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INVESTIGATING SPECULATION IN THE COMPONENTS OF THE QUARTERLY GDP GROWTH RATE: ALBANIA'S CASE 2005-2013

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Abstract

The main objectives of the present study are:**a)**To detect the speculation in components of the quarterly GDP growth rate in Albania during the period January 2005- September 2013.**b)**To evaluate the level of speculation for each component of the quarterly GDP growth rate, using the criteria C1, C2, as well as Gelfand's classification.The results of the present study include:The Agriculture Total in Albania contains a moderate speculation.The Extracting Industry in Albania contains a moderate speculation.The Manufacturing Industry in Albania contains a quite strong speculation.The Construction in Albania is a strong speculative game.The Trade, Hotels, and Restaurants in Albania are a moderate speculative game.The Transport in Albania is a moderate speculative game.The Post and Communication in Albania contain a quite strong speculation.Other Services in Albania contain a quite strong speculation.FISIM in Albania contains a quite strong speculation.The GDP growth rate in Albania contains a moderate speculation.These findings are of a particular importance to Albanian Parliament, Albanian Government, and especially to Albanian citizens.

Key words: speculation, quarterly GDP growth rate, CLT, fair game, Gelfand's classification.

Abbreviations:

CLT- Central Limit Theorem
EMH- Efficient Market Hypothesis
GDP- Gross Domestic Product
KSL- Kolmogorov – Smirnov – Lilliefors
SW- Shapiro- Wilk
FISIM- Financial Intermediation Service Indirectly Measured
INSTAT- Institute of Statistics

1. Introduction

The term "speculation" can be used so commonly in almost all financial or commodity markets. Therefore, we might expect a generally accepted definition exists for it. Surprisingly, the evidence suggests otherwise. The published definitions of the term "speculation" are often inconsistent, vague and occasionally contradictory with one another.

Essential components of the term "speculation" are: price changes, buying and selling, short term, great risk, large profit potential and divergence from market consensus.

The criteria "short term", "great risk", and "large profit potential" seem to be essential characteristic of "speculation", yet represent only vague standards.

- How short is a "short term" time-horizon?
  Less than a month or less than a quarter or less than a year?
- Where is the cutoff between "risk" and "great risk" or between "meaningful profit" and "large profit"?
- **We can classify the set of published definitions of the term "speculation" according to the following criteria:**

A. Definitions based solely on price change

1. Buying and (or) selling with a view to profit as a result of changes in price, (Seruton, 1991)
2. The practice of buying or selling with the motive of then selling or buying and thus making a profit if prices or exchange rates have changed (David W. Pearce ed., 1992).

B. Definitions based on price change and risk

3. Speculate: To buy or sell stocks, land, currency, etc, hoping to gain from price changes, to engage in any very risk venture for possible huge profits (David B. Guralnik, 1982)
4. Speculation: The risk that an investment will indeed bring higher profit Blomberg Financial Markets (electronic data base).

C. Definitions based on price change and rapidly of expected gain

5. Speculator: A dealer in markets characterized by rapidly changing prices, such as a commodity market or a securities market, who buy and/or sell commodities or securities not because he or she trades in them, but in hopes of making a short-term gain from movements in the prices of these commodities or securities (Pass, Lowes, Davis, Kronish, 1991)
6. Investment versus Speculation

- Relatively long holding period.	- Frequent turnover of holding.
- Collecting interests and dividends with less concern about current changes in market value.	- Seeking return largely from changes in market value and timing of purchases and sales to maximize profit.

D. Definitions based on price change, risk and rapidity of expected gains

7. Engagement in risky business transactions on the chance of quick or considerable profit (The American Heritage Dictionary of the English Language, 1992),
8. The assumption of high risk, often without regard to current income or to the preservation of principal, to achieve large capital gains (Pessin, Ross, 1983).

E. A definition based on risk only

9. An investment of money with no assurance that income will be received or that the principal will be recovered (Berman, 1983).

F. A definition based on divergence from market consensus

10. Speculation: The activity of forecasting the psychology of the market.
    Speculative motive: The object of securing profit from knowing better than the market what the future will bring forth (Keynes,1964).

A speculative company is one whose assets involve great risk; it offers a relatively large chance for a loss and small chance for a large gain (Reilly,1979).

Keynes claims that the essence of speculation is divergence from the market consensus.

Speculation represents one of four market roles in Western financial markets, distinct from hedging, investing and arbitrage. Speculation is a negative-sum game, but investment is a positive-sum game" (Halsey, Johnson, 1989)

The U.S. Commodity Futures Trading Commission (CFTC) acknowledges that speculation in itself is not harmful (in fact, it lists a number of economic benefits of speculation), but CFTC views excessive speculation as harmful to the proper functioning of futures markets.

Five definitions of "excessive speculation" are given below:

1. The CFTC defines excessive speculation as speculation that causes sudden or unreasonable fluctuations or unwarranted changes in the price of commodity (2008).
2. Excessive speculation is that which drives prices away from the competitive price consistent with available information. That is, excessive speculation distorts prices (Pirrong, 2010).
3. Excessive speculation is the market condition where noncommercial interest set the price (Korzenik, 2009).
4. "Speculation becomes excessive when prices move in a politically inconvenient direction (Review and Outlook: The Politics of Speculation, 2009).
5. "The excessive speculation represents the changes in the price of commodities that cause pain to voters" (Collins, 2011).

Excessive speculation exists and the excessive speculators are corrupted politicians (Pirrong, 2010, Collins 2011).

No government willingly accepts the responsibility for producing excessive speculation.

Nowadays, there is a rational dialogue about the definition of speculation or excessive speculation (Szado, 2011).

Two propositions about private speculation are widely held: first, that speculation is in fact often destabilizing, in the sense that it makes fluctuations in prices wider than they would "otherwise" be; second, that destabilizing speculation necessarily involves economic loss(Friedman, 2008).

In the present paper we focus on speculation's relationship to **efficient market hypothesis** (EMH). In Finance, the EMH relies on the efficient exploitation of information by

economic actors (market participants). Jensen(1978) states that a market is weakly-efficient if the marginal benefit of information is greater than the marginal cost of collecting the information Fama (1965, 1970) states that a market is efficient if fully reflects all available information.

There are three types of market efficiency:

- Weak efficiency requires that prices move randomly, at least at the short term period
- Semi-strong efficiency requires that prices reflect all published information.
- Strong efficiency requires that prices reflect all public information and private information.

If the prices were influenced by private information, then market participants would feel that the market is unfair (speculative), as they would lose to other participants, who had such private information (Madura, Fox, 2007).

The rest of the paper is organized as follows:

Section 2 contains the mathematical models;

Section 3 presents the dynamics of several components of quarterly GDP growth rate;

Section 4 provides the investigation of speculation in Albania's economy;

Section 5 presents the conclusions.

