

THE STABILITY OF THE FOREIGN EXCHANGE AUCTION IN ZAMBIA

BY

MWAKA KAONGA

A Thesis
submitted to the faculty of Graduate Studies
in partial fulfillment of the requirements
for the degree of

MASTER OF ARTS

Department of economics
University of Manitoba
Winnipeg, Manitoba

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ABSTRACT

Zambia's economy has been in decline since the mid 1970s. The economic crisis was the result of both external shocks and internal policy deficiencies. However, the decline of the copper industry played an important role because Zambia's economy is highly dependent on copper for its foreign exchange earnings, fiscal revenue and contribution to GDP. When copper performance deteriorated, it put the economy under great strain.

Government attempts to embark on economic recovery and diversification away from copper, were frustrated by lack of finance. By the early 1980s Zambia was considered unable to service the debt it had incurred in efforts to stabilise the economy. This further heightened the financing problem. The only source available was the International Monetary Fund which required Zambia to follow certain policy conditions in exchange for credits.

The foreign exchange auction in Zambia was introduced as one of the International Monetary Fund's stabilization policy measures. The purpose of this study was an attempt to evaluate the performance of the auction in terms of achieving its objectives and analyze its impact on the economy. This was carried out with the use of single equation least squares models.

The results of the study show that the auction was underfunded and was not supported by an adequate complimentary policy mix. The country was not ready for an auction in terms of government commitment, funding and institutional support and the bidder's were inexperienced. The auction increased the rate of inflation to unsustainable levels. However, it also led to a less unstable effective exchange rate relative to other exchange rate policies. The study concluded that although the auction had sound objectives, it was not appropriate for Zambia at that time.

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And to all those who believed in me and kept my hope alive,
THIS IS FOR YOU.

Mwaomba mwemwe mwewina katonga nakwe muchinga kwinu mwaleka
nalemasya ipensulo umulandu wa kusaya muchinga nukukazya
inkombwe pe basi.
Kangawala.

To my daughter Salipa,
for the long hours of loneliness.

and

To my mother Namwaka, whose dream
I have held while holding my own.

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CHAPTER ONE

INTRODUCTION

Zambia is currently in the grip of economic and social crisis, whose origins can be traced to both internal and external factors. At independence in 1964, Zambia inherited an economy that was solely dependent on the mining industry with copper as the main mineral wealth.

For many years Zambia has depended on copper for foreign exchange earnings and government revenue. In the late 1960's and early 1970's copper exports earned over 95 percent of total foreign exchange and about 45 percent of government revenues. In addition, the mining industry was also the largest employer (GRZ 1975-1984; Mwananshiku 1986 p33-36, Ncube, Sakala, Ndulo 1987).

During the first ten years following independence, the country's balance of payments was determined by the fluctuations in the price of copper. Deficits were accepted as the inevitable consequences of periodic fluctuations in the price of copper, which were financed by running down the country's international reserves.

The decline in copper prices during the mid 1970's

marked the beginning of Zambia's economic crisis. During 1974-1984, copper prices showed no signs of recovery and the country's economy, so dependent on imports, contracted along with the shortages of foreign exchange that came with the fall in the price of copper.

The government responded by imposing strict control over foreign exchange allocation, as a way of rationing imports and credit allocation. These government controls were detrimental to an economy that was trying to adjust, leading to mis-allocation of resources and over valued exchange rates.

Zambia borrowed heavily in anticipation of a recovery in the copper prices that would ease the foreign exchange constraint. As the crisis continued, the government continued to borrow. During the same period, the unfavorable terms of trade were compounded by external shocks such as, high oil prices, recession in the industrialised countries, and the steep increase in interest rates.

When the crisis first hit the country, it was perceived as temporary, and hence, the government adopted temporary measures like borrowing from outside. By the end of the 1970's the government realised that the problem was not temporary. At that time the balance of payments problems

had worsened, the budget deficits were large and the economy was on the verge of collapse.

By 1984 the government had taken some tentative steps towards policy reforms with the aim of diversifying the economy away from the mining industry. The reforms included economic pricing, price decontrol and increasing producer prices for farmers. This policy package was not properly implemented and the country was left with a serious external debt problem since copper exports and prices performed poorly.

To deal with its economic problems, especially the balance of payments deficits, Zambia turned to the International Monetary Fund (IMF) for assistance. The earliest dealings with the IMF were in 1973 during the oil shock, at which time the country's problems were perceived as temporary.

Since 1976, however, as Zambia's balance of payments has continued to deteriorate, the government has had to resort to IMF assistance almost without a break. This ultimately, led to the introduction of the foreign exchange auction. The market driven auction aimed at stabilising the exchange rate, improving the efficient allocation of resources, and promoting the production of exports goods both in volume and

diversity.

Since independence Zambia has tried different types of foreign exchange arrangements. At independence, the Zambian currency was pegged to the British pound and was directly convertible at par while the kwacha's parity with other currencies was derived from the pound sterling's parity with other currencies. During this period Zambia's economy was relatively sound, driven by good copper prices and favorable terms of trade in general. The foreign exchange system was not subject to control regulations except on outward transfers of capital (Nkhoma 1988, IMF annual report 1975).

The early 1970's marked the end of the Bretton Woods fixed exchange arrangements and industrialised countries adopted floating exchange rate regimes. The floating of major currencies contributed to the instability of the kwacha's effective exchange rate. The breakup of the Bretton Woods, falling copper prices, rising oil prices, inflation and domestic policy errors put the Zambian economy under great strain.

The Zambian economy is very import-dependent, and foreign exchange is an important input in the country's economic development. Industry and agriculture require a large input of imported raw materials to operate. This

makes the allocation of foreign exchange and, as we shall see, the determination of, exchange rate policy extremely important issues

PURPOSE OF THE STUDY

Based on the aforementioned reasons, the study attempts to identify and evaluate the factors that facilitated and/or impeded the achievement of a stable exchange rate for the Zambian kwacha during the foreign exchange auction period. Therefore, the primary objective of this study is to analyze the impact of the foreign exchange auction in Zambia in terms of stabilising the exchange rate and the economy as a whole.

The major questions that need to be addressed in this regard are as follows,

1. Was the foreign exchange auction appropriate for Zambia?
2. Did the auction lead to diversification of exports?
3. Was the auction market determined?
4. Did the auction stabilise the nominal exchange rate and the nominal effective exchange rate?
5. What was the effect of the exchange rate on domestic inflation?

6. What can we learn from the Zambian experience in terms of formulation of exchange rate policies

The primary objective is pursued through the achievement of the following specific objectives.

1. Determining the behavioral relationship for the availability of foreign exchange in the Zambian auction
2. Determining the exchange rate that equilibrate the supply and demand for foreign exchange
3. Simulating the equilibrium foreign exchange market condition, to determine the deviations of the estimated from the actual exchange rates.
4. Assessing the responsiveness of the foreign exchange market to market forces.
5. Evaluating the impact of the foreign exchange auction system on domestic inflation and on exports.

HYPOTHESIS

This thesis will test the following hypotheses;

1.The auction was designed to be market oriented so that it would lead to a stable exchange rate that reflected the real value of the kwacha, thus permitting an efficient allocation of resources. It is hypothesised that the exchange rate stabilised during the auction.

2.A stable exchange rate leads to a stable nominal effective exchange rate. It is, therefore, hypothesised that the stability in the exchange rate, during the auction, stabilised the nominal effective exchange rate.

3. The auction was supposed to be market driven, free from government intervention. The exchange rate was, therefore, supposed to be responsive to the laws of supply and demand. It is hypothesised that the exchange rate was uniformly driven by market forces, and was not subject to state intervention.

4.The auction was meant to promote exports in terms of volume and diversity of export goods. It is hypothesised that the auction had a significant effect on exports in terms of diversity.

5. It is also hypothesised that the auction helped raise the rate of domestic inflation, given Zambia's import dependence.

METHODOLOGY

This thesis is a study of the workings of the Zambian foreign exchange auction over a period of almost two years covering 74 weekly auctions.

Hypotheses 1,3 and 5, will be tested with the use of the ordinary least squares method. This method is preferred because supply of the auction funds is assumed to be exogenous, and only a single equation model is required.

The data is from the following sources. Economic Association of Zambia papers, IMF staff papers and publications, Zambia central statistics office, Bank of Zambia annual reports and World Bank reports.

OUTLINE OF STUDY

The study is organised as follows;

Chapter one is an introductory chapter to the thesis while Chapter two of the thesis analyses the economic crisis in Zambia since independence in 1964. This includes the rise and decline of the Zambian mining industry and it's effect

on the economy. The importance of copper was such that the economy revolved around the performance of the mining sector. The fluctuations in the Zambian economy were determined by the price and demand for copper on the London metal exchange.

Chapter 3 analyses the International Monetary Fund (IMF) and its involvement in Zambia. This includes Zambia's first dealings with the IMF, Zambia's debt to the IMF and other institutions and Zambia's policy and performance criteria under the IMF stabilization policies.

Chapter 4 is on the foreign exchange auction and its effect on the effective exchange rate. This includes the auction guidelines , operation and experience.

Chapter 5 is the econometric analysis of the auction and its effect on effective exchange rate, demand for and supply of the foreign exchange and the auction's impact on the domestic inflation and the economy.

Chapter 6 contains the conclusion and policy implications of this study.

CHAPTER TWO

THE ECONOMIC CRISIS IN ZAMBIA

On independence in 1964, Zambia inherited one of the fastest growing economies in sub saharan africa. The mining industry, with copper as it's main export, was the dominant economic activity contributing significant proportions of real gross domestic product, government revenue and export earnings.

Zambia has experienced a prolonged economic crisis since the mid 1970's. The major indication being that, while real GDP has been increasing real per capita GDP has been falling by almost 30 per cent over the past 15 years. Real income growth has been persistently low while in periods 1977-79 and 1981-83 it was negative. Although national consumption has increased, with a population growth of 3 per cent, real consumption per capita has declined by almost 18 per cent since 1977. The rate of investment an important determinant of long term growth has been reduced by over two thirds to only 7 per cent of GDP in 1988(Loxley, 1989 Young, 1988, World Bank, 1986).

However, the root cause of Zambia's crisis can be traced through the instability of the world demand and the real world price of copper since the 1970's. During most of the

ECONOMIC INDICATORS

Table 2:1

	1973	1977	1980	1984	1988
Real GDP (Kmillion 1977)	1,857	1,986	1,996	2,012	2,162
Real GDP per capita	404	382	350	314	288
Real consumption(km 1977)					
As % of GDP		78	82	79	85
Real consumption per capita		297	287	249	246
Real investment(km 1977)					
As % GDP		24	17	11	7
Copper Price U.S					
cents per lb	81	59	99	63	111
Copper Production 000 tonnes		681	660	523	425
Trade balance	591	214	343	262	427

Source: Loxley, 1989; World Bank, 1986; World Development reports.

