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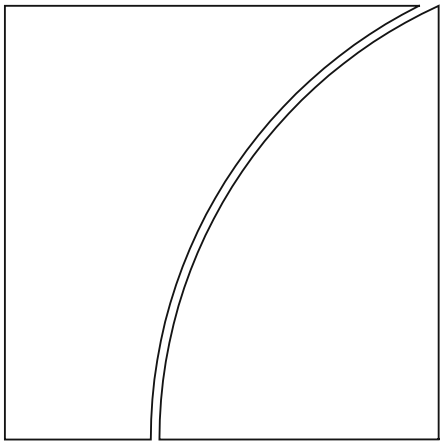

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Constructing a real estate price index: the Moroccan experience

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Constructing a real estate price index: the Moroccan experience

EL MAHMAH Assil

I. Introduction

The real estate sector became a centre of attention over the last few years, given the extent of its effects on financial and real spheres and its implications for monetary policy decisions and financial stability.

In the absence of reliable indicators for the Moroccan properties prices, The Central Bank of Morocco and the Land Registry Office began in 2010 a long process of constructing a quarterly real estate price index (REPI) based on the Office's Databases, which contain detailed information on all property transactions registered at the national level.

This first experience at the national level represents one of the pioneering attempts for the African continent. It aims to improve the transparency and well functioning of the property market, to refine the analysis of inflationary risks and to monitor real estate risk in the banking system.

However, the construction of such a tool faces many difficulties related mainly to the nature of this asset. Indeed, the housing market shows great heterogeneity, making the adoption of a uniformed approach extremely challenging since prices of different properties are influenced by intrinsic characteristics such as the surface area, number of rooms, age, geographical location…etc. In addition, a property represents a durable asset that rarely changes its owner, making the assessment of prices fluctuations difficult. This large discrepancy between the purchase and resale of the same property complicates the construction of a price index.

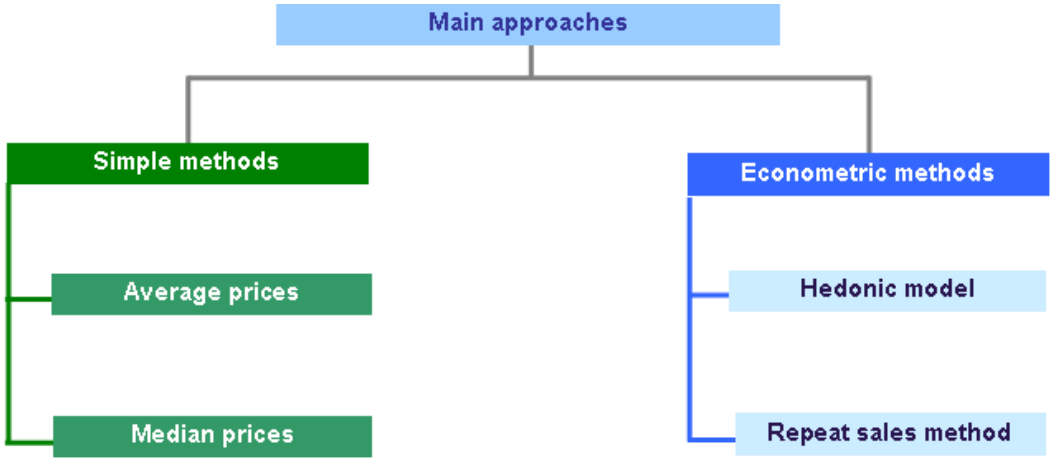
In order to limit the effect of the above-mentioned constraints and depending on the nature and richness of the databases, several approaches for developing real estate price index used at the international level are presented and discussed in the first part of this document. The second part describes the available data at national level as well as tests and treatments applied, while the third part focuses on the methodological approach adopted for the construction of the index. Finally, the results of the national index are presented and analyzed in the last part.

II. Different methods of compiling Real Estate Price Index

In order to construct a real estate price index, several approaches are adopted internationally, which can be classified into two categories: Simple techniques (simple or weighted average and median price) and econometric techniques (hedonic method and the repeat sales). In each country, there may be many indexes developed using different methods and by different institutions (Annex 1).

Figure 1:

Main approaches used internationally to calculate real estate price index



A. Simple method

This method measures the simple average, weighted average or median of real estate prices during a given period. Monitoring such indexes does not allow to distinct between price and quality changes. Moreover, the unrepresentative nature of real estate transactions over time can bias the price trends, especially when transactions relate to different ranges of properties between one period and another. This method is used in several countries, including Germany, Australia, Spain and the Netherlands, because of its simplicity and as it does not require detailed data on the characteristics of real estate.

B. Hedonic method

This approach is based on the principle that the price of a property depends on its characteristics and its location. Only changes in property prices with similar characteristics from one period to another reflect the changing conditions of supply and demand in the property market. Considering the heterogeneity of properties traded in the real estate market, the implementation of the hedonic method requires the estimation of the effect of a number of characteristics on property price, through econometric equations specified for each elementary area relatively homogeneous and for each type of property.

Then, the coefficients from these equations, considered fixed over the period of calculation of the index, are used to eliminate the quality effect, in order to obtain the variations of the "real" prices that reflect supply and demand changing conditions in the market. For each elementary area, the index of property prices is defined as the ratio between the value of a fixed reference property in a current period and its value in the base period index. The implementation of this approach requires, therefore, the existence of a database that contains the characteristics of property with a long history of real estate transactions to estimate the effect of quality.

The advantage of this method is that it can track over time the real value of a sold property. Also, it allows the valuation of property in view of their characteristics. However, it requires a detailed description of the property's characteristics over a period of time.

C. Repeat sales method (RSM)

The repeat sales method, considered as a variant of the hedonic method, overcomes the problem of heterogeneity of real estate. It consists of constructing a price index based on properties which have been sold more than once during the period under study. It assimilates price fluctuations to the average changes observed on repeat sales. This method, which

excludes new property, is difficult to apply at a minute level of strata, because of the relatively small number of such sales. Thus, the lack of data on the characteristics and the technical difficulty of the hedonic method are the main reasons for adopting the repeat sales method.

