ADDIS ABABA UNIVERSITY
SCHOOL OF GRADUATE STUDIES

DETERMINATION OF EFFICIENCY, EXCHANGE RATE AND THE PREMIUM OF THE PARALLEL MARKET FOR FOREIGN CURRENCY IN BURUNDI

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By
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This work is dedicated to my mother, my sisters and my brother who taught me that "Those who think Education is too costly should try the alternative ... Ignorance"

ADDIS ABABA UNIVERSITY
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Determination of Efficiency, Exchange Rate and the Premium of the Parallel Market for Foreign Currency in Burundi

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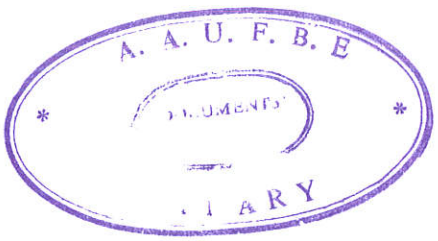
Abstract

Although Burundi is a moderate premium country, the parallel market for foreign currency has been operating for a number of decades. This was in response to the move by Burundi's authorities to impose trade and exchange controls as a way of managing economic imbalances in the early 1960s. This paper investigates the functioning of the market and its implications on the economy, based on an econometric approach.

Both the random walk model and the Ljung-Box test reveal that the parallel market for foreign currency in Burundi is efficient. Furthermore, a simultaneous equation model is used to isolate the main determinants of the parallel rate. Moreover, a stock/flow model is applied to investigate the main factors behind the determination of the premium. It is found that flow variables are by far the most important factors. The model also leads to the finding that the premium has a long-run and short-run behaviour. On the basis of these findings, policy actions are recommended.



1. INTRODUCTION

1.1. Statement of the Problem

The role of exchange rate policy in macroeconomic reforms has attracted comments from many development experts, especially since the late 1970s and early 1980s. Exchange rate policies have been perceived as pillars of successful export-led growth strategies of East Asian countries. During the last two decades, the exchange rate has gradually become the primary instrument of the Bretton Woods institutions' development strategy in addressing, among others, chronic balance of payments problems of developing countries [1]. For instance, exchange rate adjustments are prominent in structural adjustment programs (SAPs). Bretton Woods institutions put emphasis on exchange rate depreciation to raise export profitability (Sachs, 1987) and, in the process, "downplay inflation targets".

Notwithstanding the popularity of exchange rate adjustments in SAPs, the use of this instrument for economic stabilization and growth may pose some problems. In most developing countries, including Burundi, where foreign currency is scarce and rationed, policies focusing on exchange rate variations do not achieve the expected results. In such economies, inter-dependencies between the demands for consumer goods and foreign exchange when the former are in short supply lead to the creation of parallel markets for foreign currency (Azam and Besley, 1989). In this context, the "leakage" of funds to the parallel market weakens the impact of adjustment measures in the economic system. In

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[1]/ *There is wide literature, especially by the International Monetary Fund (IMF), acknowledging the central role played by exchange rate policies in development strategies. See for instance IMF Occasional Papers No. 34; 36; 78 and 118; IMF Economic Outlook (May, 1992); several issues of the IMF Staff Papers; Proceedings of the Joint IMF World Bank Symposium on Growth-Oriented Adjustment Programs (1987); B. Solnik and R. Roll (1978); and P. Wickham (1987).*

the framework of this study and based on Lindauer's (1989) approach, parallel markets for foreign exchange are defined as market structures generated in response to government interventions which create a situation of excess demand on the foreign exchange market. The main cause of these market structures is, therefore, government's interference which distorts the proper functioning of the market. The legal aspects usually associated with the definition of parallel markets are of secondary consideration.

As parallel markets increase their activities, the government tends to "lose control over the economy [because] more and more transactions are being diverted to the parallel markets" (May, 1985, p.8) and the government's ability to manage the national economy is weakened. Elaborating further on the relationship between the parallel market for foreign exchange and the global economy, Azam and Daubrée (1991) state that the parallel exchange rate is a powerful channel through which the impact of a number of variables on the economy passes. These include the quantity of money; the world price and producer price of the country's main export crop; the price of imported consumer products as well as the quantitative restrictions on imports.

To illustrate the negative impact of government intervention, Keynes, although regarded as a proponent of public intervention in the management of the national economy, gives a good account of how interventionism can affect the economy in the direction opposite to that intended. In the trade sector, for instance, he asserts that "a policy of trade restrictions is a treacherous instrument even for the attainment of its ostensible object, since private interest, administrative incompetence and the intrinsic difficulty of the task may divert it into producing results directly opposite to those intended" (Keynes, 1935, p.339).

In addition, as Nowak (1985) and Pfeffermann (1985) have remarked, parallel markets are reflections of inefficiencies existing within an economy and they have social and economic costs. Furthermore, adjustment models implemented in Africa have not taken into account the policy response limitations resulting from the existence of these market structures. Pinto, quoted by Elbadawi (1992, p.2), states correctly that "part of the current macroeconomic instability in Sub-Sahara Africa (SSA) may be due to a failure to adjust policy for the existence of parallel markets". The negative relationship between parallel markets and economic growth in developing countries has been well established (see for instance Gyimah-Brempong and Gyapong, 1993).

Our interest in investigating the functioning of parallel markets for foreign currency in Burundi stemmed from a number of reasons:

In Burundi, although parallel markets for foreign exchange have existed for decades and notwithstanding their negative impact on the economy, no specific research has been carried out on this subject in the country. The issue of parallel markets for foreign exchange is widely regarded as "taboo" in Burundi. It is a matter that is not debated openly, perhaps due to the "illegal" nature of parallel transactions. This may have in a way contributed to the lack of interest of researchers in this area. One of the objectives of this study is to stimulate a debate by undertaking an analytical research work whose results can help integrate information conveyed by parallel markets into policy makers' decisions.

Burundi launched its SAP in August 1986. As in other SAPs implemented elsewhere, the adjustment of exchange rate has been in the center of policies aimed at attaining macroeconomic stability. Nevertheless, the numerous devaluations of the Burundi Franc (BIF) have not managed to stabilize the economy.

One of the reasons for this failure is probably that these policies have not taken into account the impact of parallel markets on the economy's reaction to these policies. It is important to raise awareness of policy makers on the limitations of monetary policy actions which do not take into account the parallel market structures. In this regard, it is essential to identify the causes of parallel markets for foreign exchange and understand how they operate in order to avert their negative impact on the economy.

Furthermore, the fact that Burundi's neighbors have liberalized their foreign exchange markets is bound to have important implications on the country's economy [2]. There is a high chance that Burundi will follow suit. And yet, no study has been undertaken to guide decision makers in this area [3]. In this light, there is a need for analytical research on the best exchange rate policy to be adopted and the best way to put it in place. This paper, though not providing all the answers to these queries, aims to contribute to the understanding of the functioning of parallel markets in Burundi and eventually help policy makers take appropriate decisions in the country's on-going policy reforms. This research is carried out within the context of a currency that is neither internally nor externally convertible [4].

2/ *Uganda, Rwanda, Tanzania and Kenya, four countries on which Burundi depends heavily for its external trade have liberalized their foreign exchange markets.*

3/ *According to informal discussions with some bankers from Burundi, the liberalization of the market for foreign exchange is being given serious attention. However, it is surprising to note that no analytical study has been undertaken to back up decision makers' deliberations.*

4/ *Azam and Debrée (1991) distinguish between internal convertibility which refers to the fact that the Central Bank accepts the sale of foreign currency against national currency without incurring too high costs; and external convertibility whereby a given national currency is accepted by foreign Central Banks without any specific conditions.*

1.2. Objectives of the Study

The specific objectives of this study evolve around three aspects:

- First, using a random walk model, the study determines whether the parallel market for foreign exchange in Burundi is efficient or not and draws appropriate recommendations on this basis.

- Secondly, the study uses a simultaneous equation model built on the basis of smuggling activities to isolate the determinants of the parallel exchange rate. This can help point out where corrective measures should focus.

- Thirdly, a stock-flow model is applied to determine the factors that affect the premium [5]. Reducing the premium can only be achieved by first isolating and acting on its determining factors.

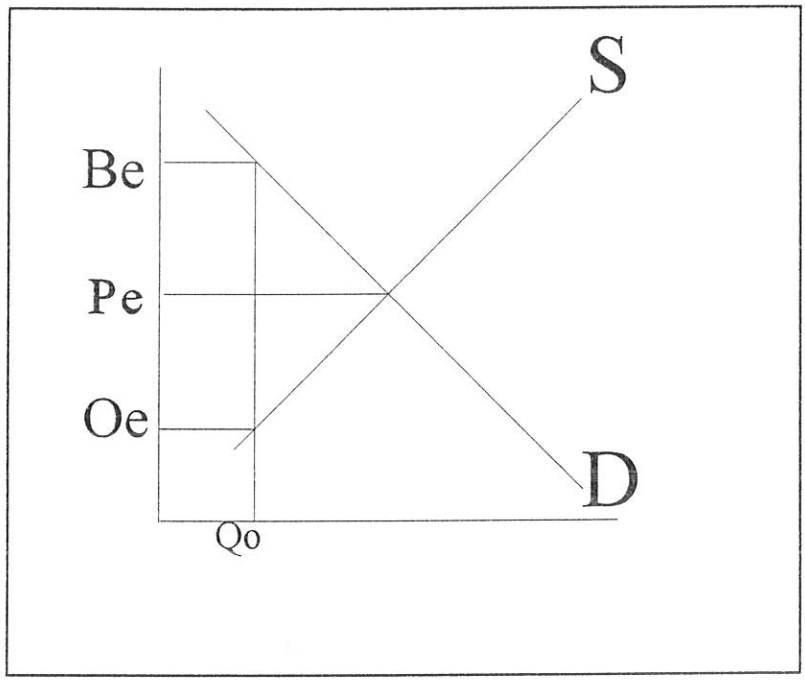
5/ *The definition of the premium used in this paper is the ratio of the black market rate to the official market rate minus one times one hundred; or [(Be/Oe)-1]*100. In other words, it is the relative difference between the official and the parallel market rates.*

2. LITERATURE REVIEW

2.1. Supply and Demand on Parallel Markets for Foreign Currency

In countries with managed exchange rates and foreign exchange rationing, parallel markets arise from excess demand for foreign exchange which is not satisfied by the official market. In addition, countries with an over-valued currency tend to impose exchange controls on importers, exporters, and on capital account transactions. Exporters are required to surrender their export proceeds to the government within a specified period of time after appropriation. Importers are required to acquire import licences which eventually entitle them access to foreign currency at the official rate. Capital account transactions have also to be conducted with many restrictions, through officially authorized institutions.

Figure 1: Theoretical Representation of a Market with Official and Parallel Rates



Because exporters are required to surrender their export earnings to the Government at the low official rate Oe, optimization attitudes push them to under-invoice their exports. From the total amount they receive, they either keep the difference in foreign accounts for future use or channel it into parallel markets to maximize revenue by selling it at the much higher rate denoted Be. On the other hand, importers who have access to foreign currency at the cheap official rate Oe have an incentive to over-invoice their imports so that the difference can be put in foreign accounts or channeled into parallel markets to be sold at the higher rate Be. The equilibrium rate, Pe, is a virtual exchange rate whose value is usually between the parallel and the official rates.

In addition, part of the remittances from abroad and tourists' spending are channeled into parallel markets which offer better rates. With respect to transfers abroad, most of them are carried out through parallel markets since government's restrictions limit

allocation of foreign currency for such transactions. Therefore, parallel market activities exist for both current and capital account transactions, although the former are far more important than the latter. In a nutshell, demand for foreign exchange in parallel markets is fueled by both importers and those who need to transfer money abroad for reasons other than trade. Supply comes primarily from export's under-invoicing and import's over-invoicing, as well as remittances from abroad and spending from incoming tourists.

2.2. Parallel Markets for Foreign Exchange: Theory

The literature on parallel markets uses different terms to represent these market structures. Although they have often been used indistinctly, these terms do not have the same meaning. Lindauer (1989, p.1873) defines the term **parallel market** as "the market structure generated in response to government interventions which create a situation of excess supply or demand in a particular product or factor market". This understanding is different from that conveyed by other terms such as curb markets, black markets, underground economy, fragmented market, informal sector, and segmented market, usually used as synonymous.

The term **curb markets** refers to residual markets, almost always for credit. It subsumes all possible explanations for prevailing interest rate differentials including relative risk premiums and differential transaction costs. **Black markets** are parallel markets derived from "black money", the latter being the proceeds of illegal transactions. The **underground economy** characterizes activities in relation to both tax evasion and the proceeds from criminal activities. It is closely related to black markets and is mostly used in relation with developed economies. Underground economy and parallel market are two concepts difficult to differentiate because the distinction between the two terms is purely motivational. A

fragmented market is a market structure in which the agents are so isolated from each other that they face different effective prices on different commodities and do not have access to the same technologies. The concept of fragmented market is associated with McKinnon's work on the financial sector. According to him, governments in developing countries play an important role in the fragmentation process, especially through their financially repressive policies. The term **informal sector** does not refer to a market structure as such; it rather refers to a sector of the economy characterized by small scale enterprises (SMEs) which generate low levels of income. The last term refers to **segmented markets.** They can be understood as markets for seemingly homogeneous goods coexisting with different settings. Developing economies' analysts borrowed this concept from the labor market analysis in developed countries due to the similarities of segmented labor markets (SLM) and parallel markets.

The definition of parallel market that fits best the focus of this work is provided by Bagachwa and Naho (1994). The parallel market is defined as opposed to the black market. These authors define parallel market operations as activities that involve the illegal production and/or trade of goods and services which are legal in themselves, and therefore, have an alternative legal market. These are different from "black market" activities which produce and/or distribute market and non-market goods that are illegal and strictly forbidden by government statutes. They include smuggling, over- and under-invoicing, unlicenced deals in arms, narcotics trafficking, and all sorts of illegal transfers, for example thefts and bribes (ibid.)

There are two schools of thought which explain the causes and consequences of parallel markets for foreign exchange differently: the Neo-classical School and the Structuralist School. The first one posits that these market structures result from

government intervention in the economy that creates inefficiencies in the allocation of resources. The impact on the economy is negative and the solution is to "leave the market alone". The Structuralist School of thought contends that the main causes of parallel markets for foreign currency in developing countries are the structural bottlenecks in their economies and the institutional settings of the international economic system. Unfavorable terms of trade and the decrease in resource transfers to these countries are two key characteristics of this system with negative impact on developing economies. They create instabilities in developing countries' economies that call for government intervention. The solution proposed by the Structuralists to the problem is to address these structural problems.

These two schools share the view that parallel markets for foreign exchange are detrimental to the economy. They only differ on its root causes and the solutions to address it. While this study shares the concerns expressed by the structuralists on the importance of structural bottlenecks in explaining the problem of parallel markets for foreign exchange in developing countries, it approaches this problem based on the Neo-Classical School. This is motivated by two reasons. First, the recent experiences in many developing countries, including in Africa, have shown that this market can be successfully liberalized, without necessarily changing the international economic setting. Currently, there are many African countries that have liberalized their foreign exchange markets. Some of these are Djibouti, Uganda, Ghana, Tanzania, Rwanda, Kenya, etc. The second reason is that the Structuralist School acknowledges the negative impact of these market structures on the economy but conditions the solution of this problem to factors that are mainly beyond the control of concerned countries. A lot has been said on the need to make the international economic system more equitable during the last three decades but little has been achieved. This study adopts a more pragmatic approach. Based on recent past

experience in Africa and in light of the growing consensus in the continent among the highest policy makers on the need for economic liberalization [6], we are convinced that the Neo-Classical approach can be successfully applied even without fundamental changes in the current international economic system. This study, therefore, evolves along Neo-Classical lines.

Nowak (1985) discusses the causes, nature and consequences of parallel markets. He identifies the main cause as being the policy makers' interventions in the market to "impose exchange and trade controls as a means of providing protection against reserve loss". He contends that the overall impact of such markets on society is negative although some privileged groups (rent-seekers) derive substantial benefits from the system [7]. In the same connection, although his article addresses the issue of exchange rates overvaluation, G. Pfeffermann's (1985) analysis of the negative link between overvalued exchange rates and development, embodied in seven propositions, is also relevant to the explanation of the negative impact of parallel markets on development. This is based on the fact that overvalued exchange rates are usually associated with active parallel markets for foreign exchange.

Economists contend that the existence of a parallel market is evidence of a "controlled" as opposed to a "free" economy. In an era where the "free economy" model has emerged as the dominant way of attaining economic prosperity, the existence of

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6/ *This sentiment was very clearly expressed by the African Ministers of Finance during their sixth session (April, 1997) at the United Nations Economic Commission for Africa (UNECA); and the African Ministers of Planning and Economic Development at their twenty-third session (May, 1997) at the UNECA.*

7 *It could, however, be argued that in some cases, when the parallel market is a way to circumvent cumbersome and pointless restrictions imposed by the system, it can be seen as contributing to the restoration of market fundamentals in the allocation of foreign exchange.*

parallel markets is seen as a sign of economic backwardness. Since 1994, the America-based Heritage Foundation publishes a Yearbook on "Economic Freedom", where 150 countries are screened and classified according to the value of their "Economic Freedom Index". The computation of the index is based on ten indicators, one of them being the importance of the parallel market. The other nine indicators are in a way or another associated with the existence of a parallel market. These are: (i) the external trade policy; (ii) fiscal policy; (iii) degree of government intervention; (iv) monetary policy; (v) capital flows and foreign investment; (vi) banking policy; (vii) price and wage control system; (viii) enforcement of property rights; and, (ix) regulation of economic activity. According to the Heritage Foundation's classification, Burundi stands as a "rather not free" economy. Over 150 countries surveyed, it stands at the 125th place in decreasing order of market freedom. The top free economy is Hong Kong, and the least free is the Democratic Republic of Korea [8].

To the widespread belief that multiple exchange rates mis-allocate resources, meaning that official and parallel markets should be unified (this is the view of the Bretton Woods institutions), Pinto (1990) cautions that there is a trade-off between the benefits of unification for resource allocation and its cost for inflation. Caution is, therefore, needed and careful analysis is necessary before taking decision on unification.

The theoretical models of foreign exchange parallel markets such as the one developed by Pinto (1990) show the narrow link between the parallel market premium and the fiscal deficit and the parameters of trade and exchange rate policy. In addition, Elbadawi (1989) and Kamin and Elbadawi (1990) show that the premium can have an

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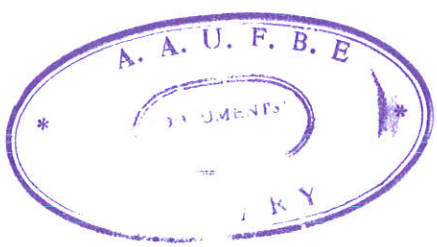
8 *This information is based on Jeune Afrique, No.1882, 29 January to 4 February 1997.*

influence on key macroeconomic indicators such as inflation, foreign trade flows, and the real exchange rate. In the same connection, in his study on Nigeria, Azam (1995) finds that the parallel exchange rate is strongly linked to the consumer price level while the latter is loosely fitted to the official exchange rate. However, it should be noted that, notwithstanding these certainties, the empirical tradition on this literature is still in its infancy (Aron and Elbadawi, 1992). The aim of this section is to review the existing literature in this field, focusing on both theory and empirical findings.

Research in the area of parallel markets for foreign currency in developing countries has flourished since the 1980s [9]. However, past research has focused on the determination of the parallel rate and the premium but not so much has been said on whether parallel markets for foreign exchange are efficient or not.

2.3. Efficiency of Parallel Markets

Can parallel markets for foreign exchange be efficient? The negative image attributed to these market structures makes them appear as inefficient and that such a question need not be raised. However, if official markets were efficient, parallel markets would not exist. There is, therefore, a need to investigate whether the latter may not be more efficient than the former. From an economic point of view, efficiency or inefficiency of parallel markets is a question that can only be answered through empirical investigations.



[9] *For a survey of the literature on Parallel markets for foreign exchange, see Agénor (1992).*

2.3.1. Theory

The literature on the determination of the behavior of exchange rates reveals a diversity of opinions among the various analysts. Dowla (1995), for instance, remarks that "the exchange rates are closely approximated by a random walk". However, Sjöö (1996a, p.39) points out that "we have to be careful when reading articles which claim that the exchange rate... should be a random walk; often, what the authors really mean is that the variable should be a martingale". Similarly, De Grauve and Vansanten, quoted by Ademola and Adebisi (1995, p.63), caution that recent literature and empirical results, especially those derived from chaos models in the field of exchange rate determination have "strengthened the presumption that the level of foreign exchange rate is not just a random walk but that it could be determined by a non-linear, deterministic model generating complex dynamic behavior". Whether the exchange rate is random or chaotic is a matter of empirical investigation.

In econometric notation, a random walk is represented as:

$$X_t = \alpha + \beta t + \gamma X_{t-1} + \varepsilon_t \quad \text{..... (1)}$$

where $\epsilon_t \sim NID(0,\sigma^2)$. This equation represents a random walk with drift (α) [10] and time trend (t). In the case of a random walk without drift and time trend, α and β are equal to zero. However, to have a random walk, γ must not be significantly different from one. If γ is significantly different from one, the variable is either stationary or integrated of order

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10 *"Drift" is used in Time Series Econometrics to represent the constant term of a given data generating process (DGP).*

higher than one. The unit root property is, therefore, a sine qua non for the model to be a random walk. In addition, ϵ_t must be a white noise[11] residual term. In the present case, X_t and X_{t-1} are respectively the values of the exchange rate at times t and t-1.

There is a tendency to confuse a random walk process with a martingale. Whereas a random walk is defined only in terms of its past values, a martingale is defined in terms of the expected mean of the variable under consideration with respect to a given information set.

A martingale is represented as:

$$E(X_{t+k}/I_t)=X_t \text{ for } k>t \quad \ldots\ldots (2)$$

This equation shows that the expected value of the exchange rate at time t+k, given a vector of information "I" at time t, is equal to the current rate of exchange. In other words, a martingale is a process whose best prediction of future value is given by the present value. Taking into consideration available information at a given time in the determination of an exchange rate is the basis for the test of market efficiency. One important common feature of the random walk and the martingale is that both are first-order stationary processes (Spanos, 1995).

The controversy over the process which approximates best the behavior of exchange rates is not a problem for the determination of market efficiency. Different forms of market efficiency can be investigated using different approaches. There are three

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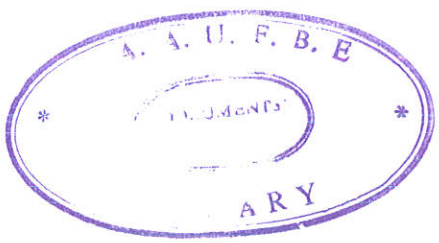
11 *The residual term ε_t is white noise if it has an unconditional mean of zero; a constant variance, and cannot be linearly predicted from its past values.*

different hypotheses of market efficiency: the weak form Efficient Market Hypothesis (EMH), the semi-strong form EMH and the strong form EMH (Dowla, 1995). The weak form Efficient Market Hypothesis (EMH) stipulates that the current price fully reflects the information contained in the historical sequence of prices. For exchange rates, the implication is that the current rate fully reflects information contained in past rates. The semi-strong form EMH suggests that the current rate reflects all publicly available information in addition to historical price information. The strong form EMH implies that the rate embodies all information that is known to all market participants. Obviously, the second and third forms EMH are difficult to measure as they require identification of all information available to public and to any market participant, respectively, which is not easy to capture.