1960's and early 1970's, copper prices were good and the export earnings from copper contributed up to about 90 per cent of foreign exchange (Ncube et al 1988).

Between 1973 and 1984 copper earnings declined by almost two thirds between 1973 and 1984. During the same Copper production has also fallen steadily from 681,000 tons in 1973 to 523,00 in 1984 as a result, total real earnings have also fallen by about 73 per cent in 1982 constant prices.

During the early 1970's copper earnings alone contributed up to 96 per cent of total export earnings, 36 per cent of GDP and 58 per cent of government revenue. Copper contribution to GDP has fallen from an average of 42 per cent in the late 1960's to an average of 14 per cent in early 1980's. Direct contribution to total fiscal revenue declined from an average of 61 per cent in the late 1960's to 3 per cent in the early 1980's. Regardless of the decline, copper export earnings still account for an average of 92 per cent in foreign exchange earnings. Apart from that, the copper mining industry is Zambia's highest employer second only to the government. It employed 16 per cent of the formal sector labour force in the 1970;s in relatively high paying jobs (Loxley 1989 Ncube et al 1987).

As well, the mid 1970's showed the beginning of deteriorating terms of trade as import prices were rising while export prices were falling. The effect has been a deterioration in Zambia's net barter terms of trade, by 75 per cent between 1970 and 1985.

Most of Zambia's industries were developed during the copper boom when there were no foreign exchange constraints; this helps explain why most economic activities are so import dependent. The manufacturing sector is one of the most developed sectors in Africa, accounting for over 25 per cent of GDP. It too uses a lot of imported material; well over 50 per cent and about 80 per cent for metal processing industries. The scarcity of foreign exchange in Zambia has led to a reduction in imports and resulted in a reduction in capacity utilization of about one third. In other words these sectors are particularly vulnerable to foreign exchange constraints (World Bank 1986 p.13).

The government recognised the instability that the economy was subject to as a result of this dependency and introduced policies designed to diversify the economy away from copper. While this policy has been Zambia's biggest challenge in all the development plans, there has not been any significant reduction in the economy's dependence on copper as most of the diversification increases the

Table 2:2

TERMS OF TRADE AND REAL IMPORTS

	1970	1973	1975	1977	1980	1983	1984	1985
Net barter terms of								
trade (1975=100)	227	n.a	100	n.a	82	64	n.a	59
Real imports								
1980=100	161	134	105	95	100	67	58	61

source: World Bank: World Development reports; World Bank
1986.

economy's dependence on imports and copper for foreign exchange earnings. After four development plans between 1966 and 1984, copper export earnings still contribute up to 90 percent in foreign exchange.

Since, the structure of the Zambian economy makes it highly dependent on imported inputs for current production and fixed capital investment, and in the absence of foreign financing, the ability of the economy to develop and diversify with help of imported investible goods depends almost entirely on the production of copper and the prevailing prices on the London metal exchange (Chukwuma 1981).

Foreign exchange is a very important input in an import dependent economy and lack of it can be a major constraint on the level of economic activity and growth. With Foreign exchange, raw materials or inputs of productive process can be bought to substitute those that may not be locally provided. In the recent crisis the volume of imports has been reduced considerably from 161 in 1970 to only 61 in 1985. The country's dependence on copper makes the decline in real earnings from copper very severe and the economy very vulnerable.

The government's initial reaction to these developments

was to introduce temporary measures as this was perceived as a temporary disturbance. The government imposed controls on imports and foreign exchange allocation. This suppressed the economy's adjustment to such external shocks as falling copper prices, oil price increase international inflation and rising interest costs on foreign debt.

Despite the declining revenue base the government was still trying to maintain the old standards by trying to maintain its services and employment. As a result government expenditures were in most periods higher than government revenue such that the budget deficit was rising. Between 1980 and 1982, budget deficits rose to 18 per cent of GDP. Real government spending on recurrent items, less interest payments and subsidies, was about 20 per cent lower than 1975 despite the increase in population of about 60 per cent since 1975. The real government spending on services is about a half what it was in 1975, while capital expenditures in real terms have fallen by 70 per cent. On the whole the budget as a proportion of GDP has deteriorated, in most years expenditures have been greater than revenues such that deficits have been large and persistent (Loxley, 1989 Young, 1988). Rising real levels of government expenditures in the 1980's, were not always matched by an increased revenue base, as a consequence, the government relied mostly on deficit financing.

Table 2:3

CENTRAL GOVERNMENT FINANCE 1975 - 1988 (Millions of kwacha)

	1975	1977	1980	1982	1984	1986	1987	1988
Total								
Revenue	476	539	809	n.a	1161	3022	4271	n.a
Total								
expenditure	855	821	1302	n.a	1621	6334	5537	n.a
Budget								
deficit	379	281	494	n.a	460	3312	1166	n.a
Debt servicing								
burden								
% Exports			31.9	47.6	45.6	39.7	n.a	20.6
Change in Arrears ±								
Debt rescheduling \$m			43	477	364	439	n.a	646

Source: Loxley, 1989; World Bank, 1986; IMF, 1988.

Fiscal deficits have varied in the range of 7 to 30 per cent of GDP since 1980. These deficits have contributed to inflationary pressure which has been rising and which reached well over 40 per cent per annum in 1987. (Young, 1987 Ncube et al 1988).

By early 1980, the constraints on Zambia's external resources were severe. The government could not keep up with debt servicing. Debt servicing as a percentage of GDP was reduced to only 21 per cent of exports by 1988 from 48 per cent in 1982. Debt servicing arrears started piling up, increasing by 93 per cent during the period 1978-80 and 1988. By 1986, Zambia's debt had risen to unsustainable levels. Between 1980 and 1984 Zambia's publicly guaranteed medium and long term debt rose about 75 per cent while accumulated arrears amounted to SDRs 226 million (Young, 1988 World Bank, 1986).

By 1980 commercial debt was very difficult to obtain as private lenders became more cautious. The only other sources were through rescheduling, some official debt relief and the IMF with high conditionality levels. Between 1980 to 1984 new external loans had been reduced by 60 percent while multilateral lending fell by 3.4 percent over the same period, bilateral lending fell 59 percent and private credits 85 percent (Young R. 1988 p 14).

Zambia's debt had increased to US\$ 5709 million by the end of 1986. This is one of the highest debt loads relative to GDP in Africa. Interest payments alone were estimated at US\$339 million which is about 35 per cent of total exports. Preferred creditors account for 32 per cent of total outstanding debt. Debt owed to multilateral institutions excluding the IMF accounts for 17 percent of outstanding total debt, or about U.S\$ 956 million, with World Bank, IDA and other institutions being owed US\$ 460, 191 and 305 million respectively.

The IMF is Zambia's major creditor with US\$856 million owing at the end of 1986, which is 15 percent of total debt. In the same period net payments to IMF were approximately US\$220 million in principal payments, and U.S\$ 47.5 million in interest payments.

Bilateral creditors hold 40 percent of Zambia's debt and most of this debt is extended on concessional but not generous terms. The grant element accounts for 35 percent of the outstanding bilateral credit, and 70 per cent of bilateral debt is owed to the Development Assistance Committee countries (Young 1987).

Total private debt accounts for 28 per cent of total debt but accounts for 37 per cent of total interest payments.

Bilateral debt accounts for 31 per cent of interest payments and multilateral debt accounts for 18 per cent. The IMF alone accounts for 14 per cent of total interest payments which is quite a big burden. Interest payments have increased tremendously. In 1987, they accounted for 50 per cent of total recurrent government spending and they are the root cause of most of the reduction in real spending on services.

Since 1983 fundamental reforms have been introduced as the government embarked on economic recovery. The reforms were meant to improve the government economic management and policy formulation and implementation. The reforms included policies such as decontrol of prices of commodities as well as of foreign exchange and interest rates and improvements in incentives to increase production and encourage diversification. The reforms were aimed at correcting domestic policy errors, which, it has been argued, contributed to Zambia's economic crisis.

For instance, during most of the period since independence the government maintained over valued exchange rates. In spite of unfavorable terms of trade, the real effective exchange rate rose by 30 per cent between 1980-1982. The value of the kwacha was never adjusted to reflect falling copper prices. This kind of foreign exchange

policy undermined the drive for export diversification and encouraged misuse of imports.

The government's mechanism used to allocate credit and foreign exchange was based on non market criteria. There was increasing use of administrative controls in resource allocation, assessment of viable projects and rationing of foreign exchange amongst competing needs and claims by both public and private sectors. This kind of policy led to mis allocation of resources.

The government's reaction to the country's economic decline was deficit financing to maintain consumption and investment levels rather than adjusting to the shocks. To finance the deficits, the government borrowed from within the country as well as outside. Therefore, Zambia's economic crisis coincide with growing external debt and rising budget deficits. As the government became less credit worthy to private lenders, it turned more to the IMF borrowing under very tough conditions. It has been argued that Zambia had no alternative to structural adjustment. If the government was to embark on economic recovery, there was need for financial support which at that time could come only from the IMF.

To get funding from the IMF the country has to conform to

structural adjustment policies, designed by the IMF. The continuity of the flow of funds depends on the country's ability to implement the IMF policies. IMF agreements demanded fundamental reforms in economic management and policies. These reforms have included decontrol of prices over a wide range of commodities including the foreign exchange rate. The decontrol of foreign exchange was achieved by introducing a weekly foreign exchange auction in October 1985.

CHAPTER THREE

ZAMBIA AND IMF PROGRAMMES.

As the country's economic crisis became unbearable, any attempt to achieve economic recovery was almost impossible without outside funding. Zambia's export earnings had been reduced drastically and copper production was not promising; the cost of production has been rising and experts say the copper ore will not last very long. On the other hand, with increases in arrears, the government's credit worthiness was not good enough to attract foreign and private finance. The only avenue left and available was the International Monetary Fund(IMF).

Zambia became a member of the IMF in 1965 but it was not until 1973 that the government made use of the IMF facilities. In all, Zambia has had seven agreements with IMF. Apart from the three year extended facility signed in 1980, most of the agreements were one to two year standby arrangements. While the first three arrangements were carried to full term, the last four were either cancelled, suspended or interrupted depending on the nature of the relationship between the Zambian government and the IMF at that time. Since the 1980's, Zambia's relationship with the IMF has been very unpredictable and some times hostile. Government association with the IMF has always caused

political controversy.

