THE DETERMINANTS OF OFFICIAL AND FREE-MARKET EXCHANGE RATES

IN ALBANIA DURING TRANSITION

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Abstract

This paper uses high-frequency data to examine the relation between official and free-market exchange rates in Albania. We use daily data to test econometrically, first, whether the official and free markets are efficient, in the sense that one cannot use exchange rate movements denominated in one currency to predict movements in another currency, and second, whether movements in the free-market rate "cause" movements in the official rate. Our results provide support for the first proposition and partial support for the second. We also report the results of a unique survey of free-market dealers in Tirana, designed to determine the main factors that influence exchange rate movements. The evidence is that country-specific factors, in particular the large flows of illegal smuggling and emigrants' remittances, are more important than fluctuations in the international exchange market.

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1.   Introduction

The determination of exchange rates is one of the most widely researched areas in economics. The collapse of communism in central and eastern Europe has opened up new areas of research into exchange rate movements, as one would expect these to behave differently from those in western countries. In common with most developing economies, many currency transactions in transition economies go through the free-market, rather than through official channels. This is especially true for the country of focus, Albania.

In this paper, we characterise the developments in Albania's exchange rates, both official and free-market, from October 1992 to July 1997, and attempt to provide answers to three important questions. The first is, can we conclude from looking at different cross-currency rates that Albania's exchange rate market is efficient, in the sense that one cannot use movements in one currency to predict future changes in another? Second, do movements in the free-market anticipate or follow those in the official rate? Third, how is the free-market rate affected by exogenous shocks?

We address the first two questions by analysing daily Albanian exchange rate data on four currencies, using time series econometric methods. Testing for efficiency and causality in exchange rate markets using high-frequency data has become increasingly common for established currencies as well as for currencies in developing countries, but we believe that we are the first to do so for a transition country.[1] Our main results are as follows: all exchange rate series are non-stationary and integrated of order one. Based on pairwise comparisons, we find very little evidence of cointegration between either official rates or free-market rates, and hence we provide support for efficiency in the Albanian exchange rate market. With regard to

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[1] Previous literature which uses daily data includes Coleman (1990) and Copeland (1991), but these are both for major currencies of advanced, mostly western countries. The paper most closely related to our analysis in section 3 is Booth and Mustafa (1991), who explore the relationship between black market and official exchange rates in Turkey.

causality, the results are less clear-cut. However, a tentative conclusion from vector autoregression analysis is that the free-market rate Granger-causes the official rate, while the latter either does not Granger-cause the free rate, or does so to a lesser extent.

The third question is difficult to be addressed econometrically due to the lack of suitable data. Hence we adopt a less orthodox approach. We carried out a random survey of dealers in the main centre for free-market foreign exchange (the central square in the capital, Tirana), and asked their views on the main determinants of fluctuations in the market. The responses from this survey suggest that the free-market rate responds more to factors such as illegal smuggling, contraband flows and emigrant remittances than it does to international movements.

The paper is organised as follows. Section 2 presents a review of the exchange rate regime in Albania during the transition, highlighting both the relative exchange rate stability between 1993 and 1996, and the volatility during the economic and political crisis in 1997. Section 3 contains the econometric analysis and results, while section 4 discusses the results from the survey. Section 5 concludes the paper.

2. The Albanian Exchange Rate Regime

Since the collapse of communism in 1991, the informal foreign exchange market has played an important role in Albania's transition. A black market for foreign currency emerged in 1990-91, when officially the country was still observing a fixed exchange rate. At the time, Albania had virtually no foreign currency reserves, so a flexible official exchange rate based on a "managed float" was introduced in August 1992 as part of an IMF-supported stabilisation programme.[2]

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[2] The suitability of the adoption of a flexible rather than pegged exchange rate in Albania finds support in the literature, especially in the context of a small open economy in transition, when the level of international reserves is below a minimum threshold (see, for example, Willett and Al-Marhubi, 1994).

The exchange rate system is largely a convertible one, although some restrictions on the capital account are maintained.

