.335	3.342	3.817	2.85	3.624	3.333	3.240
	(1.677)	(1.683)	(1.734)	(1.470)	(1.748)	(1.621)	(1.707)
Civil society/trust	3.725	3.721	3.338	4.114	3.918	3.772	3.611
	(1.982)	(2.141)	(1.821)	(1.904)	(1.941)	(1.936)	(2.043)
Members characteristics	**Total**	**La Victoria**	**Los Olivos**	**Villa El Salvador**	**NSE A-B**	**NSE C**	**NSE D**
Number of members	4.462	4.473	4.438	4.475	3.918	4.547	4.556
	(1.848)	(1.929)	(1.731)	(1.888)	(1.649)	(1.756)	(1.978)
Sex of respondent	0.377	0.368	0.343	0.421	0.447	0.348	0.385
	(0.485)	(0.484)	(0.476)	(0.495)	(0.500)	(0.477)	(0.488)
Age of respondent	42.762	43.612	42.403	42.272	46.459	41.532	42.817
	(14.241)	(15.496)	(13.709)	(13.466)	(15.140)	(13.740)	(14.288)
Children between 0 and 5	0.508	0.562	0.458	0.505	0.341	0.566	0.504
	(0.697)	(0.766)	(0.655)	(0.663)	(0.628)	(0.760)	(0.640)
Children between 6 and 18	0.997	0.896	1.065	1.030	0.706	0.970	1.123
	(1.049)	(1.084)	(1.040)	(1.022)	(0.884)	(1.029)	(1.103)
Completed secondary education	0.717	0.786	0.706	0.658	0.941	0.869	0.480
	(0.451)	(0.411)	(0.456)	(0.475)	(0.237)	(0.338)	(0.501)
Respondent unemployed	0.043	0.065	0.03	0.035	0.047	0.045	0.040
	(0.202)	(0.247)	(0.170)	(0.184)	(0.212)	(0.207)	(0.195)

(…/…)

Family income per capita	224.124 (202.098)	236.034 (156.687)	236.724 (276.989)	199.735 (144.441)	371.381 (397.565)	236.494 (153.293)	161.348 (94.133)
Lives on a rented house	0.212 (0.409)	0.358 (0.481)	0.199 (0.400)	0.079 (0.270)	0.200 (0.402)	0.243 (0.430)	0.183 (0.387)
Water from public network in the house	0.896 (0.307)	0.891 (0.313)	0.995 (0.071)	0.802 (0.400)	0.988 (0.110)	0.978 (0.148)	0.778 (0.417)
Walls are made of appropriate material	0.637 (0.481)	0.831 (0.375)	0.602 (0.491)	0.480 (0.501)	0.941 (0.237)	0.768 (0.423)	0.397 (0.490)
Roof is made of appropriate material	0.657 (0.475)	0.801 (0.400)	0.642 (0.481)	0.530 (0.500)	0.788 (0.411)	0.483 (0.501)	0.179 (0.383)
Hygienic services connected to a public network in the house	0.917 (0.276)	0.930 (0.255)	0.995 (0.071)	0.827 (0.379)	1.000 (0.000)	0.985 (0.122)	0.817 (0.387)
Area built	89.211 (58.880)	87.592 (70.377)	98.101 (54.868)	82.030 (48.315)	127.765 (73.358)	91.914 (54.946)	73.153 (50.503)

Health	Total	La Victoria	Los Olivos	Villa El Salvador	NSE A-B	NSE C	NSE D
Attends private health centre	0.113 (0.316)	0.144 (0.352)	0.109 (0.313)	0.084 (0.277)	0.224 (0.420)	0.142 (0.351)	0.044 (0.205)
Time which takes to reach the nearest health centre	17.2 (15.840)	17.09 (11.051)	19.493 (19.155)	15.03 (16.004)	22.353 (17.820)	18.670 (16.018)	13.905 (14.226)
Respondent gets by car to the nearest health centre	0.036 (0.187)	0.055 (0.228)	0.02 (0.141)	0.035 (0.184)	0.141 (0.351)	0.037 (0.190)	0.000 (0.000)
Attends health center in the district	0.735 (0.442)	0.701 (0.458)	0.637 (0.482)	0.866 (0.341)	0.506 (0.503)	0.708 (0.456)	0.841 (0.366)