In 1973 Zambia received 19 million special drawing rights (SDR) from the IMF under very low conditionality. This was based on the assumption that the balance of payments problems were temporary. The arrangement coincided with the first oil shock when oil imports drained most of the foreign exchange, compounded by falling copper prices that led to a reduction in foreign exchange earnings, international reserves and government revenues.

The program concentrated on stabilization through fiscal and demand restraint by restricting government spending, increasing tax revenues, imposing a public sector wage ceiling and limiting government borrowing from banks. Private sector credit was indexed in order to stimulate investment. In this arrangement, there were no measures for improving external earnings (Ncube, Sakala Ndulo 1987).

In 1974 copper prices recovered briefly but later declined in 1975. This led to a sharp increase in the budget deficits and deterioration in the terms of trade which resulted in the government signing another agreement with the IMF for the period 1976-1977. In this agreement Zambia obtained another 29 million SDR in Compensatory Finance Facility loans to help offset the on-going

deterioration in the terms of trade. However, this loan came with conditions tougher than the ones in the first arrangement.

The contents of this arrangement included demand restraint measures through the removal of consumption subsidies, a wage ceiling, and a reduction in government recurrent and capital spending. A series of price adjustment measures required a 25 per cent increase in the producer price of maize, a 20 per cent devaluation and an increase in interest rates. The program also aimed at reducing external payments arrears and liberalising current account transactions

(Ncube, Sakala and Ndulo 1987 ,Young 1987).

Implementing these policies was not easy due to the high cost of the liberation wars in the southern African region and the continued deterioration of the terms of trade as copper prices continued to plummet. Therefore, performance under this arrangement was very poor. During this period, real GDP fell nearly 5 percent in 1977, inflation doubled to 20 percent and overall balance of payments deficits rose to SDR 243 million against the projected level of 65 million.

Table 3:1

Performance Criteria:1976-1977

	1976 Criteria	1976 out-turn	1977 out-turn
change)		(Annual rates of	
Real GDP	1.0	4.3	-4.3
Consumer prices	10.15	18.9	19.6
Domestic credit	16.9	26.9	30.0
Broad money	11.0	26.5	12.1
Government budget			
Revenues and grants	0.9	-0.3	10.8
Total expenditure	-13.1	5.9	2.0
Currency adjustment			
Nominal	-20.0	-20.0	-
Real effective rate	--	-2.8	3.3
		(percent of GDP)	
Budget deficit	8.5	14.0	12.7
Domestic Bank Financing	3.1	12.3	11.3
Foreign financing	3.8	1.6	0.9
Current Account Balance	-9.6	-5.08	-9.0
		(millions of SDRs)	
Overall Balance of Payment	-65	-165	-243
Payments arrears	70	203	393
		(US cents per pound)	
LME Copper prices	65.0	63.6	59.4

source: Roger Young 1987 , Bank of Zambia various issues.

The price of copper was estimated at 65 cents US per tonne, but it dropped to 59 cents US per tonne. Copper output fell 6.5 per cent while total export earnings fell 13 per cent. Payments arrears rose to 393 million US from a projected 70 million US. Domestic credit almost doubled, domestic bank financing increased to 12.3 per cent of GDP in 1976 and 11 per cent in 1977 from a target of 3.1. Foreign financing dropped from the estimated 3.8 to only 0.9 per cent of GDP, while the budget deficit rose from projected 8.5 to 12.7 per cent. (table 3:1)

The major mistake in this arrangement was that projections were made without allowance for emergency funding in case of an expected disturbance, for instance a fall in copper prices or an increase in budget deficits to finance the liberation war. In fact, foreign financing decreased.

Realising the seriousness of the crisis, the Zambian government and the IMF signed another agreement, involving a two year standby facility for the 1978 to 1980 period, for SDR 250 million, equivalent to 177 percent of quota. This standby was also supported by SDR 70 million in CCF and Trust Fund financing. The agreement was aimed at reducing the inflation rate, reducing the balance of payments deficit and promoting economic growth. In return Zambia devalued

its currency by 20 percent. The government was also required to diversify the economy through agriculture by adopting better policies such as increasing agriculture producer prices. It also agreed to eliminate arrears on foreign debt.

The policy package was more successful relative to the previous ones. This success was due to reduction in copper production costs and a slight increase in copper production and prices. Copper production increased from 589,000 tonnes to 650-680.000 tonnes, while copper prices turned out be more than projected from 60 and 70 cents US to 62 and 90 cents US in 1978 and 79 respectively. The balance of payments improved from -140m SDRs to 173 million SDRs. Exports increased and the current account was in surplus in 1979, while external arrears were reduced to 350 million SDRs. The inflation rate declined from 16-18 percent in 1978 to 16.4 per cent and in 1979 fell to 9.7 per cent (table 3:2).

However, the success story was short lived. In the early 1980's Zambia was hit by a drought which reduced the agricultural sector's output leading to the need to import food to supplement the shortage. During the same period Zambia was severely affected by the second oil shock. As a result of these disturbances, the government used up most of

Table 3:2

Performance Criteria:1978-1980

	1978		1979	
	criteria	out-run	criteria	out-run
Real GDP	-2.0 - 3.0	3.9	1.0 - 2.0	-7.7
Consumer prices	16 - 18	16.4	10.0	9.68
Domestic credit	18.62	17.4	8.8	9.3
Broad money	13.5	-8.5	21.2	30.2
Government budget				
Revenues and grants	11.5	15.5	-1.0	7.8
Terms of trade	8.0	-14.1	4.9	13.6
Total expenditure	-3.7	-8.4	-1.4	49.5
Currency adjustment				
Nominal	-10.0	-10.0	-	-
Real effective rate	-	-7.6	-	-0.1
		(percent of GDP)		
Budget deficit	7.6	7.3	7.0	13.7
Domestic Bank Financing	4.3	4.2	1.9	2.3
Foreign financing	2.6	0.9	5.0	5.4
Current Account Balance	9.2	10.1	-2.0	1.4
		(millions of SDRs)		
Overall Balance of Payment	140	-207	-	173
Payments arrears	397	495	422	350
		(US cents per pound)		
LME Copper prices	60.0	61.9	70.0	89.5

source: Roger Young 1987, Bank of Zambia various issues.

its foreign exchange to import food and oil.

In the period 1980 to 1983 the government and the IMF introduced a more comprehensive structural adjustment programme under the Extended Fund Facility involving SDR 800 million. Under this facility, the government had to reduce its deficits by removing subsidies and reducing government employment. This arrangement also involved restrictions on foreign exchange allocation and government recurrent spending, introduction of better pricing policies, and the promotion of diversification and domestic production in agriculture and primary commodity sectors. Some domestic industries were protected by restricting importation of certain commodities such as wheat and cooking oils (Economist Intelligence Unit, 1985, p. 1).

These objectives were not achieved due to the continuing decline in copper prices, which were projected at 93 cents U.S but dropped to 79 cent U.S, and also due to domestic policy errors such as continuing expansion of domestic credit. Real GDP was lower than targeted in 1981, domestic credit increased significantly from a 14.7 target to 46.7 per cent per annum. Government revenue dropped to 5.4 lower than the projected 12.4 per cent per annum. The current account balance was targeted to fall to 9.8 of GDP but turned out to be 16 per cent.

Table 3:3

Performance Criteria:1981-1983 Facility*

	1981 criteria	out-run	1982 Forecast
Real GDP	5.0	4.7	5.0
Consumer prices	14 - 16	14.0	12 - 14
Domestic credit	14.7	46.7	-
Broad money	13.1	7.9	-
Interest rates			
Maximum lending rates	12.0	12.0	12.0
Nominal	-2 to -4	-2.0	-2 to 0
Government budget			
Revenues and grants	12.4	5.4	13.0
Total expenditure	-12.3	-21.1	8.8
Terms of trade	14.0	-14.2	14
	(percent of GDP)		
Budget deficit	7.1	14.0	5.5
Domestic Bank Financing	4.1	5.4	2.2
Foreign financing	2.0	8.1	2.2
Current Account Balance	-9.8	16.3	-5.6
	(millions of SDRs)		
Overall Balance of Payment	-152	-327	-35
Payments arrears	339	501	211
	(US cents per pound)		
LME Copper prices	93.0	79.0	115.0

* Since 1981-83 facility became inoperative after 1981 and cancelled in July 1982, the 1982 data reflect targets established at the beginning of the facility.

source: Bank of Zambia, Roger Young 1987

The overall balance of payments deficit increased to 327 and payments arrears increased to 500 million SDRs. (table 3:3) The program's poor performance, and the governments inability to clear arrears and budget deficits resulted in disagreements between the government and the IMF leading to the cancellation of the Extended Fund facilities in July 1982.

In 1983-1984, Zambia acquired a one year standby arrangement involving SDR 211 million. This was meant to restore the financial stability of the economy after the reduction in foreign exchange earnings due to falling copper prices. The conditionality included conventional reductions in domestic expenditures through a wage freeze on civil service and reduction in employment and more incentives for producers in both agriculture and manufacturing.

During this period the domestic currency was devalued by 20 percent and delinked from the SDR in January and July 1983 respectively (Young, 1988). Foreign debt service due in 1987 was rescheduled. Copper exports and prices deteriorated, the price of copper was estimated at 76 cents U.S but decreased to 72 cents U.S.(table 3:4). The standby facility was later cancelled because the government and the IMF could not agree on the arrears and domestic budget deficits.

Table 3:4

Performance Criteria:1983-84 Facility

	1983 criteria	out-turn
	(Annual rates of change)	
Real GDP	-	1.8
Consumer prices	25 -23	19.7
Domestic credit	10.7	8.4
Broad money	12.5	11.1
Interest rates		
Maximum lending rates		
Nominal	13.0	13.0
Real	12 to -17	-6.6
Government budget		
Revenues and grants	26.8	19.5
Total expenditure	-10.0	-16.4
Terms of trade	2.7	3.5
Currency Adjustment		
Nominal	-34.8	-38.5
Real Effective Rate	--	-18.4
	(percent of GDP)	
Budget deficit	5.6	6.3
Domestic Bank Financing	3.7	2.7
Foreign financing	0.5	1.8
Current Account Balance	-7.4	-8.3
	(millions of SDRs)	
Overall Balance of Payment	-100	-89.6
Payments arrears	720	720
	(US cents per pound)	
LME Copper prices	76.0	72.2

source: Bank of Zambia various issues, Roger Young 1987

The last and most well known agreement between the government and the IMF was the 1984-1986 standby facility which eventually led to the Zambia-IMF divorce. Under this arrangement the IMF was more aggressive in implementing stabilization policies. This agreement focused on reducing aggregate demand, increasing revenue and reducing expenditure. The government introduced a 50 percent foreign exchange retention scheme as an incentive to producers in both manufacturing and agriculture to improve their exports.