Licenses were granted by the authorities in 1992 to certain individuals to allow them to trade in currency outside of the national banks. Nevertheless, the free-market now consists largely of dealers operating without licenses, albeit quite openly and with unofficial toleration by the government. Our survey, discussed in more detail below, reveals that almost 80% of the street vendors are operating illegally and almost all of the new dealers since 1993 are without a licence. The daily turnover in the informal market is now estimated to be over US$ 2-3 million (see EBRD, 1997).[3]

Figure 1 shows the monthly average of both the official and the free-market Lek/Dollar exchange rates from October 1992 to July 1997. Clearly, both series move very closely together. A large initial overdevaluation of more than 100% in July 1992 was followed by a gradual nominal appreciation (and substantial real appreciation) and relative stability until the start of 1997, reflecting stable security conditions and an improved macroeconomic environment. Remittances from emigrants have contributed considerably to the stability of the exchange rates during this period. Since the country opened its borders in 1991, emigration flows to neighbouring countries have been huge.[4] According to estimates by the Greek Ministry of Foreign Affairs, in 1996, the total number of Albanian emigrants living abroad was about 476,000 (14.8% of the total population). The value of remittances from abroad is estimated in the region of US$ 300 - 1,200 million per year (see EBRD, 1997). These remittances have provided Albania with a much needed source of foreign exchange reserves and helped to finance

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[3] Some dealers in our survey who are involved in wholesale transactions of large sums of foreign currency with foreign banks (especially Greek and Italian) reported monthly turnovers in the range of US$ 5-10 million.

[4] The size of emigration flows makes Albania unique among European countries in transition (see Mançellari *et al*., 1996).

an ongoing deficit in the trade balance, contributing considerably to the stability of the exchange rate and to the anti-inflation programme (see Haderi *et al*., 1996).

The stability of the exchange rate over most of the period is highlighted by the volatility measure in Figure 2. This graphs for each month the difference between the maximum and minimum value of the Lek/Dollar exchange rate, divided by the monthly average. Prior to 1997, values of this volatility measure were rarely above 0.1, and compare favourably with Bulgaria for example (see Dobrinsky, 1996, Figure 5), which also has a floating exchange rate.

In 1997 a dramatic rise (depreciation) in both official and free-market rates took place, with both rates changing from around 100 to 180 Lek per Dollar between the end of 1996 and the middle of 1997; since then, both have stabilised at around 150 Lek per Dollar. There are several reasons for this depreciation, most notably the collapse of a number of fraudulent pyramid schemes, after which Albania entered a period of extreme economic, political and social instability. In the absence of a properly functioning banking system, these schemes had operated for several years as "intermediaries" between remittance flows and domestic businesses. By the end of 1996, they were competing with each other by offering unsustainable rates of interest on deposits, up to 50% a month in some cases (see EBRD, 1997). The inevitable failure of these schemes led to a loss of confidence in the financial system, including the currency, and hence a move into dollars and other foreign currency. Another factor which contributed to the currency depreciation was the end of the UN embargo in fuel sales with the former Yugoslavia. For many years the illegal trade of fuel between Albania and the former Yugoslavia was accompanied by large flows of hard currency in the informal Albanian foreign exchange market (mainly in Drachmas and US Dollars).

The new government in June 1997 restored some confidence in the financial system by approving a law that allows for the auditing of all pyramid schemes. The liquidation of these schemes is a prerequisite for the implementation of an IMF sponsored recovery strategy. In

addition, the government has started the process of liquidating insolvent state banks and has granted licenses to some new banks.

3.   Efficiency and Causality

In this section, we analyse econometrically, using daily data, the relations among different exchange rates, and between the official and free-market rates. The data have been collected by the Bank of Albania each week-day (excluding occasional days for holidays and other reasons), since July 1992 for the official market and early September 1992 for the free-market, and our sample extends to the end of July 1997. Unfortunately, we could not recover data for any day in April 1994, and we have therefore restricted our econometric analysis to the period May 1994 to July 1997.[5] In view of the extraordinary circumstances in Albania in 1997, we carry out a further round of tests by restricting the sample up to the end of December 1996, and we discuss the extent to which our results are sensitive to imposing this restriction.

The data for both official and free-markets are simple averages of the buy and sell rates, as they are measured every working day at 3pm. The Central Bank announces the "official" rate at 10am, but commercial banks are not restricted to this and may vary their own rates accordingly. For the free-market rates, the Bank of Albania sends two agents to the streets each day to collect information, and they also gather the rates from three large private exchange bureaux; our figures are an average of these different sources of information. Free-market rates are available only for the four main currencies: US Dollar, Italian Lira, Greek Drachma, and Deutschemark, and so we restrict attention to these.