Whereas the martingale approach, which requires inclusion in the model of a specific information set at a given time, is necessary to test both the semi-strong and strong form EMH, the simplest approach is a martingale form whose information set is assumed to be contained in past values of the variable. This condition is satisfied by a random walk. As Culbertson (1989, p.1916) puts it, this hypothesis assumes an "information set [which] contains only historical prices". By definition, a random walk has a permanent memory. In other words, "all past shocks driving the rate must be permanent" (Dowla, 1995, p.98) and this is what occurs in the case of efficient markets. Semi-strong and strong form EMH require vastly more extensive information.



In the framework of this study, a parallel market for foreign exchange is said to be efficient when "current rates fully reflect all available information, including current expectations about the future level of the price" (Culbertson, 1989)[12].

Market efficiency test procedures have limitations. As Sjöö (1996b) notes, "the problem with market efficiency tests is that it is not possible to say what is causing the rejection of the efficiency hypothesis. The true null hypothesis remains unknown". Several reasons can account for the rejection of the efficiency hypothesis. These relate not only to market inefficiency but also to financial risk premiums and "realignment risk" or "peso-problem". Most of the times, the idea of an inefficient market is generally rejected on the grounds that it is an unlikely phenomenon (Sjöö, 1996b).

Despite these limitations, researchers, including Dowla (1995) have used the random walk model [13] to test the weak form version of EMH for parallel markets for foreign exchange. In their review of studies on the efficiency of the Johannesburg Stock Exchange, Thompson and Ward (1995) also noted that many authors have used the random walk hypothesis as a test for market efficiency.

2.3.2. Empirical Findings

Based on the random walk properties, Dowla (1995) tested the weak form EMH for parallel market exchange rates. He computed three different tests, namely the Ljung-Box

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12 *An exchange rate can be simply defined as a relative price of two national monies, one domestic and the other foreign.*

13 *For simple presentations on random walk models, see for instance, Pindyck and Rubinfeld (1991).*

Q^*-statistic; the unit-root test, first using Dickey-Fuller, and then the Augmented Dickey-Fuller method. His sample consisted of thirteen countries from Latin America, Africa, Asia and Europe[14].

Using monthly data, he computed the Ljung-Box statistic with 12 and 24 lag-periods. The random walk hypothesis was rejected for Thailand. For Korea, Colombia, Sudan and Mexico, mixed results were obtained. The random walk hypothesis was rejected when a shorter lag (12-period lag) was considered. For all the other countries, parallel markets for foreign exchange were found to be efficient.

Using unit root tests, he found that the exchange rates of all the countries had a unit root. The values obtained for the Dickey-Fuller (DF) and Augmented Dickey-Fuller (ADF) tests showed that parallel markets for foreign exchange followed a random walk, except for Korea and Thailand. For Thailand, only the DF test showed a non-stationary parallel market exchange rate. The stationarity of exchange rates in Korea and Thailand was attributed to the Central Bank intervention to adopt a realistic exchange rate during the sample period. This policy was in agreement with the export-led growth strategy adopted by these countries during the period under consideration.

2.4. Determinants of the Parallel Market Exchange Rate

May (1985) developed a framework of analysis for the parallel exchange rate that has guided many researchers in the field. The discussions under this section are also based on May's model. It is, in turn, based on static comparative analysis.

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[14] *These are: Bolivia, Brazil, Colombia, Egypt, India, Indonesia, Israel, Korea, Mexico, Sudan, Thailand, Turkey and Yugoslavia.*

2.4.1. Theory

According to May (1985), the determination of the parallel rate is principally based on the following four factors: (i) the level of the official exchange rate; (ii) the level of government policing activities; (iii) exogenous increase in export revenue and; (iv) exogenous decrease in the value of imports.

2.4.1.1. Official Exchange Rate

May (1985) proved that when a government decides to depreciate the official rate without putting in place accompanying macro-economic measures to ease exchange controls, the parallel rate also depreciates but less than proportionately. This is explained by the interaction of both supply and demand factors on the parallel and official markets.

Some countries manage their foreign exchange reserves by setting a target level beyond which controls on allocation of foreign exchange are relaxed. Assuming that the exchange controls are independent of the level of foreign reserves, the impact of depreciation of the official exchange rate can be described as follows. On the supply side, depreciation of the official rate reduces export smuggling by exporters who channel their transactions into official markets. Depreciation also discourages the use of parallel market by foreign tourists who do not find transacting in such markets worth the risk it presents. The same holds with respect to remittances from abroad. As a result, the stock of foreign currency supplied on the parallel market decreases.

On the demand side, depreciation makes purchasing foreign exchange from official markets by importers and domestic tourists more expensive. Consequently, the rent-

seeking activities that government officials used to enjoy become less lucrative due to less demand for foreign exchange. As a result, less resources are spent on them. This leads to an increase of imports through the parallel market. Increased demand for foreign exchange on the parallel market combined with the decrease in supply is the reason why the parallel rate depreciates less than proportionately relative to the official rate.

However, if exchange controls are set in function of the level of foreign reserves, the government sets a target above which exchange controls are relaxed and below which they are tightened. In such a case, depreciation of the official rate increases the level of foreign reserves on the official market due to increase in official exports. As described above, the resulting increase in the level of foreign reserves implies relaxation of exchange controls which in turn leads to less demand for foreign exchange on the parallel market. This effect can be compounded by the increase in exports and decrease in imports resulting from the direct impact of devaluation on foreign trade [15]. The drop in demand for foreign exchange on the parallel market leads to an appreciation of the parallel rate.

Variation of the parallel rate can, therefore, be in either direction, depending on the specificity of the market under consideration. Therefore, although the second case just depicted above seems to be closer to the reality in Burundi, determination of the direction of change in the parallel rate due to a change in the official rate is a matter that can only be determined through empirical investigations.

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[15] *This is the traditional well known impact of devaluation.*

2.4.1.2. Government Policing Activities

When government increases resources devoted to fighting or preventing parallel market activities, smuggling becomes risky and less attractive. The impact of this has to be seen from two perspectives. On the supply side, there is obviously a decrease in the stock of foreign currency held in parallel markets. On the demand side, two factors acting in opposite directions need to be taken into account. On one hand, patrolling activities more likely increase rent-seeking as importers prefer to avoid smuggling and operate through the official channels. On the other hand, the tightening of import requirements makes smuggling quite a lucrative business though risky.

The overall impact on the parallel rate depends on the magnitude of these two opposite forces. If rent seeking activities dominate, the total effect is a decrease in the stock of foreign currency available in the parallel market. Depending on the magnitude of the relative decrease in the supply and demand, the new parallel market rate can be greater or lower than the original rate. If smuggling outperforms rent seeking, especially organizing it in such a way that full advantage is taken from economies of scope (Azam and Besley, 1989) [16], tightening of trade and capital account operations leads to an increase in the parallel rate.

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[16]/ *The concept of "Economies of scope" refers to a situation where a number of different products or services can be more efficiently produced together than by separate firms. This concept should not be confused with that of "economies of scale" which refers to increases in productivity, or decreases in average cost of production, that arise from increasing the size or scale of plant (Samuelson and Nordhaus, 1989). In the context of parallel markets, economies of scope may arise, for instance, when the same truck used to smuggle exports out of the country is also used to smuggle imports on its way back. Economies of scope are also manifested when smuggling in both ways is facilitated by bribing the same officials.*

This second scenario appears to be more realistic for a country with serious foreign exchange constraints. However, as in the previous case, empirical investigations are essential to determine whether a specific case falls within the first or second scenario. Nevertheless, what seems to be clear is the fact that the increase in government policing activities is systematically associated with a risk premium varying according to the gravity of the penalty facing those dealing in parallel markets [17].

2.4.1.3. Exports

The behavior of the parallel market for foreign exchange seems to be clear when one analyzes the impact of an exogenous increase in exports. When a country's exports increase as a result of exogenous factors, the stock of foreign currency increases in the country and the parallel market rate decreases. This leads to a drop in the proportion of exports channeled through parallel markets, that of rent-seeking activities as well as the level of smuggled imports. This same scenario holds whether the country sets a foreign exchange target or not. These developments, therefore, predict a negative relationship between exports and the parallel rate in the economy.

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17 *Examples from Ghana and Tanzania during the 1980s show that the severity of the penalty, as a way of reducing the premium, had completely opposite results. As reported by Gyimah-Brempong (1992), some people were executed for dealing in parallel market activities in Ghana in 1983 and 1984. During that period, the parallel market premium reached its peak at a level of 500 percent (Gyimah-Brempong and Gyapong, 1993). In Tanzania, the 1983 crackdown on parallel activities uncovered illegally held foreign currency equivalent to US$ 1.99 million (Maliyamkono and Bagachwa, 1992). Two years later, in 1985, the premium reached its highest level of 900 percent (O' Connell, 1992).*

2.4.1.4. Imports

As financing of imports constitutes the main reason why traders demand foreign currency on parallel markets, a shift in demand from imported to domestic goods or an overall decrease in the country's imports lowers the parallel rate due to depressed demand in the parallel market. As a result, the economy experiences a drop both in rent-seeking activities and in smuggled exports. In the case when the government sets a foreign reserve target, the situation remains unchanged. The fall of the parallel rate increases the share of official exports which increases the level of reserves; this leads to a relaxation of controls and reduces rent-seeking activities as well as smuggled imports. The overall impact is a reduction in the amount of foreign currency traded in parallel market. Therefore, the predicted relationship between imports and parallel exchange rate in the economy is definitely positive.

2.4.2. Empirical Works

May (1985) used a reduced form equation with the four variables outlined above as explanatory factors of the parallel exchange rate for Ghana. A dummy variable was introduced in the model to differentiate between aggressive and non-aggressive periods of government policing activity. The model was estimated for the period between 1972 and 1982, using quarterly data.

The regression shows a good fit, with $R^2 = 0.96$; however, there is a problem of autocorrelation, though not severe. All coefficients but that of exports are significant at one percent level. The coefficient for exports is significant at 6 percent level. Both imports and exports display the expected signs (positive for imports and negative for exports). With

respect to the sign of the official rate, the relationship between the real official rate and the parallel rate is negative. The reason is that due to the overvaluation of the real official rate during the years covered by the study [18], official exports were taxed while imports were subsidized. As a result, exports were smuggled out of the country and the government was thereby losing important amounts of foreign exchange.

On the other hand, due to rent-seeking activities and the fact that the government could not accommodate all imports through official channels, import smuggling was rampant. This effect was compounded by the absence of an import substitution industry that would have enabled the country to save foreign currency. Overvaluation of the real exchange rate was the main factor responsible for the importance of parallel market activities in the Ghanaian economy. The relationship between policing activity, as represented by the dummy variable, is positive and statistically different from zero. This confirms the fact that the level of the risk premium is higher in periods of severe crackdown on parallel activities, as expected. In Ghana, the premium reached 500 percent during such periods, as discussed earlier.

Gyimah-Brempong (1992) investigated the same problem for Ghana using an extended period of observation, from 1972 to 1987. His model is also different: it is a system of simultaneous equations which is preferred to May's single equation model due to the following two reasons. May's OLS model more likely presents an endogeneity problem, at least in some variables. In addition, a simultaneous equation model has the capacity to show the way in which different policies affect the parallel market exchange rate. He estimated the model using the three stage least squares (3SLS) approach. In

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[18]/ *This was the consequence of Ghana's fixed nominal exchange rate in a situation of domestic inflation rates largely exceeding world rates.*

conformity with theory, the coefficients of exports and imports are significant and respectively negative and positive. He added a one-period lagged parallel rate variable, whose coefficient is positive and significantly different from zero. This result shows that the lagged value of the parallel rate is also an important explanatory variable of the current rate. As is the case with May, the coefficient of the official rate is negative and significant at 5 percent, whereas that of the dummy representing government policing activities is positive and significant at one percent. It appears therefore that based on the same variables, May (1985) and Gyimah-Brempong (1992) arrived at the same results although they used two different approaches.

2.5. Determinants of Parallel Market Premium

2.5.1. Theory

The theoretical framework developed by May (1985) and subsequent studies carried out by Agénor (1990a, 1992), Lizondo (1990) and the review presented by Kiguel and O'Connel (1994) point to the fact that the premium is jointly determined by asset market conditions and the parallel current account. Portfolio decisions (Pinto, 1990) and expectations (Agénor, 1992) are important determinants in the short-run. Most case studies are based on the stock/flow model which combines both short and long-run considerations. The stock/flow model was refined by Dornbush and Kuenzler (1993) from an earlier model on dual market to fit the parallel market's case.

Portfolio determinants (stock aspect) are based on two variables: real money balances and official interest rate parity differential. The demand for foreign assets increases with the increase or expected increase of the official exchange rate. This results

from the rise in the premium which in turn raises the yield differential in favor of foreign currency or foreign assets. A rise in the interest rate on domestic assets encourages foreign currency denominated asset holders to re-balance their portfolios by selling part of the latter to acquire the former. These factors are usually only short-term determinants.

In the case of Burundi, this study assumes that the interest rate has not been a significant determinant of the premium. The reason is that until the late 1980s, interests rates were not determined by market forces and the government fixed them without taking these factors into account.

The long-run determinants of the premium are based on flow variables which are related to the parallel trade balance. The flow supply of foreign currency comes from legally assigned exports, export smuggling and under-invoicing, as well as import over-invoicing. The flow demand comes from legally assigned imports and import smuggling. The parallel current account balance can only be achieved through a long-run relationship between the premium and other determinants of the parallel current account. The latter can also influence the premium in the short run. These determinants are: official exchange rate, aid, terms of trade, export tax trade, import tariff trade, and real output. For some countries that have large communities living abroad such as Sudan, remittances constitute another important source of foreign currency inflows into the parallel market [19]. Equally

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[19]/ *A study by Brown (1992) found out that Sudanese nationals working in the Middle East send home more than US$ 5 billion every year, a substantial part of this amount being channeled in parallel markets. This figure appears to be exaggerated. Elbadawi (1992) finds that the non-official remittance by Sudanese nationals working abroad averaged more than one billion dollars per annum throughout the 1980s. In any case, this source of supply of foreign currency in the Sudanese parallel market is quite important.*

important are inflows of foreign currency in some countries' parallel markets for foreign exchange due to tourism [20].

Variation in the official real exchange rate adjusts the premium in the direction of the change. Devaluation of the official exchange rate, when it is not offset by growth in domestic money supply followed by macroeconomic policy fundamentals, reduces the premium. This is because, as explained earlier, devaluation reduces the parallel rate but less than proportionately. There is therefore a negative relationship between the premium and the official rate. However, this effect is transitory, often lasting less than a quarter.

Theoretically, aid has a negative impact on the premium if it increases the level of reserves and reduces pressure on the parallel rate [21]. It can also have the same impact when part of it is channeled through the parallel market, in which case it increases foreign exchange supply. Aid can have a positive impact on the premium if the income effect it generates induces more spending on imports and, therefore, more pressure on the parallel rate. The overall effect depends on which of these two opposite forces dominates. However, results from empirical research show that the income effect tends to be weak, and the relationship is often negative.

With respect to terms of trade, the way this variable affects the premium is ambiguous; its effect may be negative or positive. Improvement in terms of trade can

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[20]/ *This was the case in Kenya and Tanzania before the liberalization of their foreign exchange markets.*

[21]/ *Exchange market pressure is defined as the sum of the impact of balance of payments pressures on the exchange rate and/or foreign reserve holdings. The original idea of measuring these combined effects was presented by Girton and Roper in a 1977 American Economic Review article (Lott and Ray, 1992).*

lower the premium through an allocation of more foreign exchange for imports and an increased supply of foreign currency in the parallel market through export smuggling. On the other hand, it can have an opposite impact if the income effect is strong enough to appreciate the real official exchange and induce demand for import smuggling (Kiguel and O'Connell, 1994).

Export tariff trade (ETT) and Import Tariff Trade (ITT) are other important explanatory variables in the model. High ETT is associated with high levels of export smuggling, implying an increase in the supply in parallel markets and hence low levels of premiums. This translates into a negative relationship. In the same vein, if ITT is reduced, smuggling decreases and the pressure on demand in the parallel market is relaxed. The premium falls, suggesting a positive relationship.

Regarding GDP, its presence in the model reflects the fact that the importance of parallel market activities in general are directly linked with the overall activity of the economy. From one perspective, GDP may be positively related to the premium because its increase implies that agents spend more income, including their expenditure on imported products, part of which being financed through parallel markets. This increases the demand for foreign currency on the parallel market and hence a rise in the premium. However, this relationship is not definite. An increase in GDP may also be caused by higher level of exports, with part of export earnings diverted into the parallel market. In this case, the rise in the stock of foreign currency on the parallel market reduces the premium. The overall impact of GDP variation on the premium is, therefore, determined by the behavior of both exporters and importers, especially the extent to which their transactions are carried out on parallel markets. As in the case of aid, the overall impact

depends on the strongest force between import smuggling and export smuggling. Determination of the direction of the impact calls for empirical investigation.

Finally, the premium is a function of its own lagged variable whose sign depends on the premium past values.

Summing up the developments in this section, expected signs are negative for the following variables : real official exchange rate; aid; and export taxes trade. A positive sign is expected for import tariff taxes. Terms of trade, GDP and the lagged value of the premium can have either sign.

2.5.2. Empirical Findings [22]

Based on the eight variables mentioned in the preceding section, Kiguel and O'Connell (1994) estimated the stock/flow model for six countries (Argentina, Ghana, Sudan, Tanzania, Turkey and Zambia). Their empirical results largely conform to the predictions of the model, with differences due mainly to the frequency of data, and the details of the estimation technique. Cross country comparisons incorporating results from similar studies show that macroeconomic forces particularly those affecting the real exchange rate, asset stocks and exchange rate expectations play a prominent and systematic role in determining the parallel market premium. Following are the results:

(i) An expansion in real money balances (M_2 divided by the official exchange rate) raises the premium in the short-run in all cases, and in the long-run for

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[22]/ *Based on Kiguel and O'connell (1994)*

Sudan and Turkey. The reason may be that, in most developing countries, including the ones covered by this study, there is a strong positive correlation between increase in money supply and fiscal deficits. And theoretical literature is nearly unanimous in predicting that an increase in the fiscal deficit, ceteris paribus, leads to an increase in the premium.

(ii) As predicted by theory, increases in the interest parity differential raises the premium in the short-run.

(iii) Official real exchange rate is systematically positive both in the long and short-run, contrary to theory. More investigations are needed to find out the reasons for this "wrong" sign. This may have to do with the fact that if economic agents do not believe in the policies implemented to correct imbalances existing in the economy, including through devaluation, the latter will not have the expected impact on the premium. Evidence has shown that to be sustainable and convincing, so that it can achieve expected results, devaluation has to be supported by wide-ranging macroeconomic policy fundamentals (Agénor, 1992).

(iv) With respect to the flow determinants, the results corroborate the fact that, ceteris paribus, a real appreciation of the national currency reduces aggregate exports whereas it increases imports. The effects of the terms of trade and aid are generally statistically insignificant and tend to be negative. These negative signs may support the idea that these two variables affect the premium through the net supply of foreign currency rather than through income effect that raises total spending. Interestingly,

the Tanzanian case shows that adoption of an own-funds scheme increases the premium as predicted by theory [23].

Derrese (1996) used the same model to determine the premium for Ethiopia. According to his results, all variables are consistent with their expected signs. However, three of the variables (aid, import tariff trade and real output) are significant only at 20 percent, whereas two variables (export tax rate and terms of trade) are not significant even at 50 percent.

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[23]/ *An own-fund scheme is a system which allows importers to be granted import licences without being asked where they obtained their foreign currency. This generally increases the demand in the parallel market without an equal increase in supply and hence tends to increase the premium.*

3. OVERVIEW OF BURUNDI'S MACROECONOMIC PERFORMANCE AND FOREIGN EXCHANGE POLICIES IN THE POST-INDEPENDENCE ERA

The objective of this chapter is to give an overview of the trends in the country's main economic indicators and the most important foreign exchange policies put in place by the country since the first years of independence in the early 1960s. Uncovering the trends in different macroeconomic variables and their interaction gives an indication of the likely impact of policy intervention on a set of variables on the rest of the economy. This helps to understand why some policies, including exchange rate policies, were implemented and what were their impact on the economy.

3.1. Background Information

3.1.1. Basic Economic and Social Indicators

Burundi is essentially an agrarian and rural-based economy. Ninety percent of the population live in rural areas and 94 percent of the labor force are employed in the primary sector. More than 90 percent of the latter are represented by agricultural activities, the remaining 10 percent being accounted for by activities relating to livestock, fisheries and forestry. Agriculture is dominated by the subsistence sector which accounts for more than 80 percent of the total agricultural output. Cash crop agriculture represents only 9 percent of the total agricultural output, occupies 8 percent of the total cultivated land and accounts for 8 percent of the primary sector GDP. Agriculture also dominates the country's exports. According to the World Bank (1996), coffee, the country's main export, provided 80 percent of total export earnings in 1995. Burundi is an over-populated country which belongs to the group of least developed countries, with GNP per capita estimated at US$

150 in 1995. With a population estimated at 6.4 million in mid-1995 spread over an area of 27,834 km^2, Burundi is the second most densely populated country in Africa, after Rwanda, with an average of 229 inhabitants per square kilometer.

Burundi's exports are concentrated around a few agricultural primary commodities, namely coffee, tea, cotton and tobacco. With no known strategic natural resources, Burundi is a marginal player in international trade as evidenced by the following statistics. In 1994, the country's total imports of goods and services amounted to US$ 300 million, whereas its exports represented a mere US$ 107 million. Due to instability in commodity prices on international markets, the country's export earnings have been fluctuating over the last two decades. One of the adverse consequences of this situation has been a high dependence on foreign financial resources, both in the form of aid and debt (from bilateral and multilateral sources). As a result, the country is currently facing an unbearable external debt burden coupled with unmanageable arrears. In 1993, Burundi's total stock of external debt amounted to US$ 1062 million, representing 106.2 percent of its GDP. In the same year, its ratio of debt service to exports was 40.9 percent (ECA, 1995).

3.1.2. The Cost of Geographical Isolation

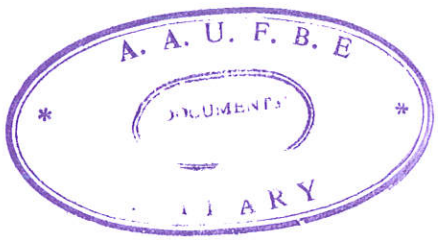
Burundi's geographical situation poses a big economic challenge. The country is landlocked between Rwanda from the North, Zaire from the West and Tanzania from the East and South. It is 2,100 km and 1600 km away from the Indian Ocean ports of Mombasa (Kenya) and Dar-Es-Salaam (Tanzania), respectively. Owing to this situation, the country's external trade has always been dependent upon its neighbors, since the shipment of almost all its imports and exports to and from the country relies on their infrastructure.