With record low copper prices at 63 cents U.S and payments in arrears of 718 million SDRs, inflation rose to 20 per cent per annum and the budget deficit rose to 11 per cent per annum, while GDP showed no growth (table 3:5). The terms of trade continued to deteriorate while the government ran down its reserves. The shortage of foreign exchange and its strain on domestic production was compounded by the strict control of foreign exchange allocation. Experts say this control led to misallocation of resources and was detrimental to the economy that was trying to recover. The facility was inactive in April 1985.

Table 3:5

Performance Criteria:1984-86 Facility*

	1984 criteria	out-turn
	(Annual rates of change)	
Real GDP	-	2.7
Consumer prices	25.0	20.0
Domestic credit	11.1	11.1
Broad money	12.0	18.0
Interest rates		
Maximum lending rates		
Nominal	17.0	17.0
Real	-8.0	-3.0
Government budget		
Revenues and grants	15.0	8.6
Total expenditure	12.8	17.5
Terms of trade	-11.9	-12.9
Currency Adjustment		
Nominal	-30.0	-31.3
Real Effective Rate	--	-14.4
	(percent of GDP)	
Budget deficit	4.5	10.7
Domestic Bank Financing	3.3	4.0
Foreign financing	1.8	1.3
Current Account Balance	10.0	8.2
	(millions of SDRs)	
Overall Balance of Payment	-93	-66.3
Payments arrears	620	718
	(US cents per pound)	
LME Copper prices	65	62.5

*Facility became inactive in April 1985 and was cancelled in February 1986.

source: Bank of Zambia various issues, Roger Young 1987.

By october 1985 the IMF suggested a decontrol of the foreign exchange allocation by letting market forces determine the allocation. This led to the introduction of the weekly foreign exchange auction in october 1985. However the Facility was cancelled in 1986 while the auction was discontinued in 1987. With this background it is to a consideration of the workings of the foreign exchange auction that we now turn.

CHAPTER FOUR

THE ZAMBIAN FOREIGN EXCHANGE AUCTION

AUCTION THEORY

There are basically four types of auctions. The Dutch, First price sealed, Second price sealed and English auctions. The First price auction is a sealed bid auction in which the highest bidder claims the object and pays the amount equal to the bid. The Second price auction is a sealed bid auction in which the highest bidder claims the object but only pays the amount equal to the value of the second highest bid.

The dutch and the First price auction are strategically equivalent. In both auctions the bidder has to select the highest price which he is willing to pay for the goods. In the Dutch auction the auctioneer begins by naming the highest price, then gradually reduces it until some bidder stops the auction. The bidder, is therefore, faced with a decision to choose a price that is optimal to himself at which he will be willing to stop the auction and claim the goods if nobody has already claimed them. The highest bid wins and the bidder pays the price equal to the bid. The same technique is used to determine the winner and the price in the First price auction. Consequently, the equilibria of the two auctions is expected to be the same.

The Second price sealed auction and the English auction

are also equivalent. In both auctions, at equilibrium, the winner will be the bidder who values the object most highly. The price he pays will be equal to the value of the second highest bid. In the English auction, the auctioneer starts with the lowest price and then gradually increases, until somebody claims the object. The bidder's strategy is to specify his possible valuations, whether or not he should be active in the bidding according to the previous activities in the auction that he has observed. However, if the bidder knows the value of the object to himself, he has a straight forward dominant strategy, which is to bid actively until the price equals his evaluation. Regardless of the other bidders strategies, his evaluation would be optimal.

Similarly, in the Second bid auction, the bidder's dominant strategy is to submit a sealed bid that is equal to his evaluation. Thus, the English and the Second price auctions have a unique dominant strategy equilibrium, which is pareto optimal; that is the winner is the one that values the object the most.

The Dutch and the First price auction have a dumping effect known as the 'winners' curse'. This is usually possible when there is more than one object to be sold and more than one winner. Bidders who bid very high find themselves paying more for the same object than the others.

As the auction progresses the bidders with a winners' curse start bidding low to reduce their cost.

Much of the existing theory analyses the independent private values model. The private value model assumes that the bidder knows the value of the object to himself and does not know the value that other bidders place on the object. Furthermore the values are assumed to be independently distributed. Therefore, the bidders are assumed to behave competitively, while the auctions are treated as non cooperative games among the bidders (Milgrom and Weber, 1982 Milgrom, 1989 Samuelson, 1981).

FOREIGN EXCHANGE AUCTION IN ZAMBIA

In recent economic debates, it has been widely agreed that the exchange rate is one of the most important variables in third world economies today. Most Third World countries economies' are very dependent on imports. As such, their economies are largely influenced by the price and distribution of foreign exchange among different projects within the country. Experts have argued that exchange rates pursued by some Third World countries have proved to be self defeating. During the late 1970's and early 1980's most developing countries maintained over valued exchange rates. These policies were detrimental to

development in the sense that over valued exchange rates undermine exports while encouraging imports (Sebastian, E. and Liquat, A. 1986). The World Bank (1980) has argued that over valued exchange rates are responsible for the dramatic deterioration in the agricultural sectors in most african countries. Apart from undermining exports, over valued exchange rates harm agriculture and lead to destabilising capital outflow.

Zambia is one of the African countries that for a long time maintained an over valued exchange rate. This was detrimental to local industry's development and competitiveness. Overvalued exchange rates also proved self defeating especially when the government was advocating diversification and import substitution whilst this policy made imports artificially cheap and exports artificially expensive or less rewarding (World Bank, 1986). As well, capital was imported, and the overvalued exchange rate made capital relatively cheaper than labour, thus contributing to the distortion in the factor market at the time when the government was trying to create employment by advocating labour intensive production.

In order to diversify the economy away from copper and promote non traditional exports, the government was urged to devalue the currency to the level that would make domestic

products and exports more competitive and at the same time create employment for the excess labour, by encouraging more labour intensive techniques. Zambia was looking for foreign exchange arrangements that would be beneficial to trade and domestic production. The exchange rate needed was one that would help rectify the overvalued rate, stabilize the movements in the foreign exchange rate and minimise the impact on the balance of trade.

The IMF suggested that the exchange rate should reflect the market valuation by allowing the foreign exchange rate to be responsive to supply and demand and allocated to individuals that value it most. This, the IMF argued, would allow the local entrepreneurs to adapt ot changing external factors and ensure that they obtain necessary imports. Inefficient firms would be forced to close down. To achieve this, the government was going to introduce massive but gradual devaluations (Burrell and Phillips, 1988).

Devaluation has never been a popular policy in Zambia. Being a small country devaluation is expected to increase exports through increasing returns to exporters and by discouraging imports. However, Zambia is highly dependent on imports such that devaluation has an immediate impact on the domestic price level. As the cost of imported materials rise, this quickly finds reflection in the prices of

consumer goods. The increase in the cost of living resulting from high cost of consumer goods is one of the major sources of political conflict, as a result the government is very reluctant to implement such policies.

On the other hand, the IMF did not want government intervention in the foreign exchange allocation. The IMF preferred a foreign exchange rate determined by market forces, hence the foreign exchange auction. Proponents of the auction are of a view that the auction is neutral in the sense that the government would not have to set the rate or determine the exchange allocation. The exchange rate would instead respond to market forces and political disputes about the appropriate level would be avoided.

In October 1986 the Bank of Zambia announced through the media the new arrangements that were to govern the foreign exchange auction. The objectives of the foreign exchange auction were to,

- 1.) ensure the exchange rate is fully responsive to changes in the demand for and supply of foreign exchange,
- 2.) provide the foreign exchange without delays,
- 3.) attract into the banking system foreign exchange which is held outside the banking system,
- 4.) reduce reliance on administrative allocation of foreign

exchange; and

5.) promote increased production and a wide range of exports (Times of Zambia, 1985).

The decontrol of foreign exchange brought new rules that were not possible before the auction. The new foreign exchange arrangements included the foreign exchange retention privileges to be enjoyed by the Zambia Consolidated Copper Mines (ZCCM) and other exporters of non traditional products. The foreign exchange earned from exports would be given to the authorised dealers at the weekly rate determined at the auction. This was an incentive for producers of export commodities.

The amount of foreign exchange to be auctioned was made available weekly. The sources of these funds were to be export earnings and disbursements of cash loans and grants. Some of the cash loans and grants that were auctioned were tied and restricted to specific importers as determined by the requirements of the source of funds. The exchange rate was to vary from auction to auction in response to supply and demand during the auction.

Some predetermined amount of foreign exchange was to be allocated outside the auction system. This involved funds for government imports and other payments, ZCCM export

earnings retention quota, nontraditional export earnings retention quota, crude oil imports and related port charges and Zambia Airways IATA payments. All weekly transactions were to be valued at the going rate for the week determined by the auction. The US dollar was to be the intervention currency for the Zambian kwacha.

Importers would still have to meet the requirements of the customs and excise. Outstanding letters of credit in commercial bank accounts were to be considered as loans. Before the auction it was very difficult to remit money into the country without being questioned by the authorities, the new rule was that remittances would be made with no questions asked. This was meant to attract money held outside the banking system and outside the country.

Travel allowance was to be approved and paid out of commercial banks' working balances without prior exchange control approval by the Bank of Zambia. Applications for business travel would be submitted to commercial banks for prior Bank of Zambia exchange control approval, and these would be paid out of commercial banks' working balances.

The cabinet office was no longer required to approve business travel unless it was government travel. Airline tickets that only involved travel on Zambia airways routes

would be paid in domestic currency. If however, travel involved a foreign airline, prior exchange control approval would be required by the Bank of Zambia. Remittances of profits and dividends would be made through the bidding subject to the limits established by the central Bank (Bank of Zambia).

A foreign exchange management committee (FEMAC) was formed and chaired by the general manager for the Bank of Zambia. This committee would administer the new foreign exchange arrangement. Their duties would include conducting the weekly auction out of approved foreign exchange budget and making direct allocations to firms and government exempted from the auction.

The role of the authorities in the auction was a more central one in the sense that they received the receipts that were surrendered to them from specified exports and services, which were later auctioned on a weekly basis. The central bank decided on how much foreign exchange to be auctioned each week. The spread between buying and selling by commercial banks was closely monitored by the central bank in order to prevent collusion practices.