Educational services	Total	La Victoria	Los Olivos	Villa El Salvador	NSE A-B	NSE C	NSE D
Children at school	1.171 (1.141)	1.124 (1.195)	1.199 (1.118)	1.188 (1.113)	0.859 (0.978)	1.187 (1.091)	1.258 (1.228)
Children in public school	0.866 (1.136)	0.836 (1.191)	0.841 (1.098)	0.921 (1.121)	0.341 (0.699)	0.809 (1.092)	1.103 (1.232)
Children in primary	0.548 (0.730)	0.567 (0.760)	0.542 (0.670)	0.535 (0.760)	0.447 (0.664)	0.554 (0.715)	0.575 (0.767)
Children in secondary	0.401 (0.692)	0.289 (0.629)	0.458 (0.754)	0.455 (0.677)	0.224 (0.472)	0.382 (0.691)	0.48 (0.744)

	Total	La Victoria	Los Olivos	Villa El Salvador	NSE A-B	NSE C	NSE D
Children studying in another district	1.018 (1.104)	0.945 (1.083)	1.104 (1.142)	1.005 (1.086)	0.706 (0.884)	1.056 (1.087)	1.083 (1.173)

Safety conditions of the neighborhood	**Total**	**La Victoria**	**Los Olivos**	**Villa El Salvador**	**NSE A-B**	**NSE C**	**NSE D**
Robberies in the neighborhood	15.691 (51.155)	30.164 (82.395)	9.760 (21.088)	6.662 (11.824)	17.012 (57.505)	17.826 (54.747)	12.901 (44.373)
Robberies in the houses	0.320 (0.832)	0.159 (0.505)	0.349 (0.838)	0.455 (1.045)	0.268 (0.546)	0.326 (0.814)	0.331 (0.928)
Exist drug dealing points in the neighborhood	0.394 (0.489)	0.542 (0.499)	0.348 (0.477)	0.292 (0.456)	0.494 (0.503)	0.438 (0.497)	0.313 (0.465)

Cleaning conditions of the streets	**Total**	**La Victoria**	**Los Olivos**	**Villa El Salvador**	**NSE A-B**	**NSE C**	**NSE D**
Trash is picked on a daily basis	0.301 (0.459)	0.881 (0.326)	0.025 (0.155)	0.000 (0.000)	0.565 (0.499)	0.363 (0.482v	0.147 (0.355)
Streets are cleaned on a daily basis	0.205 (0.404)	0.572 (0.496)	0.010 (0.100)	0.035 (0.184)	0.376 (0.488)	0.243 (0.430)	0.107 (0.310)

Parks and green areas	**Total**	**La Victoria**	**Los Olivos**	**Villa El Salvador**	**NSE A-B**	**NSE C**	**NSE D**
Respondent goes to park in the district	0.457 (0.499)	0.338 (0.474)	0.522 (0.501)	0.510 (0.501)	0.388 (0.490)	0.479 (0.501)	0.456 (0.499)
Time to the nearest park	3.556 (6.513)	2.463 (4.849)	3.383 (5.950)	4.817 (8.112)	2.729 (7.751)	3.554 (5.931)	3.837 (6.649)
Green areas in good condition	0.417 (0.494)	0.473 (0.500)	0.597 (0.492)	0.183 (0.387)	0.635 (0.484)	0.472 (0.500)	0.286 (0.453)
Number of parks	408743.6 (344673.8)	351875.0 (0.000)	856955.0 (0.000)	19338.0 (0.000)	500723.2 (271201.0)	407309.7 (324961.5)	379237.9 (381051.2)

Transport	**Total**	**La Victoria**	**Los Olivos**	**Villa El Salvador**	**NSE A-B**	**NSE C**	**NSE D**
Works in his district	0.489 (0.500)	0.590 (0.493)	0.426 (0.496)	0.454 (0.499)	0.338 (0.476)	0.512 (0.501)	0.513 (0.501)
Time which takes to get at work	33.169 (29.689)	21.208 (16.950)	37.016 (28.127)	40.745 (36.380)	29.081 (20.982)	31.528 (27.524)	36.244 (33.824)
Roads in good condition	0.391 (0.488)	0.383 (0.488)	0.577 (0.495)	0.213 (0.410)	0.576 (0.497)	0.371 (0.484)	0.349 (0.477)
Sidewalks in good condition	0.351 (0.477)	0.358 (0.481)	0.488 (0.501)	0.208 (0.407)	0.659 (0.476)	0.367 (0.483)	0.230 (0.422)

| Traffic congestion | 5.060 | 5.280 | 5.390 | 4.510 | 5.450 | 5.130 | 4.860 |
| | (2.083) | (1.552) | (2.417) | (2.086) | (1.962) | (1.970) | (2.220) |