Over the years since the early 1970, the country's imports through the port of Mombasa (Kenya) has gained importance. The road link to Burundi through the so called Northern Corridor, crosses Kenya, Uganda and Rwanda. In 1980 for example, 20 percent of the country's imports used this route. Ten years later, this proportion increased to 50 percent. The second route is the Central Corridor which links the port of Bujumbura to that of Dar-Es-Salaam, via Kigoma. In 1980, for example, 60 percent of the country's imports were transported from the port of Dar-Es-Salaam using the Central Corridor. Traditionally, some products such as cement and sugar imported from the Southern African countries are shipped to Burundi from the port of Mpulungu, Zambia, at the Southern end of lake Tanganyika. This Southern Corridor is an emergency route linking Burundi to the above-mentioned Indian Ocean ports through the Zambian railway network. In 1980, nearly one fifth of the country's imports used the Southern Corridor route. Due to the exorbitant cost of air transportation, only a very small proportion of Burundi's external trade (less than 2 percent) is airlifted.

Almost all of Burundi's exports are transported via the port of Dar-Es-Salaam in Tanzania. This Central Corridor is made of two different transportation modes: water (lake Tanganyika) from Bujumbura to the port of Kigoma in Tanzania; and the TCR (the Tanzania Railway Corporation) takes over from Kigoma to the Port of Dar-Es-Salaam. The Central Corridor is the most widely used route due to its relative low cost. On this route, the cost of transportation of one ton varies between US$ 70 to US$ 100 compared to a cost of US$ 200 to US$ 250 for the Northern Corridor. The problem with the Central Corridor is that it is slower and uncertain. It takes from 1.5 to 6 months to move goods from Dar-Es-Salaam to Bujumbura. The Northern Corridor is faster. A round trip from Bujumbura to Mombasa and back to Bujumbura takes approximately one month. This explains why the traffic on this route, though more expensive, has increased during the past years.

Two facts need to be noted in the light of this information. First, Burundi pays its geographical isolation a very high cost. It was estimated that the country pays, in hard currency, between US$ 30 to US$ 50 million per year to cover transportation and associated costs to and from the Indian Ocean ports. This amount, which does not take into account the impact on the economy of other associated costs such as the high prices of imported consumer goods in Burundi; the cost of reserve stocks; the cost of supply interruptions; etc. is high by Burundian standards. For comparison, the amount represents between one-third and one half of the country's export earnings.

The second problem relates to the fact that the country's economy is under heavy dependence on neighboring countries. At different occasions, Burundi has suffered from supply interruptions of essential imports due to internal problems in the countries of transit. Most recently, the devastating consequence of this dependence on the country has been evidenced by the impact of the decision by Burundi's neighbors to put the country under a total economic blockade on 31 July 1996 .



3.2. Macro-economic Performance [24]

3.2.1. From Independence to World Bank/IMF Economic Stabilization and Adjustment Program

From the early 1960s, Burundi's economy has been dominated by the subsistence sector. It is estimated that in 1965 only one-third of GDP was derived from the monetary economy. Trade and general commercial activities represented 8 percent of GDP and were limited to Bujumbura, the capital city. This was due to the fact that the colonial economy was framed around the export sector which was dominated by cash crops such as coffee and cotton. The production and commercialization of locally-consumed products were not, therefore, given due importance. Even the ten-year Development Plan for Ruanda-Burundi (1952-1961) launched by the Belgian administration in 1952 with a budget of US$ 20 million was centered on coffee. Therefore, as McDonald et al. (1969) remark, money income, trade and employment and the whole economic system were heavily dependent on coffee. This, in a way, is still the case in the country.

Traditionally, apart from other longer-term inflationary factors, Burundi's economy has been subject to periods of inflation during the months of May to August. This results from bullying economic activities following coffee harvests and sale throughout the country during this period. Coffee producers pay back their loans contracted during the year and buy necessities such as clothes and households. Money moves quickly, creating the annual

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[24] *This section is based on data drawn from the following publications: République du Burundi, Ministère du Plan, L'Economie Burundaise, different issues; République du Burundi, Ministère du Plan, Plan Quinquennal de développement, different periods; CNUCED (1981), Réunion de consultation par pays: Mémoire du Burundi; République du Burundi, Ministère du Plan (1988), Réunion préparatoire à la Table ronde des partenaires du développement, Volume 1; and McDonald et al. (1969), Area Handbook for Burundi, the American University, Foreign Area Studies (1969), Washington D.C. We have integrated unpublished information collected from different sources in the country.*

inflationary trend which spreads over the whole economy. Moreover, due to inelasticity of supply of commodities particularly food items, the increase in demand pushes prices upwards. Although prices of agricultural commodities rise, peasants do not have much incentive to increase production. The reason is that the economy is not widely monetized. Therefore, producers consider that their income is adequate and tend to produce less. This reduction in production increases the unfulfilled demand and pushes further inflationary pressure. During the 1960s, however, the Central Bank's conservative monetary and credit policies helped to control inflation and stabilize the value of the national currency.

Before 1962, national budget deficits were systematically met by subsidies provided by the colonial master, Belgium. After Burundi's independence in 1962, expenditures increased faster than revenue and deficits became persistent. Government finances were heavily dependent on foreign trade, especially coffee trade. In 1966 for example, 40 percent of Government revenue was derived from customs taxes and 75 percent of the country's foreign exchange was derived from coffee exports. Large fluctuations in coffee production and prices resulted in budget deficits. However, other factors contributed to the negative picture of macro-economic variables during the 1960s. Among them is political instability which characterized Burundi from 1962 to the early 1970s. From 1962 and thereafter, expenditures for defense, internal security and diplomatic representation increased substantially and widened the budget deficit. It stood at BIF 108.6 million in 1962; BIF 10.5 million in 1965 (this decrease was due to the adoption of a financial stabilization program in 1964). Despite an increase in revenue, the deficit was BIF 183.0 million in 1966 due essentially to an increase in national spending, especially administrative costs associated with the financing of internal security. Another reason behind this negative image is that Burundi, a young nation which had just acceded to its independence, lacked educated and skilled people who had the technical capability to manage the

economy efficiently. Recognizing this fact, the Government increased continuously its expenditures in education. Since 1962, this sector has become the most important item in the budget.

From 1962 to the end of the decade, the balance of payments was negative, except in 1964. This was mainly the result of a persistent negative balance of trade, as the country continuously spent more on imports while exporting less. Deficits were covered by foreign aid, especially from Belgium. However, aid flows to the country decreased over the years. Government borrowing and drafts on foreign reserves were also used to finance these deficits. In 1965, these financial problems led to a large devaluation of the Burundi Franc, from 50 to 87.5 units per US$. At the tune of the decade, foreign aid accounted for a large part in financing the national budget.

The different problems facing the economy led to sluggish economic growth. In 1966 and 1967, nominal GDP in current prices grew by 7 percent and 6 percent respectively. The Consumer Price Index (CPI), considering 1964 as base year, increased to 119 in 1965; 124.6 in 1966 and 131 in 1967. Taking inflation into account, therefore, these statistics suggest that there was no growth in real terms.

During the first half of the 1970s, the deterioration of the economy continued at unabated pace. The problems facing the country in the 1970s were compounded by three major crises. Politically, Burundi witnessed its bloodiest crisis in 1972-73 which was in a way the culmination of the different "mini-crises" that had prevailed immediately after independence. Economically, the first oil shock hit hard the economy, as Burundi imported all its oil. In addition, to add insult to injury, Burundi's export earnings plummeted as a result of the commodity crisis on international markets. The combination of these factors

resulted in a situation of economic stagnation which is well illustrated by the following statistics and chart 1.

In 1972 and 1974, the country experienced negative GDP growth rates. In 1975, GDP growth was only 1.0 percent, well below the population growth which was estimated at around 2.5 percent. Between 1970 and 1974, investment was stagnating. In current prices, 1974 investment level was only 2 times that of 1970, while it was 3.6 times a year later and 6.5 times in 1977. Throughout the period 1970 to 1975, the country systematically recorded a negative current account balance. In current prices, the cost of imports increased by 150 percent while the value of exports increased by only 20 percent between 1970 and 1975. The terms of trade deteriorated dramatically: in 1975, the terms of trade index was 58 relative to 1970 level.

At the end of 1975, this gloomy picture which started in the early 1960s compelled the authorities to adopt a set of new measures to revitalize the economy. However, Micombero, who had been in power since November 1966 when he overthrew the Monarchy, proclaiming the First Republic, did not have time to implement them. He was deposed on 1 November 1976. Colonel J.-B. Bagaza took over through a bloodless military coup, proclaiming the Second Republic.

The first years of the Second Republic coincided with a period of commodity boom on international markets. Due to the increase in coffee prices, the country's export earnings increased substantially. For example, export earnings in 1979 were almost 4 times their value in 1975. Moreover, unlike the previous regime which had not been very active in the economic sector, Bagaza regime deployed important resources in improving economic infrastructure. Between 1983 and 1988 for example, 74 percent of total

investments went to economic infrastructure. Many projects were launched (construction of hydroelectric dams; extension of the road network; improvement of airport facilities; creation of big state-owned enterprises such as VERRUNDI (production of bottles), SOSUMO sugar plant, ONC (state trading corporation), etc. During the years of commodity boom, these projects, some of them too big for a market the size of Burundi, were created with the illusion that they would be financed by export earnings.

Investments grew steadily from BIF 2,575 million in 1975 to BIF 10,504.7 million in 1979 (in current prices). GDP growth rates were positive during the second half of the decade, except in 1978. However, financing this economic growth had a cost. In five years, the consumer price index nearly doubled, from an index of 147.3 in 1975 to 288.3 in 1980. In addition, the current account of the balance of payments was consistently negative between 1975 and 1980. This was essentially due to the increase in imports of goods and non-factor services, some of which serving as inputs to feed the process of revitalization of the economy. To bridge the gap, the country borrowed large amounts of external resources. Later, Burundi's debt weighed heavily on the country's economy.

The second oil crisis of 1979 and the collapse of international commodity markets had devastating effects on Burundi's economy. By the end of the 1970s and early 1980s, the country's import bill doubled while proceeds from coffee exports plummeted. As a result, there was a high pressure on the balance of payments and on fiscal accounts. To compound the problem, adverse weather conditions affected negatively agricultural output.

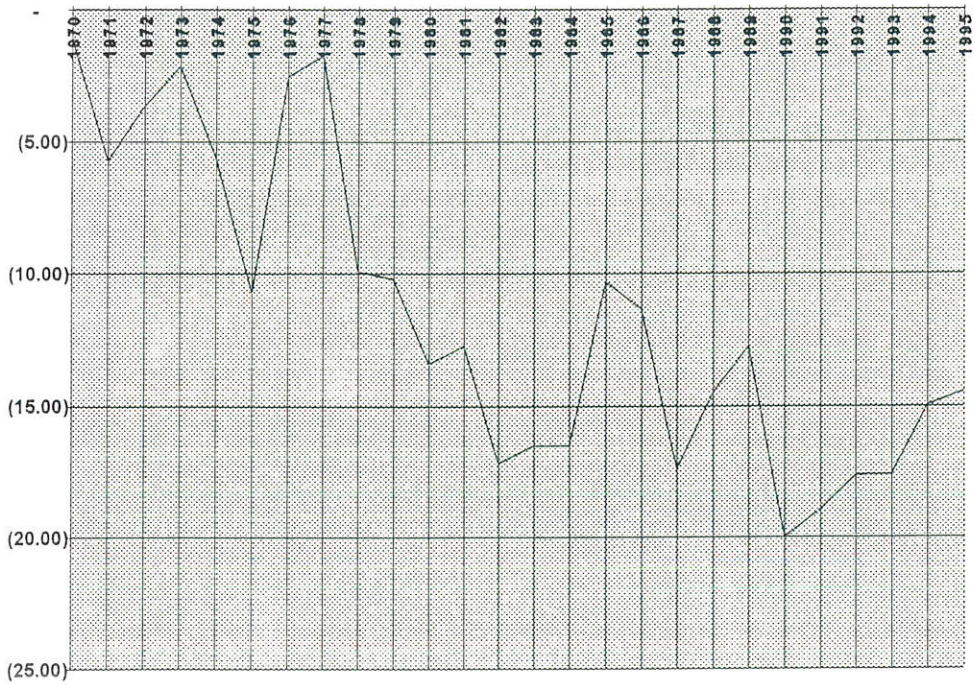
To manage the situation, the Government resorted more and more to discretionary administrative measures such as credit and foreign exchange rationing; external borrowing; as well as increased taxation on trade activity, both domestic and foreign. According to

the World Bank (1994), the situation went from bad to worse during the first half of the 1980s. During 1982-1984, for example, the vibrant GDP growth of the late 1980s dropped to 1 percent. In 1983, the overall fiscal deficit reached 18.7 percent of GDP, from 2 percent in 1978. In 1984, inflation was 14.3 percent, while external total debt as a percentage of GDP doubled between 1982 and 1984. The debt service ratio, which had averaged 4.2 percent of exports of goods and non-factor services in the late 1970s rose to 23 percent in 1985. These difficulties compelled the country to approach the Bretton Woods institutions for assistance.

3.2.2. Burundi's Economy Under Adjustment

The economic problems facing Burundian leaders in the first half of the 1980s led them to adopt, in August 1986, a program of assistance agreed upon with the World Bank and the International Monetary Fund (IMF). Its aim was economic stabilization and adjustment. As the following chart shows, this quest for external intervention in the form of stabilization and structural adjustment assistance took place at a time when the country was preoccupied by the unprecedented levels of its current account deficits which were compounded by external shocks such as the collapse in commodity prices and the decrease in official development assistance flows.

Chart 1: Ratio of Current Account over GDP



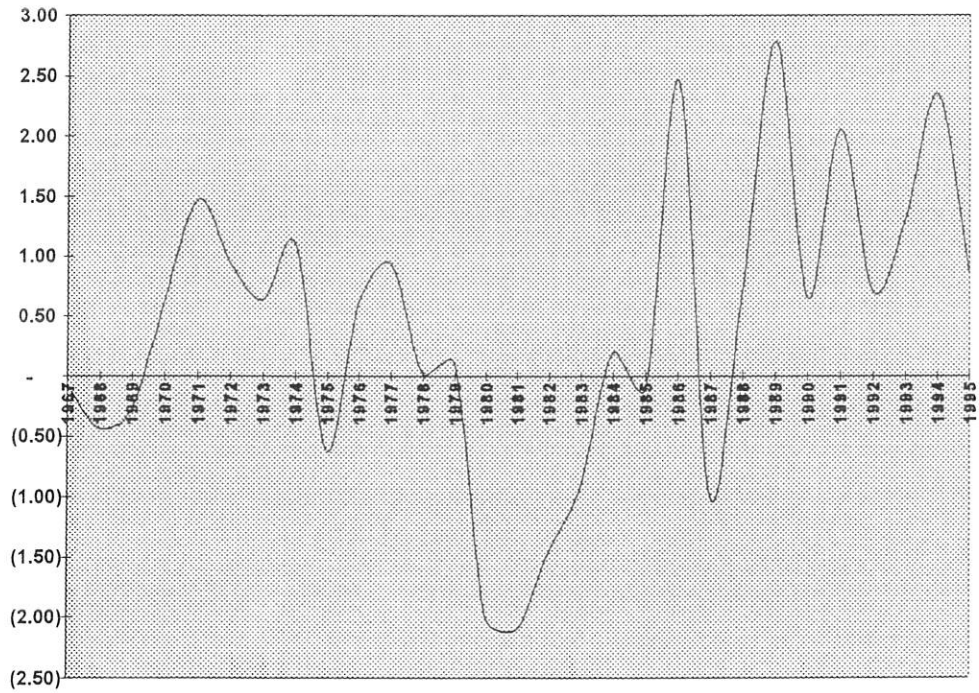
It was not the first time the country received assistance from these institutions. Since joining the IMF (and the World Bank) in September 1963, Burundi had concluded several stand-by arrangements and benefitted from technical assistance from the institution. Even well before its independence, the country had received loans from the International Bank for Reconstruction and Development (IBRD). In 1957 for example, Burundi received a loan of US$ 4.8 million from the IBRD for infrastructure maintenance and expansion in Ruanda-Burundi. The loan was guaranteed by Belgium. Co-operation with the Bretton Woods institutions was not, therefore, new by 1986 when the country approached them for structural adjustment assistance.

The World Bank's structural adjustment credits had three broad main objectives (World Bank, 1994): (i) to improve the incentives for production by removing constraints to growth and by redirecting the economy toward more reliance on market forces and a greater outward orientation; (ii) to promote private sector development and investment; and, (iii) to increase the efficiency of public resource utilization, especially through public enterprise reform and improved public expenditure management.

The IMF supported stabilization measures aimed to: correct the overvalued exchange rate and pursue a policy of adjustable exchange rates; strengthen the balance of payments and increase foreign reserves; reduce the debt service; decrease domestic financing of the budget deficit to avoid crowding out the private sector's access to investment credit sources; and increase budgetary revenues and public savings. In the light of these broad objectives, an overview of the economic performance during the period of adjustment may help assess the contribution of the program in terms of correcting the country's macro-economic imbalances and stabilizing its economy.

Statistics show that the implementation of the SAP in Burundi was accompanied by an increase in financial resource transfers to the country in the form of official development assistance. The average yearly transfers for the period 1980 to 1985, or six years before the launching of SAP, was US$ 135.2 million. Six years after the beginning of the SAP, this amount rose to US$ 191.1 million, showing a 41 percent increase. As chart 2 shows, this translated in a positive budget balance from negative values during the years preceding the implementation of the program.

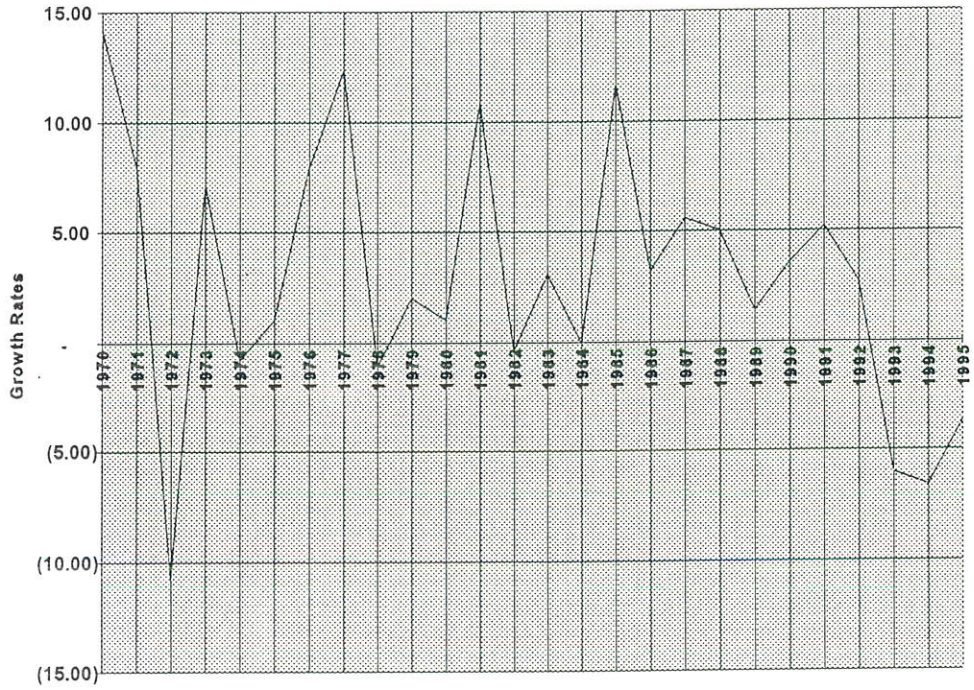
Chart 2: Budget Balance over GDP



However, other economic indicators were not equally good. The ratio of the current account to GDP, excluding grants, was worse over the period. On average, it stood at -15.7 for the period 1986-1991, compared to -13.8 for the period 1980-1985. Similarly, the ratio of the fiscal deficit over GDP, excluding grants, was quite high, though slightly lower than that of the previous period. It posted an average -11.4 compared to an average -12.6 for the period 1980-1985. One reason for this negative picture was unfavorable terms of trade which decreased from 102.4 in the period 1980-1985 to 92.1 during the period 1986-1991.

On the whole, the objectives of the SAP in Burundi for its first six years of existence were either not achieved or proved to be difficult to sustain. For example, GDP growth, at an average of 3.9 percent, was below its pre-adjustment level of 4.6 percent. All three sectors of the economy, the primary, secondary and tertiary sectors, declined during the second half of the 1980s relative to the first half. The primary sector actually witnessed a negative growth in 1989. During the adjustment period, the volume of merchandise export grew by 4.4 percent on average, a disappointing performance compared to the 6.7 average achieved in the first half of the decade. Due to changes in agricultural cycles and, to a lesser extent, market fluctuations, the volume of coffee exports followed an uneven pattern during the period of adjustment. These trends are illustrated by the low levels of GDP growth rates and their fluctuations during the last two decades and half as shown in chart 3.

Chart 3: GDP Growth



Although efforts to increase investments did not yield substantial results, an evolution was nevertheless noted during the period of adjustment. In the pre-1986 six-year period, fixed investment amounted to 15.6 percent of GDP; this proportion rose to 17 percent in the post-1986 six-year period. Between these two periods, the share of private investment increased from 2 percent to 3 percent and the public to private investment ratio fell from 7.6 to 5.9. Efforts aimed at increasing domestic savings failed, as the ratio of savings to GDP decreased from 2.7 to 1.7 before and after 1986, respectively.

Charts 1 and 3 show that during the first half of the 1990s, the situation deteriorated in Burundi. From 1992 onwards, the government's focus on economic development during the last half of the 1980s and the first years of the 1990s was lost. Political imperatives took over. In 1992, the focus on politics was due to the fact that it was the year of the re-establishment of a multi-party political system in the country. This was an important departure from the 30-year monopoly of UPRONA in national politics. In addition, 1993 was the year of presidential and parliamentary elections within a political competitive environment. This indeed happened. President Buyoya, an army Major who had succeeded to Bagaza in September 1987, lost to Melchior Ndadaye. Ndadaye was the first civilian to lead the country since the proclamation of the First Republic in 1966. He was sworn in on 10 July 1993. However, three months later, he was assassinated and the country was plunged into an unprecedented political mayhem that claimed tens of thousands of lives.

The poor macroeconomic performance of the country during the last few years is a reflection this political situation. Civil war has destroyed infrastructure and disrupted production. Almost all Burundi's partners have left the country. The World Bank and IMF have substantially reduced their activities in Burundi. According to available information

on this period, it is clear that the economy has faced very difficult times. For example, from 1992 to 1995, there was a 16.5 percent decrease in GDP. In 1994, inflation was estimated at 14.9 percent; it grew to 19.3 in 1995. Net foreign currency reserves, which stood at US$ 157.6 million (8.8 months of imports) at the end of 1995, had shrunk to US$ 49 million (2 months of imports) at the end of 1996. During these years, net fixed capital formation was estimated to be negative. This means the economy was unable to maintain the existing stock of capital and meet the cost of depreciation. The imposition of a total economic blockade on the country by its neighbors in July 1996 came to worsen this fragile situation.