2. Mathematical Models

The Central Limit Theorem (CLT) explains why many probability distributions tend to be very close to the normal distribution. The CLT is also known as the second fundamental theorem of Probability Theory. The Law of Large Numbers is the first fundamental theorem, and the Law of the Iterated Logarithm is the third fundamental theorem of Probability Theory. The Law of the Iterated Logarithm tells us what is happening "in between" The Law of Large Numbers and The CLT. Specifically, it says that the normalizing function $\sqrt{nl_n(l_n n)}$, intermediate in size between n of The Law of Large Numbers and $\sqrt{n}$ of The CLT, provides a nontrivial limiting behavior, see Shiryaev (2006). A contemporary version of the CLT is given by A.N.Kolmogorov.

Theorem 1 (CLT)

If all random samples $(x_1, x_2, \dots, x_n)$ of a reasonably large size n > 30 are selected from any random variable (population) X with finite expectation μ and variance σ^2 then the probability distribution of the sample mean $\bar{x}$ is approximately normal with expectation μ and variance $\frac{\sigma 2}{n}$. This approximation improves with larger samples, as n → ∞, see Kolmogorov (2002).

Theorem 2 (Berry – Esséen)

If the third central moment $E(X- \mu)^3$ exists and is finite, then the above convergence is uniform for all x ∈ (-∞, +∞) and the speed of convergence is at least on the order $\frac{1}{\sqrt{n}}$, see Kallenberg (1997), Shiryaev (2006).

Theorem 3 (Arstein – Ball – Barthe – Naor)
The convergence to normal distribution is monotonic in the sense that the entropy of the random variable

$$Z_n = \frac{n(\bar{x} - \mu)}{\sigma\sqrt{n}}$$

increases monotonically to that of the standard normal distribution (Arstein, Ball, Barthe, and Naor, 2004).
The amazing and counterintuitive thing about CLT is that no matter what the probability distribution of the parent population X, the probability distribution of the sample mean $\bar{x}$ approaches a normal curve.

Consider a probability space (Ω, F, P) equipped with an increasing family $\{F_t\}$, $t \in \mathrm{N}$, of sub – σ algebras of F, called a filtration. In other words, (Ω, F, P, F_t), $t \in \mathrm{N}$, denotes a filtered probability space. If for arbitrary $t \in \mathrm{N}$ the real–valued random variable $X(t) = X(t, \omega)$, $\omega \in \Omega$, is F_t – measurable, then the stochastic process $X(t)$ is said to be adapted to the filtration $\{F_t\}$. If $E[|X(t)|] < +\infty$, $\forall t \in \mathrm{N}$, where E denotes the expectation operator, then the stochastic process $X(t)$ is called integrable. A real–valued stochastic process $X(t)$ that is integrable and adapted to $\{F_t\}$, $t \in \mathrm{N}$, is said to be a discrete martingale if the conditional expectation satisfies the condition:

$$E[X(t) \mid F_s] = X(s),\ P - \text{a.s.},\ \forall s, t \in \mathrm{N},\ s \le t\ .$$

Of course, the filtration $\{F_t\}$ is very important in this definition. When we want to stress this fact, we will speak of F_t – martingale. Anystochastic process $X(t)$ is adapted to its natural filtration $F_t^0 = \sigma(X(t),\ s \le t)$ and $\{F_t^0\}$ is the minimal filtration to which $X(t)$ is adapted. In other words, $\{F_t^0\}$ is the minimal σ-algebra containing all sets of the form:

$$\{\omega \in \Omega \mid X(1) \in B_1\ ,\ X(2) \in B_2\ ,\ \ldots\ ,\ X(t) \in B_t\}\ ,$$

where B_1 , B_2 , … , $B_t \subset \mathrm{R}$ are arbitrary Borel sets.

To say that $X(t)$ is adapted to $\{F_t\}$ is to say that $F_t^0 \subset F_t$, $\forall t \in \mathrm{N}$.

We need the following statements:

Theorem 1

If a stochastic process $X(t)$ is F_t^0 – martingale, then $E\,[\,X(t)\,]$ = constant, $\forall t \in \mathrm{N}$.

Theorem 2

If a stochastic process is not F_t^0 – martingale, then it is not also F_t – martingale.

Theorem 3

The stochastic process $\{ X(t) \}$, $t \in \mathrm{N}$, is a F_t^0 – martingale if and only if the process

$$\{Z(t) = X(t) - X(t-1)\},\ t \geq 2,$$

is a **fair game**. That is, Z(t) follows normal distribution and

$$E[Z(t) \mid F_{t-1}^0] = E[Z(2)] = 0 \quad ,\ \forall t \geq 3.$$

In most applications where we wish to test for normality, the population mean μ and variance σ^2 are unknown. In order to perform the Kolmogorov–Smirnov test, we must assume that μ and σ^2 are known. The Lilliefors test, which is quite similar to the Kolmogorov – Smirnov test, overcomes this problem. The major difference between the two tests is that, with the Lilliefors test, the sample mean $\bar{x}$ and the sample standard deviation *s* are used (instead of μ and σ) to calculate the cumulative distribution function *F(x)*. The sample cumulative function *S(x)* and the test statistic

$$D = \max_i \left| F(x_i) - S(x_i) \right|$$

are both computed as in the Kolmogorov – Smirnov test. In the Lilliefors test we compare the computed value *D* with the critical value D_c provided by the table of the Lilliefors test.

The SW test for normality compares a set of sample data $(x_1, x_2, \ldots, x_n)$ against the normal distribution. The SW test for normality is a very powerful test. This test is of regression type and assesses how well the observed cumulative frequency distribution curve fits the expected normal cumulative curve. The SW test for normality is sensitive to both skewness and kurtosis. In general, SW test is more accurate that KSL test, Cramer – Von Mises test, Durbin test, Chi-squared test, and b_1 test. (Wackenly, Mendenhall, and Schaeffer 2007, Hogg 2009, Field 2009).

We use SPSS version 20.

3. Statistical analysis of some components of quarterly GDP growth rate

GDP is the market value of all officially recognized final goods and services produced within a country in a given period of time (quarterly GDP versus annual GDP).

GDP per capita is often considered as an indicator of a country's standard of living.

Official GDP estimates not take into account the underground economy, in which transactions contributing to production (such as illegal trade and tax-avoiding activities) are unreported, causing GDP to be underestimated.

GDP can be determined in three ways, all of which should, in principle, give the same result:

- Production Approach
- Expenditure Approach
- Income Approach

The most direct of three ways is the Production Approach which calculates the sum of outputs of every class of enterprise to arrive at the total.

In Albania, GDP was calculated by INSTAT only through Production Approach and Expenditure Approach. Among these two methods, is being considered that Production Approach better evaluates GDP for Albania's conditions.