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[5] We are missing six consecutive observations for the free market rates in August 1994, but as this was a time of relative stability in the market, we do not cut off the sample before this point. The results we report are robust to the case where we restrict the sample to post-September 1994.

Our first task is to assess the order of integration of the data. Table 1 reports tests for each series based on the Augmented Dickey-Fuller statistic.[6] The results show clearly that all series are I(1) at the 95% confidence level. This is consistent with other results in the literature with high-frequency data (see for example Goodhart *et al.*, 1993). We have tested to see if the unit root results are being driven by the structural break in 1997, using the methodology of Perron (1989), and our conclusions are unchanged. This may be slightly surprising given the stability of the series over most of the period, but it is worth bearing in mind that the power of unit root and cointegration tests is rather low when the time span is short, even with a large number of observations (see Shiller and Perron, 1985; Hakkio and Rush, 1991).

Having established the order of integration, we can now test a number of hypotheses. First, we test for efficiency of the exchange rate markets. We do this by looking for cointegration between each pair of currencies in the official market, and then for each pair in the free-market. As Coleman (1990) and Copeland (1991) point out, if cointegration is present, then movements in one exchange rate can be predicted by movements in another, and this is inconsistent with efficiency. Table 2 reports the results for the official market, and Table 3 for the free-market. We have tested for cointegration using the popular Engle-Granger test; that is, we estimate the long-run equilibrium relationship between the two variables, for example the official Lek/Dollar and Lek/Drachma rates, in levels and test whether the residuals from this regression are stationary. A well-known drawback of this procedure is that it may be sensitive to which variable is put on the left-hand side (LHS) of the equilibrium regression, so we have reported the p-values using each variable in turn on the LHS.

Table 2 suggests that, with the possible exception of the Lek/Dollar and Lek/Drachma rates (depending on whether the former or latter is placed on the LHS), official exchange rates in

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[6] Other unit root tests (the Weighted Symmetric and Phillips tests) gave similar results and are not reported here. All tests and regressions were carried out using the package TSP 4.3.

Albania are not cointegrated, and Table 3 shows no evidence of cointegration between exchange rates in the free-market. Again, these results are consistent with those found for established currencies (Coleman, 1990; Copeland, 1991). It is worth noting that alternative tests for efficiency, based on purchasing power parity, have also found that the black market is efficient in a number of developing countries.[7]

To test for causality between the official and free-markets, we run vector autoregressions in first differences and, when the dependent variable is the official rate, we look for Granger-causality by carrying out block exogeneity tests on the free-market lags, and vice versa. If the two variables are cointegrated, we include also on the right-hand side of each equation the residuals from the cointegrating regression (see, for example, Enders, 1995). If the two variables are X and Y and if Y does not Granger cause X, then not only should the coefficients on the lagged values of Y (in first differences) be equal to zero when the change in X is the dependent variable, but the coefficient on this "error correction" (ECM) residual term should also be insignificantly different from zero.

We examine first whether, within a currency, official and free-market rates are cointegrated.[8] The results for these tests are reported in Table 4. The evidence is somewhat mixed: we find cointegration between official and free rates for the Drachma and the Lira, but not for the Dollar and the Mark. Therefore, we include the ECM term in the former two VARs, but not in the latter.

Table 5 reports these results from the VARs. Since the data are daily, we include a relatively large number of lags (30) on the right-hand side of each equation. We experimented with longer and shorter lags and the main results do not change. Turning to the F-tests first, in all

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[7] See Koveos and Seifert (1986) for Latin American countries; El-Sakka and McNabb (1994) for Egypt; Sánchez-Fung (1998) for the Dominican Republic; Bahmani-Oskooee (1993) for Iran.
[8] Note that Dowla (1993) found cointegration between black and official rates in Yugoslavia, but not in Hungary and China.

four cases, the value of the F-statistic is higher when lags of the free-market rate are excluded from the official rate equation than in the converse case. In the latter however, the F-statistic is only insignificant for the Drachma VAR. This suggests that there may be two-way causality, at least for three of the four currencies. The ECM terms in the Drachma and Lira VARs however provide more support for the hypothesis that free-market rates are driving the official rate, but not vice versa, being highly significant in the official regression but not in the free-market one.[9]