3.3. Burundi's Monetary History and Recent Exchange Rate Policies [25]

Until 1960, Burundi, Rwanda, Congo (current Zaire) formed an economic union. Their monetary unit was the Congolese franc, with an exchange value on a par with the Belgian franc. After Congo's independence in 1960, its economic union with its two neighbors ended. However, Burundi and Rwanda maintained the union and a new monetary unit, the Rwanda-Burundi franc, was introduced. It was issued by the "Banque d'Emission du Rwanda et du Burundi", with an exchange rate of 50 francs per US$. This monetary union survived after the independence of these two countries in 1962 but lasted only until 1963.

Disagreements emerged between the two countries on monetary management, mainly due to divergence on budget policies and on the then dual exchange rate and price

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[25]/ *Information in this section is based on Pick's Currency Yearbook, different issues; and unpublished data from the Central Bank.*

control policies [26]. On December 31, 1963, Rwanda announced the end of the monetary union. As a result, Burundi's Central Bank was officially established on May 19, 1964, the official date of dissolution of the Union. The Burundi Franc replaced the Rwanda-Burundi Franc and maintained the link with the Belgian Franc. The official exchange rate remained BIF 50 per US$, the same par value as the Belgian franc. Burundi's Central Bank, the Bank of the Kingdom of Burundi which later became the Bank of the Republic of Burundi (BRB), was responsible, for the monetary policy of the country.

A multiple exchange rate system governed the new Burundi franc. It consisted of the official rate of BIF 50 per US$ and a free market rate of 117.00 per dollar as well as effective selling rates of BIF 52.50; BIF 60.00 and BIF 122.85 per US$, based on exchange taxes of 5 and 20 percent. On January 26, 1965, the link to the Belgian Franc was terminated. As a result, an initial par value of BIF 87.50 per US$ was established, translating in a 42.9 percent devaluation in terms of gold. On February 11, 1965, the multiple exchange rate structure was terminated. All transactions had to take place within prescribed margins of the new official rate.

After five years of relative stability, the Burundi Franc entered a period of turbulence. On April 21, 1970, the Burundi Franc was pegged to the US$ with no change in parity. Subsequently, the decision to float the US dollar on 15 August 1971 did not affect the parity of the Burundi Franc, resulting in a de facto devaluation. As a result, on December 18, 1971, following the US dollar devaluation, the Burundi Franc's theoretical gold content was reduced by 7.89 percent, retaining the official rate of BIF 87.50 to the US$. On November 2, 1972, the Burundi Franc's devaluation a year earlier became official.

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[26] *This is detailed in later developments.*

On February 20, 1973, following the second depreciation of the US Dollar after the 1971 decision to float the currency, the official rate appreciated from Fb 87.50 to 78.75; this was due to the Burundi Franc's unchanged gold content. Later, on May 3, 1976, the gold content of the Burundi Franc was reduced by 12.5 percent. As a result, a new official rate of BIF 90.00 per US$ was established.

More than seven years of exchange rate stability followed this period until November 23, 1983 when Burundi franc's peg to the US$ was terminated. The US$ was replaced by the IMF's SDR (Special Drawing Rights). The exchange rate was BIF 122.70 per SDR. This resulted in the establishment of a controlled floating effective rate system for the Burundi franc. On July 10, 1986, the Burundi franc was devalued by 13 percent to BIF 141.00 per SDR. Subsequently, it was devalued in several stages and by the end of 1987, it stood at 201.00 per SDR. These successive devaluations of the currency went on. By the end of 1991, the exchange rate was equivalent to BIF 181.51 per US dollar and BIF 273.1 per SDR. Therefore, between 1970 and 1991, Burundi had a system of fixed exchange rates, the national currency being pegged to the US$ until 1983 and then to the SDR. The main criticism to this policy is that the rate of exchange was determined on the basis of developments not in the country itself but in developed countries, particularly in the United States [27].

In the course of 1991, the Burundi franc terminated its peg to the SDR. The peg switched to a basket of a number of currencies. This was in response to the limitations that had been observed during the previous years. The current regime may be termed as

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27/ *This was not only true for the period between 1970 to 1983 when the currency was pegged to the US$ but also during the subsequent period until 1991 taking into consideration the fact that the weight of the US$ in the SDR is approximately 42 percent.*

a "dirty float" which is characterized by government intervention from time to time (devaluations) but with allowance for variations in the value of the currency. This system of flexible exchange rates accommodates periodical adjustments which reflect not only changing underlying economic conditions in the national economy but also exchange rates and inflation differentials in Burundi's trade partners' economies. For 1996, the average rate of exchange was BIF 322.35 to the US$. Currently, exchange rates for 19 currencies are daily quoted by the Central Bank on the basis of the BIF/SDR rate.

Before the implementation of the new measures taken in the framework of SAP, the Central Bank was the instrument by which the Government administered its monetary policies. Its main role was to issue currency, control foreign exchange allocation and discount operations. Only the Central Bank could authorize payments abroad and receive foreign currency from abroad. This policy was characterized by the use of exchange restrictions in an attempt to reduce the foreign trade deficits and to prevent deterioration of the value of the national currency. The residents could not own foreign currency or foreign securities, nor maintain foreign bank balances abroad. Foreign exchange was allocated on a case-to-case basis, whether for travel, remittances or merchandise imports. Even commercial banks were prohibited to deal in foreign currency and they were required to apply to the Central Bank to make any payment abroad. Exports required prior licence and the proceeds had to be surrendered to an authorized bank within a specified time limit after appropriation. Only gold exporters were exempted from the surrender requirement. With respect to the status of non-residents, they could remit a fixed percentage of their net annual income after taxes. However, conditions were imposed on these capital transfers.

Sensible relaxation of the system of exchange rate has been recorded during the recent years, especially within the context of the structural adjustment program. From the launching of SAP in 1986, Burundi has gone a long way in terms of exchange rate liberalization. The most important reforms of Burundi's exchange system were undertaken in 1992 when a system of Open General Licence (OGL) was adopted for imports and exports, as well as the freedom accorded to commercial banks in the purchase and sale of foreign currency. As a result of these reforms, the balance of payments' current account is now totally liberalized. Non-residents may transfer up to 70 percent of their salaries (80 percent if they are exporters of non-traditional products), while 100 percent of their dividends and net profits are freely transferable. The compulsory declaration of foreign currency carried by individuals entering the country has been abolished. There are no more limitations on the number of business trips allowed per year, and the daily allowance given in hard currency has been raised from US$ 165 to 200 for all types of businesses except for exporters of non-traditional goods who are entitled to up to US$ 250. In addition, Burundi nationals residing abroad can now open foreign currency accounts in Burundian banks.

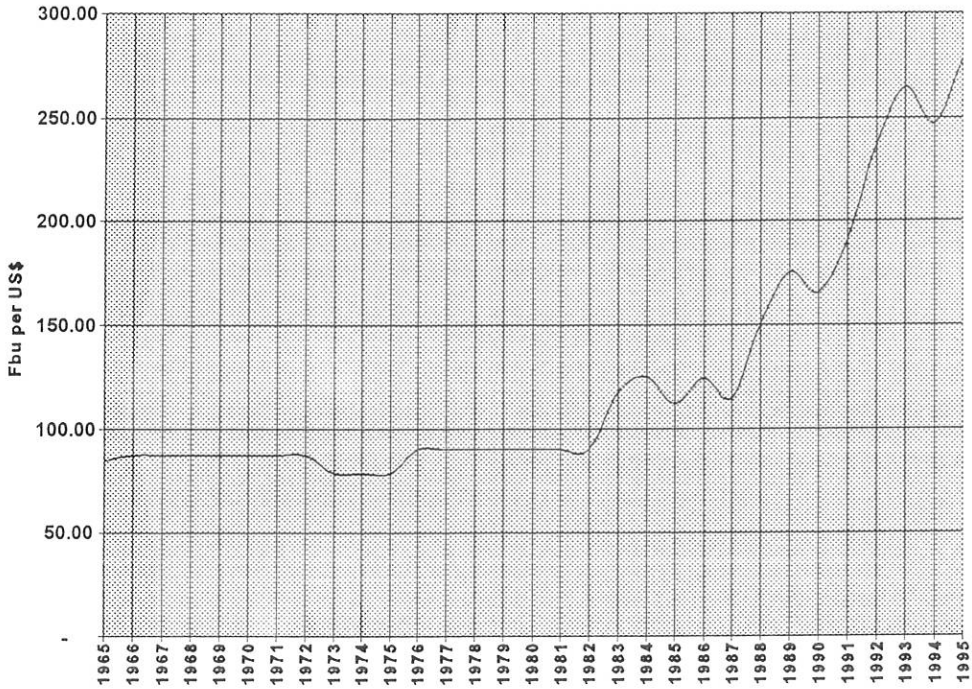
Since May 1992, commercial banks intervene in the management of foreign currency, both on the local and foreign markets. They freely determine exchange rates for foreign currency, provided the rates are within the limits set by the Central Bank. Moreover, the 0.3 percent exchange fee that used to be levied by the Central Bank on every sale and purchase of foreign currency has been abolished. In addition, as developed in the next section, exchange rate-related control measures regarding the external trade sector have been either completely removed or substantially relaxed. Among the most recent measures taken was the November 1995 decision to allow "pure" tourists, namely

those travelers who are neither on official nor on private mission, to have access to foreign currency at the official rate.

It should, however, be noted that these positive developments have not completely removed exchange controls in Burundi. Some imperfections are still hindering the free operation of the exchange system. They include the following: involvement of commercial banks in the management of foreign currency is limited by the fact that they are required to sell to the central bank their foreign currency holdings as soon as the latter exceed 10 percent of the banks' capital. Furthermore, the processing of the licences by commercial banks does not benefit them as the 1 percent fee on FOB value charged per licence is still cashed by the Central Bank. Moreover, the amount of foreign currency to be held by nationals is still limited to 30 percent of non-traditional export earnings. This shows that the management of foreign exchange is still under strict control of the Central Bank.

Historical developments in the official exchange rate are summarized in the following chart.

Chart 4: Official Exchange rate



3.4. Foreign Trade Sector Management

There are two main instruments applied to manage the foreign trade sector: trade-related and exchange rate-related policies. Since the latter have already been exposed in the preceding section, the following section focuses only on trade-related policies.

Until recently, before the implementation of the liberalization measures within SAP framework, trade restrictions were used as a strategy for the management of the external sector. Through the licensing system, importers of "essential products" were able to buy foreign currency at a cheaper official rate while those importing "non-essential products" purchased their hard currency at a higher price from the parallel market. The categorization of products between essential and non-essential was the discretion of the Central Bank. The actual effect of this policy was contrary to the intended results. Because of the rationing of foreign currency and the discrimination between these two categories of products, imported goods became scarce and prices tended to rise.

This outcome was contrary to the pursued objective of granting foreign currency at a cheaper price for essential imports to guarantee low consumer prices for the latter. This logical thinking was undermined by rent-seeking of officials and the optimization behavior of the importers who tended to over-invoice their imports, shifting part of the resources to speculative activities. In addition, as exporters were required to surrender the proceeds from their sales at the low official rate to make them available for importers of essential goods, they were subsidizing importers. This discouraged the development of the export sector in Burundi. To circumvent this, exporters tended to smuggle their exports, by under-invoicing, among others. Taxes, especially on imports, were also used, to regulate external trade in the country.

In view of the distortions introduced by these policies in the economy, one of the objectives of the structural adjustment program was to liberalize the external trade sector in order to increase exportable production and rely on market forces rather than government regulations. A number of measures have been indeed initiated in this respect. Following are some examples of policy changes that have occurred: (i) suppression of state monopoly on the export of a number of cash crops such as coffee, tea, cotton and rice; this measure is yet to be fully implemented; (ii) all imports of goods and non-factor services have been liberalized and requests for foreign currency are honored upon presentation of an import declaration which has replaced the import license. An open general licence was also introduced in May 1992. As a result of these trade liberalization measures, the number of licensed importers in the country grew from 145 in 1985 to 400 in 1991; (iii) the fact that the import licence has been replaced by an import declaration is also an important improvement. The declaration is just for information and statistic purposes only and not an import control device; (iv) the 1 percent administrative tax on imports of fuel was suppressed on 2 March 1993; (v) the conditions for surrendering to the Central Bank foreign currency proceeds from non-traditional exports have been made more flexible. For instance, exporters of such products are allowed to open foreign currency accounts and keep 30 percent of their export earnings in hard currency; (vi) coffee exporters have been allowed to borrow money in hard currency in order to cover their transactions against the risk of exchange fluctuations.

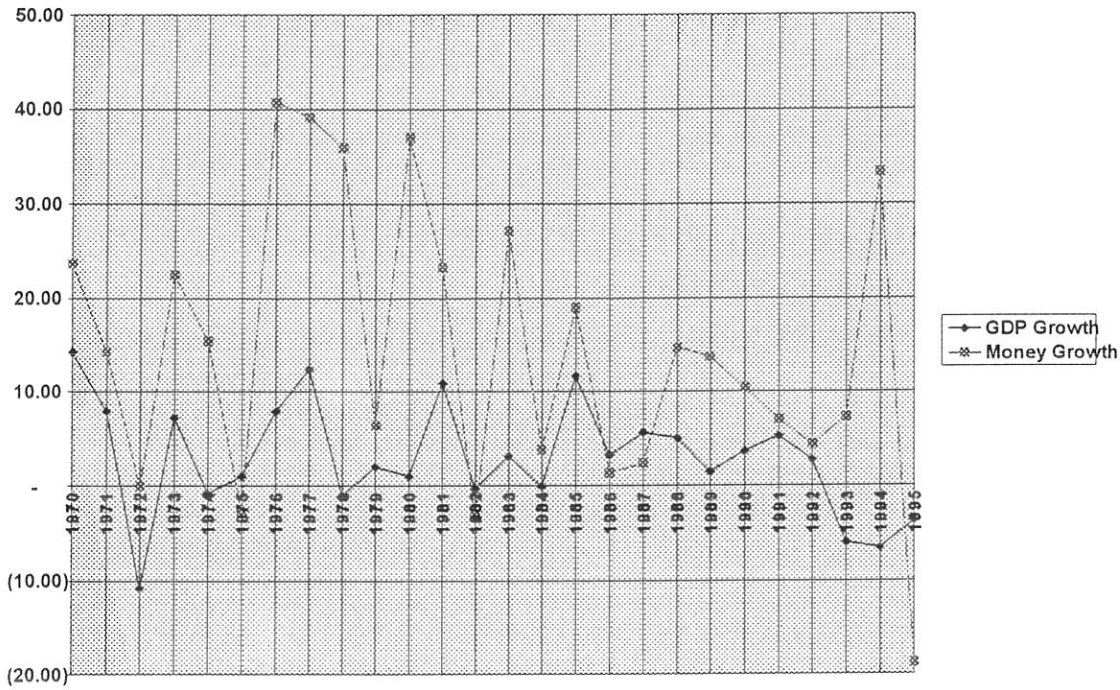
3.5. Money Supply and Credit

Like in other sectors, the monetary policy of the different Governments in Burundi was a reflection of the state control philosophy that prevailed in the country for long years. For instance, until August 1986, it was the Central Bank which determined the lending

rate, deposit rate and the discount rate. It also imposed a heavy regulation on credit allocation to domestic private sector by commercial banks. It is through this process that money supply was managed.

Acting as the financier of the Government, the Central Bank has been called upon to finance the chronic budget and balance-of-payments deficits. This was particularly the case in the 1960s. For example, between January 1964 and January 1965, money supply increased by 64.5 percent in order to cater for Government's needs. However, since the early 1980s, the situation has improved. There have not been very large discrepancies between the increase in broad money and GDP, except in the last few years during the socio-political crisis. The following chart compares the rates of money growth and GDP growth.

Chart 5: GDP and Money Growth



For many years before liberalization of the monetary sector, banks in Burundi were characterized by over-liquidity and negative real interest rates. The objective of SAP reforms in the sector was not only to promote resource mobilization through positive real interest rates, but also to reduce inflation and balance-of-payments deficits. The strategy to be pursued was to control money supply through a substantial decrease in the credit to government and an increase in the credit to the private sector. This was based on the fact that credit to government, which was mainly absorbed by big public enterprises, had been crowding out the amount of credit available for the private sector. In 1986, the credit to the economy fell by 2.6 percent. A year later, in 1987, it picked up and increased by an average annual rate of 7.8 percent between 1987 and 1991. This increase was the result of additional credit to the private sector during the period. However, the ratio of money supply to GDP remained stable between 1986 and 1991; this conservative policy helped maintain inflation low during the second half of the 1980s. Determination of interest rates was progressively freed, based on the monthly auctions of treasury bills since 1988. As a result, real interest rates were globally positive towards the end of the 1980s and the beginning of 1990s.

A number of additional measures have been adopted during the past few years to liberalize further the monetary sector and make it more flexible. The following are illustrations of this notable improvement. Currently: (i) the Central Bank determines only its lending rate to financial institutions. Since May 1993, this rate has been set at 10 percent; (ii) deposit and lending rates are determined according to demand and supply and there is competition among financial institutions; (iii) the rates of legal reserves, which used to differ according to the term of the deposit (5 percent for long-term and 10 percent for short-term) have been unified at 7.5 percent. As a result, the World Bank (1994), quoting

an IMF source, acknowledges that most bank deposit rates and loans are now "proximately determined by market conditions".

However, the deep political and economic crisis prevailing in the country since October 1993 has negatively affected the economy. Money supply increased from BIF 36.1 billion in 1992 to BIF 52.3 billion in 1994, driving inflation upwards. In 1996, money supply declined to BIF 41.4 billion from BIF 50.6 billion in 1995. The credit to the private sector followed the same patterns. It increased to BIF 51.1 billion in 1994 from BIF 42.2 billion in 1992. In 1996, it was estimated to have declined to BIF 35.8 billion from BIF 48.9 billion in 1995. On the contrary, net credit to Government skyrocketed from BIF 0.6 billion in 1992 to BIF 7 billion in 1996, due most probably to increases in military spending. Another example illustrating this crisis economy is that currently, treasury certificates have negative real interest rates (12 points below the inflation rate). This situation may lead to a collapse of the treasury bill market since, as a principle, the latter should never yield negative interest rates. Detailed discussions of economies in similar situations could be found in Alimamy (1996) who, analyzing the case of Sierra Leone, provided interesting insights into the characteristics of a war-torn economy. Trends in money supply and interest rates are shown in the next two charts.

Chart 6: Money Supply

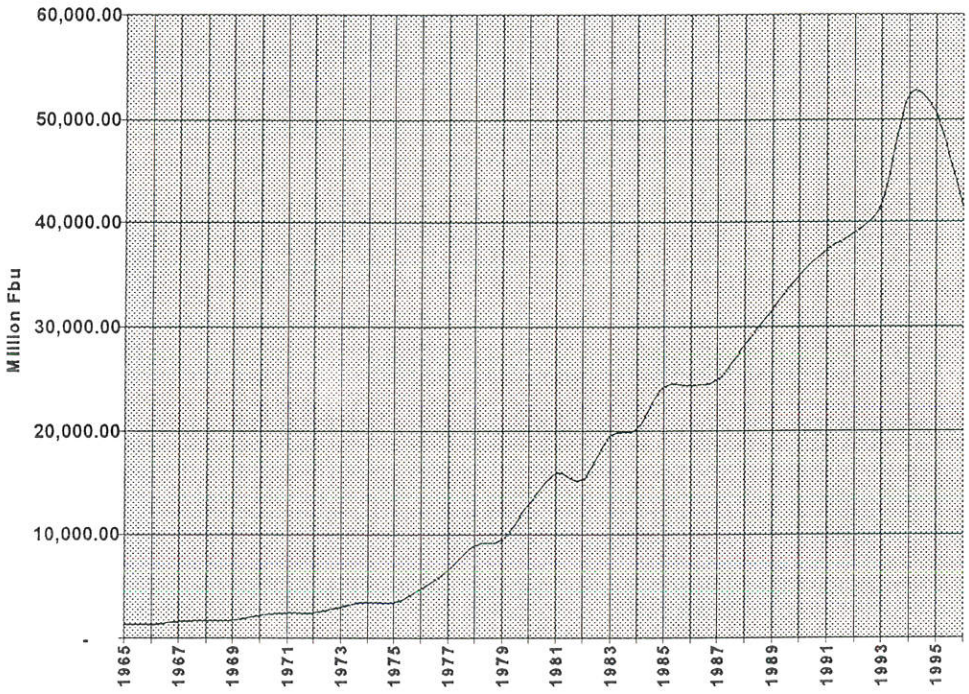
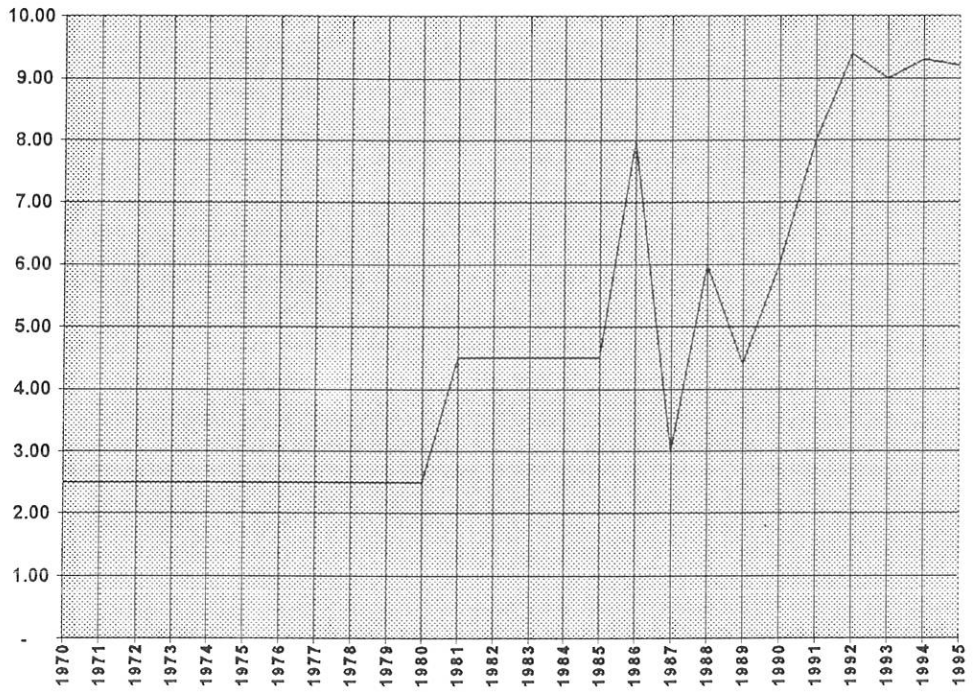