- According to the Production Approach, GDP is calculated by the formula:
  GDP = VAT + TP + CT + SB, where
  GDP denotes the Gross Domestic Product at market prices,
  VAT denotes Value Added Tax at basic prices,
  TP denotes taxes on products including VAT,
  CT denotes customs tax,
  SB denotes subsidies on products and imports.

The Production Approach is the basic method to calculate GDP in Albania.

The quarterly growth rate of Agriculture Total during the period January 2005-September 2013 in Albania is given in Table 1. We calculate the statistical parameters for the data.

Sample size	35
Sample mean	1.1132
95% confidence interval for mean	-1.4966; 3.7230
Median	1.6600
Variance	55.946
Standard deviation	7.47969
Coefficient of variation	6.719
Maximum	14.69
Minimum	-14.18
Range	28.87
Interquartile range	11.95
Skewness	-0.161
Kurtosis	-0.370

The successive differences of the quarterly growth rate of Agriculture Total during the period January 2005- September 2013 in Albania are given in Table 2. We calculate the statistical parameters for the data.

Sample size	34
Sample mean	0.30235
95% confidence interval for mean	-3.842; 4.4468
Median	-0.2050
Variance	141.090
Standard deviation	11.878
Coefficient of variation	39.2855
Maximum	23.180
Minimum	-21.100
Range	44.280
Interquartile range	15.5450
Skewness	0.169
Kurtosis	-0.635

The quarterly growth rate of Agriculture during the period January 2005- September 2013in Albania is given in Table 1. We calculate the statistical parameters for the data.

Sample size	35
Sample mean	1.0409
95% confidence interval for mean	0.7899; 1.2918
Median	1.0400
Variance	0.517
Standard deviation	0.71926
Coefficient of variation	0.691
Maximum	2.36
Minimum	-0.69
Range	3.05
Interquartile range	0.88
Skewness	-0.405
Kurtosis	0.188

The successive differences of the quarterly growth rate of Agriculture during the period January 2005- September 2013 in Albania are given in Table 2. We calculate the statistical parameters for the data.

Sample size	34
Sample mean	0.0200
95% confidence interval for mean	-0.2753; 0.31534
Median	-0.1350
Variance	0.716
Standard deviation	0.84645
Coefficient of variation	42.3225
Maximum	1.870
Minimum	-2.280
Range	4.150
Interquartile range	1.020
Skewness	0.123
Kurtosis	0.901

The quarterly growth rate of Extracting Industry during the period January 2005- September 2013 in Albania is given in Table 1. We calculate the statistical parameters for the data.

Sample size	35
Sample mean	4.7547
95% confidence interval for mean	-0.3714; 9.8808
Median	4.5600
Variance	215.843
Standard deviation	14.69160
Coefficient of variation	3.0899
Maximum	48.95
Minimum	-21.24
Range	70.19
Interquartile range	20.13
Skewness	0.672
Kurtosis	1.143

The successive differences of the quarterly growth rate of Extracting Industry during the period January 2005- September 2013 in Albania are given in Table 2. We calculate the statistical parameters for the data.

Sample size	34
Sample mean	0.29088
95% confidence interval for mean	-7.80277; 8.3845
Median	-2.250
Variance	538.079
Standard deviation	23.196
Coefficient of variation	79.7442
Maximum	70.190
Minimum	-53.310
Range	123.50
Interquartile range	28.060
Skewness	0.619
Kurtosis	1.639

The quarterly growth rate of Manufacturing Industry during the period January 2005- September 2013 in Albania is given in Table 1. We calculate the statistical parameters for the data.

Sample size	35
Sample mean	0.6879
95% confidence interval for mean	-2.0689; 3.4448
Median	1.6500
Variance	62.429
Standard deviation	7.90123
Coefficient of variation	11.486
Maximum	15.63
Minimum	-15.73
Range	31.36
Interquartile range	12.06
Skewness	-0.234
Kurtosis	-0.168

The successive differences of the quarterly growth rate of Manufacturing Industry during the period January 2005- September 2013 in Albania are given in Table 2. We calculate the statistical parameters for the data.

Sample size	34
Sample mean	0.30147
95% confidence interval for mean	-4.0316; 4.6346
Median	0.79500
Variance	154.228
Standard deviation	12.41881
Coefficient of variation	41.1941
Maximum	24.310
Minimum	-21.590
Range	45.9000
Interquartile range	18.17750
Skewness	0.138
Kurtosis	-0.671

The quarterly growth rate of Industry Total during the period January 2005- September 2013 in Albania is given in Table 1. We calculate the statistical parameters for the data.

Sample size	35
Sample mean	1.1656
95% confidence interval for mean	0.6078; 1.7233
Median	0.8850
Variance	2.555
Standard deviation	1.59855
Coefficient of variation	1.3714
Maximum	5.24
Minimum	-1.82
Range	7.06
Interquartile range	2.01
Skewness	0.777
Kurtosis	0.766

Thesuccessive differences of the quarterly growth rate of Industry Total during the period January 2005- September 2013 in Albania are given in Table 2. We calculate the statistical parameters for the data.

Sample size	34
Sample mean	-0.030588
95% confidence interval for mean	-0.778; 0.717
Median	-0.120
Variance	4.593
Standard deviation	2.1432
Coefficient of variation	-70.0667
Maximum	4.160
Minimum	-5.000
Range	9.160
Interquartile range	1.7025
Skewness	0.047
Kurtosis	0.535

The quarterly growth rate of Construction during the period January 2005- September 2013 in Albania is given in Table 1. We calculate the statistical parameters for the data.

Sample size	35
Sample mean	0.5879
95% confidence interval for mean	-2.6027; 3.7786
Median	0.7950
Variance	83.620
Standard deviation	9.14438
Coefficient of variation	15.554
Maximum	21.29
Minimum	-16.20
Range	37.49
Interquartile range	13.17
Skewness	0.177
Kurtosis	-0.292

The successive differences of the quarterly growth rate of Construction during the period January 2005- September 2013 in Albania are given in Table 2. We calculate the statistical parameters for the data.

Sample size	34
Sample mean	-0.2864
95% confidence interval for mean	-5.0825; 4.509
Median	-1.0805
Variance	188.943
Standard deviation	13.745
Coefficient of variation	-47.992
Maximum	24.540
Minimum	-30.860
Range	55.400
Interquartile range	14.6850
Skewness	-0.285
Kurtosis	0.016

The quarterly growth rate of Trade, Hotels and Restaurants during the period January 2005- September 2013 in Albania is given in Table 1. We calculate the statistical parameters for the data.

Sample size	35
Sample mean	0.9879
95% confidence interval for mean	0.1389; 1.8370
Median	0.5650
Variance	5.921
Standard deviation	2.43337
Coefficient of variation	2.463
Maximum	6.24
Minimum	-3.43
Range	9.67
Interquartile range	3.48
Skewness	0.316
Kurtosis	-0.507

The successive differences of the quarterly growth rate ofTrade, Hotels and Restaurants during the period January 2005- September 2013 in Albania are given in Table 2. We calculate the statistical parameters for the data.