GUIDELINES FOR OPERATION

Foreign exchange available for the auction was meant for users who had no access to direct allocation. Bidders were required to submit their bids to their respective commercial banks, stating in US dollars how much foreign exchange they wanted and the rate they were willing to pay in domestic currency for one US dollar. Bids were then submitted together with the required documentation such as bidders' identity, import licence, pro-forma invoices, exchange control approval by the Bank of Zambia and a cheque in full value of their application in domestic currency. The commercial banks kept the cheques in their suspense accounts until the bidding was done for that week. The commercial banks submitted the bids to the central bank with all the proper documentation. All the bids were later covered by one commercial bank cheque on behalf of its customers to the central bank. FEMAC sorted the bids and ranked them from highest to lowest. The marginal rate was determined by the lowest rate that fully exhausted the foreign exchange available for the week. This rate became the ruling rate for all the transactions until the next auction. Bids below the marginal did not qualify. All the successful bidders were required to pay the marginal rate.

AUCTION EXPERIENCE

The first Zambian auction was held on October 11th 1985, the kwacha devalued from the pre auction rate of 2.20 kwacha per US dollar to 5.01 K/US\$, about 128 per cent depreciation. The first 42 auctions were marginal auctions and during this period, the kwacha fluctuated from 5.01 to 8.01, 156 per cent depreciation in less than a year. The auction funds were most of the period fixed at 5 million US\$ and later changed to 9 million.

By June 1986, the firms that were originally eligible for direct allocation were allowed to bid. During the same period, FEMAC decided to publish names of all bidders and their bids in the national media. This was meant to expose bidders who were bidding too high thus driving the rate up.

By July 1986, further documentation was needed when bidding, bidders were now required to provide tax clearance certificates and evidence that the foreign exchange provided to them earlier had been used as intended. Bidders were asked to provide customs clearance for imported goods as evidence for their expenses. Most bidders were informed at short notice and therefore could not provide the required documentation and were therefore disqualified. The exchange rate dropped to 5.03K/US\$ as a result of abrupt changes in rules that reduced successful bidders.

In August 1986, the Dutch auction was introduced. This was meant to control the effect of speculation on the exchange rate by making the successful bidders pay the price they asked for, hoping that the winners' curse would take effect. Reckless bidders would find themselves with overpriced goods, after paying more for foreign exchange than other bidders. As a result bidders would become more cautious and submit bids that are genuinely equal to their evaluation. This would eventually lead to lower marginal prices.

During the Dutch auction, the kwacha's lowest value was 5.01 per US\$, however, this low rate was due to an increase in available funds from 9.5 million US\$ to 22 million US\$, almost every bidder was successful. Out of 760 bids submitted, 634 were successful and the rate fell to K/US\$ 5.0 from K/US\$ 6.0. Unfortunately, the 22 million was more than what the government had in hand, hence the pipeline began to build up, some successful bidders had to wait 10 weeks before they could get the foreign exchange allocated to them. The fall in the price was therefore short lived. There was speculation that the auction was going to be abandoned, the business community panicked, and understandably the bid price began to rise. In January 1987 the rate had reached 14 K/US\$, and the president discontinued the auction temporarily (EAZ, 1988).

Nine weeks later the auction was reintroduced with some changes. A two tier auction was introduced. Foreign exchange was to be allocated through two windows. The official window was restricted to debt service and government imports for health and education. All the other bidders had to obtain foreign exchange through the second window, that was the auction window. Except for crude oil import, bids were not allowed to take up more than 5 per cent of the available funds.

In February 1987 the Bank of Zambia governor announced new arrangements for the auction. The changes were that every first week of the month was reserved for bidders from agriculture and small scale industries. However, the bidders from these two sectors were not excepted from taking part in other auctions. Considering the pipeline, a bidder had the right to withdraw the bid while waiting for disbursement. The floor rate of 9.00 K/US\$ was established and bidding below the rate was not allowed, however, no upper limit was set. The auction was flexible and subject to modifications. Successful bidders were still determined by the marginal rate (Nkhoma, F, X, 1988).

On top of the previous requirements for documentation, bidders had to provide evidence of payment of customs duty for the goods that had arrived supported by the bills of

entry. If however, the goods had not arrived the bidder was required to show bills of landing. The auction was proving to have too many rules such that some bidders preferred to use the black market. By may 1987 the rate was 21.02 K/US\$ and the president cancelled the auction.

Perhaps the most negative impact attributed to the auction system on the Zambian economy and the people was the inflation. Since the introduction of the auction in 1985 the cost of living increased, the price of most essential commodities rose to make up for the cost of obtaining foreign exchange. Immediately after the 128 per cent depreciation in the kwacha, prices began to increase. Fuel prices doubled, while bus and taxi fares went up by 70 percent (EAZ 1987). The annual rate of inflation increased from 35 per cent in September 1985 to 46 per cent in October 1985. By July 1976 the rate of inflation was up by 59 per cent (Ncube, Sakala, and Ndulo 1988).

THE AUCTION AND THE NOMINAL EFFECTIVE EXCHANGE RATE.

Before the general floating of major currencies in 1971, most developing countries maintained a fixed peg against a single intervention currency. However the beginning of floating major currencies, has left Third World countries with a choice of maintaining a stable exchange rate. There are three major choices, a country can choose to peg it's currency to one major currency, peg to a basket of currencies or SDRs or adopt an independent float.

One major disadvantage of pegging to one major currency is that, movements in the exchange rate of the intervention currency, will not, in most cases reflect the conditions in the foreign exchange market of a developing country. While pegging to an import weighted basket takes into account some of the conditions affecting trade of less developed countries and will therefore reduce distortions and costs from movements in exchange rates among other currencies. Independent float is another option, but the benefits and cost from this arrangement depends on the level of development of a particular country. There has to be a well developed industrial sector or efficient and open capital markets. This enables the exchange rate, flexibility, to facilitate the problem of external adjustment while not interfering with domestic objectives.

The type of exchange rate arrangement that a country adopts, depends on the purpose, however if the main objective is to maintain a stable exchange rate, then a country may adopt a policy that stabilises the effective exchange rate. The effective exchange rate, measures the value of the domestic currency in terms of a weighted group of currencies relative to a chosen base period. The weighted currencies are usually those of the country's major trading partners. Movements in the effective exchange rate index depend on the degree of diversification of a particular country's trade pattern and the standard at which it is pegged.

If trade is done with only one major industrial country, then movements in the exchange rate of other countries will have little effect on the effective exchange rate index in terms of stabilization. Consequently, stabilising the nominal exchange rate with respect to major trading partners' currencies, will also stabilise the effective exchange rate. If however, trade is with a number of industrialised countries, the floating of those currencies with respect to one another, will cause exogenous movements in the developing country's effective exchange rate.

CHAPTER 5

MODEL AND ANALYSIS

The purpose of this chapter is to present and test the model of the Zambian auction which, hopefully, will assist in testing hypotheses 1, 2 and 5 stated in chapter one. Section 5:1 consists of ordinary least squares regression results and interpretation, simulation, plotted results and interpretation. This includes the predicted and actual price, the low bid, high bid and the price and finally the available funds and the price. The plotted results will help in testing divergence, convergence and stability. Section 5:2 includes measurement of the stability of the effective exchange rate using the exponential growth model. Section 5:3 has the inflation regression results and interpretation.

Section 5:1

MODEL:

The model to be tested is as follows;

$$pt = \beta_0 + \beta_1 WAF_t + \beta_2 pt_{-1} + \beta_3 BIt + \beta_4 LBit + \beta_5 HBit + \beta_6 DUMMY_t + \epsilon_t$$

Where,

pt: is the price of the U.S \$ in Zambian kwacha determined weekly during the auction. This is basically the marginal

rate.

WAF: is the amount of funds available weekly to be auctioned. The amount is determined by auction officials.

Pt-1: is the lag of the weekly marginal price.

BI: is the number of bids submitted each week.

LBI: is the value of the lowest bid submitted each week.

HBI: is the value of the highest bid.

DUMMY: is the variable representing the two types of auctions. The Marginal auction has the value equal to one, while the Dutch auction takes the value of zero.

et: is the error or residual.

The auction results on the demand side reflect the market demand obtained when the amount of foreign exchange asked for by all the bidders is added together. What the model is measuring is the movement on the demand curve that indicates how much demand was satisfied during each auction. The determination of the struck price during the weekly auction represents a point on the demand curve, which could be lower, higher or the same as the previous rate.

The supply of funds is assumed to be exogenously determined outside the auction and hence, the supply will not be estimated. Similarly, we assume that we already have the market demand curve by adding total demand of all the bidders. The demand curve is assumed to be downward

sloping, such that the lower the struck price the more demand is satisfied. The model in this text will not include the estimation of the demand curve in terms of the variables that affect the demand for foreign exchange.

The weekly available funds (WAF), play an important role because once the value of WAF is known a marginal rate is determined. This marks the cutting point between successful bids and unsuccessful bids. Bids that are above the marginal rate are declared successful, while the bids below the marginal rate are unsuccessful.

The lag price is included in the model because, according to the auction theories, bidders make use of information about past auction trends. This helps them to reduce their chances of being unsuccessful. The model lags the actual price by one period.

The number of bids are included in the model because if fewer bids are submitted, it is assumed that the clearing price would likely be high since the available funds would have to be distributed among fewer bidders. Similarly, if the number of bids is large, it is likely that the marginal rate would be lower.

The low bids were all the time below the marginal and

therefore, unsuccessful. It has been hypothesised that, if all or most of the bidders bid lower it would lead to a reduction in the marginal rate. Similarly, if most or all bidders bid high it would lead to an increase in the marginal rate.

The dummy variable is important in the model because it helps to determine the difference in the two auctions. The reasons the authorities gave for switching from the Marginal to the Dutch auction will be verified by the use of the dummy variable.

EXPECTED SIGNS AND COEFFICIENTS

p_t is the price of the U.S.dollar in Zambian kwacha, the struck price determined weekly through the auction. The price was supposed to be responsive to supply and demand and hence, p_t was designed to be an equilibrium price. In this model, p_t is the dependent variable.

The WAF is the available funds for each auction. This helped to determine the movement along and a point on the demand curve. The sign of the coefficient is expected to be negative, indicating that the lower the available funds the higher the struck price and the less the demand satisfied

Pt-1 is the lag price. In auction theory bidders are expected to be cautious and calculating. Which means that they have to study the previous auction results and bidding procedure to minimise their loss. It has been hypothesised that the bidders in the Zambian auction may have based their current bidding on the previous price in order to increase their chances of their bid being successful.