To check whether our results are being driven by the high volatility and depreciation of the exchange rates in 1997, we test the sensitivity of our results by dropping 1997 data and re-running all tests. For brevity, we do not report the detailed results here, but our conclusions do not change dramatically.[10] The unit root and cross-currency cointegration tests give similar results to those from the full sample. With regard to cointegration between official and free-market rates, we find that the Dollar and Mark now exhibit cointegration, but rather surprisingly, the Lira rates are not cointegrated. For the causality tests, the F-statistics again support two-way causality for all currencies except the Drachma, while the ECM coefficients indicate one-way causality from the free-market to the official for the Drachma and Mark, but two-way for the Dollar.

Our tentative conclusion from this section is that there is at least partial support for the view that the free-market is the driving force in the Albanian exchange rate market, and that the official rate reacts to movements in free-market rates more than it determines them. This is consistent with Gupta's (1981) findings for example, using a different methodology, for Taiwan and South Korea. Nevertheless, it would be unwise to infer from our results that the Central Bank is merely a passive actor in the process. It intervenes occasionally in the free-market, and it

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[9] Of course, at least one of the ECM terms must be non-zero otherwise the long-run equilibrium relationship does not appear and there would therefore be no cointegration.
[10] These results are available on request.

has also encouraged local banks in Albania to trade foreign exchange; it is significant that these banks tend to use the free-market rate as their reference point.

4.   Free-Market Exchange Rate Determinants

The previous section has provided some evidence on the importance of the free-market in Albania as a predictor of official exchange rate fluctuations. However, one would like to know how movements in both official and free-market rates are determined by outside forces. For example, do exchange rates in Albania respond quickly to macroeconomic policy shifts or to fluctuations in the international currency markets, or are they mainly influenced by country-specific factors such as smuggling and emigrants' remittances? Unfortunately, data collection on key economic variables in Albania is still at a primitive stage, and it is not possible to use econometric techniques to give precise answers to these questions. Therefore, we decided on an alternative approach, based on a survey of dealers in the free market in Tirana.[11]

The survey was carried out in January 1996.[12] The free market in Tirana is concentrated in the central square of the city (Skanderbeg Square) in front of the Bank of Albania, and each day, about 250 dealers gather there. From these, 63 dealers were chosen at random, and were interviewed by students from the University of Tirana, under the close supervision of one of the authors.[13]

Table 6 provides background information on the size and source of capital in the informal market. The majority of dealers operate with a monthly cash turnover between

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[11] The use of surveys of economic agents to elicit intentions and motivations for observed behaviour has become increasingly popular in recent years (see, for example, Blinder, 1991; Bewley, 1995).

[12] Some of these results were presented earlier in Muço and Salko (1996).

[13] The use of students had the advantage of reducing the chance of non-cooperation, due to fear of official harassment. This is particularly important given that the majority of the dealers surveyed were operating without a license.

US$1,000 and US$5,000, but a significant proportion, about one in five, has a monthly turnover greater than US$10,000, and they tend to earn the greatest profit each day between the buy and sell rates on the market. In fact annual profit rates range widely from 5% to 80%, with about half of our sample declaring rates between 25% and 50%. These profits are used both to increase operational capital in the market and for other business activities. Table 6 shows that most dealers (71%) operate with their own capital, rather than using borrowed capital. The main currency is the US Dollar, and about 60% of the street vendors deal exclusively in this currency.

In response to our questions, 80% of the interviewed exchangers said that they do not consider the official banking system as a serious competitor, while almost all of them consider other factors as the main determinants of exchange rate movements. In an attempt to find out which are the most important, interviewees were presented with five possible factors that might determine day-to-day exchange rate fluctuations, and were asked to rank them in order of importance from 1 to 5. The five factors were: fluctuations in the international foreign exchange market; illegal sales of fuel to parts of former Yugoslavia during the UN embargo; smuggling of contraband, cigarettes, etc.; remittances from emigrants returning back home; and remittances from emigrants living abroad. The results are presented in Table 7.

The final column of Table 7 presents an arbitrary weighting of the results, based on five points for the most important factor, four points for the second most important, and so on. This column indicates that dealers placed greater importance on the role of smuggling and illegal fuel sales relative to foreign exchange rate fluctuations. Factors such as remittances from emigrants returning back home and remittances from emigrants leaving abroad score relatively less; nevertheless, the size of remittance flows makes them an important determinant of the exchange rate.