Chart 7: Interest Rates



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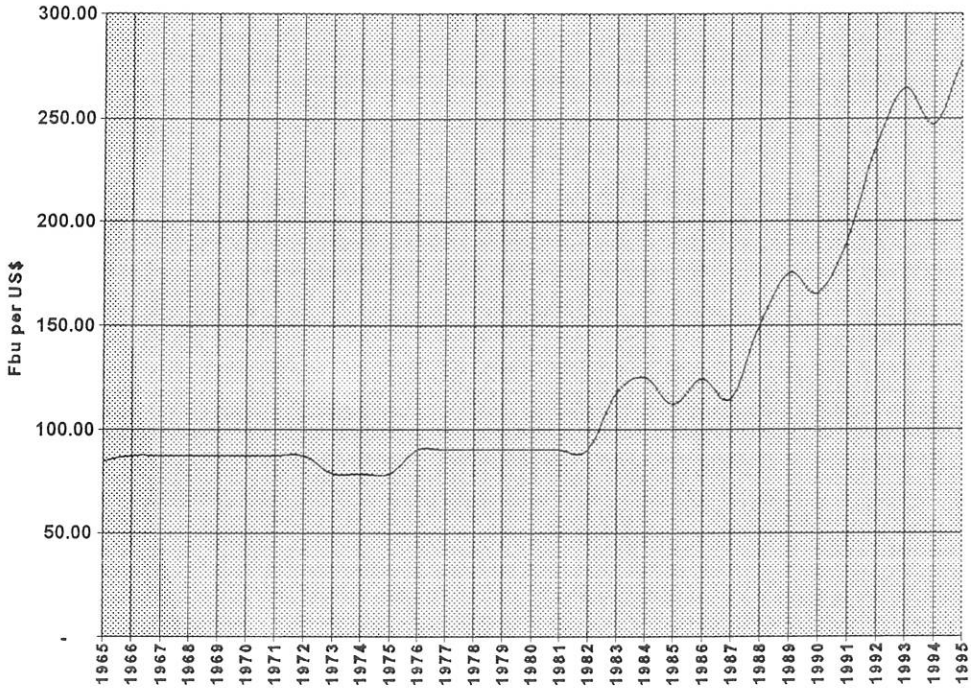

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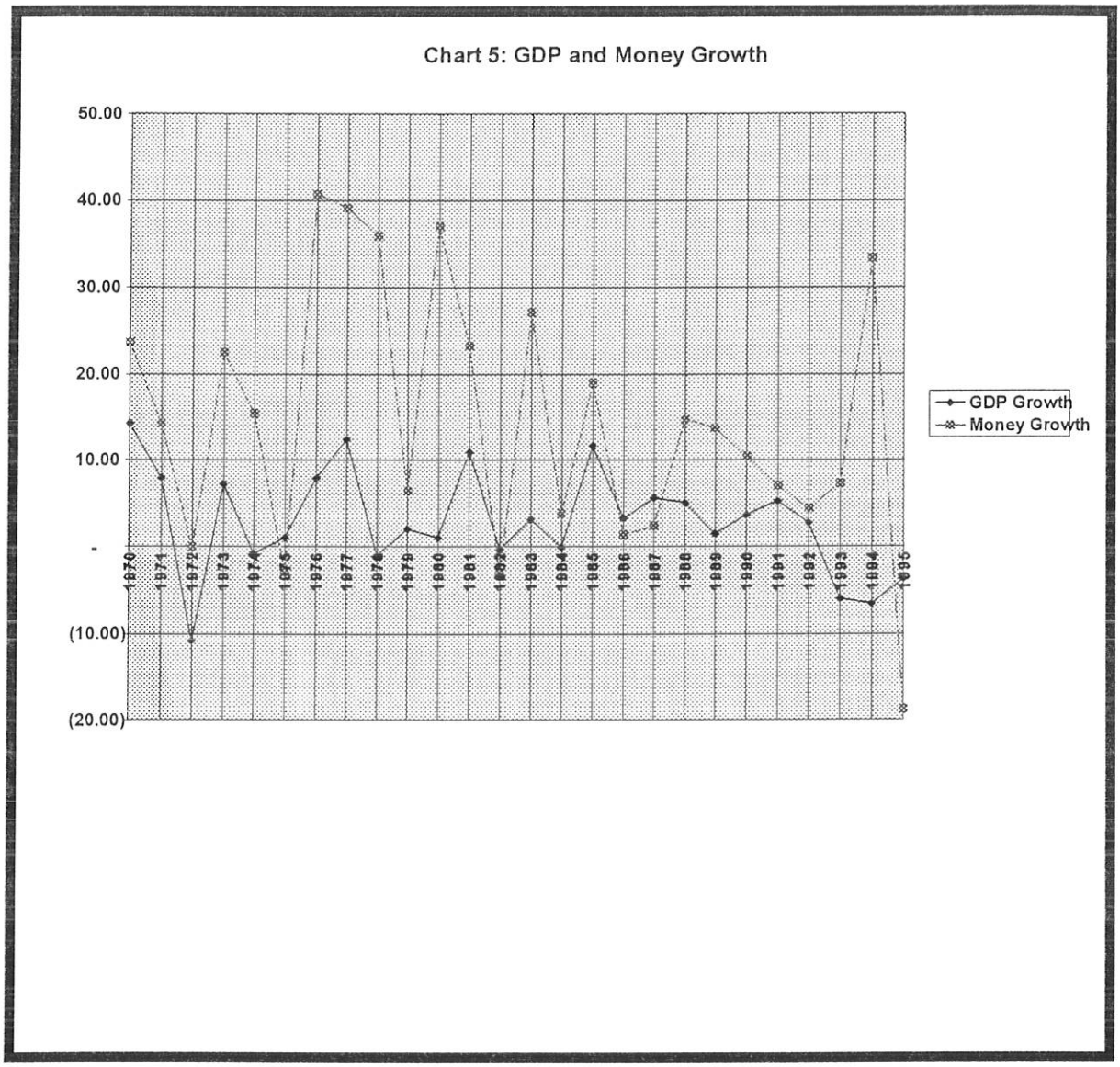


Chart 5: GDP and Money Growth
50.00
40.00
30.00
20.00
10.00
-
(10.00)
(20.00)
GDP Growth
Money Growth

For many years before liberalization of the monetary sector, banks in Burundi were characterized by over-liquidity and negative real interest rates. The objective of SAP reforms in the sector was not only to promote resource mobilization through positive real interest rates, but also to reduce inflation and balance-of-payments deficits. The strategy to be pursued was to control money supply through a substantial decrease in the credit to government and an increase in the credit to the private sector. This was based on the fact that credit to government, which was mainly absorbed by big public enterprises, had been crowding out the amount of credit available for the private sector. In 1986, the credit to the economy fell by 2.6 percent. A year later, in 1987, it picked up and increased by an average annual rate of 7.8 percent between 1987 and 1991. This increase was the result of additional credit to the private sector during the period. However, the ratio of money supply to GDP remained stable between 1986 and 1991; this conservative policy helped maintain inflation low during the second half of the 1980s. Determination of interest rates was progressively freed, based on the monthly auctions of treasury bills since 1988. As a result, real interest rates were globally positive towards the end of the 1980s and the beginning of 1990s.

A number of additional measures have been adopted during the past few years to liberalize further the monetary sector and make it more flexible. The following are illustrations of this notable improvement. Currently: (i) the Central Bank determines only its lending rate to financial institutions. Since May 1993, this rate has been set at 10 percent; (ii) deposit and lending rates are determined according to demand and supply and there is competition among financial institutions; (iii) the rates of legal reserves, which used to differ according to the term of the deposit (5 percent for long-term and 10 percent for short-term) have been unified at 7.5 percent. As a result, the World Bank (1994), quoting

an IMF source, acknowledges that most bank deposit rates and loans are now "proximately determined by market conditions".

However, the deep political and economic crisis prevailing in the country since October 1993 has negatively affected the economy. Money supply increased from BIF 36.1 billion in 1992 to BIF 52.3 billion in 1994, driving inflation upwards. In 1996, money supply declined to BIF 41.4 billion from BIF 50.6 billion in 1995. The credit to the private sector followed the same patterns. It increased to BIF 51.1 billion in 1994 from BIF 42.2 billion in 1992. In 1996, it was estimated to have declined to BIF 35.8 billion from BIF 48.9 billion in 1995. On the contrary, net credit to Government skyrocketed from BIF 0.6 billion in 1992 to BIF 7 billion in 1996, due most probably to increases in military spending. Another example illustrating this crisis economy is that currently, treasury certificates have negative real interest rates (12 points below the inflation rate). This situation may lead to a collapse of the treasury bill market since, as a principle, the latter should never yield negative interest rates. Detailed discussions of economies in similar situations could be found in Alimamy (1996) who, analyzing the case of Sierra Leone, provided interesting insights into the characteristics of a war-torn economy. Trends in money supply and interest rates are shown in the next two charts.

Chart 6: Money Supply

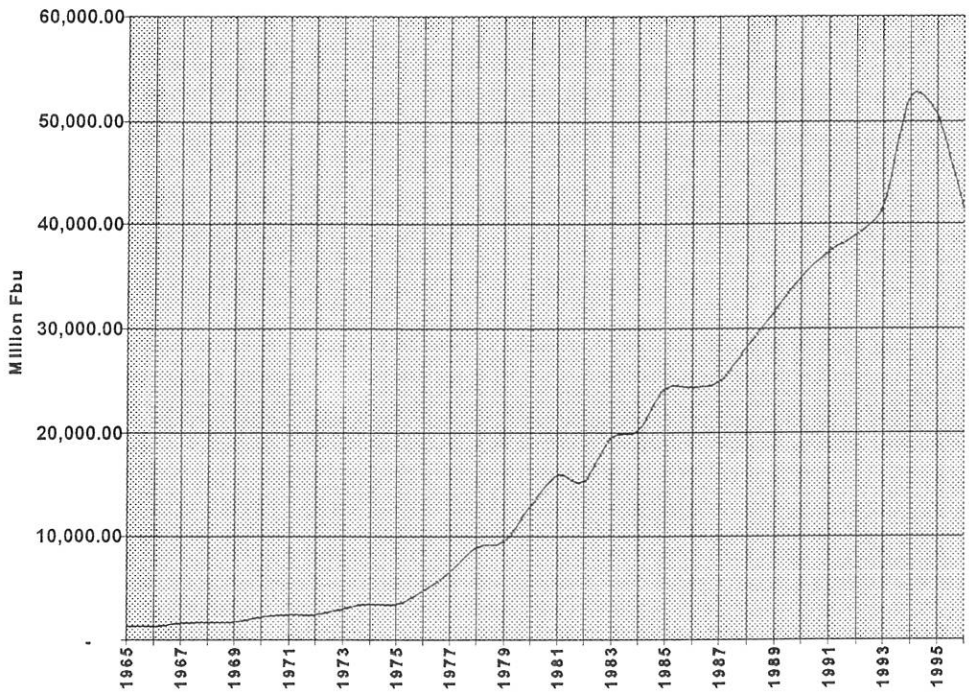
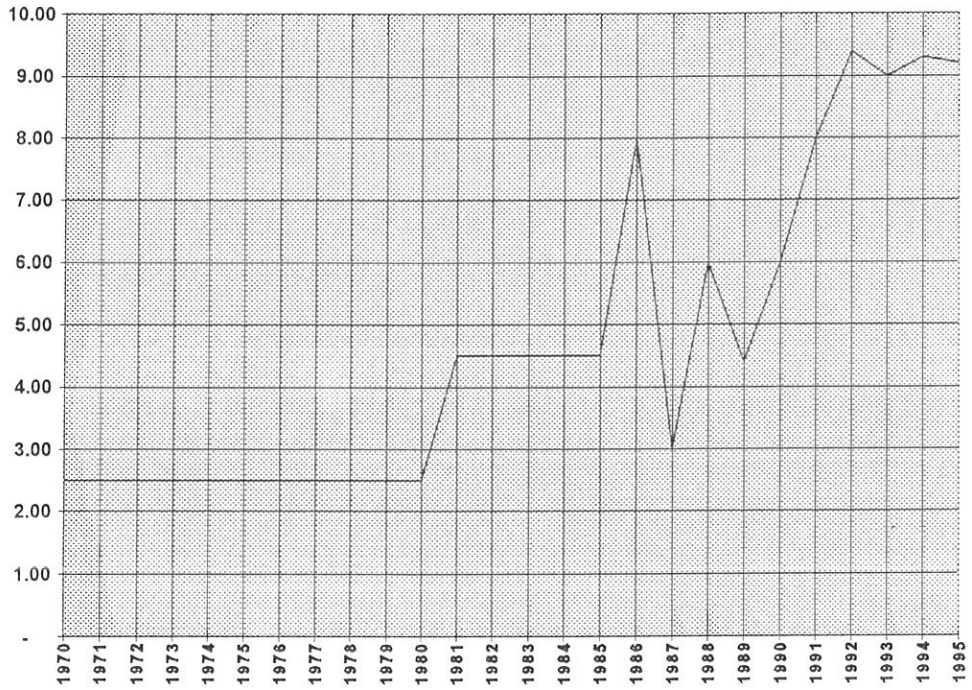


Chart 7: Interest Rates



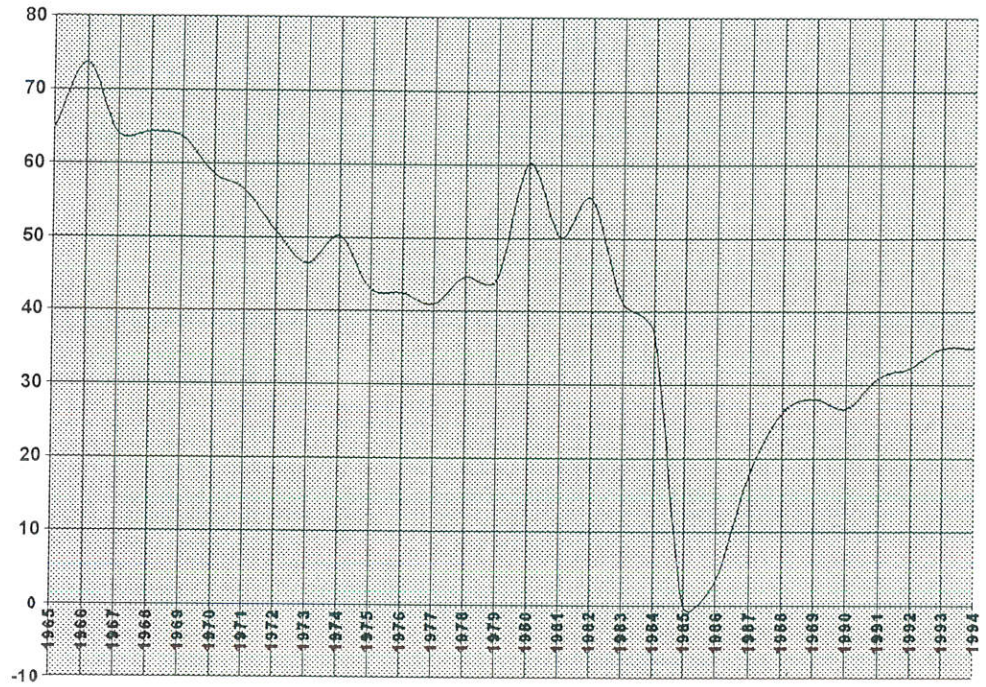
3.6. Development of Parallel Markets in Burundi

In Burundi, parallel market activities, though not officially recognized, have existed for both current and capital account transactions. Notwithstanding its importance in the country, the parallel market for foreign exchange in Burundi has never been the subject of any analytical study. In fact, research in the area of parallel markets in Burundi is scanty and it is difficult to know exactly how these markets started and evolved over time. This section, using a variety of information, attempts to narrow this gap in knowledge.

Before the policy changes that were launched in 1986 in the framework of the structural adjustment program, Burundi had a relatively controlled economy. Government's regulations in most sectors of the economy were a general case rather than an exception. In addition, the discriminatory allocation of scarce resources in favor of inefficient public enterprises was crowding out resources available for the private sector. The rent seeking behavior of Government agents and the inefficiencies usually associated with government managed economies resulted in important transactions on the parallel markets. According to calculations [28] computed on the basis of a model used for Ghana (May, 1985) and Tanzania (Maliyamkono and Bagachwa, 1992), with data covering the period 1965 to 1994 parallel market activities in Burundi were as important as more than 70 percent of GDP in the mid-1960s and around 30 percent in 1994, taking 1985 as base year, as illustrated in the following chart.

28/ *These results should be treated as rough estimates due to the limitations of the model used (see Appendix 1 for more on this). Nevertheless, they give a good indication of the presence and extent of the parallel market in Burundi's economy.*

Chart 8: Parallel market as Percentage of GDP



With respect to the specific case of the parallel market for foreign exchange in Burundi, it is very difficult to trace its origin as this area has not been researched before. However, based on the analysis of the evolution of the economy since the country's independence in 1962, some indications suggest that this market was a result of the changes in the Burundian monetary system and ensuing policies after the end of the country's economic union with Congo (currently Zaire) in 1960 and Rwanda in 1963.

Before 1960, owing to the economic union between Congo, Rwanda and Burundi, Congo was an important export market for Burundi. The political and economic crises that erupted in Congo from 1960 onwards had far-reaching consequences on Burundi's economy. It entered an era of balance-of-payments and fiscal deficits, coupled with monetary difficulties. For the first time in Burundi's economic history, as McDonald et al. (1969) note, exchange restrictions were used to reduce the foreign trade deficit and to prevent the deterioration of the value of the currency. In the same connection, import restrictions were instituted and a system of dual exchange rates appeared in the economy. Foreign exchange for the importation of goods falling into the category of "non-essential products" was acquired at rates higher than those applied to the category of "essential goods". Whereas foreign exchange for the second category was provided by the official market, that for the first category was available in what was called the free market. In 1963, this rate was BIF 100 per US$, compared to a rate of BIF 50 per US$ applied to the imports of essential goods.

Other factors leading to the existence of parallel markets also appeared at that same period. As exporters were required to surrender their export earnings to the Government in exchange of Burundian francs at a rate lower than the market rate, exporters resorted to smuggling to avoid exchange losses. For example, large quantities of coffee were

exported through illegal networks to avoid both the export taxes and the compulsory surrender of export proceedings to monetary authorities. In addition, foreign visitors were more attracted by the higher rates of the free market.

Because cash crop producers received less for their production (because they were paid according to the official rate) while paying more for buying imported consumer goods, production was discouraged. Production of exported goods declined in 1963, causing a decrease in the supply of foreign currency and compounding the problem of rationing. In February 1965, the BIF was devalued under the advice of IMF experts and monetary reforms were also implemented. Among others, the quantitative restrictions on imports and the dual exchange rate system were abolished. This led indeed to a market regulated economy. By the late 1960s, as a result, the economy displayed better macroeconomic variables.

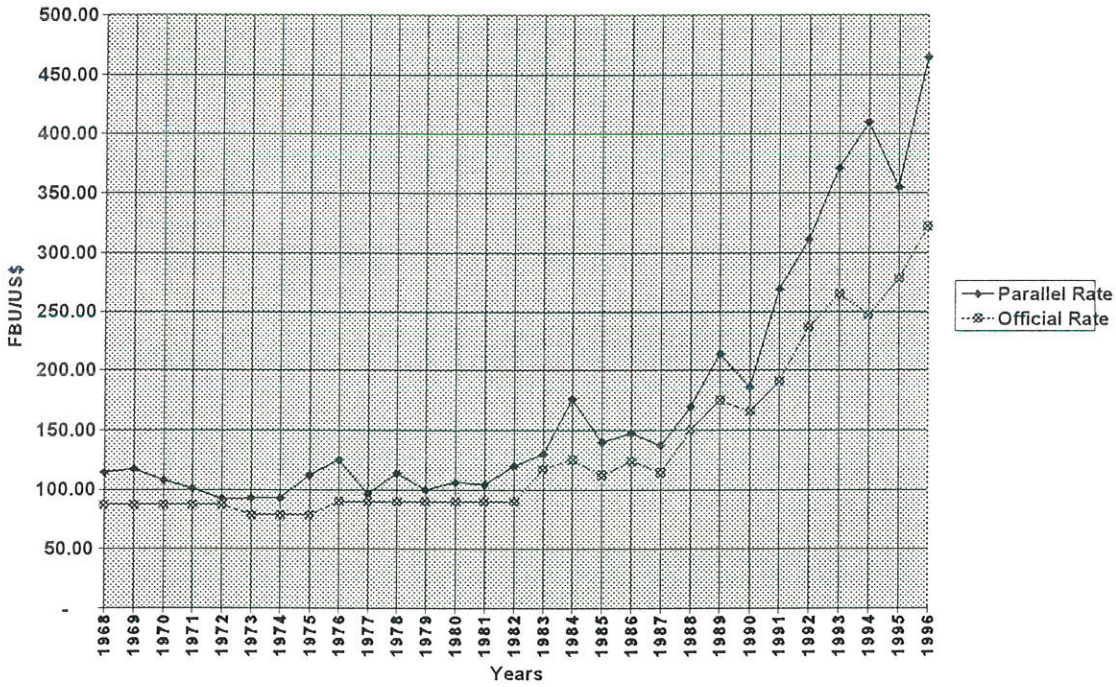
However, this economic stability did not last long. From the early 1970s onwards, Burundi's economy failed to absorb the shocks emanating from international markets, such as the oil shocks of the 1970s and early 1980s, and the collapse of international commodity markets. Exchange restrictions and other controls were adopted again as an economic management tool to counter the impact of the shocks on the economy. This was most apparent in the mid-1970s and went hand in hand with the development of parallel markets. Up to the implementation of the relevant SAP measures, the different policies applied did not address directly the issue of parallel markets. Until now, it is surprising to note that, despite the well known distortionary effect of parallel markets on the economy, this problem has not been successfully tackled; exchange controls are still in vigor and parallel markets are still active in the country. This is one of the reasons why the measures put in place to restructure and stabilize the economy have not had their full impact.

Currently, the parallel market for foreign exchange in Burundi is mainly supplied by the following sources: trade of gold; export under-invoicing; import over-invoicing; export smuggling; foreign tourists; expatriates working in Burundi; remittances from Burundians residing abroad; and, savings from mission allowances of residents coming back from official or private missions abroad. It seems, however, that over all these sources, trade of gold is by far the main supplier of the parallel foreign exchange. A study undertaken by the "Secrétariat Permanent du Comité de Suivi du Programme d'Ajustement Structurel" over the period 1986 to 1993 shows that export revenue from sales of gold was, on average, higher than that from coffee. This situation is due to the fact that, as already stated, transactions on gold in the country are essentially carried out in hard currency and exporters of gold are not required to surrender their export income to the Central Bank.

The sale and purchase of foreign currency in the parallel market take place in public places, mainly in the vicinity of the central market in Bujumbura. Although the United States dollar notes are the most widely exchanged currency on the market, others such as the French franc, the Belgian franc and, to a lesser extent, the German Deutsche Mark, are also exchanged. Currencies from the neighboring countries such as the Kenyan Shilling, the Ugandan Shilling, the Tanzanian shilling and the Rwandese franc are also available. Everyone in Bujumbura knows where to go to purchase or sell foreign currency on the parallel market. From the importer to the tourist who intends to travel; from the civil servant coming back from an official trip to the foreigner coming to Burundi for leisure or for business, the parallel market is the common place where the needs of each of these individuals or institutions are satisfied. Due to the very nature of this market, it is extremely difficult to estimate the amount of foreign currency traded on the parallel market. According to some sources, US$ 200,000 are traded daily on the market, the scale of variation being between US$ 100,000 and US$ 500,000.

With this in mind, the question arises why the authorities have tended to ignore the existence of parallel markets in their policies and have so far failed to do away with these distorting market practices. So far, the parallel market has been characterized by a relatively high premium, as shown in chart 9 which compares the official and parallel market rates.