Therefore, bidders may tend to submit their bids with offer prices very close to the previous price. The coefficient of the lag price is expected to be positive and less than one, indicating that if the previous rate was low the bidders would ask for lower rates. Similarly, if the previous rate was high bidders would tend to ask for higher rates as long as this would increase their success rate. The size of the coefficient will determine the speed of adjustment of current bid prices from previous struck prices that is a coefficient close to one indicates a slow rate of adjustment.

BI is the number of bids submitted weekly during the auction. the fewer the number of bids submitted the more likely that the struck price will be higher, since the marginal price was the value of the bid that cleared the weekly available funds. The coefficient is expected to be negatively related to the price.

LBI is the value of the lowest bid submitted. Since the struck price is the marginal price that clears the amount of auction funds available, the more lower bids in the auction, the more likely that the marginal price will be low, assuming that lower bids put less pressure on the demand for foreign exchange. The lower the marginal price the more successful bids. In other words more demand is satisfied. Therefore the coefficient for LBI is expected to be positive.

HBI is the value of the highest bid in each auction. The coefficient is expected to be positively related to the price. The greater the number of bidders submitting high bids, the higher the marginal and hence the struck price, assuming that high bids increase the pressure on the demand. Therefore, high bids tend to depreciate the value of the Zambian kwacha and increase the price of the U.S dollar in Zambian kwacha. High bids also tend to reduce the amount of demand satisfied by the auction by increasing the marginal price.

The dummy variable in the model depicts the two types of auctions that were tried in Zambia. These are, the Marginal and the Dutch auction. The first 42 weeks was the Marginal auction while the last 32 auctions were Dutch auction. It has been argued that the switch from the Marginal to the

Dutch auction was meant to stop reckless bidders that bid too high and depreciated the kwacha. The Dutch auction was meant to bring down the price of the U.S dollar. The switch was meant to make use of the winner's curse to reduce the rapid depreciation of the Zambian kwacha. The expected sign for the coefficient is positive, that is we are expecting a higher intercept for the Marginal auction. Since the Marginal auction has a value of one in the dummy, and it has been hypothesised that the Marginal auction led to more depreciation of the kwacha than the Dutch auction, the sign would have to be positive to verify this argument. However, had the Dutch auction taken the dummy value of one, the sign would have been expected to be negative to indicate a lower intercept.

INTERPRETATION OF THE REGRESSION RESULTS.

Table 5:1 show the results of the first regression. We have a very high F value which seems to indicate that the overall model is significant. The theoretical F value at 5 percent level of significance and 6:66 degrees of freedom is less than the calculated value. The theoretical value is 2.79 while the calculated value is 141.759. From this we may conclude that the explanatory variables truly explain the variation in the price.

The R - Square and the Adjusted R - Square are also quite high. Since the R- square gives the percentage of total variation in the dependent variables that can be explained by the independent variables we may conclude that the explanatory variables are responsible for 94 percent of the total variation of the marginal rate. This may mean that the regression line is a good fit. Only 6 percent of the variation is attributed to the disturbance term. Although the model has a high F value and a high R- square most of the coefficients are not individually significant when we apply the t - test at 5 per cent level of significance and some coefficients have the wrong signs.

The coefficient for the WAF variable has a correct sign and it is statistically significant at 5 per cent level of significance. This could mean that the WAF indeed was

negatively related to the marginal price. The reduction in the amount of available funds led to the increase in the marginal and hence the struck price. The results are consistent with the critics of the auction that the auction was under funded. Since the available funds and the marginal price have a negative relationship, an increase in the auction funds could have resulted in lower struck prices.

The lag price has the right sign. The coefficient is large at 0.8 and it is statistically significant. The outcome may help us conclude that while the lag price is important in auctions, it was not fully utilised in the Zambian auctions, indicating that the bidders might have been inexperienced. This indicates that the bidders made use of the previous auction outcomes when submitting their bids, but they were very slow in making use of the previous prices.

The coefficients for number of bids, low bids and high bids are related to the struck price in the direction hypothesised but they are not statistically significant. The dummy variable has a wrong sign and is not statistically significant. Therefore, they may not be reliable variables for the model and could not have influenced the outcome of the auction.

With only two variables statistically significant, the model cannot help us draw firm reliable conclusions, although the F value and the R-square value indicate that the regression is a good fit.

Table 5:1

Dependent Variable:price

Variable	Parameter Estimate	Standard error	T-Ratio
Intercept	1.08075084	0.91118515	1.186
WAF	- 0.09410984	0.03688551	-2.551*
LGPR	0.83304729	0.12980162	6.418*
BI	- 0.001087047	0.001831649	- 0.593
LBI	0.07100401	0.12128382	0.585
HBI	0.06123186	0.09455491	0.648
DUMMY	-0.47527545	0.32762983	- 1.451
F VALUE	141.759		
R-SQUARE	0.9439		
ADJUSTED R_SQUARE	0.9372		

* significant at 5 per cent level of significance

However, a high R-square and F value with few significant t ratios could mean that we have a multicollinearity problem. Therefore, the second regression was run without the variables that were not significant, that is the number of bids, the low bids and the high bids.

The second regression results are depicted in Table 5:2. This regression has only three independent variables, WAF, pt-1, and the dummy. The expected signs and sizes are the same as in the first regression. According to the results, WAF and Pt-1 are related to the struck price in the expected direction. Although the dummy variable coefficient has a wrong sign, it is statistically significant. We may have to conclude that there was in fact a significant difference between the two types of auctions. However, the findings do not confirm the argument that the Marginal auction led to higher struck prices. The negative sign indicates that the marginal price did have a lower price of the U.S dollar relative to the Dutch auction. We may therefore conclude that there was a difference in price between the two types of auctions, and the Marginal auction resulted in lower struck prices than the Dutch auction. Hence the argument made by IMF and Bank of Zambia officials that the Marginal auction made it possible for speculators to depreciate the currency more could, perhaps, be refuted.

However this finding might simply reflect the argument that during the Dutch auction the government got a lot of funds from the auction and also that bidders were speculating that the auction might be abandoned as the pipeline developed and the auction rules and regulations changed more frequently. This could have put pressure on demand and led to reckless bidding that was being avoided in the earlier Marginal auction period.

All the coefficients are statistically significant at 5 per cent level of significant. Therefore, this regression might be more reliable than the first one. The intercept is positive and statistically significant. The WAF has the right sign and is significant at 5 per cent level of significance. We may conclude that the supply of auction funds was not responsive to either demand or price. It was expected to increase along with increased demand and struck prices but this did not happen. This may be because by the end of the Marginal auction the pipeline had developed, there were more successful bids than there were funds, in other words the auction was under funded.

The coefficient for the lag price has the right sign and it is statistically significant. We may conclude that while the participants in the auction may have been guided by the previous price the adjustment period was very slow as can be

seen from the size of the coefficient it was almost 9 times slower, that is, $(0.069/1-0.9)$, where numerator is the short term impact on the price.

The coefficient for the dummy variable has a wrong sign but that may help us conclude that the Marginal auction did not have a higher intercept than the Dutch auction. The coefficient has a negative sign and since the Marginal auction takes the value of one, the findings indicate that the Marginal auction had a lower intercept and hence lower struck prices.

Reducing the number of independent variables has not changed the R square but we have an increase in the F value from 142 to 328 in tables 5:1 and 5:2 respectively and the difference of 186 is significant. We may conclude that reducing the variables led to an improvement in the overall regression. We also ended up with significant variables that were not significant before.

Table 5:2

Dependent variable:price

Variables	Parameter Estimate	Standard error	T Ratio
Intercept	1.55917242	0.49924357	3.123*
WAF	- 0.06868504	0.3290022	- 2.088*
LGPR	0.92399300	0.04116559	22.446*
DUMMY	- 0.65021005	0.22413588	-2.901*
F VALUE	327.758		
R-SQUARE	0.9398		
ADJUSTED R-SQUARE	0.9369		
DURBIN WATSON	1.94		

* significant at 5 per cent level of significance.

INTERPRETATION OF SIMULATION AND PLOTTED VALUES

The predicted and the actual prices are shown in table 5:3, while the plot is shown in figure 5:1. The graph and the table portrays a model that reproduces the time path for the actual price quite closely. All the turning points have been reproduced. This is a very stable simulation between the predicted and the actual price.

The out of sample projection was done on the last five observations and the findings show a very close prediction supporting the previous simulation. The same simulation was done, leaving out the last 5 observations. The five observations were then substituted in the equation, making use of the coefficients. The prediction was similar to the simulation findings. This is useful for forecasting purposes, we can estimate the effect of changing one of the variables or all the variables. For instance, holding all the variables constant, increasing the WAF from U.S\$5.6 million to U.S\$10 million led to a reduction in the marginal rate of almost 50 per cent, from 13.3 to 6.6.

Figure 5:2 represents the deviation of the low bid and the high bid from the actual price. According to the graph, during most of the Marginal auction period, the gap between the price and the low and high bids was wider but decreasing.

Table 5:3

predicted	Week	Actual and predicted price:	
		Actual	
	1	5.01	.
	2	6.10	5.2
	3	7.00	6.2
	4	6.44	6.9
	5	6.3	6.4
	6	6.0	6.4
	7	5.8	6.2
	8	5.8	6.0
	9	5.7	5.9
	10	5.8	5.9
	11	5.8	5.9
	12	5.7	6.0
	13	5.8	5.9
	14	5.9	6.0
	15	6.0	6.1
	16	6.4	6.2
	17	6.4	6.4
	18	6.5	6.6
	19	6.7	6.6
	20	6.8	6.6
	21	7.0	6.8
	22	6.9	7.0
	23	6.8	6.9
	24	6.9	6.5
	25	6.9	7.0
	26	6.9	6.7
	27	7.0	7.0
	28	7.1	6.8
	29	7.0	7.0
	30	7.0	6.9
	31	7.1	7.2
	32	7.0	6.9
	33	7.2	7.2
	34	7.3	7.1
	35	7.3	7.4
	36	7.3	7.1
	37	7.4	7.1
	38	7.5	7.3
	39	7.7	7.3
	40	8.1	7.8
	41	5.0	8.1
	42	6.1	5.0

(Dutch Auction)

43	5.0	5.1
44	5.4	5.5
45	5.8	6.6
46	6.3	6.6
47	6.9	6.7
48	7.0	7.0
49	5.6	7.3
50	6.4	6.6
51	7.1	7.0
52	7.6	7.7
53	8.3	8.3
54	9.4	9.0
55	10.3	9.8
56	11.5	10.8
57	12.3	11.9
58	13.5	12.6
59	14.7	13.6
60	15.3	14.7
61	12.1	15.3
62	11.9	12.4
63	12.5	12.2
64	12.7	12.7
65	13.0	12.9
66	13.5	13.2
67	14.1	13.7
68	14.9	14.2
69	15.0	
70	17.0	
71	18.8	
72	20.0	
73	21.0	
74	15.0	

OUT OF SAMPLE PROJECTION

66	13.5	13.3
67	14.1	13.0
68	14.9	14.3

The gap for the high bid reflects some reckless bidding that took place during the early period of the Marginal auction. The low bid line is generally increasing as unsuccessful bidders revise their expectations by trying to bid high enough to be successful.