Recreational activities	**Total**	**La Victoria**	**Los Olivos**	**Villa El Salvador**	**NSE A-B**	**NSE C**	**NSE D**
Respondent goes to theatre	0.071	0.104	0.050	0.059	0.200	0.067	0.032
	(0.257)	(0.307)	(0.218)	(0.237)	(0.402)	(0.251)	(0.176)
Respondent goes to sport shows	0.336	0.284	0.303	0.421	0.365	0.326	0.337
	(0.473)	(0.452)	(0.460)	(0.495)	(0.484)	(0.469)	(0.473)
District-level government offers theatre shows	0.110	0.049	0.168	0.117	0.130	0.095	0.120
	(0.314)	(0.216)	(0.374)	(0.322)	(0.338)	(0.293)	(0.326)
District-level government offers sport shows	0.365	0.408	0.286	0.394	0.346	0.432	0.299
	(0.482)	(0.493)	(0.453)	(0.490)	(0.479)	(0.496)	(0.458)

Civilian participation	**Total**	**La Victoria**	**Los Olivos**	**Villa El Salvador**	**NSE A-B**	**NSE C**	**NSE D**
Participated in a club or association	0.152	0.106	0.125	0.225	0.141	0.155	0.153
	(0.359)	(0.309)	(0.332)	(0.418)	(0.351)	(0.362)	(0.361)
Influence on decisions in the district	4.250	4.170	4.200	4.380	4.470	4.300	4.130
	(2.086)	(2.131)	(2.040)	(2.090)	(2.032)	(2.107)	(2.081)
Perception about civil participation mechanisms	3.730	3.720	3.340	4.110	3.920	3.770	3.610
	(1.982)	(2.140)	(1.819)	(1.903)	(1.942)	(1.936)	(2.042)

Standard errors in parenthesis

Names and definitions	
Sex of the respondent (male=1)	Dummy variable
Age of respondent	Continuous variable
Age of respondent^2	Continuous variable
If respondent has completed secondary education (yes=1)	Dummy variable
Number of children among 0 and 5 years in the household	Continuous variable
Proportion of children among 0 and 5 years in the household, measured as log (proportion of children between 0 and 5 + 1)	Continuous variable
Number of children among 6 and 18 years in the household	Continuous variable
Proportion of children among 6 and 18 years in the household, measured as log (proportion of children between 6 and 18 + 1)	Continuous variable
Whether respondent has a partner (yes=1)	Dummy variable
Whether respondent is unemployed (yes=1)	Dummy variable
Whether respondent is employed (yes=1)	Dummy variable
Number of members in the household	Continuous variable
Number of people who work as independent workers, measured as log (number of independent workers + 1)	Continuous variable
Number of people who work as dependent workers, measured as log (number of dependent workers + 1)	Continuous variable
Rate of economic dependence, defined as the proportion of those who don't provide economic contributions to the household and those who do, measured as log (rate of economic dependence + 1)	Continuous variable
Familiar income per capita, measured as log (familiar income per capita)	Continuous variable
Proportion of blocks belonging to the A and B SEL from total of blocks, measured as log (proportion blocks belonging to the A and B SEL from total)	Continuous variable
Whether the person owns his house (yes =1)	Dummy variable
Whether the person lives on a rented house (yes =1)	Dummy variable
Whether the source of water comes from a public network inside the house (yes = 1)	Dummy variable
Whether the roof of the house is made of appropriate material: concrete or cement armed / coated / painted (yes = 1)	Dummy variable
Whether the wall of the house is made of an appropriate material: brick / concrete or brick coated and painted / plating (yes = 1)	Dummy variable
Whether hygienic services are connected to a public network inside the house (yes =1)	Dummy variable
Area built (m2)	Continuous variable
Number of rooms	Continuous variable
Whether the respondent attends to private health centre (yes=1)	Dummy variable
Time, in minutes, which takes to reach the nearest health centre, measured as log (time which takes to reach the nearest health centre)	Continuous variable
Whether respondent gets by car to the nearest health centre (yes=1)	Dummy variable
	(…/…)