Chart 9: Parallel and Official Rates



4. METHODOLOGY OF THE STUDY

Taking into account the nature of data to be used, analyzes in this study are based on time series Econometrics. Three models are empirically applied to investigate the problem of parallel markets for foreign currency. The first model aims at finding out whether the parallel market for foreign exchange is efficient or not. If the analysis confirms that the parallel rate follows a random walk, the meaning will be that the rate process has a permanent memory, reflecting an efficient market (Dowla, 1995). Determination of the parallel market rate relies on a simultaneous equation model (Gyimah-Brempong, 1992). The preference for this model as opposed to a single equation approach has already been elucidated. In determining the level of the premium, the cointegration technique allows to conclude whether we have stable relationships between the premium and its determinants. Moreover an Error-Correction Mechanism (ECM) makes it possible to distinguish between short-run and long-run dynamics of the premium and its determinants in the model.

4.1. Market efficiency

As stated earlier, this paper uses the random walk model to test the efficiency of the parallel market for foreign exchange. To reduce dependency on a single measure, three different tests are applied: (i) the Ljung-Box test; (ii) the Dickey-Fuller (DF) test and; (iii) the Augmented Dickey-Fuller (ADF) test.

4.1.1.1. The Ljung-Box Test

The Ljung-Box method is used to test the white noise property of the residuals from equation (1). Analyzing the variance of the residuals, it tests for the absence of significant residual autocorrelation. In other words, the Ljung-Box test is used to test the following null hypothesis:

$$\text{Ho: } \varepsilon_t \sim \text{NID } (0,\sigma^2) \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (3)$$

The Ljung-Box test is a modified version of the Box-Pierce or Q-test. The latter is computed as:

$$Q=(T-d)\sum_{i=1}^{k}\rho^2 \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (4)$$

where T is the number of observations; d = the number of times data is differenced to attain stationarity and ρ is the autocorrelation coefficient at lag k. The problem with the Q-statistic computed in this form is that it is very sensitive to the lag process and has rather poor small sample properties. This problem becomes very serious when dealing with models comprising lagged values of the regressand as a regressor [29]. To address this limitation, Box and Ljung proposed a modified Q-statistic, conventionally denoted as Q^*, which takes into consideration the sample size and the number of lags:

$$Q^*=T(T+2)\sum_{i=1}^{k}\frac{\rho^2}{T-k} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (5)$$

29/ *A brief exposition on the problems posed by the presence of lagged values of the dependent variable may be found in Maddala, G S (1992).*

with $Q^* \sim \chi^2$ (k-p-q) under the null hypothesis; where k is the number of lags; p and q are respectively the number of times the series are differenced in order to attain a stationary ARMA representation. If the white noise property is not rejected, the implication is that the market is efficient, according to the weak form EMH.

4.1.1.2. The Dickey-Fuller Test

The Dickey-Fuller equation is a standard econometric test that is used to determine the order of integration of non stationary series [30]. Since the random walk represents the simplest case of an integrated variable, the DF equation can be applied to determine whether the variables under consideration, X_t and X_{t-1} are integrated and what is their order of integration. The objective of the DF test for random walk is to determine whether the order of integration (d) of the variables in equation (1) is equal to one. If $d = 1$, the variable is said to be of unit root or follows a random walk.

Dealing with integrated time series variables presents special econometric methodological problems. In standard econometric modeling, sample moments of the variables under consideration converge to constants as the sample size approaches infinity. This is supported by the Law of Large Numbers (LLN) and the Central Limit Theorem (CLT) (Spanos, 1995). However, LLN and CLT do not apply in the case of time series integrated variables. Sample moments in the latter case do not converge to constants but rather to random variables which are functions of Wiener processes or Brownian motions [31]. In such

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30/ *A series is said to be integrated of order **d** when it has no deterministic component and when it has a stationary ARMA representation after differencing it **d** times, but when it is not stationary after differencing it **d-1** times.*

31/ *Further elaborations on this issue are presented in Appendix 1. Its objective is to briefly outline why econometricians, starting from the 1970s, found it essential to develop a*

a case, the standard distributions used in Econometrics, such as F, t, Z, χ^2 etc. cannot be relied upon any more because they would lead to spurious results. Parameters derived using standard distributions have skewed distributions compared to the normal. This is why Fuller (1976) and Dickey and Fuller (1979) came up with unit root tests and, using Monte-Carlo simulations, generated critical values for DF and ADF statistics which are used in the case of integrated variables (see Cuthbertson et al., 1992).

Based on the following data generating process (DGP),

$$X_t=\beta_0+\beta_1 t+\rho X_{t-1}+\varepsilon_t \quad \ldots\ldots(6)$$

where ϵ_t is white noise, β_0 is the drift and t a time trend, Dickey and Fuller developed a special test to investigate the null hypothesis of non stationarity (Ho: $\rho = 1$) against the alternative hypothesis of stationarity (Ho: $|\rho| < 1$). The test is:

$$\Delta X_t=\beta_0+\beta_1 t+\gamma X_{t-1}+\varepsilon_t \quad \ldots\ldots(7)$$

where ΔX_t represents the value of variable X_t differenced once. Parameters of this equation can be estimated using the standard OLS method. The test for $\rho = 1$ is the same as testing for $\gamma = 0$. This is derived from equation (6). Subtracting X_{t-1} from both sides of equation (6) yields the following:

$$X_t - X_{t-1} = \beta_0 + \beta_1 t + \rho X_{t-1} - X_{t-1} + \varepsilon_t$$

$$\Delta X_t = \beta_0 + \beta_1 t + (\rho - 1) X_{t-1} + \varepsilon_t$$

Taking $\gamma = \rho - 1$

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different methodology for Time Series Econometric modeling.

we get $\Delta X_t = \beta_0 + \beta_1 t + \gamma X_{t-1} + \varepsilon_t$, which is equation (7).

The test is the usual t-statistic but with a non-standard asymptotic distribution whose tabulated values have been specially computed using Monte-Carlo simulations.

4.1.1.3. Augmented Dickey-Fuller

If the residuals are not white noise, the results from the DF test are biased. To have white noise residuals, the DF test is modified by adding to the DF equation lags of the dependent variable. This process yields the so-called augmented Dickey-Fuller test which is also based on the t-ratio on ρ_1 but with the Dickey-Fuller statistics. ADF has the following representation:

$$\Delta X_t = \beta_0 + \beta_1 t + \gamma_1 X_{t-1} + \sum_{i=1}^{k} \gamma_{21} \Delta X_{t-i} + \varepsilon_t \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (8)$$

A number of tests have been developed to determine the optimal number of lags to be added to the DF equation [32]. The tests most commonly used in time series econometric packages are the Akaike Information Criterion (AIC) and the Schwartz Criterion (SC).

$$AIC(P) = Ln\sigma^2 + \frac{2P}{T} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (9)$$

where σ^2 is the variance; P the number of parameters to be estimated and T the number of observations.

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32 *A good exposition and examples on the use of these tests is found in Bourbonnais, R. (1993).*

$$SC(P) = Ln\sigma^2 + \frac{PLnT}{T} \quad \text{.....(10)}$$

where variables are as defined earlier. For each of these criteria, the objective is to get a parsimonious regression or, in other words, the regression that minimizes the value of AIC or SC.

4.2. Determination of the Parallel Rate and the Premium

Three main approaches are usually adopted to investigate and model parallel markets for foreign exchange. Firstly, the "real trade" approach is based on partial equilibrium analysis and considers the parallel market as serving mainly commercial purposes. Secondly, the portfolio balance or currency substitution approach stresses the role of asset composition in the determination of the parallel market exchange rate. Thirdly, the monetary approach emphasizes the role of monetary factors in the behavior of parallel market exchange rates. Most recently, a fourth approach has been developed: it is a cluster of models of dual markets with leakage. This fourth approach has not yet been widely used as the first three models in empirical studies.

The currency substitution and the monetary approaches can be criticized on the grounds that they are based on weak assumptions, at least in the context of most African economies and that of Burundi in particular. Two such assumptions are as follows: the first one is that there is a division of functions between the official and parallel exchange markets, with the former dealing with commercial transactions and the latter with capital transactions. Obviously, as pointed out by Pinto (1990), this assumption is not relevant

to most developing countries where the parallel market deals with both commercial and capital transactions. Besides, research has shown that in most developing countries, parallel markets are more concerned with commercial rather than capital transactions.

The second assumption is that demand for foreign currency on parallel markets is only justified by the need of economic agents to alter the composition of their portfolio of financial assets. In developing countries, this assumption may hold true in some specific situations when agents hold foreign exchange as a secure stock of monetary value especially under conditions of heightened economic or political uncertainty. However, our hypothesis is that this only happens in exceptional circumstances and cannot be treated as the general situation. In any case, based on our knowledge of the situation of the parallel market for foreign exchange in Burundi, we believe that asset composition is not really a significant motive for transacting in the parallel market for foreign exchange in the country.

An important limitation of this second assumption is, therefore, that it ignores the fact that parallel markets not only serve as a way of carrying out international transactions in goods and services, but are also used to finance smuggled imports entering the country as a result of trade restrictions such as tariffs and quotas put in place by government. Therefore, this assumption is not realistic.

In view of the limitations of models based on these assumptions in the analysis of the factors explaining the determination of the parallel rate, the "real trade" approach is found to be more relevant to the case of many African countries in general and Burundi in particular. Indeed, past empirical research on Africa in this area has also privileged this approach.

A number of empirical studies undertaken on the determination of parallel exchange, such as the one by May (1985), have been based on single linear equation models. However, for reasons stated earlier, a single equation model represents poorly the reality of parallel markets. To remedy this problem, recent researchers have developed simultaneous equation models to this end. Following Gyimah-Brempong (1992), the present study uses a simultaneous equation model for the determination of the parallel exchange rate in Burundi.

4.2.1. Determination of the Parallel Rate

The model consists of four equations, namely the parallel rate function, import function, export function and the output function [33]. A dummy variable, ERP, is introduced in the equations to account for important changes in exchange rate regimes.

4.2.1.1. The Parallel Rate Function

$$B_{et} = B_{et} \quad (O_{et}, \Omega, IM^{*}, X, ETT) \ldots\ldots\ldots\ldots\ldots\ldots (11)$$

where B_{et} is the parallel rate; O_{et} the official rate; IM^{*} desired imports; X_o official exports and ETT export taxes. The impact of ETT on the parallel rate is indirect through its effect on official exports. Ω is the expected punishment associated with dealing in parallel markets. It is represented by a dummy variable which takes the value 1 during periods of crackdown and 0 during relaxed periods.

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33 *For the methodological problems associated with the estimation of these functions, see Gyimah-Brempong (1992).*

$\partial B_{et}/\partial IM^{*} > 0$; $\partial B_{et}/\partial X < 0$; whereas $\partial B_{et}/\partial O_{et}$; $\partial B_{et}/\partial \Omega$ and $\partial B_{et}/\partial ERP$ cannot be signed a priori. The functional form of the equation is:

$$B_{et} = \beta_0 + \beta_1 O_{et} + \beta_2 \Omega + \beta_3 IM^{*} + \beta_4 X + \beta_5 B_{et-1} + \beta_6 ERP + \varepsilon_t \quad \ldots\ldots\ldots (12)$$

4.2.1.2. Import Function

$$IM_t = IM\ (Z_e, O_e, \Omega, P_x, P_m, Y) \quad \ldots\ldots\ldots (13)$$

where Z_e is the parallel premium; P_x and P_m are respectively world price of Burundi's exports and world price of Burundi's imports and Y is output represented by GDP. Other variables are as defined earlier. $\partial IM_t/\partial Y > 0$; $\partial IM_t/\partial P_x > 0$; $\partial IM_t/\partial P_m < 0$; $\partial IM_t/\partial O_e < 0$; and $\partial IM_t/\partial Z_e < 0$. Ω cannot be signed a priori for reasons already explained. Put in its functional form, the equation is:

$$IM_t = \gamma_0 + \gamma_1 Z_e + \gamma_2 \Omega + \gamma_3 P_x + \gamma_4 P_m + \gamma_5 Y$$
$$+ \gamma_6 ERP + \gamma_7 IM_{t-1} + \gamma_8 O_e + \varepsilon_t \quad \ldots\ldots\ldots (14)$$

4.2.1.3. Export Function

$$X = X\ (Z_e, IM_{t-1}, P_x, OECDY, ETT, B_e) \quad \ldots\ldots\ldots (15)$$

where OECDY is a variable representing weighted average incomes of OECD countries given by their GNPs. This variable is supposed to represent the demand side of the exports since the bulk of African countries' exports go to OECD countries. In the specific case of

Burundi, however, a closer look at the country's exports and the real reasons behind African countries loss of their export revenues allows to neglect this variable. Burundi's main export is coffee, which represents more than 80 percent of the country's export earnings. Despite its dependency on this single product, Burundi is a marginal exporter of coffee, with less than 0.5 percent of market share. Fortunately, it exports an excellent arabica which is highly demanded to blend other types of coffee. Furthermore, as works on market research have shown, consumers from Europe and North America of tropical beverages such as coffee have not really changed their consumption patterns with respect to these products as a result of economic crises they have gone through. In fact, as the Fraser Report (1990) points out, the global consumption of almost all products of special export interest to Africa has been growing. The real problem has been, as this is clearly shown in the case of coffee by the FAO's SOFA Database (1995), that Africa has lost its market share while its competitors from Asia and Latin America have substantially increased it. What has rather affected Africa's exports, at least for coffee, is mainly lack of competitiveness and other supply side constraints. For these reasons, this study assumes that Burundi's exports have not been affected by the variations in OECD countries income during the period of observation. For comparison purpose, the study by Derrese (1996) on Ethiopia, another country which is heavily dependent on coffee exports to OECD countries, finds that this variable is not only insignificant, but it also comes out with a wrong sign. Based on these reasons, therefore, this variable is not included in the estimated model for the determination of the parallel market exchange rate.

In the above equation, $\partial X/\partial P_x > 0$; $\partial X/\partial IM_{t-1} > 0$; $\partial X/\partial B_e > 0$. On the other hand, $\partial X/\partial Z_e < 0$. Because an increase in P_x increases the profitability of exports, the coefficient of P_x is expected to be positive. In its functional form, the export equation is:

$$X = \delta_0 + \delta_1 Z_e + \delta_2 IM_{t-1} + \delta_3 P_x + \delta_4 ERP + \delta_5 ETT$$

$$+ \delta_6 ETT + \delta_7 B_e + \varepsilon_t \quad \text{..... (16)}$$

4.1.2.1.4. Output Function

$$Y = Y(m^*, Y^*, x^*) \quad \text{..... (17)}$$

where m^* is equal to the growth rate of real money supply in excess of the growth rate of real GNP, representing excess demand for output; Y^* is trend output; and x^* is the growth rate of exports. $\partial Y/\partial m^* > 0$; $\partial Y/\partial Y^* > 0$; $\partial Y/\partial x^* > 0$. Put in its functional form, this equation becomes:

$$\mathbf{Y_t = \theta_0 + \theta_1 m^* + \theta_2 Y^* + \theta_3 Y_{t-1} + \theta_4 ERP + \theta_5 x^* + \varepsilon_t} \quad \text{..... (18)}$$

The system of simultaneous equations is therefore as follows:

$$\mathbf{B_{et} = \beta_0 + \beta_1 O_{et} + \beta_2 \Omega + \beta_3 IM^* + \beta_4 X + \beta_5 B_{et-1} + \beta_6 ERP + \varepsilon_t}$$

$$\mathbf{IM_t = \gamma_0 + \gamma_1 Z_{et} + \gamma_2 \Omega + \gamma_3 P_x + \gamma_4 P_m + \gamma_5 Y + \gamma_6 ERP + \gamma_7 IM_{t-1} + \gamma_8 O_e + \varepsilon_t}$$

$$\mathbf{X = \delta_0 + \delta_1 Z_{et} + \delta_2 IM_{t-1} + \delta_3 P_x + \delta_4 ERP + \delta_5 ETT + \delta_6 B_e + \varepsilon_t}$$

$$\mathbf{Y_t = \theta_0 + \theta_1 m^* + \theta_2 Y^* + \theta_3 Y_{t-1} + \theta_4 ERP + \theta_5 x^* + \varepsilon_t}$$

As noted earlier, ERP is a dummy variable which captures the changes in exchange rate policy. Lagged variables included in the equations provide a dynamic specification.

4.2.2. Determination of the Parallel Market Premium

In the framework of this study, the stock/flow model represents the best approach for the determination of the premium.

The portfolio equilibrium can be written in a dynamic form for the parallel premium as follows:

$$Z_{et} = Z(E^t, Z_{t+1}, M_t/O_{et}, F_t, d^o_t, X^s_t) \quad \text{.....(19)}$$

where: Z_t is parallel market premium; E^t = expectations conditional on information available at time t; M_t/O_{et} = Real money balances; F_t = Foreign assets; d^o_t = interest parity differential; X^s_t is a vector of the other variables affecting the unofficial current account (terms of trade, export and import taxes, and the enforcement effort). $Z_t = B_{et}/O_{et}$; where: B_{et} and O_{et} are as defined earlier.

The assumptions of the model are that:

(i) Individuals demand domestic assets (M) and foreign assets (F) in a proportion determined by the difference between their respective yields, with the interest parity differential defined as:

$$d_t = d^o_t + E_t Z_{t+1} - Z_t \quad \text{.....} \quad (20)$$

(ii) Net capital inflows at the commercial rate are zero and the authorities do not intervene in the parallel market

The difficulty with the estimation of equation (19) is that the stock of foreign assets held by private agents cannot be determined. To circumvent this problem, researchers usually assume rational expectations and build an equation for the parallel premium which is a function of its own lagged values and the other variables present in equation (19) as follows:

$$LnZ_t=\alpha LnZ_{t-1}+\beta(B)'W_t+\varepsilon_t \quad \ldots\ldots(21)$$

where: $W_t = [E_t, M_t/O_{et}, d^o_t, X^f_t, X^s_t]'$ is a vector of the theoretical determinants of Z; B(L) is a vector of polynomials in the lag operator B, and ε_t is a white-noise disturbance term.

Equation (21) can be explicitly written in a linear form since no simultaneity problem is expected:

$$LnZ_t=\alpha_0+\alpha_1 LnO_e+\alpha_2 Ln(M_t/O_{et})+\alpha_3 LnA_t+\alpha_4 LnTOT_t+\alpha_5 LnETT_t$$

$$+\alpha_6 LnITT_t+\alpha_7 LnY_t+\alpha_8 LnZ_{t-1}+\alpha_9 d_t^0+\varepsilon_t \quad \ldots\ldots(22)$$

where $\partial Z_t/\partial O_t > 0$; $\partial Z_t/\partial(M_t/O_t) > 0$; $\partial Z_t/\partial ITT_t > 0$; $\partial Z_t/\partial Y_t > 0$; $\partial Z_t/\partial ETT_t < 0$; $\partial Z_t/\partial A_t$ and $\partial Z_t/\partial TOT_t$ can take either sign. A_d = aid; TOT = terms of trade index; ETT = export tax trade; ITT = import tariff trade; and Y_t = real output. Other variables are as already defined.

Since the premium and its determinants are non-stationary series, as this is confirmed by unit root tests, there is a need to test whether the premium and its determinants are cointegrated. Cointegration of Z_t and the economic fundamentals is a desired property of the model for the following main reasons: first, if the series are cointegrated, the estimated parameters converge at a faster rate to the true parameters than in case of stationary series. This property, called "super-convergence", reduces the problem of simultaneity in the series and decreases the bias due to errors in variables and errors of measurement. Secondly, cointegration is used to test the existence of meaningful steady-state (stable) economic relationships. In other words, cointegration shows that there is a long-run equilibrium between the premium and the fundamentals. Thirdly, whereas standard test statistics cannot be applied in case of integrated variables, cointegration allows to use such test statistics without fearing any spurious results. Fourthly, cointegration makes it possible to have an error correction representation of the model, which helps uncover short-run dynamics.

There are different test procedures for cointegration. The Johansen test produces the best results but is too sophisticated and too costly for the scope of this study. We apply the Granger and Engle two-step procedure [34] which gives good results. The test is performed as follows:

(i) Run OLS of Z_t on its explanatory variables in levels

(ii) Derive the residuals from the OLS results

(iii) Test unit root of the residuals and find out whether they are integrated of order zero or order one, based on the following equation:

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34 *This procedure was developed by Granger and Newbold in 1987.*

$$\Delta\varepsilon_t = \rho\varepsilon_{t-1} + \sum_{i=1}^{k} \gamma_i \Delta\varepsilon_{t-1} + V_t \quad \text{.....(23)}$$

(iv) If $\Delta\varepsilon_t$ is integrated of order zero, it means that the premium and its determinants are cointegrated of order one. Note that the test statistic derived is not a Dickey-Fuller; critical values for this test have been computed by Granger, Yoo and Hendry in 1987. Their critical values are adjusted for the number of regressors because it influences the results of the test.

Whereas the test for cointegration allows to uncover long-run equilibrium relationships, it is important to note that there may be short-run disequilibrium in the model. To have a complete picture of the nature of the relationships between the premium and economic fundamentals, there is a need to test also for short-run dynamics of the behavior of the premium. In doing this, the long-run aspect of the model has to be maintained. The test used is based on the Error Correction Mechanism (ECM) which ties the short-run behavior of Z_t to its long-run value and corrects for disequilibrium. The error term in the cointegrating equation can be seen as the equilibrium error which measures the extent of disequilibrium in the market. The ECM has the following specification:

$$\Delta z_{t+1} = \lambda'\Delta F + \rho RESD_t + u_t \quad \text{..... (24)}$$

where Δ is the symbol denoting first difference; F is the vector of fundamentals; RESD is the residual from the cointegrating equation, representing the empirical estimate of the equilibrium error term; and u_t is the usual disturbance term.

In the above equation, the premium is related to the change in the fundamentals and to the "equilibrating" error in the previous period. The fundamentals capture the short-run disturbances in the premium whereas $RESD_t$, the error correction term, captures the adjustment toward the long-run equilibrium. If ρ is statistically significant, it represents the proportion of the disequilibrium in the premium at time t which is corrected in the next period, at time $t+1$ (Gujarati, 1995).

5.DATA USED AND EMPIRICAL RESULTS

5.1. Nature and Sources of Data

Yearly data is used in these models and cover the period 1970 to 1995. As much as possible, it was collected from IMF and World Bank sources. Other sources were used to complement data from these institutions.

- Data on official exchange rates, imports, exports, growth rate of money as well as broad and narrow money, GDP, CPI index and budget balance were collected from IMF, International Financial Statistics Yearbook, 1996. The official exchange rate is in terms of units of Burundi francs per one US Dollar. The CPI used was computed based on a survey covering Bujumbura civil servants until 1980, and then all Bujumbura households from that year onwards. The basket it is based on is adjusted every ten years to capture changes in consumption patterns.

- Data on aid, export and import taxes were collected from the Ministry of Planning, Economie Burundaise, different issues; Banque de la République du Burundi, Rapport Annuel, different issues; and unpublished statistics of the Ministry of Finance. Aid is represented by the grants to government, excluding technical assistance.

- Data on the Parallel market exchange rates were collected from: World Bank, African Development Indicators, different issues; Pick's Currency Yearbook, different issues, and unpublished sources of the Central Bank.

- Data on interest rates were collected from the IMF, International Financial Statistics 1996, and Banque de la République du Burundi, Rapport Annuel, different issues. Interest rates considered are those applied for one to three-month term deposits.