The role of remittances as a determinant of day-to-day fluctuations in the exchange rates is expected to increase in the future as emigration flows continue to increase. According to the

latest estimates provided to us by the Greek Ministry of Foreign Affairs, about 100,000 more Albanians have emigrated since 1996, bringing the total number of emigrants living abroad at present to 571,000 (17.8% of the total population). In contrast, the role of illegal fuel sales to the former Yugoslavia in exchange rate fluctuations is expected to decline as the volume of transactions and the accompanied flows of hard currency have been reduced significantly since the end of the UN embargo (although the trade of fuel with some parts of the former Yugoslavia still continues). Also, smuggling and contraband activities associated with fuel are expected to continue to generate significant money flows as the demand for cheap fuel for domestic consumption has increased considerably in recent years.

5.   Conclusion

This paper attempts to provide answers to three important questions concerning the efficiency, causality and determination of exchange rates in Albania during the transition. Our conclusions are as follows. First, using high frequency daily data over more than three years, our econometric tests support the view that both the official and the free-market exchange rates in Albania are efficient, in the sense that one cannot use past movements in one currency to predict future movements in another. Second, our econometric results provide partial support for the view that movements in the free-market precede those in the official market, but it is clear that there is some degree of two-way causality at least. Third, the results of a unique survey of street vendors in the informal Albanian foreign exchange market reveals that the market has been heavily influenced during the transition by smuggling, contraband flows and illegal sales of fuel to the former Yugoslavia, and less so by international fluctuations in foreign exchange markets. The survey also reveals that remittances in general are very important in the determination of exchange rates.

The informal foreign exchange market in Albania has played and will continue to play an important role in the transition of the country to a market economy. The serious political, economic and social instability and unrest in 1997 that followed the collapse of the pyramid schemes has damaged confidence in the financial system as a whole, demonstrating that the government should have some control over the activities of the informal sector. In that respect, the functioning of the informal foreign exchange market as a stabilising factor in the economy urgently requires the establishment of a new regulatory framework. A first step towards this direction can be the creation of a supervising committee with the power to grant, suspend and revoke licences from individual dealers and private exchange bureaux, and the right to request any information and documents for auditing.

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TABLE 1

Testing for Stationarity / Unit Roots

	Level	First-Difference
Lek/Dollar official	-2.82 (20) 0.19	-3.56 (19) 0.03
Lek/Dollar free	-2.67 (16) 0.25	-10.46 (4) 0.00
Lek/Drachma official	-2.47 (5) 0.34	-13.06 (5) 0.00
Lek/Drachma free	-3.40 (33) 0.05	-9.81 (7) 0.00
Lek/Lira official	-2.53 (7) 0.31	-8.81 (6) 0.00
Lek/Lira free	-2.56 (8) 0.30	-8.27 (7) 0.00
Lek/D-mark official	-2.52 (6) 0.32	-11.34 (3) 0.00
Lek/D-mark free	-2.57 (5) 0.30	-12.98 (2) 0.00

Note: For each currency, the first statistic is the value of the Augmented Dickey-Fuller statistic, where the number of lags (in parentheses) is chosen optimally to ensure the residuals are white noise. The second statistic is the p-value.

TABLE 2

Pairwise tests for cointegration (official market)

	Lek/Dollar	Lek/Drachma	Lek/Lira
Lek/Drachma	0.241 (9) 0.041 (8)		
Lek/Lira	0.947 (5) 0.825 (5)	0.625 (11) 0.590 (11)	
Lek/D-mark	0.897 (3) 0.687 (4)	0.749 (13) 0.698 (11)	0.726 (5) 0.806 (3)

Notes: Numbers in table are p-values for the null hypothesis of non-stationarity of the residuals from the cointegrating regression, and hence no cointegration between the two variables. That is, a p-value greater than 0.05 indicates that one cannot reject the null hypothesis of non-cointegration with 95% confidence. The critical values for this test are based on MacKinnon (1990). The optimal number of lags, chosen to minimize autocorrelation in the residuals, is in parentheses. Two statistics are given for each pairwise comparison, based on two regressions from the Engle-Granger procedure.