III. Data Processing

A. Source and nature of data

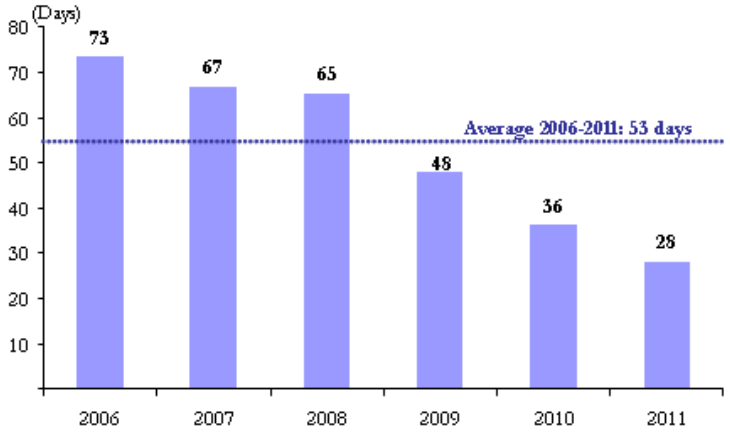
Data used to construct the real-estate price index are drawn from the database of the Land Registry Office. This Office, which has 75 regional branches at the national level, records the transfer of ownership of property and land titled to the benefit of the purchaser. It has the characteristics and the prices indicated in the properties deeds. In addition to the global coverage of national territory, the recent computerization[1] of their database and its update in real time are the main strengths of this database. This latter contains information on more than 3 million registered properties, including those who have never been sold.

The analysis of the databases of this Office and the tests performed on different variables allowed the identification of useful information for constructing a real estate price index on the basis of the exhaustiveness and the quality of available information.

- **Time data integration:** The buyer must record the transaction on his property within 18 months at the Land Registry Office. The analysis of the database showed that the delay between the date of the act and the recording date of the sale transaction is in continuous decline. Indeed, it decreased from 73 days on national average in 2006 to 28 days in 2010. This period could be shortened further in the future and exhaustiveness of the databases could be improved through awareness-raising actions by the Office.

Chart 1:

Delays between the date of the act and the recording date of the sale transaction



- **Date of transaction:** The date of each real estate transaction (Act Date) is available at the database of the Land Registry Office. For missing data, it has been

[1] It should be noted that the process of computerization of the regional services has not started at the same time, which will result in the need to define a base year that is the same for all the selected cities.

supplemented from the date of registration (registration date) at the Office using the following formula:

Date_Act =Date_ register – DM

Where DM is the yearly average difference by city, between the date of registration and date of transaction, calculated based on the available observations[2].

- **Price of transactions:** Only registration fees collected by the Land Registry Office, representing 1 percent of the price of each transaction, are entered in the database of the Office and not the price of real estate transaction. Thus, prices used in this work are calculated based on the revenues received by the Office.
- **Types of sales:** Total sales, which represent over 92 percent of transactions recorded at the Office, are only taken into consideration in this work. The partial sales are excluded, because the share of property sold is not known and we can not estimate the total price of the property concerned.
- **Category decomposition:** This variable, which indicates the nature of property registered, distinguishes nearly 60 different types of property. The Office uses an internal reference to codify the nature of the property subject of the transaction. It is this standard that was adopted for this work.
- **Categories of real estate:** The categories of properties sold were determined by grouping similar consistencies (Annex 3), in order to establish classes as homogeneous as possible. Theses will probably have similar price trends within each strata and a number of observations sufficient to guarantee strong results. Six categories were identified: Apartments, Houses, Villas, Urban lands, Business premises and Offices.

Table 1:

Categories of real estate

Type	Category	Definitions
Residential	Apartment	a dwelling located in a collective building and comprising one or several rooms
	House	a single or several-story individual dwelling with no garden
	Villa	an individual dwelling with a garden
Land	Urban land	a plot of land located in the urban area
Commercial	Business premise	space fitted for commercial activity
	Office	working premises

- **Characteristics of property:** Except for the surface area, identifying the characteristics of real estate involves intense work. Thus, the characteristics identified are: the existence of a garage, garden, pool, courtyards, balconies, roof, basement, number of floors for homes and villas, and the floor number for apartments. Other important features for the application of the hedonic method do

[2] This method allowed us to recover more than 11 percent of the entire database.

not exist in the databases of the Office, especially the number of rooms, age of property, built area, etc.

- **Geographic coverage:** The choice of the geographical coverage for compiling the real estate price index has focused on the most dynamic cities in each region over the period 2006-2008. The cities selected cover the entire country and represent approximately 86 percent of transactions on average over the period 2006-2008 (Annex 3 for details).

Table 2:

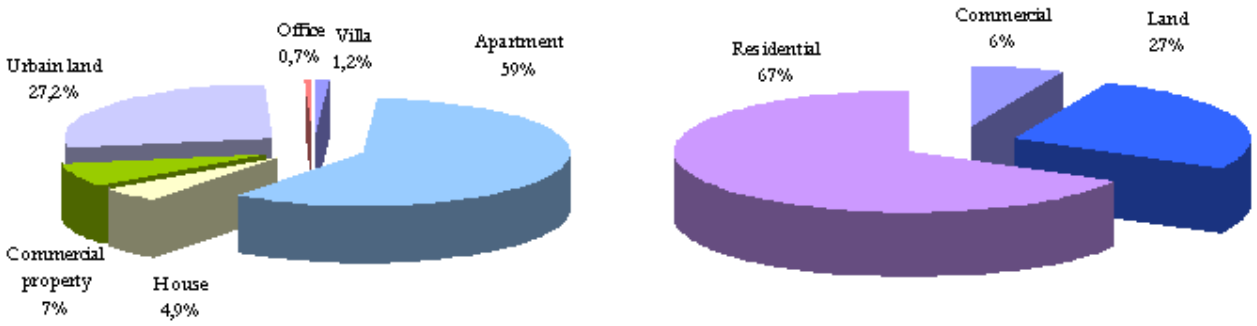
Geographical distribution of selected cities

Region	code	selected cities	Coverage rate (percent)
Le Grand Casablanca	1	Casablanca, Mohammadia	**78,2**
Rabat – Salé – Zemmour - Zaër	2	Rabat, Salé, Temara	**76,4**
Tanger - Tétouan	3	Tanger, Tétouan	**76,4**
Fès - Boulemane	4	Fès, Sefrou	**77,5**
Gharb - Chrarda - Bni Hssen	5	Kénitra, Sidi Kacem	**69,6**
Chaouia - Ouardigha	6	Berrechid, Settat	**86**
Meknès - Tafilalet	7	Meknès, El Hajeb, Ifrane	**97,2**
Doukkala - Abda	8	El Jadida, Safi	**85**
Souss – Massa - Draâ	9	Agadir, Inzegane Aït Melloul	**95,8**
Marrakech – Tensift - El Haouz	10	Marrakech, Essaouira	**100**
L'Oriental	11	Oujda, Berkane, Nador	**65**
Tadla - Azilal	12	Beni Mellal, Fquih Ben Saleh	**100**
Taza - Al Hoceima - Taounate	13	Taza, Al Hoceima	**97,4**
Laâyoune – Boujdour - Sakia El Hamra	14	Laâyoune	**81,1**
Oued Ed-Dahab - Lagouira	15	Dakhla	**70**
Guelmim - Es-Smara	16	Guelmim	**100**
National	-	-	**86percent**

- **The breakdown of transactions:** It shows that residential property represents 66 percent of all sales, with the predominance of apartments. Urban lands represent nearly 27 percent of the domestic market, while transactions on commercial property make up around 7 percent.