- Data on terms of trade index, GDP growth, export growth, money in circulation, demand deposits, current account balance, import and export price indices and agriculture output were computed from the World Bank, World Tables, different issues.

- Some statistics for 1994 and 1995 were collected from World Bank, World Debt Tables, 1996; and World Bank, Trends in Development Economies, 1996

- All data, except indices, are in millions of current Burundian francs. Indices are computed using 1987 as base year.

- Capacity output is computed using the following model proposed by Olgun (1984):

$$Y^* = Y_0 e^{gt} + (Y_t^a - Y_0^a e^{rt}) + (M_t - M_0 e^{mt}) \quad \ldots\ldots\ldots\ldots\ldots\ldots (25)$$

where g, r and m are trend growth rates of real GDP, real agricultural output and imports, respectively. The following values for the above coefficients, were calculated by regressing the three variables on time: g = 0.098465; r = 0.031654 and m = 0.11428.

Regarding the variable on desired imports, our assumption is that their level was not significantly different from the actual imports for the following reasons: first, although Burundi has imposed import restrictions as an instrument of managing its internal imbalances, it has always allowed imports that are not financed through the official channel. In other words, imports that were not benefitting from the official reserves were financed through the "franco valuta" scheme, or, the parallel market. This practice has alleviated the burden of import restriction measures on the economy. Secondly, import restrictions in Burundi have not been as strong as in many other African countries with similar economic conditions. Available data show, for instance, that with an average rate of 17.8 percent during the first half of the 1990s, Burundi stands as one of the African countries with the lowest rate of taxes on international trade and transactions. This rate is lower than the average for Sub-Saharan Africa, excluding South Africa and Nigeria, which is equal to 25.7 percent for the same period(African Development Indicators, 1996). This study, therefore, considers desired imports not to be significantly different from actual imports. The variable IM is therefore used instead of IM*.

Similarly, government policing activity does not seem to be important for Burundi. All the dummies introduced to account for this were insignificant. These variables are supposed to capture the impact of strong government interventions to crack down activities on the parallel market for foreign exchange, as opposed to periods of relaxed policy. However, unlike some other African countries such as Ghana and Sudan where people caught operating on the parallel market could face the death penalty; or countries such as Ethiopia and Tanzania where operating on the parallel market was a very hazardous criminal activity, Burundi has always tolerated its parallel market for foreign exchange. Apart from some rare and shy interventions many years ago which have never been taken seriously, nothing has been done to discourage this market. A good indication of this is

the fact that, throughout its history after independence, Burundi has almost never recorded any jail sentence for those accused of dealing in the parallel market for foreign exchange. Current discussions on this issue in the country show that Burundian authorities have preferred to use economic rather than police actions to tackle this problem. In this light, therefore, the dummy variables on government policing activity are not included in the estimated models.

As in any study relying on quantitative analysis, the quality of data used in this study has some limitations, although these are not thought to affect significantly the quality of the conclusions. One such limitation is the fact that a study on exchange rates should be able to capture the important variations occurring over time. Quarterly or monthly data are normally recommended. Due to unavailability of this type of data, this study, as many other previous studies on other countries, relies on yearly data.

However, there are strong reasons to assume that economic statistics on Burundi are relatively reliable. Since the early 1960, a government institution has been in charge of collecting and publishing economic statistics on a yearly basis. It has worked quite satisfactorily as evidenced by the fact that it has never interrupted its publications, even during the last few years of social and political crisis. Another indication of reliability of economic statistics in Burundi is that government services and the other institutions that produce them (Central Bank, Ministry of Planning, Ministry of Finance, UN agencies, etc.) meet regularly to discuss and harmonize their statistics.

In any case, the problem of the quality of statistics used by economists and econometricians has to be seen in relative terms. Researchers are well aware of the fact that economic statistics they rely upon in their analyzes present limitations and that this

is not a problem peculiar to any specific country, although the degree of reliability may vary from case to case. The feeling on the quality of data used by econometricians was well expressed by Josiah Stamp in 1929, who asserted that:

The Governments are very keen on amassing statistics - they collect them, add them, raise them to the nth power, take the cube root and prepare wonderful diagrams. But what you must never forget is that every one of those figures comes in the first instance from the village watchman, who puts down what he damn pleases. (Taken from Kennedy, 1992, p. 137)

It is assumed that the results of this study are not affected by data limitations in a significant way.

5.2. Empirical Results

5.2.1. Determination of Market Efficiency

As stated earlier, market efficiency is determined using the random walk property of the parallel rate. According to the Dickey-Fuller and Augmented Dickey-Fuller tests, the null hypothesis of non-stationarity of the parallel rate cannot be rejected at 95 percent significance level. Since the first difference of the parallel rate becomes stationary, according to both the DF and ADF as shown in Table 1, the parallel market rate has a unit root. The Ljung-Box test reveals the same patterns. The disturbance term is not white noise in the case of the parallel rate in log levels. However, when data is differenced, the Q* test cannot reject the null hypothesis of white noise residuals. The following table summarizes these results.

Table 1: Results of DF, ADF and Q* Tests on the Parallel Rate for Foreign Currency

	Log Level	Log First Difference
Dickey-Fuller	-2.3220 (-3.6027)	-6.5272 (-3.6119)
Augmented Dickey-Fuller	-1.6628 (-3.6119)	-3.6359 (-3.6219)
Ljung-Box Q^* (1)	21.5107 (0.000)	1.9243 (0.165)

- For DF and ADF, the values in parentheses represent critical values at 5 percent significance level.

- For the Q*-test, the value in parentheses represents the probability of falsely rejecting the null hypothesis of serial correlation in the white noise. The Chi-square distribution critical value for one degree of freedom at 5 percent significance level is equal to 3.84. The result is therefore that, according to the Q*-test, the variable is non-stationary in level and stationary in first difference.

These findings show therefore that the hypothesis that the parallel rate follows a random walk is not rejected by the econometric tests. In other words, the weak form EMH, is not rejected, suggesting that the parallel market for foreign exchange in Burundi is efficient. This conclusion conforms to those derived from other studies on developing countries' parallel markets. In Africa, for instance, Dowla (1995) found that the parallel market for foreign currency was efficient in the case of Sudan and Egypt. Efficiency of the parallel market for foreign exchange in Burundi has important policy implications as outlined in the concluding chapter.

5.2.2. Determination of the Parallel Market Rate

Before estimating the simultaneous equation model for the determination of the parallel exchange rate for foreign exchange, the rank and order conditions are ascertained to be sure that the model is identified. Since all the four equations of the model are found to be over-identified, it is concluded that the model is identified and can therefore be estimated. The Two-Stage Least Squares (2SLS) methodology is applied to estimate the model. This methodology is preferred for its relative simplicity and its robustness, reasons which have made it popular for the estimation of simultaneous equation models. Indeed, "of all these methods [single-equation methods used to estimate simultaneous equation models], 2SLS is by far the most popular" (Kennedy, 1992, p.157). Four instrumental variables are estimated by regressing each endogenous variable on all the predetermined variables of the system. The instrument retained for each endogenous variable is represented by the series of the fitted values derived from these equations (see Kennedy, 1992, for the methodology). All the variables in the model but m* and r* are in logarithmic form. To avoid spurious results, r* is not included in the output equation because it is stationary in level whereas all the other variables explaining GDP are non-stationary in levels.

In the import equation, the official exchange rate appears twice as an explanatory variable (first in the premium and then on its own). To avoid multicollinearity, this variable is only kept in the premium. The official exchange rate is therefore removed from the equation. For similar reasons, the parallel rate is removed from the export equation because it already appears in the premium.

The results of the estimation show that the model is a good fit. Statistics for the goodness of fit and diagnostic tests display good results for all the four equations of the model. (Refer to table 2 for test statistics and estimation results).

In the parallel rate equation, all the coefficients are significant at one percent. The premium is most elastic to changes in the official exchange rate, with an elasticity equal to 1.101. It is followed by ERP, the lagged value of the premium, imports and then exports, with elasticities equal to -0.0633; 0.042; 0.035 and -0.025, respectively. This means that the official rate is the most important determinant of the parallel rate. Imports, exports and the lagged value of the parallel rate have expected signs. The official rate comes out with a positive sign. The positive relationship is due to the fact that when the official exchange rate, which in nominal terms, depreciates say vis-a-vis the Dollar, more units of the national currency are needed to buy one dollar both at the official and the parallel rate. The negative sign of ERP means that the flexibility of the exchange rate introduced by pegging the Burundi franc to the SDR in 1983 and, later on, to a more diversified basket of currencies, has had a negative impact on the premium. This has limited the spread in the premium.

The results of the import equation show that all the variables which are significant at 10 percent or better have expected signs, except for the price of imports. These are: GDP, ERP and the lagged value of imports. Two facts need to be commented upon. First, two factors may account for the positive sign of the price of exports. The first explanation is that Burundi's imports are dominated by essential goods such as fuel, medicines and foodstuffs. It does not therefore buy according to the prices on the market; whether these products are cheap or expensive, Burundi imports them. The second reason is the fact that an important share of the country's import cost is constituted by the cost of freight, since

the country is landlocked. The second comment concerns the negative sign of ERP. It is a well known fact that a regime of fixed exchange rates is usually associated with overvalued rates. It encourages imports while discouraging exports. According to theory, depreciation of a currency discourages imports while encouraging exports. Therefore, as the Burundi franc started its controlled floating against other currencies, a change which is represented by ERP, imports were negatively affected as the currency depreciated continuously. It is this fact that is represented by the significance and the negative relationship between ERP and imports.

Except the premium, all the variables of the export equation are significant. Price of exports, ERP and the lagged value of imports are significant at one percent or better. Export tariff trade is significant at 3 percent. The positive sign of ERP in this equation shows, it the light of what has just been discussed in the previous paragraph, that the change in the exchange rate policy has had a significant and positive impact on the economy. A disturbing fact is the positive sign of Export tariff trade. The sign of this variable should have been negative since an increase in export taxes normally discourages exports. A possible explanation may be found in the analysis of the structure of the coffee sector in Burundi, since the taxes on coffee exports represent almost all export tax income of the country. As said earlier, Burundi's exports are dominated by coffee (more than 80 percent of export earnings). Coffee producers in the country are peasants who sell their produce at a price fixed by government. Until very recently, producers had to sell their produce at a guaranteed price to OCIBU, a state owned corporation which was in charge of all operations, from the collection of coffee beans to export. This system has isolated coffee production from exposure to market fluctuations. Moreover, coffee exports constitute almost the only way the country earns foreign currency (beside foreign assistance), meaning that coffee may be exported, even at a loss, just to earn the much

needed hard currency. In this context, it becomes obvious that taxes on coffee exports do not have a significant impact on the quantity of exports. This may be the reason behind the "wrong" sign of this variable in the export equation.

In the output equation, only two variables, namely capacity output and the lagged value of output are significant and have the expected signs. Although the variable representing the excess demand for output has the right sign, it is not significant. Variable r* is not included for reasons already clarified. ERP is also not significant, meaning that the change in exchange rate policy has not had a significant impact on the country's production.

Following are the expected signs of the different variables. In the parallel rate equation, a positive sign is expected for Imports (IM) and a negative sign expected for Exports (X). Official rate (Oe); the dummy representing the expected punishment (Ω) and the dummy representing change in exchange rate policy (ERP) cannot be signed a priori. In the Import equation, positive signs are expected for GDP and Export price (Px). Negative signs are expected for Import price (Pm); Official rate and the Premium (Ze). Ω cannot be signed a priori. For the Export function, signs are expected to be positive for Px; the parallel rate (Be) and the lagged value of imports [IM(t-1)]. The premium is expected to come out with a negative sign. All the variables of the Output function are expected to have positive coefficients. These are Trend output (Y*); Growth of exports (r*) and the variable representing Excess demand for output (m*).

Table 2: Parallel Exchange Rate: Estimation Results

EQUATIONS				
VARIABLES	Log Be	Log IM	Log X	Log Y
Constant	0553(16.01)***	2.927(3.82)***	1.313(3.64)***	0.245(1.82)*
Log Oe	1.101(67.30)***	-	-	-
Log IM	0.035(5.62)***	-	-	-
Log X	0.025(3.54)***	-	-	-
Log Be (t-1)	0.042(2.97)***	-	-	-
Log Z	-	0.034(1.36)	0.027(0.72)	-
Log Px	-	0.002(0.04)	0.568(6.70)***	-
Log Pm	-	0.181(1.81)*	-	-
Log IM (t-1)	-	0.315(1.93)*	0.481(9.88)***	
Log GDP		0.761(.87)***	-	-
ERP	-0.063(-10.91)***	-0.091(-1.72)*	0.267(3.00)***	-0.009(-0.44)
Log ETT	-	-	0.051(2.27)**	
Log Y*	-	-	-	0.691(8.91)***
m*	-	-	-	0.004(1.15)
Log GDP(t-1)	-	-	-	0.282(3.44)***
R-SQ	0.99981	0.99691	0.98534	0.99918
R-Bar-SQ	0.99975	0.99582	0.98127	0.99900
RSS	0.010042	0.065797	0.17973	0.012459
DW	1.7626	2.7207	1.5407	1.7905
F-Statistic	F(5,19) = 19490	F(6,17) = 913.43	F(5,18) = 241.97	F(4,19) = 5768
T	25	24	24	24

- ***, **, * indicate respectively significance level of 1; 5 and 10 percent at least.
- Values in parentheses after the values of coefficients are t-ratios
- T is the number of observations
- Z is the premium and all other variables are as defined in the paper.
- The results reported are values obtained after correcting for autocorrelation, using the Cochrane-Orcutt Iterative Method. The error term follows a first order autocorrelation process.
- Endogenous variables are represented by their instruments which are, in turn, determined according to the methodology outlined above.

How do these results on Burundi compare to other studies undertaken on other African countries?

These results are generally in conformity with earlier research on other African countries. All the coefficients of the equation of parallel rate are significant as in the case of the two studies on Ghana (see Literature review) by Gymah-Brempong (1992) and May (1985). These results also conform to those obtained by Derrese (1996) in his study on Ethiopia, the only difference being that, in his case, the coefficient of the official exports in the parallel rate equation is not statistically significant.

5.2.3. Determination of the Premium

The analysis of the parallel market premium in Burundi allows to uncover both its long-run and short-run determinants. This is done by first running an OLS model of the premium on its theoretical explanatory factors to determine the long-run (steady-state) relationship between the premium and its fundamentals. Secondly, following the general-to-specific approach, only variables which are significant at 10 percent level or better are kept in the static model as the ones that explain the behavior of the premium. The test of the residuals of each equation helps to determine whether the variables are cointegrating or not. Thirdly, as all the significant variables are non-stationary according to the version of the Augmented Dickey-Fuller equation that comprises a drift and time trend, they are all differenced once to become stationary before they can be included in the dynamic regression. The test for the order of integration of the variable representing Aid gives mixed results. According to the DF with and without trend and the ADF without trend, the first difference of this variable is stationary. However, the variable is only stationary when differenced twice according to the ADF with trend. In the empirical results, the variable

was assumed to be stationary in its first difference form. The essence of regressing the premium on its explanatory variables, in difference form, is to find out the short-run determinants of the premium. The lagged value of the residuals saved from the static equation is added to this new equation. Its coefficient represents the speed of adjustment of the premium to its equilibrium value.

In the first equation, all the theoretical determinants of the premium are included. However, as the objective is to uncover long-run relationships between the premium and economic fundamentals, the lagged value of the premium is not included. The variable on interest parity differential is not included for reasons explained earlier. Out of the seven variables, two are not significant at 10 percent or better. These are the terms of trade and export tariff trade. A similar result was also obtained by earlier studies (Derrese, 1996) for Ethiopia and Kiguel and O'Connell (1994).

Among the significant variables, Import tax trade (ITT) and money balances do not have the expected signs. For money balances, the literature says that its positive theoretical relationship with the premium is an indirect one, associated with high fiscal deficits which are financed through seigniorage. But, as clearly illustrated by Chart 5, Burundi is known as a country that has pursued a prudent and conservative monetary policy over the years, not relying much on money creation. The country has not, unlike many other developing countries, resorted to money printing to absorb its internal economic imbalances. This monetary policy has therefore had a contractionary effect on the premium, and this may explain the negative relationship between the premium and real money balances. It is indeed due to Burundi's prudent fiscal and monetary management that the country has remained a moderate premium country throughout the period covered

by this study. A negative relationship between the premium and real money balances was also found for Zambia (Aron and Elbadawi, 1992).

An interesting result is the negative sign of the coefficient of the official exchange rate. Theory says that this relationship is indeed negative, but only in the short-run (see May, 1985). For Burundi, the negative relationship between the premium and the official exchange rate is proved both in the long-run and the short-run. The explanation is as follows. Based on May's model, it is known that a depreciation of the official exchange rate also depreciates the parallel rate but less than proportionately. In other words, an increase in the official rate of exchange reduces the premium, but this holds only in the short-term. In the long-run, this relationship eventually becomes positive. In the case of Burundi, the negative relationship is maintained from the short-run to the long-run because the country has been devaluing its currency quite regularly as clearly shown in chapter 3. For example, according to information communicated to us by the Central Bank, between 23 November 1983 when the Burundi franc was pegged to the SDR, up to 9 August 1991 when it was pegged to a wider basket of currencies, the national currency was readjusted 25 times [35]. In this context, the short-run impact dominates since the series of devaluations did not allow the system enough time to adjust and attain its long-run behavior.

The second static model comprises only variables from the first equation which are significant. The results are in the second column of table 3. Unit root tests of the residuals saved from these two static equations show that they are both stationary. The implication of this is that variables in the two models are cointegrating. In other words, the long-run

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35/ *Though some rates of adjustments were low, some others were as high as 30 percent.*

relationship between the premium and its explanatory variables is stable. The model is in a steady-state equilibrium.

Having investigated the long-run relationship, the next step is to analyze the short-run determinants of the premium and the nature of the relationship. As all the variables to enter the dynamic specification of the premium are first-order difference processes, the first differences of the premium are regressed on a constant and first differences of the official exchange rate, money balances, aid, import tax trade, GDP and the lagged value of the residuals derived from the static equation. Inclusion of the error term, representing an Error-Correction Mechanism (ECM) ties the short-run and long-run dynamics of the model. This is why the error term is usually referred to as the "equilibrating factor".

All the variables are significant at 10 percent level or better, meaning that the short-run determinants of the premium are the official exchange rate, money balances, foreign aid, import tax trade and output. This result means that the long-run and short-run determinants of the premium are the same, although the dynamic model displays a better fit. In addition, long-run elasticities are much more important than those in the short-run. The statistical significance of the lagged value of the residuals conveys very important information. Its value of -1.0294, which is almost equal to unity, means simply that the impact of factors that tend to drive the premium away from its long-run equilibrium value is corrected within one year. In other words, the speed of adjustment of the model is approximately unity, meaning that the previous year error is fully corrected in the following year. The test applied for stability of the parameters of the model is the Cumulative Sum of Recursive Residuals (CUSUM) and the Cumulative Sum of Squares of Recursive Residuals (CUSUMSQ). At 5 percent significance level, the plots of the recursive residuals do not display any significant change in the parameters since the curve remains within the

critical bounds. The meaning is that there were no significant structural breaks in the system throughout the period of estimation that may have been due to the different crises the country has gone through. The estimated parameters are therefore stable.

Earlier case studies were generally on high premium countries. The differences noticed in the results, compared to these studies may be in part due to the fact that Burundi, with an average premium of 25.9 percent per annum, is classified as a moderate premium country, according to the definition given by Ghei and Kiguel (1992)[36]. In general, the relationship between the premium and macroeconomic variables are clearer in high premium than in low premium countries. An additional reason may be the way the economy of Burundi was managed during the period under consideration, as highlighted throughout the paper. This may bring some peculiarities in the results obtained. However, in general, results of this study conform to those reached by other researchers such as Kiguel and O'Connel (1994) on six countries, four of them from Africa; Aron and Elbadawi (1992) on Zambia; Elbadawi (1992) on Sudan; and Derrese (1996) on Ethiopia. The following table summarizes the results of the estimation of the model on the premium.

In the long-run, expected signs are positive for Official exchange rate (Oe); Real Money balances (M/Oe); Import tariff trade (ITT) and Output (GDP). Export Tax Trade (ETT) is expected to carry a negative sign. Aid (Ad) and Terms of trade (TOT) can take either sign, according to theory.

36/ *According to these authors, high premium countries are those with premiums in excess of 35 percent on average, and those below are moderate premium countries. Burundi belongs to the second category.*

Table 3: Determination of the Premium: Estimation Results

Premium in Log Levels and in Log First Differences				
	Log Z	Log Z	Δ Log Z	Δ Log Z
Constant	-12.455(-1.22)	-7.443(-1.44)	0.045(0.34)	-
Log Oe	-4.254(-2.30)**	-3.220(-2.23)**	-2.152(-1.73)*	-1.963(-1.80)*
Log (M2/Oe)	-3.06(-1.90)*	-2.299(-2.05)**	-1.829(-2.29)**	-1.751(-2.35)**
Log Aid	0.621(2.34)**	0.617(2.54)**	0.490(2.17)**	0.487(2.21)**
Log TOT	0.102(0.220)	-	-	-
Log ETT	-0.080(-0.754)	-	-	-
Log ITT	-1.292(-2.20)**	-1.016(-2.32)**	-1.079(-263)**	-1.084(-2.71)***
Log GDP	4.867(1.95)*	3.465(2.28)**	2.564(2.09)**	2.776(2.70)***
ECM (t-1)	-	-	-0.994(-4.1)***	-1.029(-4.78)***
R-SQ	0.61861	0.54528	0.83049	0.82914
R-Bar-SQ	0.37342	0.39371	0.75138	0.76507
RSS	3.2288	3.8965	2.5211	2.5411
DW-Statistic	2.208	2.3633	2.4691	2.4602
F-Statistic	F(9, 14) = 2.5230	F(6, 18) = 3.5975	F(7, 15) = 10.50	F(6, 16) = 12.941
Unit Root Test on Residuals	ADF = -4.7730 (-3.6331)	ADF = -4.5052 (-3.6219)	-	-
T	25	26	24	24

***; **; * represent significance level of 1 , 5 and 10 percent or better, respectively.

- Variables in columns 3 and 4 (dynamic regressions) are first differences.
- Values in parentheses after each coefficients are t-ratios. For unit root tests, values in parentheses are critical values of the ADF with trend at 5 percent significance level
- All variables are as defined in the study.

CONCLUSION AND POLICY RECOMMENDATIONS

The parallel market for foreign exchange in Burundi has not attracted researchers for a number of reasons. Two of them are: a negative image associated to it in the country, and a lack of objective information on this field. Although operating in parallel market is seen as a breach of the law, dealing in these markets can be a lucrative business. Foreign exchange is proposed at the supply/demand conditions, and the movement of market operators is more fluid compared to the official market. Therefore, no matter how harsh are the measures put in place by the Government to prevent it, this market is the alternative for economic agents who do not have access to the restricted official channel.