TABLE 3

Pairwise tests for cointegration (free market)

	Lek/Dollar	Lek/Drachma	Lek/Lira
Lek/Drachma	0.832 (9) 0.583 (8)		
Lek/Lira	0.974 (4) 0.903 (4)	0.802 (9) 0.777 (9)	
Lek/D-mark	0.953 (7) 0.889 (2)	0.560 (10) 0.582 (10)	0.754 (5) 0.847 (5)

Note: See Table 2.

TABLE 4

Test for cointegration between official and free-market rates

Dollar	0.459 (19)
	0.377 (19)
Drachma	0.000 (9)
	0.000 (9)
Lira	0.002 (7)
	0.001 (7)
D-mark	0.185 (14)
	0.145 (14)

Note: See Table 2.

TABLE 5

Tests for causality

Dependent Variable	Residual Coefficient	F–statistics
Δ **Dollar Official**	n/a	13.90
Δ **Dollar Free**	n/a	2.56
Δ **Drachma Official**	-0.387 (8.02)	2.16
Δ **Drachma Free**	-0.014 (0.27)	0.54
Δ **Lira Official**	-0.138 (2.73)	3.64
Δ **Lira Free**	0.049 (1.20)	3.47
Δ **D-mark Official**	n/a	6.61
Δ **D-mark Free**	n/a	2.83

Notes: Residuals are from the cointegrating regression.
t-statistics (absolute values) are in parentheses.
F-statistic is a block exogeneity test for lagged values. For example, when the official Dollar rate is the dependent variable, the F-statistic tests whether lagged values of the free-market Dollar rate Granger-cause the official rate (5% critical value = 1.47).

TABLE 6

The size and source of monthly capital turnover in informal forex currency market

Capital (in US$)	Own Capital	Borrowed capital	Own and borrowed capital	Total (number of dealers)	Percentage
up to 1000	4	-	-	4	6%
1000-5000	32	1	10	43	68%
5000-10000	2	-	1	3	5%
over 10000	7	1	5	13	21%
Total	45	2	16	63	100%
Percentage	71%	4%	25%	100%	

TABLE 7

Factors that determine spontaneous fluctuations in the exchange rate

Significance _____ Currency entry from:	1 (5 points)	2 (4 points)	3 (3 points)	4 (2 points)	5 (1 point)	weighted significance (points)
1. Fuel sold illegally during UN embargo	7	19	30	5	2	212
2. Remittances from emigrants coming back home	4	3	10	36	10	138
3. Remittances from emigrants living abroad	4	6	11	11	31	130
4. Smuggling (cigarettes, fuel, etc. contraband)	33	12	4	9	5	248
5. Fluctuations in the international forex market	15	23	8	2	15	210

Note: Numbers in the table are the number of votes that each factor received amongst the interviewed exchangers, ranked from 1 to 5. To estimate each factors' significance, we have weighted each vote by points from 5 to 1, e.g. $7 \times 5 + 19 \times 4 + 30 \times 3 + 5 \times 2 + 2 \times 1 = 212$.