Chart 2:

Breakdown of real estate transactions



B. Data processing

This database has been subject to special treatment in order to eliminate incomplete observations, data incorrectly entered and inconsistent transactions. Missing data issue has been overcome, especially concerning the variable of "date of transaction", which is directly involved in the calculation of the index[3], by calculating the average lapse between the date of registration and the date of the transaction. Similarly, the extreme values of price per m² are rejected on the basis of the Box Plot method[4], to reduce their impact. Thus, after this phase of pre-treatments, 586 000 transactions were selected on the basis of 700 000 observations.

Considering the large volume of data to be processed each quarter for the development of the real estate price index, the data mining process has been automated allowing a logical and efficient data processing. It can also reduce the time development of the index when changing or updating a file.

In order to respect the requirements of the ISO9001 standard for validating computer applications for data processing, two data processing programs were developed separately with two different software (Stata and SPSS), to compare the results obtained and to ensure the reliability of treatment.

IV. Methodological Approach

The mean and the median of real estate prices are the most common methods used internationally. However, it is subject to serious bias because it does not distinguish between price fluctuations and changes in the composition of properties sold from one year to another. At the same time, data available at national level, despite their importance, are insufficient for estimating the effect of quality, which is the starting point for applying the hedonic method. Based on the assumption that when a property is sold twice, the quality of the property remains constant, the method adopted is repeat sales method (RSM). Even if there is a problem of selection bias, since the property sold twice are supposed to represent all of the properties, this method was chosen because of its flexibility, transparency and its relevance to the nature of available data at national level.

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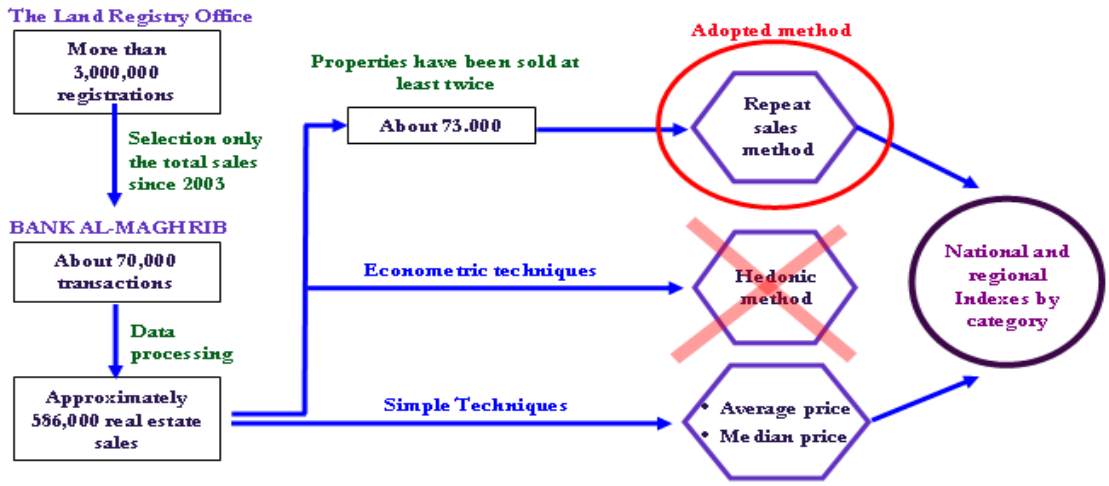
[3] The Office has made seizure of this variable obligatory from September 2009.

[4] Data are considered outliers if their value is outside of this interval: **[Average price per m² ± 1.5 * (Q3-Q1)] with Qi is the ith quartile price per m².**

Figure 2:

Methodological approach adopted for the construction of the REPI



A. Difficulties in the development of the real estate price index

The establishment of a real estate price index at the national level is a very difficult task. In fact:

- The heterogeneity of property makes it difficult to adopt a unique approach to pricing. Several characteristics of a property are involved in the formation of its price, including the size, number of rooms, age and geographical location.
- The wide variation in property prices, which originates in the heterogeneity of real estate. In addition, distortions in the development of average prices over time are always possible: if during a quarter, transactions concerned mainly new properties in good conditions while in the next quarter, they involve properties not well maintained. This can result in price changes that don't reflect the actual trend.
- The lack of some important characteristics, such as the number of rooms, age of property or the built area. This also makes the price per m² widely dispersed for some type of properties.
- The difficulty of distinguishing the actual price changes of the quality that evolves over time.
- The existence of two distinct markets: the new and the old one (According to the census of 2004, over 56 percent of Moroccans are owners of their homes and about 50 percent of houses in Morocco have over 20 years, while 26 percent are over 50 years). This database does not distinguish between new homes and existing homes, because the information needed to set the age of the properties does not exist.

B. Reasons for choosing the repeat sales method

The choice of this method is justified by the following reasons:

- The information available in databases of the Office does not allow testing the hedonic method because of the unavailability of the main characteristics of properties (number of rooms, age of the property ...).

- The repeat sales method, unlike the simple methods that involve significant biases due to the heterogeneity of real estate, has the advantage of limiting the effects of this heterogeneity by making the price index based on the same property .
- The variable “surface area” is not involved in the calculation of the index, which will limit the bias of data entry errors of this variable. Moreover, the variable “transaction price” is more controlled at the Office, because tax income is calculated on this basis.
- This method requires no information on the characteristics of each property and therefore is not subject to specification errors.

In addition to excluding the new housing market and the difficulty in applying the method to a high level of strata, the following criticism can be brought to the repeat sales method:

- **The lack of exhaustiveness of the sample of properties sold**, because this method dismisses the property having been exchanged once. Therefore, the available sample is reduced to a number of observations, which can generate a selection bias. In our case, 73 000 transactions were selected by the repeat sales method. However, this exhaustiveness problem can be reduced over time because each edition of this index includes all real estate sold for the second time.
- **Updating the index every quarter requires the adjustment of its history**, because any new resale of a property is related to the first sale of the same property. Similarly, late registrations of properties sold are also taken into account in the following editions.