After the 25 th auction the public started demanding that the bidders and their bids be exposed in the national media. At this point there is a reduction in the high bids almost as though we are getting a convergence. The Marginal auction lasted for 42 auctions. During this period, the price is relatively stable.

The first 10 auctions for the Dutch auction, shows an increased gap in the high bid, which was not long lasting. Bidders in the Dutch auction were required to pay the amount that they bid for. Some bidders found themselves with the winner's curse, as they ended up paying more than the other successful bidders for the same foreign exchange. After the 50th auction the gap between the high bids and the price falls. The high bid reproduces the price quite well.

The most striking trend is the instability of the price after the Marginal auction. The price increases rapidly reflecting the reduction of the available funds, the speculation pressures and uncertainty that led to reckless

bidding.

The under funding of the auction is reflected in figure 5:3 . For most of the period the available funds were less than demand. The weekly available funds did not respond to changes in price. The two times that the funds were increased created a pipeline in the auction. Most of the Dutch auction period was characterised by very low funding and during this period the increase in price is tremendous. The graph also depicts the negative relationship between price and available funds.

fig 5:1 Actual and Predicted Auction Prices - Zambia

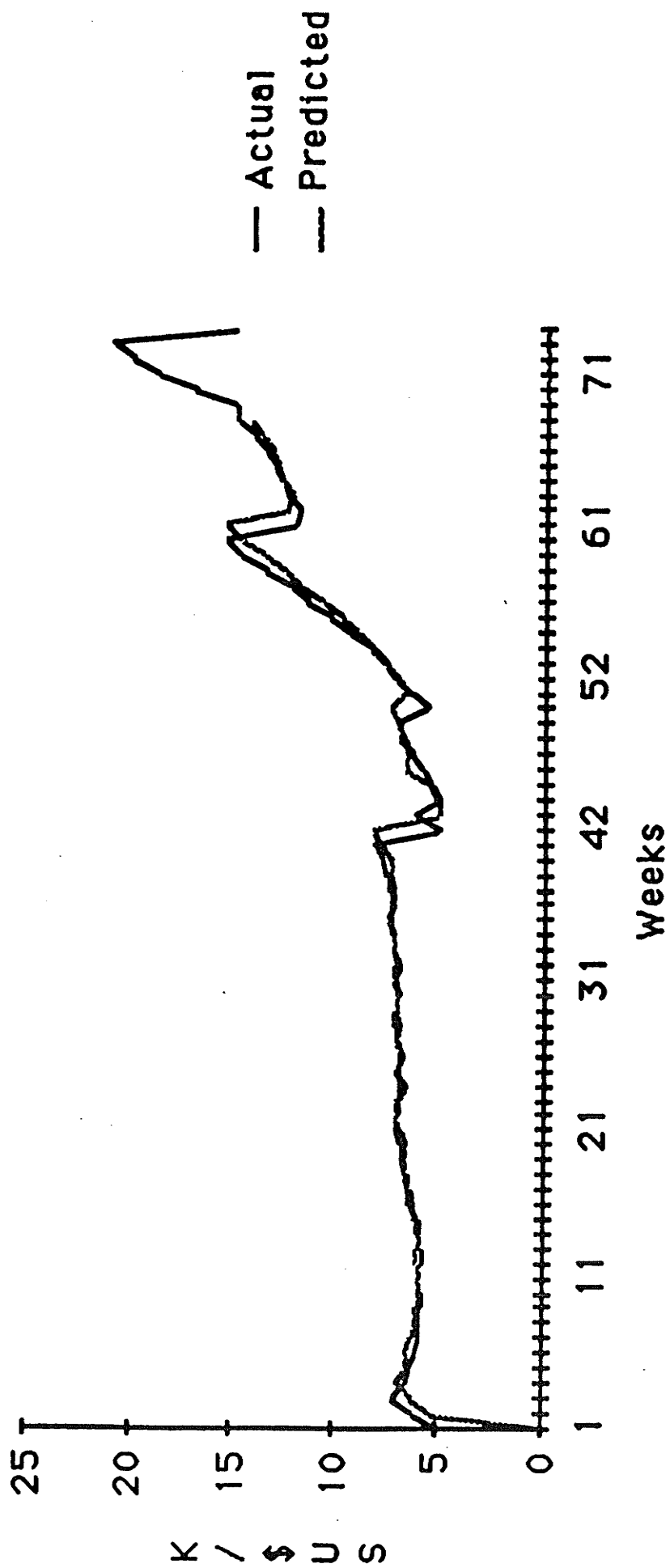


Fig.5:2

Title Lowbid, Highbid and Price

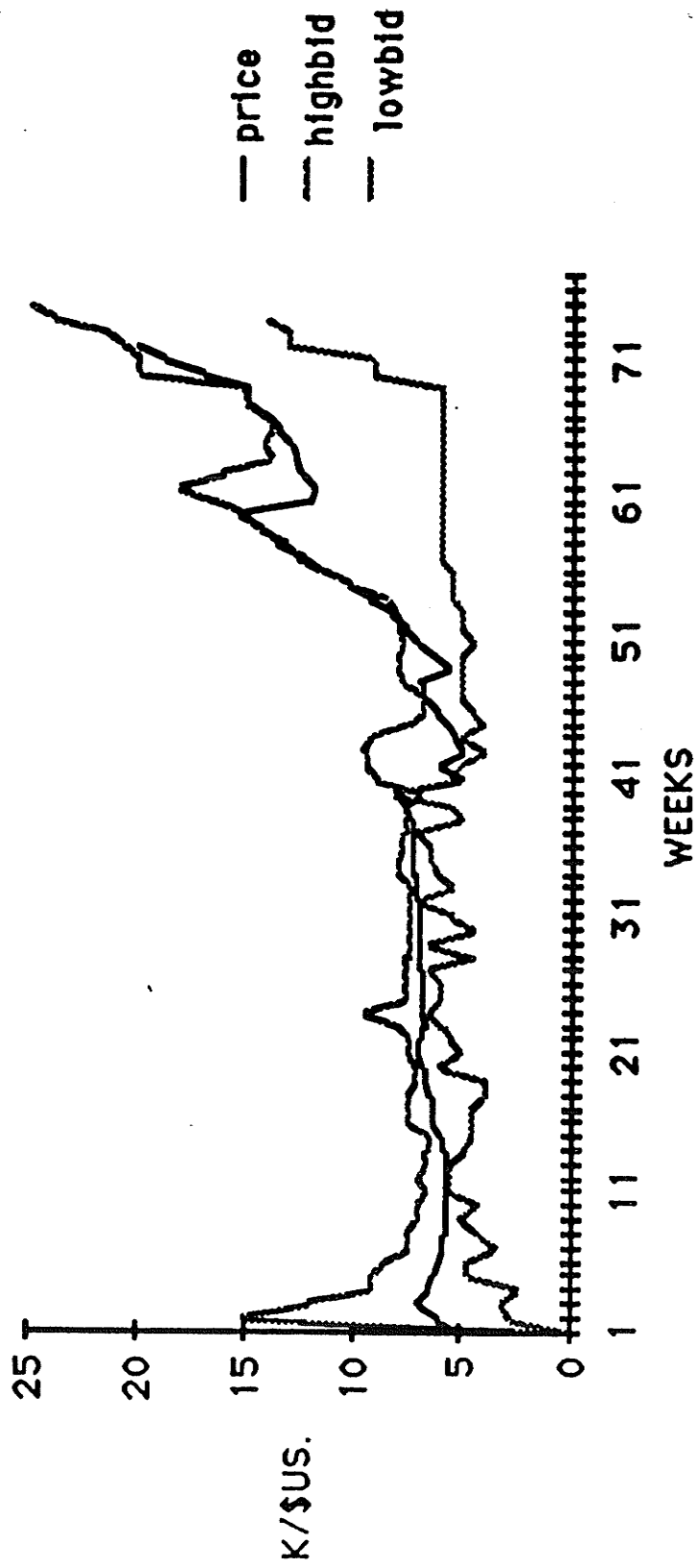
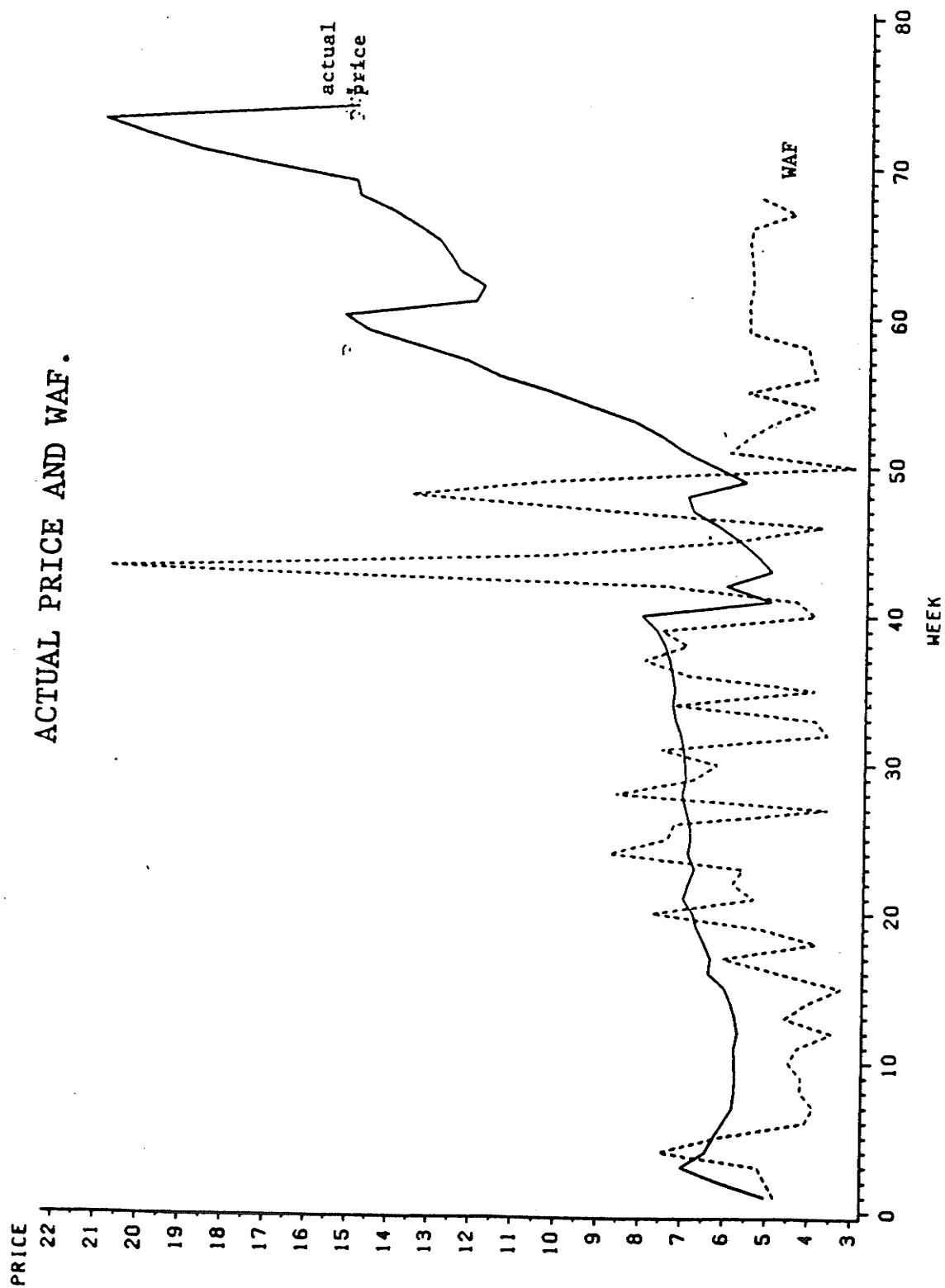