Sample size	34
Sample mean	-0.05823
95% confidence interval for mean	-1.9920; 1.2155
Median	-0.520
Variance	13.328
Standard deviation	3.650
Coefficient of variation	-62.68247
Maximum	6.950
Minimum	-6.220
Range	13.170
Interquartile range	4.9450
Skewness	0.313
Kurtosis	-0.677

The quarterly growth rate of Transport during the period January 2005- September 2013 in Albania is given in Table 1. We calculate the statistical parameters for the data.

Sample size	35
Sample mean	0.7956
95% confidence interval for mean	-0.6752; 2.2664
Median	0.3350
Variance	17.770
Standard deviation	4.21541
Coefficient of variation	5.2984
Maximum	9.51
Minimum	-5.60
Range	15.11
Interquartile range	6.45
Skewness	0.397
Kurtosis	-0.591

Thesuccessive differences of the quarterly growth rateofTransport during the period January 2005- September 2013 in Albania are given in Table 2. We calculate the statistical parameters for the data.

Sample size	34
Sample mean	-0.0764
95% confidence interval for mean	-2.35604; 2.20310
Median	-0.5550
Variance	42.684
Standard deviation	6.5332
Coefficient of variation	-85.5130
Maximum	13.730
Minimum	-13.730
Range	26.790
Interquartile range	7.1700
Skewness	-0.074
Kurtosis	-0.144

The quarterly growth rate of Post and Communication during the period January 2005- September 2013 in Albania is given in Table 1. We calculate the statistical parameters for the data.

Sample size	35
Sample mean	2.2021
95% confidence interval for mean	0.9042; 4.3100
Median	0.5850
Variance	36.497
Standard deviation	6.04127
Coefficient of variation	2.7434
Maximum	28.96
Minimum	-4.95
Range	33.91
Interquartile range	5.10
Skewness	2.942
Kurtosis	11.502

The successive differences of the quarterly growth rate of Post and Communication during the period January 2005- September 2013 in Albania are given in Table 2. We calculate the statistical parameters for the data.

Sample size	34
Sample mean	-0.123235
95% confidence interval for mean	-3.1856; 2.9392
Median	0.260
Variance	77.036
Standard deviation	8.777
Coefficient of variation	-71.221
Maximum	27.360
Minimum	-32.540
Range	59.900
Interquartile range	3.5675
Skewness	-0.669
Kurtosis	7.711

The quarterly growth rate of Other Services during the period January 2005- September 2013 in Albania is given in Table 1. We calculate the statistical parameters for the data.

Sample size	35
Sample mean	1.2762
95% confidence interval for mean	0.5125; 2.0399
Median	0.8500
Variance	4.791
Standard deviation	2.18872
Coefficient of variation	1.715
Maximum	8.28
Minimum	-1.96
Range	10.24
Interquartile range	2.89
Skewness	1.186
Kurtosis	1.958

The successive differences of the quarterly growth rate ofOther Services during the period January 2005- September 2013 in Albania are given in Table 2. We calculate the statistical parameters for the data.

Sample size	34
Sample mean	0.0147
95% confidence interval for mean	-1.1486; 1.1780
Median	0.1950
Variance	11.116
Standard deviation	3.334041
Coefficient of variation	226.8055
Maximum	5.470
Minimum	-9.690
Range	15.160
Interquartile range	4.680
Skewness	-0.711
Kurtosis	0.895

The quarterly growth rate of FISIM during the period January 2005- September 2013 in Albania is given in Table 1. We calculate the statistical parameters for the data.

Sample size	35
Sample mean	2.0856
95% confidence interval for mean	0.8722; 3.2990
Median	2.0950
Variance	12.094
Standard deviation	3.47770
Coefficient of variation	1.6675
Maximum	11.08
Minimum	-5.42
Range	16.50
Interquartile range	2.62
Skewness	0.552
Kurtosis	1.725

Thesuccessive differences of the quarterly growth rate ofFISIM during the period January 2005- September 2013 in Albania are given in Table 2. We calculate the statistical parameters for the data.

Sample size	34
Sample mean	-0.023235
95% confidence interval for mean	-1.73001; 1.683538
Median	0.0100
Variance	23.928
Standard deviation	4.8916
Coefficient of variation	-210.527
Maximum	11.3000
Minimum	-11.450
Range	22.750
Interquartile range	5.1500
Skewness	0.004
Kurtosis	0.380

The quarterly GDP growth rate during the period January 2005- September 2013 in Albania is given in Table 1. We calculate the statistical parameters for the data.

Sample size	35
Sample mean	0.9524
95% confidence interval for mean	0.2116; 1.6931
Median	1.0350
Variance	4.508
Standard deviation	2.12311
Coefficient of variation	2.229
Maximum	6.38
Minimum	-2.61
Range	8.99
Interquartile range	2.50
Skewness	0.514
Kurtosis	0.544

The successive differences of the quarterly GDP growth rate during the period January 2005- September 2013 in Albania are given in Table 2. We calculate the statistical parameters for the data.

Sample size	34
Sample mean	0.0002941
95% confidence interval for mean	-1.12574; 1.1263
Median	0.550
Variance	10.415
Standard deviation	3.2272
Coefficient of variation	10973.138
Maximum	7.880
Minimum	-6.380
Range	14.260
Interquartile range	3.99250
Skewness	0.084
Kurtosis	0.096

The source of the data isINSTAT. In Albania, data on the quarterly growth rate before January 2005 is missing.

4. Investigating speculation in the quarterly GDP growth rate for Albania during the period January 2005-September 2013

For investigating the speculation, we recommend two criteria:

C 1: Testing for the harmonization of the data set with normal distribution.

C 2: Testing for the weakly efficient market hypothesis. That is, testing for the fair game hypothesis, in Stein-Vorobiev sense.

4. 1The data set is the quarterly growth rate of Agriculture in Albania during the period January 2005-September 2013.

Test the hypothesis

H_0: The quarterly growth rate of Agriculture for Albania during the period January 2005-September 2013 follows a normal distribution.

H_1: The quarterly growth rate of Agriculture for Albania during the period January 2005-September 2013 follows a non-normal distribution.

We find the observed value of KSL test = 0.080 and the observed value of SW test = 0.980.

Decision Rule:

Reject the null hypothesis H_0 at the confidence level 22.2%. That is, the CLT is not applicable for the quarterly growth rate of Agriculture total in Albania during the specified period, at the confidence level 22.2%.

- The data set consists of the successive differences of the quarterly growth rate of Agriculture in Albania during the period January 2005-September 2013.

Test the hypothesis

H_0: The successive differences of the quarterly growth rate of Agriculture for Albania during the period January 2005-September 2013 follows a normal distribution.

