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TRIP REPORT

**Evaluation of Property Taxation,
Valuation and Cadastral Systems**

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By

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Table of Contents

Abstract.....	1
1. Introduction.....	2
2. Property Taxation	2
3. Property Valuation.....	2
4. Cadastral Systems	3
5. Local Government	4
Attachment A: Yerevan Apartment Model	

Abstract

The following is a trip report prepared by ICMA Consultant Richard Almy on his August 1996 trip to Armenia under Task Order #88. In this report, Mr. Almy offers his assessment of the progress on Property Taxation, Property Valuation, and Cadastral Systems and makes recommendations thereon.

1 3

Introduction

The situation in Armenia continues to evolve with the enactment of new legislation and with the creation of new institutional arrangements. Although these developments can be seen as positive, key concepts of democratic government and market economics appear not to have developed strong roots. The State Tax Inspectorate (STI) remains the most effective force for reform.

Property Taxation

Throughout the mission, Mr. Almy worked with the property tax department (headed by Samvel Abrahamian) of the Tax Inspectorate in the STI's efforts to implement the Law on Property Tax, which was approved in 1995. It is a tax on the value of buildings and certain movable properties, but not land. Land is taxed under the Law on Land Tax introduced in 1994.

The introduction of the property tax has been difficult, largely because responsibility for calculating the taxable values of buildings was assigned to two traditional inventory offices (one for Yerevan and the other for the balance of the country) apparently without any provision of funds for the work. The offices are self-funding, deriving their revenue from fees paid by people who want to register their title to properties they obtained under privatization programs or purchased. Many people are reluctant to register their properties because they see registration merely as adding them to the tax rolls. They do not always appreciate the security title registration is intended to provide. Moreover, the implementation timetable was unrealistically short. In contrast with the STI, neither inventory office has demonstrated much vision or commitment to reform.

Although definitive statistics have not yet been received, collections appear to meet USAID's targets (In 1994, land tax collections totaled 405 million drams. Land and property taxes currently are budgeted to produce 1.5 billion drams.). Collections should continue to improve for several years, as only a small percentage of Yerevan property has been valued for tax purposes, and it is estimated that 25 percent of all property in Armenia is unregistered and therefore escaping taxation.

Mr. Almy participated in discussions related to future improvements in the two property tax regimes. The STI ultimately wants a consolidated property tax law and market-valued-based assessments, goals with which the consultant agrees. A wrap-up meeting with Sapharian covered some institutional rearrangements, to be described in a later memorandum. It is hoped that USAID will not curtail its assistance in fiscal reform, specifically property tax administration and valuation.

Property Valuation

There is great interest in property valuation in Armenia. In his last mission, Mr. Almy presented a short seminar on basic single-property valuation procedures to an audience largely composed of real estate brokers. Although the STI was represented, the inventory offices were not. On his most recent TDY, Mr. Almy presented a one-day seminar of mass valuation for property tax purposes to an audience composed of representatives of the STI. The new cadastral department (see below) also had representatives in attendance throughout the seminar. The inventory offices sent representatives, however, they did not attend the entire seminar [See attached roster (the maximum number of attendees at any time was twenty-four)].

The seminar and consultations were designed to set the stage for more intensive training in mass valuation. Mr. Almy attempted to outline what should be done in market monitoring (perhaps changing the sampling approach) and building a market data base (specifically its content) in order to explore the feasibility of a systematic comparison of current normative values with market prices. He supports the concept of the proposed Center for Real Estate Research and Training (CRERT).

Part of the seminar was devoted to presenting the results of a small-scale pilot study using multiple regression analysis to develop a mass appraisal model. The results were encouraging. The chief shortcoming of the model was our use of asking price data, which are freely available, instead of sales prices data, which are concealed. The approach to developing a way of discounting asking prices to the level of sales prices is appealing.

Although its immediate practicality is not yet clear, the idea of a valuation working group composed of Melik Karapetyan, representatives of the STI, representatives of the cadastre department if it survives, and, if he can devote some time, Vahan Harutiunian is worth pursuing. The inventory offices may not have qualified participants. It seems premature to involve local government representatives.