C. Calculation method

For the repeat sales method, only the price change and the number of transactions are included in the construction of the index. It creates an index sensitive to the market dynamics, taking into account the time distribution of transactions. Thus, each repeated sale (couple of transactions on the same property) is used to calculate a price change. The index is then constructed on the basis of these individual transactions. Formally, the estimating equation is:

$$\log\left(\frac{P_{it}}{P_{i\tau}}\right) = \sum_s \beta_s D_{is} + \varepsilon_{it\tau}, \quad s = 1, \ldots, S$$

with

$$D_{is} = \begin{cases} 1 \text{ if } s = t \\ -1 \text{ if } s = \tau \quad \text{, with } t > \tau \\ 0 \text{ else} \end{cases}$$

When $P_{i\tau}$: Price of the property at the time τ , date of the first sale.

P_{it} : Price of the same property at the time t, date of the second sale.

β_s : coefficient to estimate for the period s

$\varepsilon_{it\tau}$: Error term

S : Number of Quarters contained in the study period.

Where $\tau = t - 1$, price development is assimilated to average price movements on repeat sales observed between t and $t - 1$.

Once estimated, the coefficients β_s used to construct the index on a base of 100 for the quarter ***t :***

$$I_t = 100 \exp(\hat{\beta}_t - \hat{\beta}_\tau).$$

D. Calculation of the global index and regional indexes

The application of RSM to a region and a category of property provide the desired real estate price index. Similarly, the national price index for a given category is calculated from the national database on this relevant category. The index obtained does not differ from the one which is defined as the average of the different regional indexes weighted by the number of transactions, because the repeat sales method implicitly includes the weight (number of transactions) of each region in the global index. Thus, regions with the most transactions have a greater impact in the global index.

The national real estate price index is also obtained by applying the RSM to the national database on all property types.

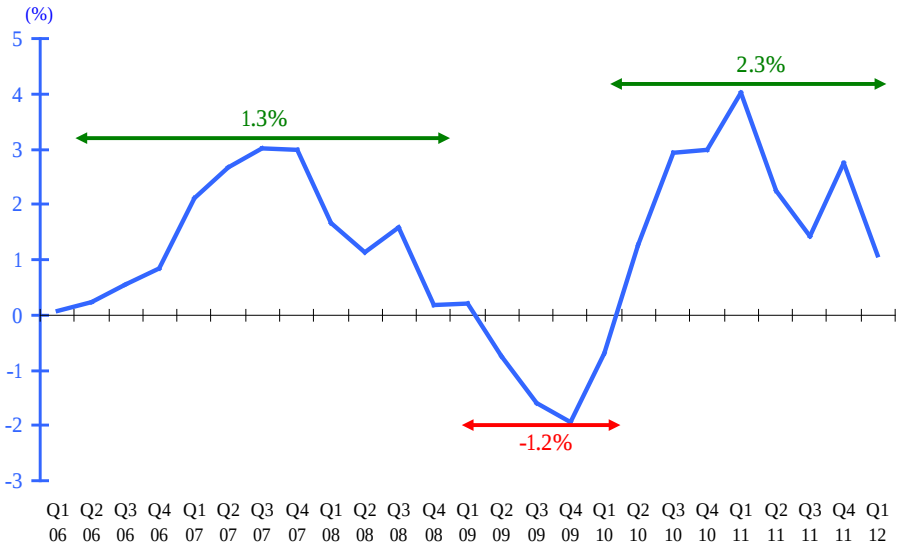
V. Result Analysis

A. Price developments

The development of a real estate price index in Morocco, year on year, revealed three distinct periods: Between 2006 and 2008, property prices have registered an upward trend, with an average growth rate of 1.3 percent. Thereafter, prices began a downward trend until the first quarter of 2010, with a decrease of 1.2 percent on average. From the second quarter of 2010, prices have rebounded, their average growth rate having risen to 2.3 percent.

Chart 3:

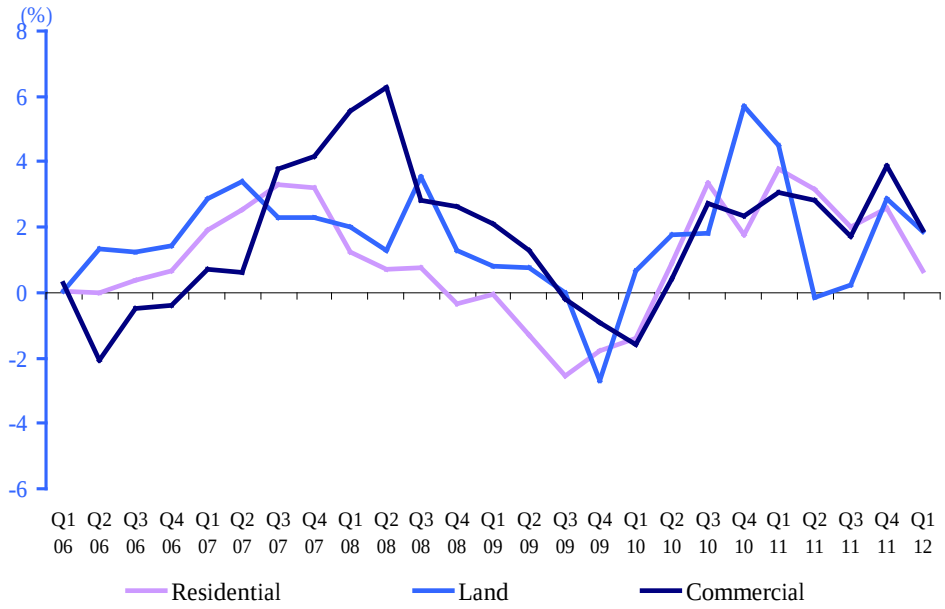
Real estate price index



With particular regard to the latest results of the first quarter 2012, property prices grew by 1.1 percent, year on year, after 2.8 percent in the fourth quarter of 2011. This reflects an increase in prices of all real estate categories (Annex 4).

Chart 4:

Real estate price index by category

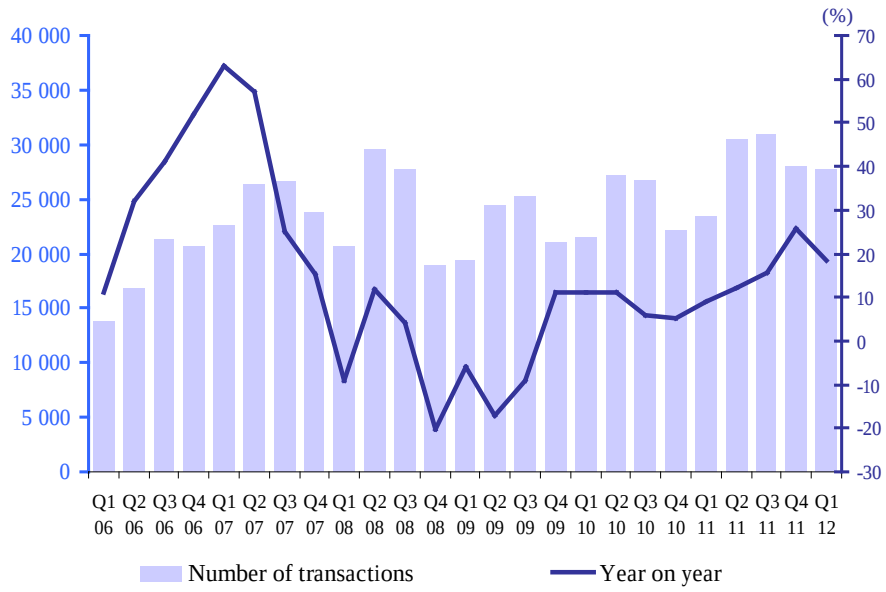


B. Number of transactions

The development of property sales registered at the Land Registry Office has generally three phases. Indeed, the number of transactions increased from 13,800 in the first quarter of 2006 to nearly 26,600 units in the third quarter 2007, reflecting higher sales of residential property, land and commercial estate by 41 percent, 54 percent and 68 percent on average. Then, there was a downward trend, falling to nearly 19,000 sales in the end of 2008, due to the regression of these categories, respectively by 10 percent, 19 percent and 15 percent. From 2009, sales showed an adjustment reaching 28,000 in the fourth quarter 2011, up 13 percent average.

Chart 5:

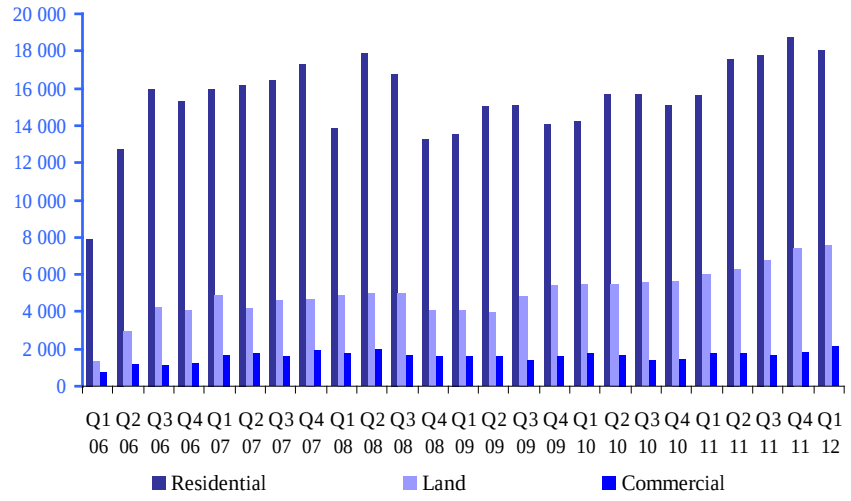
Number of real estate transactions



In the first quarter 2012, the number of residential property transactions fell at a quarterly rate of 3.8 percent to 18,022. This decrease particularly concerned apartments and villas with a decline of 4.1 percent and 5.8 percent, respectively. However, the volume of transactions on commercial and land property moved up 17.8 percent and 1.4 percent, respectively. Year on year, all real estate categories recorded higher sales, except for villas and offices whose sales dropped 18 percent and 1.1 percent, respectively.

Chart 6:

Number of Real estate transactions by category

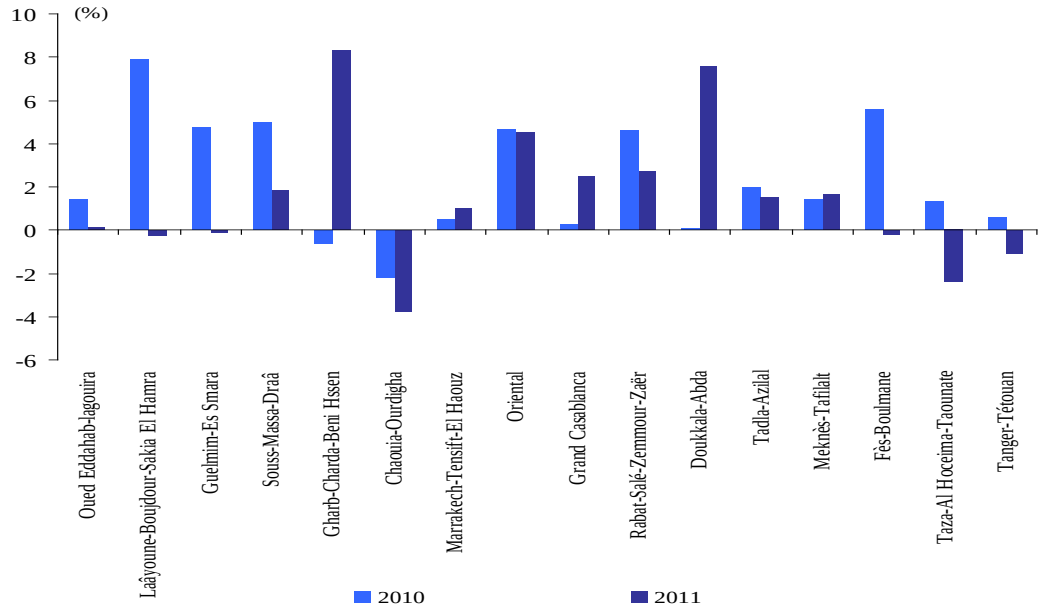


C. REPI by region

In 2011, the increase ranged from 1 percent in the region of Marrakech-Tensift-El Haouz to 8.3 percent in Gharb-Chrarda-Beni Hssen, while the price decline was mostly observed in large cities of the regions of Tangier-Tetouan, Taza-Al Hoceima-Taounate and Chaouia-Ourdigha. In other regions, prices did not change markedly.

Graph 7:

Annual change in prices by region

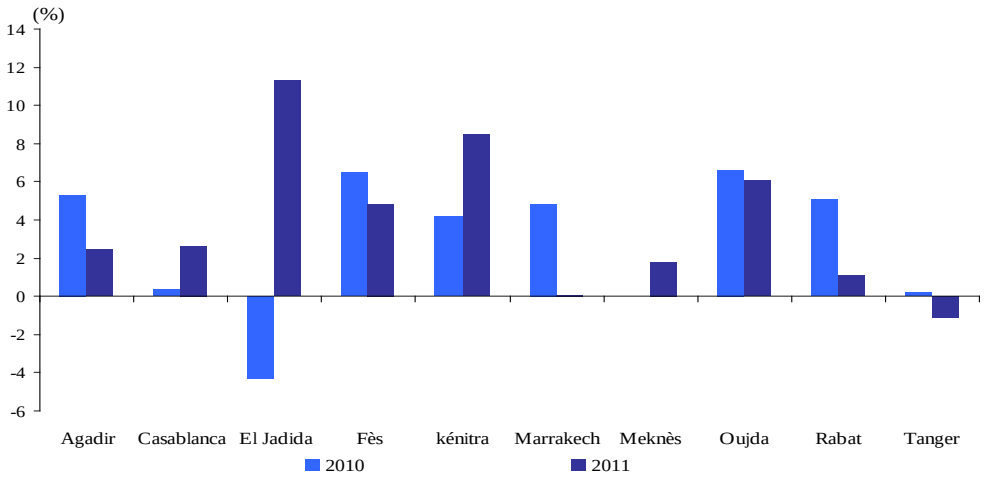


D. REPI by city[5]

By city, property prices broadly increased in 2011. Indeed, with the exception of Tangier, where they fell 1.1 percent, and Marrakech, where they virtually stagnated, prices in other cities increased within a range of 1.1 percent in Rabat and 11.3 percent in El Jadida.