H_1: The successive differences of quarterly growth rate of Agriculture total for Albania during the period January 2005-September 2013 follows a non-normal distribution.

We find the observed value of KSL test = 0.136 and the observed value of SW test = 0.955.

Decision Rule:

Reject the null hypothesis H_0 at the confidence level 82.6%. That is, the Agriculture in Albania during the period January 2005-September 2013 is a speculative game at the confidence level 82.6%.

For the sake of simplicity, we state the null hypothesis H_0 and the alternative hypothesis H_1 in the general forms.

H_0: The quarterly growth rate of the specified component of GDP for Albania during the period January 2005-September 2013 follows a normal distribution.

H_1: The quarterly growth rate of the specified component of GDP for Albania during the period January 2005-September 2013 follows a non-normal distribution.

Respectively,

H_0: The successive differences of the specified component of the GDP for Albania during the period January 2005-September 2013 follows a normal distribution.

H_1: The successive differences of the specified component of the GDP for Albania during the period January 2005-September 2013 follows a non-normal distribution.

4. 2The data set is the quarterly growth rate of Agriculture total in Albania during the period January 2005-September 2013.

We find the observed value of KSL test = 0.117 and the observed value of SW test = 0.965.

Decision Rule:

The CLT is not applicable for the quarterly growth rate of Agriculture total in Albania during the specified period, at the confidence level 66.1%.

- The data set consists of the successive differences of the quarterly growth rate of "Agriculture Total" in Albania during the period January 2005-September 2013.

We find the observed value of KSL test = 0.065 and the observed value of SW test = 0.977.

Decision Rule:

Reject the null hypothesis H_0 at the confidence level 66.2%.That is, the Agriculture Total in Albania during the period January 2005-September 2013 is a speculative game at the confidence level 66.2%.

4. 3The data set is the quarterly growth rate of Extracting Industry in Albania during the period January 2005-September 2013.

We find the observed value of KSL test = 0.085 and the observed value of SW test = 0.968.

Decision Rule:

Reject the null hypothesis H_0 at the confidence level 60.1%. That is, the CLT is not applicable for the quarterly growth rate of Agriculture total in Albania during the specified period, at the confidence level 60.1%.

- The data set consists of the successive differences of the quarterly growth rate of Extracting Industry in Albania during the period January 2005-September 2013.

We find the observed value of KSL test = 0.101 and the observed value of SW test = 0.965.

Decision Rule:

Reject the null hypothesis H_0 at the confidence level 66.3%. That is, the Extracting Industry in Albania during the period January 2005-September 2013 is a speculative game at the confidence level 66.3%.

4. 4The data set is the quarterly growth rate of Manufacturing Industry in Albania during the period January 2005-September 2013.

We find the observed value of KSL test = 0.180 and the observed value of SW test = 0.964.

Decision Rule:

Reject the null hypothesis H_0 at the confidence level 68.9%. That is, the CLT is not applicable for the quarterly growth rate of Agriculture total in Albania during the specified period, at the confidence level 68.9%.

- The data set consists of the successive differences of the quarterly growth rate of Manufacturing Industry in Albania during the period January 2005-September 2013.

We find the observed value of KSL test = 0.084 and the observed value of SW test = 0.973.

Decision Rule:

Reject the null hypothesis H_0 at the confidence level 43.8%. That is, the Agriculture in Albania during the period January 2005-September 2013 is a speculative game at the confidence level 43.8%.

4. 5The data set is the quarterly growth rate of Industry total in Albania during the period January 2005-September 2013.

We find the observed value of KSL test = 0.123 and the observed value of SW test = 0.955.

Decision Rule:

Reject the null hypothesis H_0 at the confidence level 82.8%. That is, the CLT is not applicable for the quarterly growth rate of Agriculture total in Albania during the specified period, at the confidence level 82.8%.

- The data set consists of the successive differences of the quarterly growth rate of Industry total in Albania during the period January 2005-September 2013.

We find the observed value of KSL test = 0.148 and the observed value of SW test = 0.945.

Decision Rule:

Reject the null hypothesis H_0 at the confidence level 91.3%. That is, the Agriculture in Albania during the period January 2005-September 2013 is a speculative game at the confidence level 91.3%.

4. 6The data set is the quarterly growth rate of Construction in Albania during the period January 2005-September 2013.

We find the observed value of KSL test = 0.060 and the observed value of SW test = 0.985.

Decision Rule:

Reject the null hypothesis H_0 at the confidence level 9.8%. That is, the CLT is not applicable for the quarterly growth rate of Agriculture total in Albania during the specified period, at the confidence level 9.8%.

- The data set consists of the successive differences of the quarterly growth rate of Construction in Albania during the period January 2005-September 2013.

We find the observed value of KSL test = 0.136 and the observed value of SW test = 0.967.

Decision Rule:

Reject the null hypothesis H_0 at the confidence level 61.7%. That is, the Agriculture in Albania during the period January 2005-September 2013 is a speculative game at the confidence level 61.7%.

4. 7The data set is the quarterly growth rate of Trade, Hotels and Restaurants in Albania during the period January 2005-September 2013.

We find the observed value of KSL test = 0.101 and the observed value of SW test = 0.975.

Decision Rule:

Reject the null hypothesis H_0 at the confidence level 39.3%. That is, the CLT is not applicable for the quarterly growth rate of Agriculture total in Albania during the specified period, at the confidence level 39.3%.

- The data set consists of the successive differences of the quarterly growth rate of Trade, Hotels and Restaurants in Albania during the period January 2005-September 2013.

We find the observed value of KSL test = 0.082 and the observed value of SW test = 0.966.

Decision Rule:

Reject the null hypothesis H_0 at the confidence level 64.2%. That is, the Agriculture in Albania during the period January 2005-September 2013 is a speculative game at the confidence level 64.2%.

4. 8The data set is the quarterly growth rate of Transport in Albania during the period January 2005-September 2013.

We find the observed value of KSL test = 0.083 and the observed value of SW test = 0.960.

Decision Rule:

Reject the null hypothesis H_0 at the confidence level 75.4%. That is, the CLT is not applicable for the quarterly growth rate of Agriculture total in Albania during the specified period, at the confidence level 75.4%.

- The data set consists of the successive differences of the quarterly growth rate of Transport in Albania during the period January 2005-September 2013.

We find the observed value of KSL test = 0.110 and the observed value of SW test = 0.975.

Decision Rule:

Reject the null hypothesis H_0 at the confidence level 39.9%. That is, the Agriculture in Albania during the period January 2005-September 2013 is a speculative game at the confidence level 39.9%.

4. 9The data set is the quarterly growth rate of Post and Communication in Albania during the period January 2005-September 2013.

We find the observed value of KSL test = 0.188 and the observed value of SW test = 0.719.