The idea that calculating a value according to a rigid, regulated procedure is not true "valuation" is difficult to convey, as is the idea that a valuation made at one time for one purpose may not be valid at another time or for another purpose.

Cadastral Systems

There have been several potentially significant developments in the area of cadastral systems. These include the enactment of the Law on Real Property, the very recent consolidation of responsibility for registration in the Ministry of Urban Development, and the property registration demonstration project. Mr. Almy has yet to review these documents.

Mr. Almy collaborated with the director of the demonstration project, Ivan Ford, and of ICMA's project manager, Vahan Harutiunian in trying to explain to registration officials how their activities might be reorganized to serve the diverse clients of cadastral services more effectively. It is especially important to not tie land title registration reform to property tax reform. In addition, the rationale for traditional inventorization needs to be critically

reexamined. Presumably the demonstration project will reveal that there are technological alternatives to maintaining current passports as a kind of paper-based master property record. Sergey Patooryan, head of the STI's information department, is very interested in tile use of Oracle (a relational database management system) in the demonstration project.

Institutional arrangements appear to be in flux. Everyone alluded to forthcoming decisions (presumably after the presidential elections) which could affect the outcome of cadastral organization. Nevertheless, bringing the registration of agricultural property under the supervision of the cadastral department is under active consideration. Mention was made of creating an independent cadastral service under the Government.

Local Government

The enactment of the Law on Local Self Government, which came into force on 22 July, could be a harbinger of true local democracy, however, regional governments seem to have considerable power over local officials.

Upon review of several drafts of a law on annual budget and appropriations, only the most recent draft by Richard Russo embraces the important concepts of performance budgeting and accountability. He indicates that it has been difficult to get high level central government officials to understand the role of budgeting in democratic government. Not only is the draft budget law not applicable to local government, but indoctrinating thousands of local officials would be a huge task as well.

New local governments are due to be elected on 11 November. Presumably they will get organized shortly thereafter. ICMA should be in the forefront, starting with the upcoming TDYs on legal and institutional reform. Educational needs, including written materials, will be enormous, if experience in the areas of taxation, valuation, cadastral systems, and budgeting is any guide.

There has been a degree of administrative decentralization in Armenia through the creation of marz under the supervision of the Ministry of Territorial Administration. As the regional governors have considerable power over local governments, the posture of this ministry toward genuine local government will be crucial.

According to the STI, the constitution does not authorize local governments to levy taxes. Therefore, tax rates need to be set centrally. However, the central government plans to earmark land taxes and at least a portion of property taxes to local governments. It should be explored whether the National Assembly could set rates annually and whether rates need to be uniform. Local fiscal autonomy should be factored into property tax reform plans. The STI is developing a number of scenarios along these lines.

When and if responsibility for property tax administration is devolved to local governments, there will be a need for a control function. In the current scheme of things, the STI should have this responsibility.

Attachment A: Yerevan Apartment Model

Yerevan Apartment Model

I. Introduction

This report summarizes results of a project to model apartment sales in Yerevan using multiple regression analysis. The results are encouraging. They indicate that the market behaves rationally and thus can be successfully modeled. Results appear comparable to those that would be obtained in the United States using similar data.

II. Data Base

The data base consisted of 301 apartment units in Yerevan recently listed for sale. The data base contained the following items (appendix 1 shows descriptive statistics).

1. Property number: 1 to 302 (#233 was missing).
2. Date listed (advertised). All have a date of 14 June, 1996.
3. Abbreviated street name.
4. Zone: 1-6. Zone 1 is closest to the city center, zone 2 next closest, and so forth.
5. Number of rooms (1 - 5).
6. Number of stories in the building (maximum value = 16).
7. Floor on which the unit is located (maximum value = 14).
8. Balcony. There are two basic types. "XOZ" are small balconies facing the street. "PARAD" are larger balconies not facing the street. Some apartments have more than one balcony.

9. Condition. This variable indicates whether the unit has been remodeled (55 had). In addition, 14 units were coded as having "PADVAL" (basement storage). One unit was "MEBILE" (furnished) and one was "NISHA" (partitioned by the occupant).
10. Asking price (\$4,500 to \$80,000).
11. Total area in square meters (maximum = 180).
12. Living area in square meters (maximum value = 95).
13. Source of listing, e.g., "AREA".