Chart 7:

Annual change in prices by City



E. Importance of tracking property prices

The construction of the REPI allowed the analysis of property price fluctuations to evaluate and to understand their effects on the macroeconomic framework in general. Several studies have been conducted in this area, intending to analyze the impact of these price fluctuations on economic activity and inflation, with the aim to test a possible synchronization between the two cycles.

Taken recently into consideration in the informational system of Bank Al-Maghrib, the integration of real estate prices in the analytical device strengthens the monitoring and evaluation of monetary policy and financial stability. Indeed, fluctuations in property prices are sources of potential uncertainties about the development of aggregate demand and inflation, and ultimately on monetary policy decisions. Considering that real estate constitutes the privileged household investment, it should take a strategic position in the financial stability analytical framework.

Moreover, the significant proportion of real estate loans to total loans reinforces the importance of developments in the property market and their implications for the stability of a financial system dominated by banks. Indeed, nearly a third of the credits granted by the banking system are intended to the property sector, hence the emergence of a high risk for banking institutions that see their business broadly focused around a single sector. Thus, fluctuations in the prices of these assets could potentially threaten the functional equilibrium of banking institutions.

[5] The selection focused on the 10 most dynamic cities in terms of number of property transactions.

Chart 8:

Year-on-year change in the REPI and core inflation

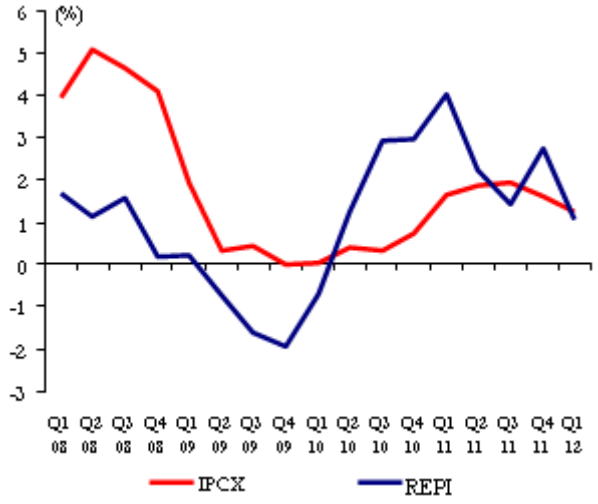


Chart 9:

Change in the REPI and real estate loan interest rates

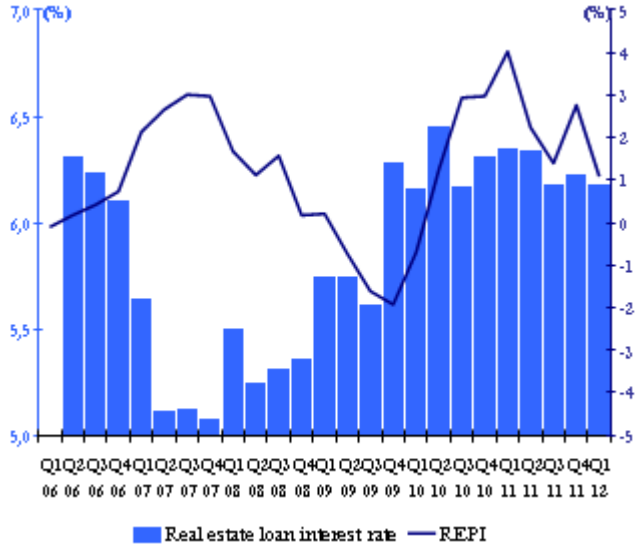
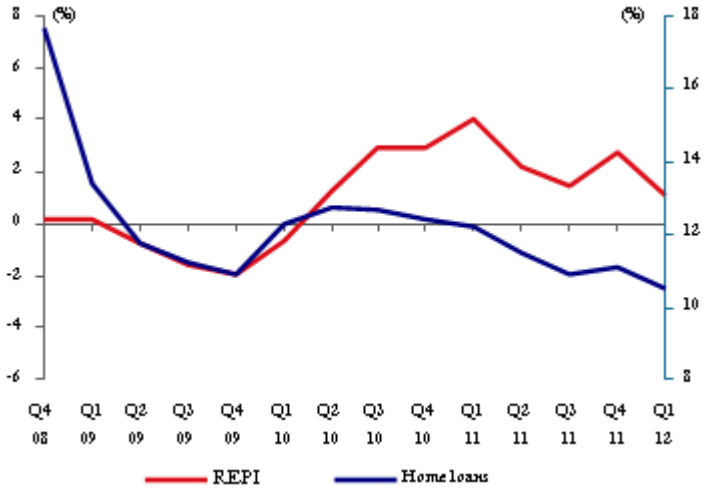


Chart 10:

Year-on-year change in the REPI and home loans



VI. Conclusion

The real estate price indexes (REPI) were jointly constructed by Bank Al-Maghrib and the Land Registry Office on the basis of the latter's data. These quarterly indexes, which have a base value of 100 in 2006, are calculated following the repeat-sales method that controls the heterogeneity of properties. This method does indeed take into account only the properties sold at least twice during the period under review.

The REPI capture changes in residential property prices nationwide, by region and by major cities in the three major types, namely residential property, urban lands and commercial property, as well as in the six categories: apartment (a dwelling located in a collective building and comprising one or several rooms), house (a single or several-story individual

dwelling with no garden), villa (an individual dwelling with a garden), urban land (plot of land located in the urban area), business premises (space fitted for commercial activity) and office (working premises).

These indexes are calculated on the basis of data taken 35 days after the quarter under review, which implies an update of historical data. This update may be important because of the lag between transactions and registrations and/or the integration of property that was sold at least twice during the quarter. This methodologically rigorous approach, however, requires setting a minimum threshold of transactions for its calculation, which does not allow developing indexes for certain cities, regions and/or quarters.