Decision Rule:

Reject the null hypothesis H_0 at the confidence level 99.99%. That is, the CLT is not applicable for the quarterly growth rate of Agriculture total in Albania during the specified period, at the confidence level 99.99%.

- The data set consists of the successive differences of the quarterly growth rate of Post and Communication in Albania during the period January 2005-September 2013.

We find the observed value of KSL test = 0.233 and the observed value of SW test = 0.762.

Decision Rule:

Reject the null hypothesis H_0 at the confidence level 99.99%. That is, the Agriculture in Albania during the period January 2005-September 2013 is a speculative game at the confidence level 99.99%.

4.10The data set is the quarterly growth rate of Other Services in Albania during the period January 2005-September 2013.

We find the observed value of KSL test = 0.140 and the observed value of SW test = 0.925.

Decision Rule:

Reject the null hypothesis H_0 at the confidence level 97.8%. That is, the CLT is not applicable for the quarterly growth rate of Agriculture total in Albania during the specified period, at the confidence level 97.8%.

- The data set consists of the successive differences of the quarterly growth rate of Other Services in Albania during the period January 2005-September 2013.

We find the observed value of KSL test = 0.089 and the observed value of SW test = 0.961.

Decision Rule:

Reject the null hypothesis H_0 at the confidence level 74%. That is, the Agriculture in Albania during the period January 2005-September 2013 is a speculative game at the confidence level 74%.

4.11The data set is the quarterly growth rate of FISIM in Albania during the period January 2005-September 2013.

We find the observed value of KSL test = 0.196 and the observed value of SW test = 0.919.

Decision Rule:

Reject the null hypothesis H_0 at the confidence level 98.5%. That is, the CLT is not applicable for the quarterly growth rate of FISIM in Albania during the specified period, at the confidence level 98.5%.

- The data set consists of the successive differences of the quarterly growth rate of FISIM in Albania during the period January 2005-September 2013.

We find the observed value of KSL test = 0.117 and the observed value of SW test = 0.976.

Decision Rule:

Reject the null hypothesis H_0 at the confidence level 36%. That is, the FISIM in Albania during the period January 2005-September 2013 is a speculative game at the confidence level 36%.

4.12The data set is the quarterly growth rate of GDP in Albania during the period January 2005-September 2013.

We find the observed value of KSL test = 0.102 and the observed value of SW test = 0.962.

Decision Rule:

Reject the null hypothesis H_0 at the confidence level 72.7%. That is, the CLT is not applicable for the quarterly growth rate of Agriculture total in Albania during the specified period, at the confidence level 72.7%.

- The data set consists of the successive differences of the quarterly growth rate of GDP in Albania during the period January 2005-September 2013.

We find the observed value of KSL test = 0.100 and the observed value of SW test = 0.975.

Decision Rule:

Reject the null hypothesis H_0 at the confidence level 37.4%. That is, the quarterly growth rate of GDP in Albania during the period January 2005-September 2013 is a speculative game at the confidence level 37.4%.

The confidence level γ denotes the probability of rejecting the null hypothesis H_0.

Using the criteria C1, C2 and Gelfand's classification we obtain the following estimations concerning the level of speculation:

$0< \gamma \leq 0.15$ indicates a quite weak level of speculation,

$0.15 < \gamma \leq 0.40$ indicates a weak level of speculation,

$0.40 < \gamma \leq 0.80$ indicates a moderate level of speculation,

$0.80 < \gamma \leq 0.95$ indicates a strong level of speculation,

$0.95 < \gamma < 1$ indicates a quite strong level of speculation.

The relative weights of the quarterly GDP growth rate components fluctuate over time. The expected financial loss associated with speculation depends on the relative weights of GDP components. INSTAT reported the mean relative weights of the GDP components for Albania during the period January 2005-September 2013:
Agriculture Total = 18%, Extracting Industry = 1.5%, Manufacturing Industry = 13.5%, Construction = 17%, Trade, Hotels, and Restaurants = 21%, Transport = 7.5%, Post and Communication = 2.5%, Other Services= 18%.

5. Conclusion

Using the criterion C1 and Gelfand's classification for Albania's economy during the period January 2005- September 2013, we obtain the following results:

1. The Agriculture in Albania contains a weak speculation.
2. The Agriculture Total in Albania contains a moderate speculation.
3. The Extracting industry in Albania contains a moderate speculation.
4. The Manufacturing Industry in Albania contains a quite strong speculation.
5. The Industry Total in Albania contains a strong speculation.
6. The Construction in Albania contains a quite weak speculation.
7. The Trade, Hotels, and restaurants in Albania contain a weak speculation.
8. The Transport in Albania contains a moderate speculation.
9. The Post and Communication in Albania contain a quite strong speculation.
10. Other Services in Albania contain a quite strong speculation.
11. FISIM in Albania contains a quite strong speculation.
12. The GDP growth rate in Albania contains a moderate speculation.

Using the criterion C2 and Gelfand's classification for Albania's economy during the period January 2005-September 2013, we obtain the following results:

13. The Agriculture in Albania is a strong speculative game.
14. The Agriculture Total in Albania is a weak speculative game.
15. The Extracting Industry in Albania is a moderate speculative game.
16. The Manufacturing Industry in Albania is a moderate speculative game.
17. The Industry Total in Albania is a strong speculative game.
18. The Construction in Albania is a strong speculative game.
19. The Trade, Hotels, and Restaurants in Albania are a moderate speculative game.
20. The Transport in Albania is a moderate speculative game.
21. The Post and Communication in Albania are a quite strong speculative game.
22. Other Services in Albania are a moderate speculative game.

23. FISIM in Albania is a weak speculative game.
24. The GDP growth rate in Albania is a weak speculative game.

These findings are of a particular importance to Albanian Parliament, Albanian Government, and especially to Albanian citizens.

References

Arstein, S., K. Ball, E. Barthe and A. Naor (2004). Solution of Shannon's problem on the monotony of entropy. Journal of the American Mathematical Society. Vol 114. No 498 pp.844 – 866.

Berman, Ben (1983), The Dictionary of Business and Credit Terms, New York: National Association of Credit Management, p 183

Blanchard, O. (2011). Microeconomics, Pearson, Boston (USA).

Collins, D. (2011). Excessive speculation, the political definition, The Future Magazine, April 23, 2011

Fama, E. (1970). Efficient capital markets: A review of theory and empirical work, journal of Finance, 25 (2), 383-417.

Field, A. (2009). Discovering Statistics Using SPSS (3ed.), London: Sage.

Friedman, M. (2008). The Optimum Quantity of Money, AldineTransaction, New Brunswick (USA).

Gihman, I. I. and Skorohod, A.V. (1974 – 1979). Theory of Stochastic Processes, 3 volumes, Springer – Verlag, New York – Berlin.