Whether health centre is located in district of respondent (yes=1), measured as log (attends health center in the district + 1)	Dummy variable
Number of health centres in the district , measured as log (Number of health centres in the district)	Continuous variable
Number of children at school	Continuous variable
Number of children in public school	Continuous variable
Number of children on primary educational level	Continuous variable
Number of children on secondary educational level	Continuous variable
Number of children who study in the district, measured as log (number of family members studying in the district +1)	Continuous variable
Average transportation time per child in the home, measured as log (time to get to school + 1)	Continuous variable
Number of robberies in the neighborhood in the last 12 months	Continuous variable
Number of robberies in the houses in the last 12 months	Continuous variable
Whether respondent has been victim a theft in the last year (yes=1), measured as log (victim of a theft +1)	Dummy variable
Whether respondent has been victim of an attempt of robbery in last year (yes=1), measured as log (victim of attempt of robbery +1)	Dummy variable
Whether there exist gangs in the neighborhood (yes=1), measured as log (exist gangs in the neighborhood + 1)	Dummy variable
Whether there exists drug dealing points in the neighborhood (yes=1)	Dummy variable
Whether trash is collected on a daily basis (yes=1), measured as (trash is picked on a daily basis + 1)	Dummy variable
Whether trash is collected at least inter-daily (yes=1)	Dummy variable
Whether streets are cleaned on a daily basis (yes=1), measured as (streets are cleaned on a daily basis + 1)	Dummy variable
Whether streets are cleaned at least inter-daily (yes=1)	Dummy variable
Whether sidewalks and roads are clean	Dummy variable
Whether respondent goes to park in the district (yes=1)	Dummy variable
Time, in minutes, which takes to go to the nearest park, measured as log (time to the nearest park + 1)	Continuous variable
Perception of interviewer about quality of green areas, measured as log (green areas in good condition + 1)	Dummy variable
Number of parks, measured as (number of parks)	Continuous variable
Whether respondent works in his district (yes=1)	Dummy variable
Time, in minutes, which takes to go to work	Continuous variable
Whether respondent gets by car at work (yes=1), measured as log (respondents gets at work by car + 1)	Dummy variable
Time, in minutes, which takes to the nearest bus stop, measured as log (time to the nearest bus stop + 1)	Dummy variable
Whether roads are in good condition (yes=1)	Dummy variable
Whether sidewalks are in good condition (yes=1)	Dummy variable
Level of traffic congestion (high level=10)	Continuous variable
Flatten roads (m2), measured as log (flatten roads +1)	Continuous variable

Whether respondent goes to movie shows (yes=1), measured as log (respondent goes to movie shows + 1)	Dummy variable
Whether respondent does sports activities (yes=1), measured as log (respondent does sport activities + 1)	Dummy variable
Whether respondent goes to sport shows (yes=1)	Dummy variable
Number of restaurants in the district, measured as log (number of restaurants in the district)	Continuous variable
Whether district-level government offers sports tournaments(yes=1) , measured as log (district-level government offers sports tournaments + 1)	Dummy variable
Whether district-level government offers movie shows (yes=1), measured as log (district-level government offers movie shows + 1)	Dummy variable
Whether district-level government offers sports activities (yes=1),measured as log (district-level government offers sports activities + 1)	Dummy variable
Whether district-level government offers sport shows (yes=1)	Dummy variable
Number of times shared a recreational activity with a person in the neighborhood who is not familiar, measured as log (Recreational activities with neighbors + 1)	Continuous variable
Whether the respondent participated in a club or association in the last 12 months (yes=1)	Dummy variable
If respondent participates in the program participatory budgeting (yes=1), measured as log (participates in participatory budget + 1)	Dummy variable
If respondent knows about participatory budgeting (yes=1), measured as log (knows about participatory budget + 1)	Dummy variable
Perception of respondent about influencing decisions in the district (high influence=10)	Continuous variable
Perception of respondent about civil participation mechanisms (high participation=10)	Continuous variable
If district-level government implanted the participative budget program (yes=1)	Dummy variable
Average trust in the neighbors, measured as log (average trust in the neighbors)	Continuous variable
Trust in neighbors in a scale from 1 to 10.	Continuous variable