Data were not available on quality of construction, building age, or location desirability (e.g., neighborhood) within zones.

III. Regression Model

A simple additive model was used. The dependent variable was PRICE (asking price).

Ten properties were excluded in modeling. These included six properties with no listed area, one furnished unit (MEBILE), one partitioned unit (NISHA), and two properties listed in excess ^{of} \$60,000.

Preparatory to modeling, PRICE was graphed against several key variables: living area, rooms, stories, story level, and zone. Appendix 2 contains the graphs. The graph of PRICE with living area is particularly important. It reveals a linear relationship between asking price and living area: the two variables increase in rough proportion to each other. There is also a very strong relationship between price and rooms and between price and zone (the closer to the city center, the higher the value). On the other hand, there does not appear to be any clear relationship

between price and either number of stories or story level.

Appendix 3 contains the regression program and output. Variables were created and entered for living area, other area (total area minus living area), number of rooms, number of XOZ and PARAD balconies, remodeled (no = 0, yes =1), number of stories, ground level unit (no = 0, yes = 1), garage (no = 0, 1 = yes), basement storage or "PODVAL" (no = 0, 1 = yes), and zone. Zone was handled as a series of binary variable with zone "2" serving as the reference area (it had the most properties). Binary variables (coded 0 = no and 1 = yes) were created for zones 1, 3, and 4-6 combined (total of three binary variables). Since the typical unit had one XOZ balcony, the XOZ variable was centered on 1. Thus, a unit with no XOZ balcony was coded -1, a unit with one XOZ balcony was coded 0, and a unit with two XOZ balconies was coded as 1.

The model produced quite good results. The adjusted R-square was 0.760, indicating that the model explained slightly more than three-fourths of the variation in asking prices. The standard error of estimate was \$5,201. Assuming a normal distribution of the errors (a generally reasonable assumption in MRA), this indicates that approximately two-thirds of the errors (difference between actual and predicted asking price) were less than \$5,201 and 95% were less than \$10,402. Finally, in terms of traditional sales ratio statistics, the median ratio of predicted to actual asking price was 1.012 and the COD (average percent difference from the median ratio) was 22.9.

The second page of appendix 3 shows the mean and standard deviation of the regression variables and the order in which the variables entered the model. A "stepwise" procedure was used to exclude variables that did not contribute to the model at a 95% confidence level.

The third page of the appendix show the actual regression model, including the R-Square and standard error of estimate. The

following variables entered the model at the 95% confidence level (in fact, all were significant at the 99% level): LIVAREA (living area), OTHAREA (other area), PARAD, REMODEL, XOZ-ADJ (number of XOZ balconies less one), STORIES, and the three binary variables for zone. The living area variable is the single most important variable, followed by the zone variables. Zone "1" commands a substantial premium. Zone "3" is clearly less desirable than zone "2" and zones 4-6 are least desirable.

Interestingly, the variable for room count did not enter even though, as seen from the graphs, it is highly correlated with asking price. This is because the variable is also highly correlated with the area (square meter) variables, which are already in the model. The garage variable would have entered at the 80% confidence level but was not significant at the 95% level, perhaps because it was correlated with variables already in the model or there were too few cases to establish a consistent relationship (15 units had garages). The variables for PODVAL (14 cases) and GROUND (story level of "0" or 1) also did not enter.

The final page of appendix 3 shows the worst "errors" from the model. Specifically, it lists those cases where the difference between the actual and predicted list price exceeded three standard errors (normally about 1% of cases). In a mass appraisal system, these properties would be reviewed for possible data errors or unusual conditions. The bottom of the page shows statistics regarding the ratios of predicted to actual asking prices, including the key median and COD statistics mentioned above. The median of 1.012 indicates that the model produces values that are centered on asking prices. The COD indicates that the average error, on a percentage basis, is 22:9.

IV. Conversion to Base Home Format

The base home approach is the conversion of a regression or other

12

statistical valuation equation to table format. The table simplifies explanation and use of the model.