Although Burundi is a moderate premium country, the parallel market foreign exchange has been quite active for many years. Using econometric tests, this market was found to be efficient. The implication is that in their policies, Burundian authorities need to give serious consideration to the information conveyed by this market, especially in determining the rate of exchange of the official market. It is particularly recommended that the Central Bank, until exchange rates are completely liberalized, monitor the movement in the parallel rate in order to adjust the official rate as soon as the premium exceeds a benchmark rate. The latter should be set based on the country's objectives regarding exchange rate policy. This, obviously, implies that the Central Bank collects, on a regular basis, the rate in the parallel market. One major problem this study had to overcome was to find statistics on the parallel rate. In this regard, the Bank should collect as much information as possible on this market, in order to facilitate further research on the subject that will enlighten better policy makers. To this end, further research should use quarterly

or monthly data, in order to capture better information contained in the frequent variations in the rate of exchange. The action taken by the Central Bank to collect data on the level of the rate of exchange on a daily basis since August 1995 is a commendable initiative. It should be pursued and extended to the collection of other information such as the importance of the amounts exchanged, the origin of supply and demand, and other relevant information.

Empirical results on the determinants of the parallel rate and the premium have uncovered the strong relationship between the official and the parallel rate in Burundi. This is a clear indication that any policy aimed at integrating this market structure into the formal economy must focus on measures that involve, directly or indirectly, the official rate. For instance, the managers of the national economy should ensure that the official rate is not overvalued, as this is usually associated with high premiums. However, they should not also lose sight of the fact that several other factors are at the basis of the existence of the parallel market for foreign exchange. The simultaneous equation model has shown the conduits through which the rate is determined. This is an important information as it shows where policies should focus. Trade variables are essential determinants and the way imports and exports are regulated in the country has a very important impact on the level of the rate. Furthermore, the dummy variable representing changes in exchange rate policy turned out to be important as a direct explanatory variable of the parallel rate, but it has also an important indirect effect through its impact on imports and exports. This helps policy makers to have an idea on the nature of policies to be implemented and their impact on the parallel market for foreign exchange. This study shows, for instance, that liberalization of the foreign trade sector (export and import sector) is one key area for policy intervention in order to address the issue of the parallel market for foreign exchange.

As expected, the empirical results have shown that flow variables are much more important than portfolio variables in the determination of the level of the premium in Burundi. This is consistent with our field observation and with the conclusions of similar studies on other African countries. The parallel market for foreign exchange in Burundi serves mainly commercial activities. An interesting conclusion is the fact that the same factors influence the long-run and short-run behavior of the premium, as summarized in table 3. It is a good indication that policies targeting short-run results are also good for long-run results.

Another interesting conclusion of this study is that currency rationing and other controls imposed with the objective of improving resource allocation since the early 1960s has led to market distortions instead. Due to the fact that these controls cannot be enforced as evidenced by the persistence of the parallel market for foreign exchange in the country, authorities should note that their course of action was not the best policy solution to the imbalances that appeared in the economy as a result of poor management and external shocks. In addition to the fact that these control policies turned out to be very costly, economic agents have managed to beat the system, sometimes with cooperation of those supposed to enforce the restrictions, through different means, including export under-invoicing and import over-invoicing. Far from correcting the problem they were supposed to address, these policies have instead created a mass of rent seekers who have benefitted from the system at the expense of society. Two negative consequences have been capital flight and corruption.

It goes, therefore, without saying that an efficient system of foreign currency allocation must be based on the marginal price of the currency. The experiences of a

number of countries in Africa and elsewhere show that this is the best way of ensuring equilibrium between supply and demand. The system also ensures transparency and reduces transaction costs. In the case of Burundi, this should translate into unification of the parallel and the official rate, through a gradual process. Caution should be taken to minimize the negative impact of unification on the economy, especially by controlling the rise in inflation. This could be done drawing from the experiences of some countries in the region which have successfully completed this process, such as Ghana, Uganda and Zambia; or countries that are still undergoing this process such as Ethiopia. In doing this, it should be borne in mind that unification, to be successful, necessitates a whole range of accompanying macro-economic liberalization policies, whose pace of implementation must take into account social, political and economic conditions in the country.

According to discussions held with officials from public and private institutions as well as some individuals in Burundi, everybody seems to agree on the need to liberalize the market for foreign exchange. However, as some individuals pointed out, the current political and social instability in the country do not allow an immediate implementation of this policy. Experience from other countries has shown that for such a policy to succeed, economic actors must fully adhere to it and important resources must be made available to cater for the short-run impact of the shock. In addition, these are policies that need a strong political backing. These conditions cannot be satisfied in the current context. However, as soon as the country regains its political stability, there is no reason why such a policy would not be implemented.

This process will obviously need to be backed by more focused and detailed studies on the subject.

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APPENDIX I: ESTIMATING THE SIZE OF THE PARALLEL MARKET

(a) Description of the Approach

The model is a monetary approach to the measurement of the size of the second economy. It uses the discrepancy between the stock of currency needed in the economy and that which is actually observed. This approach, developed by Cagan and made popular in the economic literature by Peter Gutmann, has been applied, among others, to the cases of Ghana by May (1985) and Tanzania by Maliyamkono and Bagachwa (1992). Following is the description of the model as reflected in section 2.5 of Maliyamkono and Bagachwa's publication on "The Second Economy in Tanzania". It is built around four assumptions: (i) the second economy is cash based; (ii) there is an easily identifiable bench-mark period in which the parallel market activities were negligible; (iii) C-DD ratio (ratio of the currency to demand deposits) associated with the bench-mark period would be constant through the final period of analysis if there were no growth in the second economy; (iv) the volume of GNP supported by one unit of currency is the same in both the parallel and official market.

First, the model identifies the bench-mark year. The latter is determined by identifying the year in which the C-DD ratio is lowest, or the year in which parallel market activities are "negligible". Secondly, assuming that C-DD ratio is constant throughout the observation period, and since DD is known for every year, the actual C can be calculated for any given year relative to the bench-mark year in the following way: [(C/DD) = X ⇒ C = X*DD]. The actual C comprises C_1 the currency in circulation in official channels and C_2 the currency in circulation in parallel markets (the missing money). Thirdly, the velocity of money is calculated by dividing official GNP, say GNP_1, by official C, say C_1. Fourthly,

since the velocity in the parallel market is assumed to be equal to that in the official market, GNP for the parallel market can be calculated: $GNP_2 = C_2 * Velocity$. Finally, the relative size of the parallel market in the economy is given by $(GNP_1 / GNP_2)*100$.

(b) Comments

Obviously, these assumptions have weaknesses [37]. They oversimplify the reality of a developing economy such as that of Burundi which is mainly a subsistence economy. A monetary approach to the estimation of parallel markets is not therefore the best one in such economies. This is the reason why Maliyamkono and Bagachwa (1992) have cautioned in their paper that using this approach makes it possible just "to get some **clue** as to the overall size of the second economy activities...". Also, it should be kept in mind that parallel markets are not just a monetary phenomenon. They arise as a result of different factors such as the sub-optimal government interventions in the economy, the proximity or coexistence of different markets with different structures, the absence of modern market infrastructures in an economy or in a sector of the economy; etc. In the light of this, a thorough analysis of the parallel market activities must look at the issue in a global way that goes beyond the oversimplified monetary approach.

Because of the shortcomings of Gutmann's model, researchers have developed more robust models that attempt to palliate the problems associated with the former. For instance, a more flexible econometric approach, which eliminates the problem of the constancy of the C-DD ratio and that of the sensitivity of the results to the bench-mark year was developed by Tanzi. The Gutmann's approach should therefore be viewed as one

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37/ *A detailed critique of this model is contained in the paper by Maliyamkono and Bagachwa, Op. cit.*

that allows to have just **an idea** on the existence and scope of parallel market activities in a given economy. However, the present model serves the need of this paper since its primary objective is not to estimate the size of the parallel market in Burundi but just to have a quick idea on its existence and its importance. Otherwise, more sophisticated but much more costlier approaches are recommended for the analysis of the size of the second economy.

APPENDIX II: WHY A DIFFERENT APPROACH FOR TIME SERIES ECONOMETRIC MODELING?

The question to be answered is why we do not just estimate our time series model in the usual econometric fashion, look at t-values and draw conclusions. In other words, isn't Time Series Econometrics not much ado about nothing? [38].

This Appendix intends to briefly outline why Time Series Econometrics is not much ado about nothing as this idea has been advanced by a certain number of researchers. Two main reasons why Time Series Econometrics is different from standard econometric analysis: first, there is severe multicollinearity between explanatory variables, as these are lags of the dependent variable. In this case, standard errors become inflated and the t-test are no more reliable. Secondly, one important assumption behind the use of standard econometric analysis is that the error term is normally and identically distributed with mean zero and constant variance. In Time Series Econometrics, when dealing with integrated variables, the error term is no more white noise. As a result, the CLT becomes inoperative and tests such as t, Z, F, χ^2 are no longer valid. Estimated parameters have a non-standard distribution which is skewed compared to the normal distribution. This points to the need for other techniques that allow to perform correct inferences and avoid spurious regression results.

Taking the simplest case of integrated variables, namely a random walk regressed on another random walk, in the form:

38/ *This idea was expressed by a Professor who was acting as External Examiner for a thesis defended at Addis Ababa university during 1995-1996 academic year!*

$$Y_t = Y_{t-1} + \epsilon_{1,t}$$

$$X_t = X_{t-1} + \epsilon_{2,t}$$

$$Y_t = \beta X_t + u_t$$

we get the following sample moments: $[1/T\sum X_tX_t]$; $[1/T\sum X_tY_t]$ and $[1/T\sum X_tu_t]$. The question is to determine how these sample moments behave when $T \to \infty$. When the latter is the case, the data generating process becomes a continuous time process noted:

$$X(t) = X(t-1) + \epsilon(t)$$

Mathematical derivations of the distributions behind these processes, which use too advanced mathematical techniques for the scope of this thesis, yield the following random variables:

$$[1/T \sum X_tX_t] \to \int W_1(r)^2 \, dr$$

$$[1/T \sum X_tY_t] \to \int W_1(r) \, W_2(r) \, dr$$

$$[1/T \sum X_tu_t] \to \int W_1(r) \, W_3(r) \, dr$$

This contrasts with the case of non-integrated variables where all sample moments tend to constants as $T \to \infty$. For integrated variables therefore, as this can be seen, the sample moments are no more converging to constants; they converge to the random variables outlined above which, in turn, are functions of Wiener processes or Brownian motions [39].

39/ *Literature in Econometrics refers to Wiener processes for univariate cases and Brownian motions for multivariate processes.*

ANNEXES

VARIABLES USED IN ANNEX 1

PARATE	Parallel rate
PREMIUM	Premium
NEXRATE	Nominal exchange rate
IMPORTS	Value of imports
EXPORTS	Value of exports
AID	Aid
GDP	Gross domestic product
GDPAGR	Agriculture GDP
M2	Money supply
M2GRO	Growth rate of money supply
DEMDEP	Demand deposits
INTERES	Nominal deposit interest rate
TOT	Terms of trade
EXPTAX	Export tax revenue
IMPTARIF	Import tax revenue
BUDGBAL	Budget balance (deficit)
MONECIR	Money in circulation
EXPRICE	Export price index
IMPRICE	Import price index
CPI	Consumer price index
INFLAT	Inflation
CURACC	Current account balance
TREOUTP	Trend (capacity) output
GDPGRO	Growth rate of GDP
EXPGRO	Growth rate of exports

YEARS	PARATE	PREMIUM	NEXRATE	IMPORTS	EXPORTS	AID	GDP	GDPAGR	M2	M2GRO	DEMDEP
1970	107.60	23.00	87.50	1,956.00	2,132.00	587.00	19,014.00	13,880.00	2,138.00	23.60	759.00
1971	101.00	15.40	87.50	2,619.00	1,701.00	598.50	22,278.00	14,330.00	2,444.00	14.20	891.00
1972	92.40	5.60	87.50	2,736.00	2,302.00	651.00	21,595.00	13,120.00	2,440.00	(0.10)	1,035.00
1973	92.92	18.00	78.75	2,495.00	2,444.00	936.10	24,355.00	15,420.00	2,988.00	22.40	1,277.30
1974	92.92	18.00	78.75	3,396.00	2,440.00	1,218.60	27,190.00	16,590.00	3,451.00	15.40	1,434.20
1975	112.60	43.00	78.75	4,856.00	2,515.00	1,601.70	32,672.00	20,320.00	3,350.00	(2.90)	1,499.00
1976	125.00	38.90	90.00	5,027.00	5,420.00	1,375.80	38,676.00	23,000.00	4,713.00	40.70	2,137.40
1977	96.50	7.20	90.00	6,678.00	8,011.00	1,528.00	49,578.00	27,390.00	6,550.00	39.10	2,929.90
1978	114.00	26.70	90.00	8,843.00	6,243.00	2,119.10	54,821.00	29,640.00	8,902.00	35.90	3,864.20
1979	100.00	11.10	90.00	13,721.00	9,361.00	2,934.40	68,086.00	37,910.00	9,477.00	6.40	4,181.80
1980	106.00	17.80	90.00	15,114.00	5,884.00	3,875.10	85,607.00	47,660.00	12,860.00	37.00	3,044.10
1981	104.00	15.50	90.00	14,509.00	6,744.00	3,864.80	89,086.00	50,710.00	15,874.00	23.20	5,404.20
1982	120.00	33.30	90.00	19,280.00	7,901.00	4,445.00	94,094.00	47,980.00	15,305.00	(3.30)	4,407.50
1983	130.00	10.70	117.41	17,075.00	7,522.00	4,220.80	102,892.00	53,830.00	19,439.00	27.00	6,582.90
1984	176.00	40.80	124.95	22,383.00	12,367.00	6,022.10	120,451.00	64,590.00	20,206.00	3.80	7,264.30
1985	140.00	25.00	111.97	22,754.00	13,533.00	5,919.80	141,347.00	77,660.00	24,183.00	19.00	11,199.70
1986	147.70	18.90	124.17	23,195.00	17,674.00	5,087.80	140,842.00	72,060.00	24,347.00	1.30	11,900.80
1987	137.30	19.90	114.47	25,465.00	11,117.00	2,392.40	143,590.00	70,680.00	24,854.00	2.30	11,052.20
1988	169.60	13.10	149.94	28,885.00	18,589.00	7,160.40	152,907.00	73,270.00	28,241.00	14.70	10,901.70
1989	214.00	22.00	175.43	29,910.00	12,304.00	11,900.25	179,548.00	83,280.00	31,635.00	13.70	11,243.50
1990	186.10	12.50	165.35	40,179.00	12,784.00	23,118.75	196,656.00	98,990.00	34,920.00	10.40	12,467.10
1991	269.30	40.90	191.10	46,154.00	16,698.00	21,418.18	204,951.00	102,980.00	37,359.00	7.00	12,462.00
1992	310.90	31.40	236.55	46,106.00	15,355.00	31,453.30	258,391.00	111,420.00	38,997.00	4.40	13,841.00
1993	370.70	40.20	264.38	47,434.00	15,019.00	27,193.60	261,952.00	107,640.00	41,789.00	7.20	14,721.00
1994	409.40	65.80	246.94	56,468.00	26,500.00	59,535.00	286,548.00	152,157.00	52,300.00	33.00	19,095.00
1995	355.00	27.70	277.92	58,200.00	26,591.00	36,131.00	308,314.00	171,731.00	50,600.00	(18.80)	18,730.00

YEARS	INTERES	TOT	EXPTAX	IMPTARIF	BUDGBAL	MONECIR	EXPRICE	IMPRICE	CPI	INFLAT	CURACC
1970	2.50	180.30	351.90	539.30	119.80	1,192.00	42.50	23.60	19.85	(0.20)	(210.00)
1971	2.50	131.90	272.40	671.90	329.70	1,333.00	37.90	28.70	20.60	3.90	(1,286.25)
1972	2.50	137.20	401.90	616.50	202.30	1,370.00	44.00	32.10	21.47	3.80	(778.75)
1973	2.50	135.00	285.60	610.00	155.10	1,548.00	51.20	36.70	22.72	6.00	(520.20)
1974	2.50	103.70	330.20	839.60	300.40	1,873.00	55.80	56.60	26.34	15.70	(1,527.75)
1975	2.50	99.10	177.40	928.00	(80.70)	1,710.00	54.30	59.20	30.46	15.70	(3,504.38)
1976	2.50	197.40	1,293.90	853.00	238.90	2,411.00	111.90	58.40	32.58	6.90	(974.63)
1977	2.50	280.80	2,138.70	1,282.80	468.70	3,225.00	172.60	63.00	34.71	6.80	(855.00)
1978	2.50	191.80	1,623.50	1,691.10	6.20	4,542.00	128.10	69.60	43.07	23.90	(5,427.00)
1979	2.50	182.20	1,935.60	2,529.20	67.10	4,876.00	139.00	81.90	58.80	36.50	(6,948.00)
1980	2.50	131.00	1,330.00	2,717.30	(1,708.00)	4,971.00	136.00	104.00	60.30	2.50	(11,493.00)
1981	4.50	115.50	177.00	2,178.40	(1,873.00)	7,059.00	105.10	96.10	67.54	12.20	(11,358.00)
1982	4.50	128.10	170.20	2,932.90	(1,362.10)	6,419.00	112.90	91.30	71.54	5.90	(16,155.00)
1983	4.50	125.00	107.60	2,720.60	(917.80)	7,262.00	107.40	89.00	77.40	8.20	(16,963.38)
1984	4.50	135.80	2,367.30	2,363.30	231.40	7,498.00	118.80	87.50	88.51	14.30	(19,907.77)
1985	4.50	113.00	3,743.80	2,720.60	(148.50)	7,253.00	107.00	95.00	91.76	3.80	(14,558.83)
1986	8.00	139.00	4,804.00	3,236.30	3,475.00	8,008.00	136.00	98.00	93.38	1.70	(16,013.48)
1987	3.00	100.00	755.10	3,178.00	(1,433.20)	8,734.00	100.00	100.00	100.00	7.10	(24,985.07)
1988	6.00	114.00	3,227.00	4,765.50	1,116.10	9,605.00	112.00	98.00	104.49	4.50	(22,145.29)
1989	4.40	88.00	4,071.90	5,081.90	4,649.10	10,166.40	92.00	104.00	116.73	11.70	(22,923.05)
1990	6.00	71.00	192.60	6,018.40	1,273.70	11,077.90	80.00	112.00	124.84	7.00	(39,344.69)
1991	8.00	79.00	445.40	8,018.20	4,219.30	11,717.20	89.00	113.00	136.08	9.00	(38,815.91)
1992	9.40	72.00	1,104.80	7,153.00	1,796.80	13,281.90	72.00	101.00	142.20	4.50	(45,565.63)
1993	9.00	106.00	714.20	6,898.20	3,442.60	14,724.00	77.00	73.00	155.93	9.70	(46,068.87)
1994	9.30	107.00	2,618.80	6,934.40	6,743.10	19,075.00	121.00	114.00	179.15	14.90	(42,875.00)
1995	9.20	91.00	4,917.00	6,194.50	2,630.00		114.00	125.00	213.61	19.30	44,571.00

YEARS	TREOUTP	GDPGRO	EXPGRO
1970	20,298.30	14.25	64.00
1971	22,856.16	7.90	(10.00)
1972	23,385.72	(10.80)	16.00
1973	27,263.85	7.20	(5.10)
1974	31,371.35	(0.80)	(8.20)
1975	38,838.14	1.00	9.60
1976	44,231.43	7.90	(16.60)
1977	53,108.02	12.40	4.90
1978	60,682.48	(1.10)	4.50
1979	77,347.48	2.00	38.90
1980	92,402.08	1.00	(31.10)
1981	99,194.07	10.90	31.00
1982	106,062.32	(0.40)	15.40
1983	115,064.19	3.10	(4.40)
1984	137,073.02	(0.10)	10.70
1985	157,098.53	11.70	15.70
1986	159,233.43	3.20	19.20
1987	168,198.97	5.60	(20.90)
1988	183,145.59	5.00	54.70
1989	204,065.63	1.40	(28.40)
1990	240,974.09	3.60	20.30
1991	263,018.49	5.20	8.00
1992	284,755.78	2.70	(14.90)
1993	297,042.40	(6.00)	(3.00)
1994	366,865.34	(6.60)	(5.50)
1995	406,130.39	(3.70)	2.1

ANNEX 2: SUMMARY STATISTICS OF THE VARIABLES USED

Variables	Maximum	Minimum	Mean	Standard Deviation	Skewness	Kurtosis - 3	Coef. of Variation
Be	409.4	92.4	168.5	94.7	1.4	0.6	0.6
Ze	65.8	5.6	24.7	13.9	1.0	1.0	0.6
Oe	277.9	78.8	131.9	62.5	1.2	0.1	0.5
IM	58200.0	1956.0	21747.6	17699.1	0.7	-0.7	0.8
X	26591.0	1701.0	10352.0	7059.5	0.7	-0.1	0.7
A	59535.0	587.0	10280.3	14437.2	2.0	3.5	1.4
GDP	308314.0	19014.0	120210.7	89019.6	0.7	-0.7	0.7
M2	52300.0	2138.0	19975.5	15642.9	0.6	-0.8	0.8
m*	39.6	-15.1	11.5	13.9	0.5	-0.4	1.2
TOT	280.8	71.0	129.0	46.3	1.5	2.6	0.4
ETT	4917.0	107.6	1521.5	1524.9	1.0	-0.3	1.0
ITT	8018.2	539.3	3218.2	2377.9	0.6	-0.9	0.7
Px	172.6	37.9	96.8	34.7	-0.1	-0.1	0.4
Pm	125.0	23.6	81.2	28.7	-0.6	-0.7	0.4
Y*	406130.0	20298.0	141525.0	111293.3	0.8	-0.3	0.8
r*	64.0	-31.1	6.4	23.1	0.7	0.3	3.6
ERP	1.0	0.0	-0.5	0.5	0.0	-2.0	1.0
M2/Oe	217.1	24.4	133.5	69.2	-0.5	-1.4	0.5

ANNEX 3: UNIT ROOT TESTS (ADF WITH TREND) OF THE VARIABLES USED

Variables	Levels[1]	First Difference[2]
Be	-1.6628	-3.6359
Ze	-3.1399	-5.2642
Oe	-1.8259	-5.2738
IM	-1.1158	-4.1510
X	-2.2684	-4.0303
A[3]	-2.3116	-3.1853
GDP	-1.0701	-3.7447
M2	-0.6633	-3.8463
m*	-3.2717	-5.4886
TOT	-2.9243	-3.7250
ETT	-3.1852	-3.9908
ITT	-1.7438	-3.8069
Px	-2.1779	-3.6948
Pm	-2.4564	-4.3488
Y*	-1.4245	-3.7780
r*	-4.7465	-
M2/Oe	-0.7055	-4.7502

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1 The 95 percent critical value is -3.6119. All variables but r*, ERP and m* are in logarithm.

2 The 95 percent critical value is -3.6219

3 Aid is stationary according to DF with and without trend as well as ADF without trend

Declaration

This thesis is my original work, has not been presented for a degree in any university and, all sources of materials used have been duly acknowledged.

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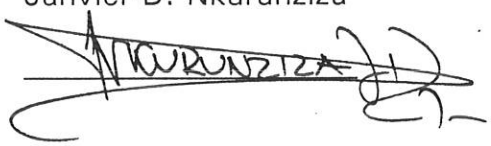
Signature 

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