Moreover, to improve the information system, the central Bank of Morocco and the Land Registry Office have started in 2012 the project for developing an index that tracks changes in new property prices, excluded by the RSM. However, due to the unavailability of information on the age of the property, the making of such an indicator faces several challenges.

Annex 1:
Different methods used internationally for compiling real estate index

Simple methods

Country	Institute	Data source	Category	Method	Frequency
France	The National Federation of Real Estate	Prices displayed in real estate agencies	existing homes	Average price per m² by category	Quarterly
Canada	Bank of Canada	Survey (Estimated prices)	bungalows and two-storey houses	National average price	Quarterly
Australia	Australian Bureau of Statistics	registered transactions	Houses	Regional average price	Quarterly
Belgium	STADIM	available data	existing homes	Average price by region and by city	Quarterly
Germany	National Institute of Statistics	notaries sales contract	existing homes	Average price by region	Annual
Spain	Ministry of Construction	available data	existing homes	Average price per m²	Monthly
Netherlands	The Netherlands Association of real estate agencies	available data	existing homes	Median price	Monthly

Econometric methods

Country	Institute	Data source	Category	Method	Frequency
France	INSEE	notaries sales contract	existing homes	Hedonic method	Quarterly
United Kingdom	Halifax	Transactions financed by HBO	existing and new homes	Hedonic method	Monthly & Quarterly
	Office of the deputy prime minister	Survey (Estimated prices)	existing and new homes	Hedonic method	Monthly
	Nationwide Building Society	Prices displayed in real estate agencies	existing and new homes	Hedonic method	Monthly
USA	S&P	available data	existing and new homes	repeat sales method	Quarterly
	Freddie Mac & OFHEO	available data	existing homes	repeat sales method	Quarterly
	Commercial department	Survey (Estimated prices)	New homes	Hedonic method	Quarterly
Hong Kong	Hong Kong property review	available data	existing homes	Hedonic method	Monthly
Sweden	National Institute of Statistics	available data	existing homes	Hedonic method	Quarterly
Switzerland	Cantonal Bank of Zurich	notaries sales contract	existing and new homes	Hedonic method	Quarterly

Annex 2:
Definition of properties types

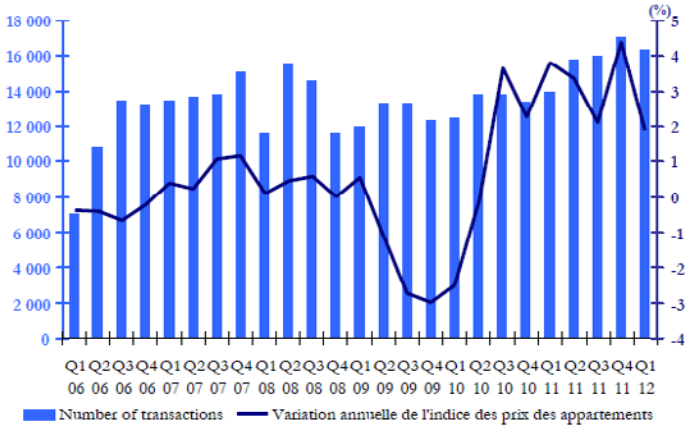
Category	Consistence	Category code
Land	Land	1
	Agricultural dry land	1
	Irrigated agricultural land	1
	Bare land	1
	Agricultural land	1
	Irrigated planted land	1
	Land intended for building	1
	Planted land	1
Villa	Villa	2
	One-story villa	2
	Two-story villa	2
partment	Studio	3
	Duplex	3
	Apartment	3
	Duplex apartment	3
	Very small apartment	3
	Room	3
House	Land with a building	4
	Building	4
	Dwelling house	4
	Ground floor	4
	Underground story	4
Business premises	Commercial building	5
	Building for industry or crafts	5
	Shop	5
	Snack	5
	Store	5
	Business premises	5
Office	Office	6

Annex 3:
Structure of real estate transactions by city in 2006-2008

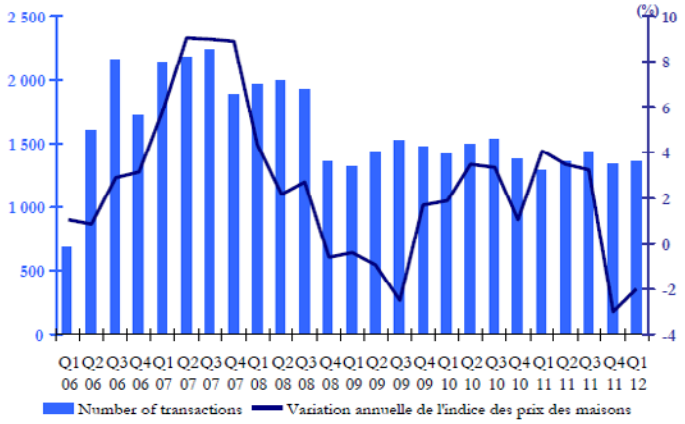
Region	City	Number of registrations				
		2006	2007	2008	Average	Rank
CHAOUIA OUARDIGHA	BERRECHID	9 523	6 811	16 242	10 859	1
	SETTAT	8 011	13 379	9 343	10 244	2
	KHOURIBGA	4 659	8 191	4 676	5 842	3
	BENSLIMANE	6 782	4 509	5 343	5 545	4
DOUKKALA-ABDA	EL JADIDA	12 018	11 688	14 763	12 823	1
	SAFI	7 857	8 922	8 757	8 512	2
	SIDI-BENNOUR	7 101	5 870	4 801	5 924	3
	SIDI SMAIL ZMAMRA		1 209	5 254	3 232	4
FES-BOULEMANE	FES	26 904	32 034	28 546	29 161	1
	SEFROU	3 478	4 124	4 077	3 893	2
	KARIA BA MOHAMED	702	917	915	845	3
	BOULMANE		1	78	40	4
GHARB CHRARDA - BENI HSSEN	KENITRA	17 980	17 946	17 363	17 763	1
	SIDI-KACEM	7 678	8 141	8 620	8 146	2
	SIDI SLIMANE	4 166	5 040	5 047	4 751	3
	SOUK ELARBAA	3 048	2 369	2 845	2 754	4
GRAND CASABLANCA	CASABLANCA	92 941	104 639	95 886	97 822	2
	MOHAMMEDIA	7 331	8 244	8 303	7 959	2
GUELMIM-ES-SMARA	GUELMIM	518	544	418	493	1
LAAYOUNE-BOUJDOUR-SAKIA-EL-HAMRA	LAAYOUNE	1 240	1 998	2 193	1 810	1
MARRAKECH-TENSIFT-AL HAOUZ	MARRAKECH	17 278	11 939	13 741	14 319	1
	ESSAOUIRA	3 013	4 065	4 340	3 806	2
	AL HAOUZ	2 311	3 250	5 131	3 564	3
	EL KELAA	1 860	2 301	2 326	2 162	4
	BENGUERIR	831	2 029	1 528	1 463	5
	CHICHAOUA	456	764	916	712	6
MEKNES-TAFILALET	MEKNES	17 758	21 750	24 700	21 403	1
	EL HAJEB	2 354	4 533	5 532	4 140	2
	IFRANE	1 535	2 962	2 173	2 223	3
	KHENIFRA	1 665	1 742	1 922	1 776	4
	ERRACHIDIA	1 136	1 174	1 350	1 220	5
	MIDELT	712	731	810	751	6
ORIENTAL	OUJDA	12 508	15 768	17 456	15 244	1
	BERKANE	5 469	7 751	6 373	6 531	2
	NADOR	2 501	2 667	3 161	2 776	3
	TAOURIRT	698	731	725	718	4
OUED ED-DAHAB-LAGOUIRA	DAKHLA	868	1 030	958	952	1
RABAT-SALE-ZEMMOUR-ZAËR	TEMARA	15 102	21 781	25 650	20 844	1
	SALE	17 960	15 894	26 028	19 961	2
	RABAT	10 888	11 966	13 076	11 977	3
	KHEMISSET	7 036	9 362	8 407	8 268	4
	ROMMANI	3 321	2 914	3 274	3 170	5
SOUSS-MASSA-DARAA	AGADIR	14 486	17 789	16 928	16 401	1
	INEZGANE AIT MELLOUL	7 216	6 532	3 660	5 803	2
	TAROUDANT	2 611	3 819	3 104	3 178	3
	TIZNIT	2 581	2 847	2 220	2 549	4
	OUARZAZATE	904	1 184	1 299	1 129	5
TADLA-AZILAL	FQUIH BEN SALAH	5 599	7 899	8 277	7 258	1
	BENI-MELLAL	5 518	4 940	5 418	5 292	2
	AZILAL	613	533	516	554	3
TANGER-TETOUAN	TANGER	18 628	24 809	32 088	25 175	1
	TETOUAN	6 302	6 929	8 168	7 133	2
	LARACHE	4 033	5 418	5 220	4 890	3
	MDIQ FNIDEQ		204	1 437	821	4
TAZA-HOCEIMA-TAOUNATE	TAZA	5 209	6 355	5 716	5 760	1
	TAOUNATE	1 135	1 218	1 318	1 224	2
	AL HOCEIMA	817	822	1 158	932	3
	GUERCIF		0	1 281	641	4