In the base home approach, the hypothetical typical property is identified and its value is found from the regression model. The regression model is then further analyzed and the regression coefficients (amount of adjustment for each variable in the model) converted to a table. The value of an individual or "subject" property is then found by taking the base home value and applying any adjustments indicated by the table.

The upper half of exhibit 1 shows the "base home". The typical or base unit in this case has 35 square meters of living area, 30 square meters of additional area, has not been remodeled, is located in a 5-story building, has one XOZ balcony, and is located in zone 2. As shown in exhibit 2, it has a value, calculated from the regression model, of \$17,086.

The lower half of exhibit 1 shows the component adjustments used to calculate adjustments to the base home value. These are derived from the regression equation itself (appendix 3) but are in table format.

Exhibit 3 illustrates calculation of value for a subject property using the base home approach. Positive adjustments are made for additional living and other area, remodeling, and presence of a PARAD versus XOZ balcony. A small negative adjustment is made for location in a six versus five story building. The indicated total value is \$24,459 (the same value could be calculated directly from the regression model).

V. Conclusions

The model is simple in format and produces reasonably good results, particularly considering the limited characteristics available.

Additional data on construction quality, building age, other amenities, and location could be expected to improve performance further. The model can be converted to base home format to simplify explanation.

**Exhibit 1
Regression Model
Converted to Base Home Format**

Base Home Description:

Living Area	35 square meters
Other Area	30 square meters
Balconies	1 - XOZ
Remodeled	NO
Stories	5
Zone	2
Base Home Value:	\$ 17,086 =====

Component Adjustments:

Living area: ± \$332.84 per square meter (base = 35)

Other Area: ± \$202.52 per square meter (base = 30)

Remodeled: NO = 0; YES = \$3,675

Stories: - 406 per story for each story over 5
+ 406 per story for each story under 5

Zones: 1 = + \$6,440; 2 = 0; 3 = - \$5,614;
4,5,6 = -\$8,414

Balconies: None = - \$1,899
1 XOZ = 0
2 XOZ = + 1,899
3 XOZ = + 3,799
1 PARAD = + 1,225
2 PARAD = + 4,351
1 XOZ + 1 PARAD = + 3,125
2 XOZ + 1 PARAD = + 5,024

Exhibit 2
Calculation of Base Home Value

Constant:		\$ 1,391
Living Area: 35 square meters x 332.84 =		+ 11,649
Other Area: 30 square meters x 202.52 =		+ 6,076
Remodel: 3675 x 0 =		0
Stories: 5 x -406 =		- 2,030
XOZ Balcony: 1899 x 0 (one is base in MRA model) =		0
PARAD Balcony: 3124 x 0 =		0
Zone (zone 2 assumed in MRA model) =		0
Base Home Value =		\$ 17,086 =====

16

**Exhibit 3
Value Calculation Form**

Parcel Number: _____

Property Address: _____

Base Home Value \$ 17,086

	Subject	Base Home	
Living area (square meters)	40	35	+ 1,664
Other area (square meters)	36	30	+ 1,215
Remodeled	Yes	No	+ 3,675
Stories	6	5	- 406
Zone	2	2	0
Balconies	PARAD	XOZ	+ 1,225
Subject Property Value			\$ 24,459 =====

APPENDIX 1
DESCRIPTIVE STATISTICS

DESCRIPTIVE STATISTICS - YEREVAN APARTMENT SALES

ZONE

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	78	25.9	25.9	25.9
	2	127	42.2	42.2	68.1
	3	51	16.9	16.9	85.0
	4	11	3.7	3.7	88.7
	5	19	6.3	6.3	95.0
	6	15	5.0	5.0	100.0
	Total	301	100.0	100.0	

Valid cases 301 Missing cases 0

ROOMS

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	80	26.6	26.6	26.6
	2	112	37.2	37.2	63.8
	3	92	30.6	30.6	94.4
	4	16	5.3	5.3	99.7
	5	1	.3	.3	100.0
	Total	301	100.0	100.0	

Valid cases 301 Missing cases 0