FIGURE 1

Average Monthly Exchange Rates (Lek/$), October 1992 - July 1997

Date
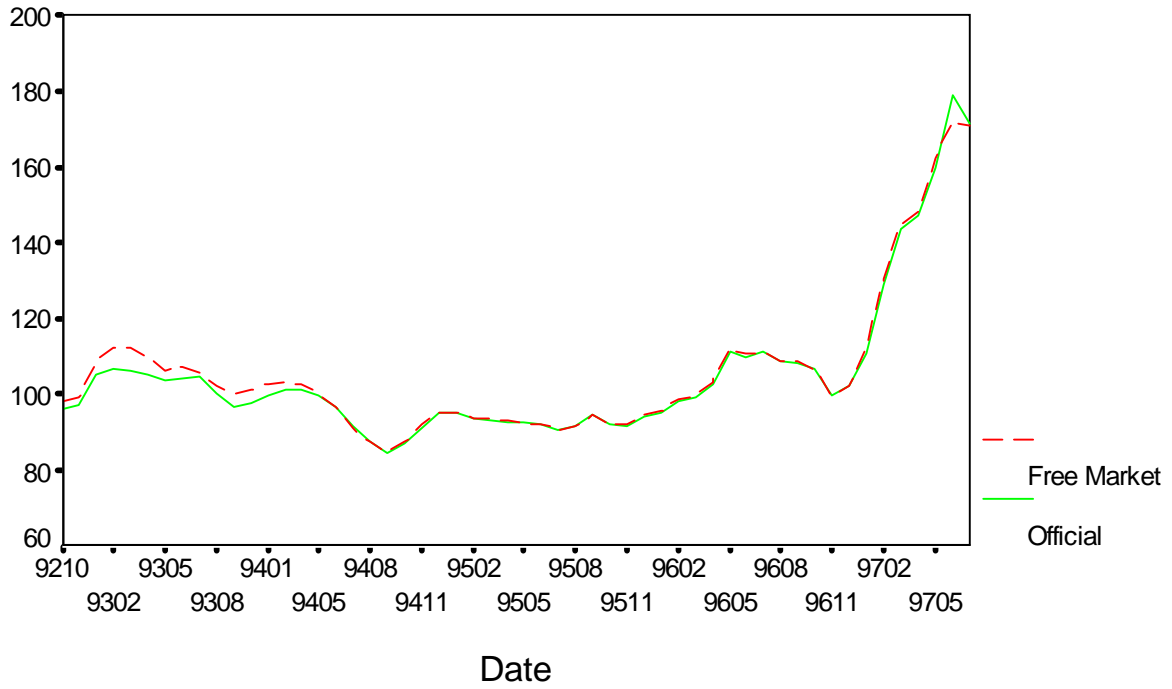
FIGURE 2

Exchange Rate (Lek/$) Volatility, October 1992 - July 1997

Date
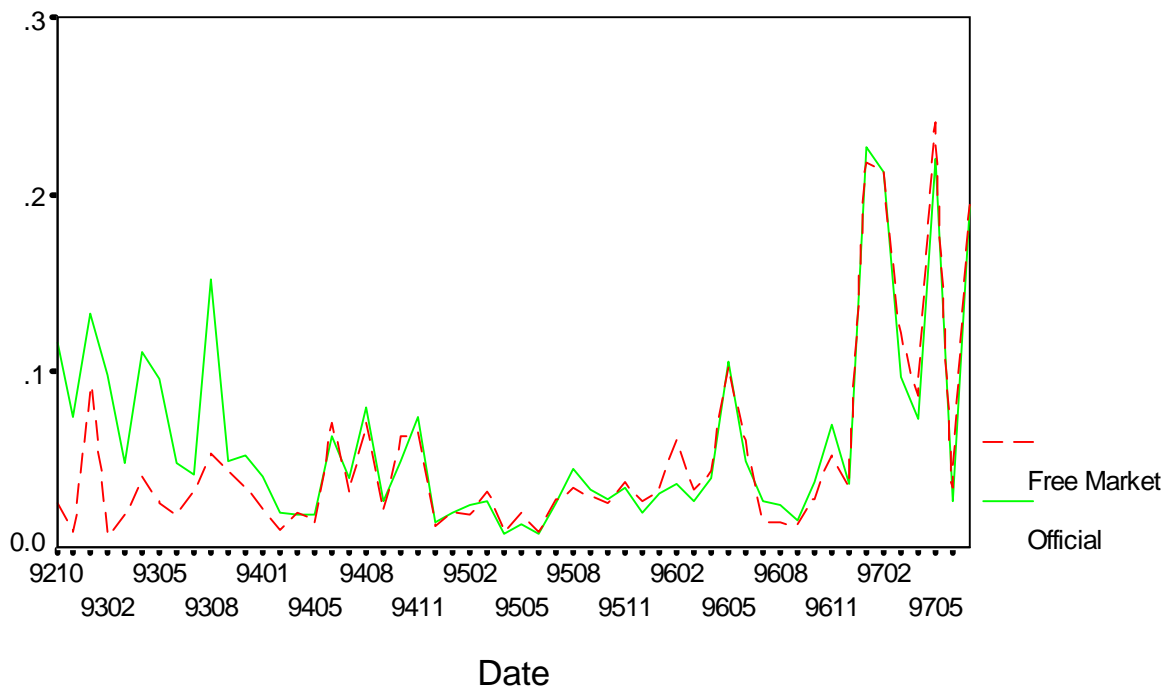
Volatility is defined as $\{e_{max} - e_{min}\}/e_{ave}$ where e_{max}, e_{min} and e_{ave} are the maximum, minimum and average values of the exchange rate for any given month.