Annex 4:
Results of the real estate price index by category

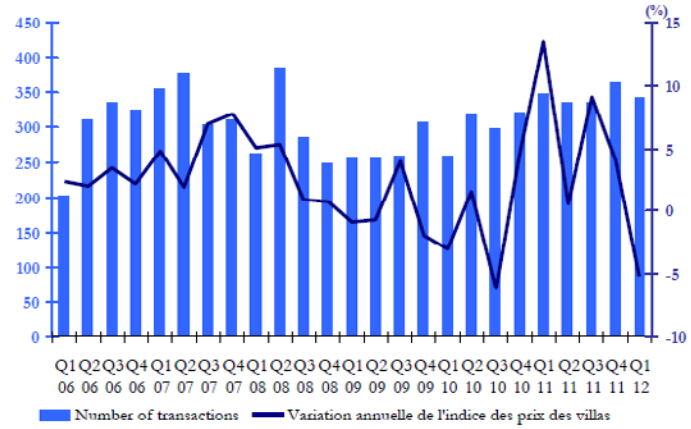
Apartments



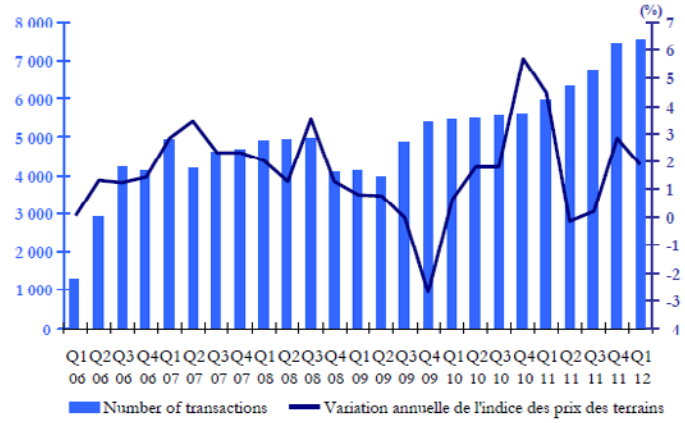
Houses



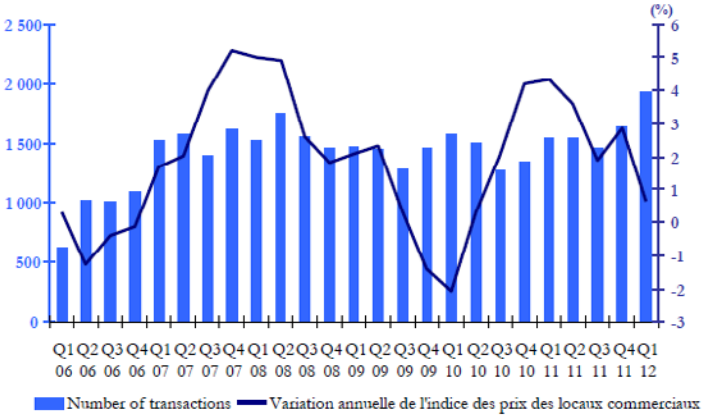
Villas



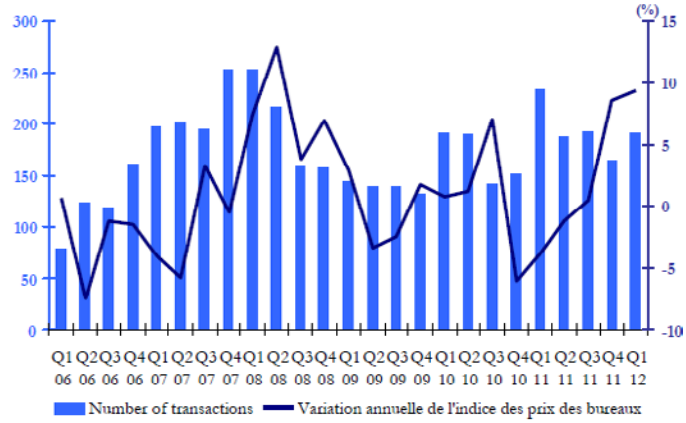
urban lands



Business premises



Offices



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