Guralnik, David B (1982), Webster's New World Dictionary, 2nd concise ed. New York: Simon & Schuster, p 719

Hogg, R.V. (2009). Probability and Statistical Inference, 8ed., Prentice Hall.

Jensen, M. (1978). Some anomalous evidence regarding market efficiency, Journal of Financial Economics, 6 (2-3), 95-101.

Keynes, John Maynard (1964). The General Theory of Employment, Interest and Money. New York: Harcrout, Brace & World, p 158 and p 170

Keynes, John Maynard (1964). The General Theory of Employment, Interest and Money. New York: Harcrout, Brace & World, p 158 and p 170

Kolmogorov, A. N. (2002). Probability Theory. Moscow: Nauka.

Korzenik, Jeff (2009). Defining excessive speculation available at http.//inefficientfrontiers.wordpress.com/2009/07/14

Lipster, R. M. and Shiryaev, A. N. (1996). Martingale Theory (in Russian), Moscow, Mir.

Madura, J. and Fox, R. (2007). International Financial Management. Thomson Learning.

Mankiw, N.G (2009). Macroeconomics,seventh edition, Worth.

Pass, Christopher, Bryan Lowes, Leslie Davis and Sidney J. Kronish (1991). The Harper Collins Dictionary of Economics, New York: Harper Collins Publishers, p 492

Pearce, David W. ed. (1992). The MIT Dictionary of Modern Economics, 4th ed., Cambridge, MA: MT Press, p 404

Pessin, Allan H. and Joseph A. Ross (1983), Words of Wall Street: 2000 Investment Terms Defined, Dow Jones-Irwin, p 240

Pirrong, Craig (2010). Is excessive speculation in oil and commodities markets actually occurring? Available at http.//seekingalpha.com/article/147945

Reilly, Frank K. (1979), Investment Analysis and Portfolio Management, Hinsdale, IL: The Dryden Press, pp 348-349

Revuz, D. and Yor, M. (1991). Continuous Martingales and Brownian Motions, Springer – Verlag, New York – Berlin.

Samuelson, P.A (2006). The Collected Scientific Papers of Paul Anthony Samuelson, Vol 6, MIT Press.

Samuelson, Paul A. and William D. Nordhaus (1992). Economics, 14th ed. New York: McGrawHill, p 198

Saragent, Thomas J. (1993). Bounded Rationality in Macroeconomics. Oxford: Oxford University Press

Scruton, Roger (1991). A Dictionary of Political Thought. New York: Hill and Wang, p 443

Shiryaev, A. N. (2006). Probability, second edition, Springer, New York.

Stein, J.L. (2012). Stochastic Optimal Control and U.S Finance Debt Crisis, Springer, New York.

Szado, Edward (2011). Defining speculation: The first step toward a rational dialogue. The Journal of Alternative Investments, 14 (1), pp 75-82

Tirole, Jean (1982), On the Possibility of Speculation under Rational Expectation. Econometric, Vol. 50, No. 5, pp 1163-1181

Wackearly, D. D., Mendenhall, W., & Scheaffer, R. L. (2007). Mathematical Statistics with Applications, Duxbury Advanced Series.

Appendix

Table 1 Components of the quarterly GDP growth rate

Year	Quarter	Agricultu re	Total	Extractin g	Manufact uring	Construct ion	Total	Trade	Transport	Post	Other	FISIM	Gross value
2005	T1	0.15	-8.62	-7.87	-8.68	-10.31	0.9	0.76	3.13	4.61	-0.01	-0.6	-1.96
	T2	-0.53	14.56	2.2	15.63	12.79	5.06	6.24	7.88	6.38	3.17	3.7	5.92
	T3	1.34	-6.54	-14.09	-5.96	0.51	0.06	0.02	-5.18	0.35	1.28	2.95	-0.46
	T4	0.92	1.23	5.18	0.95	-2.52	0.1	-1.67	8.55	0.15	-0.19	-1.7	0.07
2006	T1	0.67	6.24	9.34	6.01	-4.12	1.44	2.13	-3.45	5.38	1.38	2.3	0.98
	T2	0.92	-0.32	-19	1.1	5.15	0.87	1.15	-2.58	-1.33	1.78	7.89	1.09
	T3	0.4	2.45	11.25	1.91	12.32	-0.01	-3.43	8.22	6.9	0.11	3.37	1.96
	T4	0.02	4.88	12.71	4.36	8.6	3.75	3.34	-0.83	6.77	4.67	10.74	3.6
2007	T1	0.84	-13.94	11.04	-15.73	3.55	0.77	0.84	1.94	3.29	0	11.08	-0.86
	T2	0.7	5.64	1.11	6.07	-16.2	3.03	1.77	3.99	5.21	3.49	-0.37	-0.29
	T3	1.62	-7.68	20.58	-10.22	8.34	2	2.29	-2.66	2.02	2.81	2.25	1.78
	T4	1.02	-3.81	-8.15	-3.28	21.29	5.24	4.49	-4.37	3.53	8.28	-5.42	6.38
2008	T1	1.99	8.56	29.14	6.21	4.33	0.74	2.56	4.56	0.39	-1.41	5.88	2.08
	T2	1.45	5.95	12.87	4.98	-8.78	-1.82	-2.54	-4.94	3.57	-1.53	-1.79	-1.68
	T3	1.21	2.78	-9.63	4.63	1.13	2.26	4.41	-0.85	1.6	1.21	6.16	1.76
	T4	1.59	-4.03	-12.21	-2.98	-0.48	2.78	-1.05	6.02	28.96	0.49	1.57	1.37
2009	T1	-0.69	5.74	-21.24	8.9	7.76	1.83	2.62	-5.6	-3.58	3.99	2.88	2.59
	T2	1.05	4.74	48.95	1	7.75	-0.03	0.07	3.8	-4.95	0.29	0.81	1.92
	T3	1.03	1.1	-4.36	1.78	-12.26	-0.63	-1.5	1.64	-1.45	-0.17	0.45	-2.24
	T4	2.36	1.85	-9.05	3.13	-14.26	-1.08	-2.87	0.98	-3.14	0.41	2.65	-2.34
2010	T1	2.25	14.69	22.73	13.86	-2.52	2.22	2.68	9.51	-2.14	1.3	-5.06	3.24
	T2	1.4	1.47	6.87	0.87	1.08	2.94	5.22	4.45	-1.1	1.58	2.78	2.2
	T3	1.27	-6.24	2.46	-7.27	-1.63	1.12	0	3.37	-1.25	2.01	2.53	-0.15
	T4	0.23	9.4	9.67	9.37	-4.81	0.44	0.37	1.41	0.78	0.22	2.45	0.65
2011	T1	1.5	3.94	16.62	2.28	18.38	0.27	2.53	1.23	1.2	-1.96	-0.25	3.19
	T2	0.98	-14.18	-4.8	-15.58	-11.59	1.04	-0.7	-0.09	1.17	2.77	1.22	-2.61
	T3	0.77	4.76	24.04	1.52	1.59	1.5	5.18	0.76	0	-1.08	1.92	1.69
	T4	1.16	-6.13	0.86	-7.57	-3.29	1.42	2.19	-2.68	1.48	1.68	2.57	-0.12
2012	T1	1.97	-6.78	-7.22	-6.68	-7.26	1.38	-1.41	-5.42	-0.14	5.61	1.84	-0.42
	T2	1.95	14.41	10.96	15.18	-11.69	0.86	0.18	-0.51	14.37	-0.74	1.94	0.95
	T3	1.76	7.68	16.06	5.89	4.7	0.7	-0.32	-2.48	-1.81	2.69	1.84	2.06
	T4	1.14	-7.73	5.73	-10.91	-1.17	-0.59	-0.86	-0.32	-1.35	-0.27	2.55	-1.25
2013	T1	0.39	0.36	-5.03	1.86	2.8	-0.5	0.08	-0.99	-0.55	-0.85	-0.73	0.15
	T2	0.56	1.42	3.94	0.76	10.81	-0.43	-1.18	-1.44	-0.45	0.38	0.51	1.13
	T3	0.83	1.66	2.02	1.57	-20.05	-0.14	-1.22	0.53	0.42	0.49	-1.39	-1.95

Table 2 Successive differences for the components of the quarterly GDP growth rate

Year	Quarter	Agriculture	Total	Extracting	Manufacturing	Construction	Total	Trade	Transport	Post	Other	FISIM	Gross value
2005	T2-T1	-0.68	23.18	10.07	24.31	23.1	4.16	5.48	4.75	1.77	3.18	4.3	7.88
	T3-T2	1.87	-21.1	-16.29	-21.59	-12.28	-5	-6.22	-13.06	-6.03	-1.89	-0.75	-6.38
	T4-T3	-0.42	7.77	19.27	6.91	-3.03	0.04	-1.69	13.73	-0.2	-1.47	-4.65	0.53
	T1-T4	-0.25	5.01	4.16	0.06	-1.6	1.34	3.8	-12	5.23	1.57	4	0.91
2006	T2-T1	0.25	-6.56	-28.34	-4.91	9.27	-0.57	-0.98	0.87	-6.71	0.4	5.59	0.11
	T3-T2	-0.52	2.77	30.25	0.81	7.17	-0.88	-4.58	10.8	8.23	-1.67	-4.52	0.87
	T4-T3	-0.38	2.43	1.46	2.45	-3.72	3.76	6.77	-9.05	-0.13	4.56	7.37	1.64
	T1-T4	0.82	-18.82	-1.67	-20.09	-5.05	-2.98	-2.5	2.77	-3.48	-4.67	0.34	-4.46
2007	T2-T1	-0.14	19.58	-9.93	21.8	-19.75	2.26	0.93	2.05	1.92	3.49	-11.45	0.57
	T3-T2	0.92	-13.32	19.47	-16.29	24.54	-1.03	0.52	-6.65	-3.19	-0.68	2.62	2.07
	T4-T3	-0.6	3.87	-28.73	6.94	12.95	3.24	2.2	-1.71	1.51	5.47	-7.67	4.6
	T1-T4	0.97	12.37	37.29	9.49	-16.96	-4.5	-1.93	8.93	-3.14	-9.69	11.3	-4.3
2008	T2-T1	-0.54	-2.61	-16.27	-1.23	-13.11	-2.56	-5.1	-9.5	3.18	-0.12	-7.67	-3.76
	T3-T2	-0.24	-3.17	-22.5	-0.35	9.91	4.08	6.95	4.09	-1.97	2.74	7.95	3.44
	T4-T3	0.38	-6.81	-2.58	-7.61	-1.61	0.52	-5.46	6.87	27.36	-0.72	-4.59	-0.39
	T1-T4	2.28	9.77	-9.03	11.88	8.24	-0.95	3.67	-11.62	-32.54	3.5	1.31	1.22
2009	T2-T1	1.74	-1	70.19	-7.9	-0.01	-1.86	-2.55	9.4	-1.37	-3.7	-2.07	-0.67
	T3-T2	-0.02	-3.64	-53.31	0.78	-20.01	-0.6	-1.57	-2.16	3.5	-0.46	-0.36	-4.16
	T4-T3	1.33	0.75	-4.69	1.35	-2	-0.45	-1.37	-0.66	-1.69	0.58	2.2	-0.1
	T1-T4	-0.11	12.84	31.78	10.73	11.74	3.3	5.55	8.53	1	0.89	-7.71	5.58
2010	T2-T1	-0.85	-13.22	-15.86	-12.99	3.6	0.72	2.54	-5.06	1.04	0.28	7.84	-1.04
	T3-T2	-0.13	-7.71	-4.41	-8.14	-2.71	-1.82	-5.22	-1.08	-0.15	0.43	-0.25	-2.35
	T4-T3	-1.04	15.64	7.21	16.64	-3.18	-0.68	0.37	-1.96	2.03	-1.79	-0.08	0.8
	T1-T4	1.27	-5.48	6.95	-7.09	23.19	-0.17	2.16	-0.18	0.42	-2.18	-2.7	2.54
2011	T2-T1	-0.52	-18.12	-21.42	-17.86	-29.97	0.77	-3.23	-1.32	-0.03	4.73	1.47	-5.8
	T3-T2	-0.21	18.94	28.84	17.1	13.18	0.46	5.88	0.85	-1.17	-3.85	0.7	4.3
	T4-T3	0.39	-10.89	-23.18	-9.09	-4.88	-0.08	-2.99	-3.44	1.48	2.76	0.65	-1.81
	T1-T4	0.81	-0.65	-8.08	0.89	-3.97	-0.04	-3.6	-2.74	-1.62	3.93	-0.73	-0.3
2012	T2-T1	-0.02	21.19	18.18	21.86	-4.43	-0.52	1.59	4.91	14.51	-6.35	0.1	1.37
	T3-T2	-0.19	-6.73	5.1	-9.29	16.39	-0.16	-0.5	-1.97	-16.18	3.43	-0.1	1.11
	T4-T3	-0.62	-15.41	-10.33	-16.8	-5.87	-1.29	-0.54	2.16	0.46	-2.96	0.71	-3.31
	T1-T4	-0.75	8.09	-10.76	12.77	3.97	0.09	0.94	-0.67	0.8	-0.58	-3.28	1.4
2013	T2-T1	0.17	1.06	8.97	-1.1	8.01	0.07	-1.26	-0.45	0.1	1.23	1.24	0.98
	T3-T2	0.27	0.24	-1.92	0.81	-30.86	0.29	-0.04	1.97	0.87	0.11	-1.9	-3.08
	T4-T3												