FIG. 5:3

ACTUAL PRICE AND WAF.



Section 5:2

THE STABILITY OF THE EFFECTIVE EXCHANGE RATE.

In order to analyze the stability of the effective exchange rate during the auction, an exponential growth equation was used. The data included the pre auction period to allow us to compare the different foreign exchange arrangements that Zambia has tried, that is pegging to a basket of currencies, pegging to the SDR and auctioning the foreign exchange.

There are two variables in the equation and these are, the nominal effective exchange rate and time with the intercept term suppressed. The nominal effective exchange rate was calculated as an index of a weighted basket of currencies of Zambia's major trading partners. Time takes the period from 1977 to 1988, this period allows for the three different types of foreign exchange arrangements that is, the peg to the basket of currencies, the peg to the SDR and the auction.

The equation is; $NEER = e^{rt}$

The log of this equation would be;

$$\ln NEER = rt$$

where;

NEER is the nominal effective exchange rate

r is the rate of growth, the coefficient of time and

t is time from 1977 to 1988.

We are expecting the period when the kwacha was pegged to the SDR to be less unstable than the other exchange rate arrangements, followed by the peg to a basket of currencies. This is consistent with the empirical findings in Williamson 1982, that countries that pegged to the SDR had a less unstable effective exchange rate than countries that pegged to a basket of currencies or to a single major currency. However, the auction period is expected to be less unstable than any of the pegs mentioned above given the auction objectives. The Dutch auction is expected to lead to a less unstable effective exchange rate than the Marginal auction. This expectation is due to the fact that the introduction of the auction system was meant to correct the inefficiencies in foreign exchange management that would lead to a rate that reflects the real value of the kwacha. On the other hand, the switch from the Marginal to the Dutch auction was meant to reduce volatility and stabilise the exchange rate (the marginal price) and consequently, a stable exchange rate would lead to a stable effective exchange rate.

The results of this equation are shown in table 5:4 indicating that the auction period led to a more stable nominal effective exchange rate than in the pre auction period. The pre auction period had a mean square error of 0.6 while the auction period had a lower mean square error of 0.07. The SDR peg was more stable than the basket of

currencies peg but was still unstable relative to the auction period. The SDR had the mean square error of 0.4 which still falls short of the auction mean square error of 0.07.

The outcome of the equation may be due to the fact that the government was not certain of what exchange rate arrangement to adopt, and reduced the confidence of the business community and foreign investors in the government. At the same time, during the early 1980's the government's reputation with the IMF was not good and the payments arrears were increasing. This could have contributed to the instability.

The findings also indicate that, the Marginal auction had a more stable effective exchange rate than the Dutch auction. The mean square error for the Marginal and Dutch auctions were 0.02 and 0.05 respectively. While this outcome is quite contrary to the expectations, it substantiates earlier regression findings, that the Marginal auction had, in fact, lower struck prices than the Dutch auction. At the same time the Dutch auction coincided with the uncertainty and speculation that the auction was going to be abandoned. This might have destabilised the effective exchange rate.

Table 5:4ROOT MEAN SQUARE ERRORS FOR THE EXPONENTIAL GROWTH RATE
EQUATION

Period	RMSE
Preauction	0.7
Auction	0.07
Basket peg	0.6
SDR peg	0.4
Marginal auction	0.02
Dutch auction	0.05

Section 5:3THE EXCHANGE RATE AND THE INFLATION RATE.

In order to determine the causal effects on inflation, we have an equation that includes the excess demand for money, measured as the difference between money supply growth rates and the real GDP growth rates. This is consistent with monetarist economic theory that the growth in money supply should be in line with the growth in real GDP. The excess demand for money is expected to have a positive relationship with inflation. The higher the excess demand for money the higher the rate of inflation.

The import price index is included as a growth rate in the equation because in an open import dependent country increases in the price of imports are expected to exert an independent influence on consumer prices. The import price index is expressed, therefore, in foreign currency terms. The import price index is expected to be positively related to inflation.

We also have the growth rates of the nominal effective exchange rate (NEER). The index used in calculating this expresses a fall in the nominal exchange rate as a depreciation, therefore, a positive relationship will have a negative sign, and we are indeed expecting the coefficient to have a negative sign. This will measure the effect of

devaluation on inflation.

Finally, an increase in per capita food production can lead to a reduction in inflation and vice versa. Since food carries a weight of over 50 per cent in the consumer price index, an increase in per capita food production is expected to ease the pressure on food prices and directly moderate the consumer price index. Per capita food production is, therefore, expected to be negatively related to inflation. Per capita food production is also included as a growth rate.

All the variables in the equation are lagged by two months. This was done in order to capture the lagged impact of the change in the variables on the rate of inflation. The data is divided into four groups, the pre auction period, which will help us explain the inflation trend before the auction, the auction period which is later divided into two, the Marginal auction and the Dutch auction. Given the rapid depreciation of the kwacha during the auction, we are expecting the coefficient for the neer to be negative and significant to support hypothesis number five, that the auction led to an increase in the rate of inflation resulting from the massive devaluations.

The equation is as follows;

$$P_t = \beta_1 + \beta_2 E_{dt} + \beta_3 P_{mt} + \beta_4 NEER_t + \beta_5 F/P_t + e_t$$

where;

P_t is the inflation rate, that is the consumer price index,

E_{dt} is the excess demand for money,

P_{mt} is the import price index in U.S\$,

$NEER_t$ is the nominal effective exchange rate and

F/P_t is the per capita food production.

e_t is the residual.

The auction period was only for 18 months and detailed data was not available for this short duration. Therefore, it was not possible to split the data into two types of auctions. Instead, the data is broken up into the pre auction and the auction periods. We could not get data for F/P for the auction period, hence the auction has only three variables, the excess demand for money, NEER and the import price index.

INTERPRETATION OF THE RESULTS

The pre auction results are shown in table 5:5. We have a high R - square indicating that the variation in the rate of inflation is 83 per cent due to the explanatory variables, which is a good fit. The F Value is also quite high and significant.

The excess demand for money, the nominal effective exchange rate and the import price index have the expected signs and they are statistically significant at 5 per cent level of significance. The per capita food production has a sign different from the one hypothesised and it is not statistically significant.

According to the pre auction findings, the rate of inflation was largely influenced by the excess demand for money, the nominal effective exchange rate and the import price index, while per capita food production did not have a significant effect on the rate of inflation. These results for the per capita food production are not surprising since the state subsidises basic foodstuffs. We also conclude that devaluations in the 1980's have had significant effects on the rate of inflation even before the auction was introduced.

Table 5:5

REGRESSION RESULTS FOR INFLATION RATE
PRE AUCTION

DEPENDENT VARIABLE: PRICE

Variable	parameter estimate	Standard error	T Ratio
Intercept	53.4	42.7	1.25
ED	2.45	0.99	2.47*
PM	1.23	0.46	2.66*
NEER	- 1.14	0.48	- 2.36*
F/P	4.32	5.60	0.77
R - square	0.827		
F Value	214.2		

* significant at 5 per cent level of significance.

The auction period results are shown in table 5:5. The variables are 70 per cent responsible for the variation of the rate of inflation. The F Value is 9.834 which is greater than the theoretical value at 3.98. All the coefficients have the correct signs and are significant at 5 per cent level of significant. We may conclude that, contrary to the popular perception of the impact of the auction on inflation, the rate of inflation during the auction was not only due to the massive devaluations, but also to excess demand for money and the import price index. However, the exchange rate played a very important role. Since Zambia has a high import content, the price of imports finds fairly rapid reflection in the consumer prices as the business community tries to make up for the increase in the cost of imports. Similarly, much of the pressure on money supply originated in the government's budget. Servicing external debt and paying for government imports would have been made more expensive in kwacha terms because of the devaluation. Between 1984 and 1986 government expenditure increased by 75 per cent in kwacha terms. This had a significant impact on the rate of inflation.

The findings in this chapter helped us to test the hypotheses stated in chapter one. One of the hypothesis in chapter one was that during the auction the exchange rate stabilised leading to a stable effective exchange rate.

Table 5:6

REGRESSION RESULTS FOR INFLATION RATE
AUCTION PERIOD

DEPENDENT VARIABLE: PRICE

Variable	Parameter estimate	Standard error	T Ratio
Intercept	476.9	191.7	2.48*
ED	4.51	1.24	3.63*
NEER	-1.25	0.53	-2.39*
PM	2.13	0.95	2.24*
R - square	0.6966		
F Value	9.834		

* significant at 5 per cent level of significance.

According to the findings, we may accept this hypotheses; the auction period and especially the Marginal auction, did result in a less unstable effective exchange rate relative to the pre auction period. Given the volatility of the supply of auction funds, and it's effect on the exchange rate, we have reason to believe that the government intervened in the auction, taking a lot of funds out of the auction and reducing the weekly available funds. Both auctions were sealed bid auctions, it is very likely and possible in a sealed bid for an auctioneer to manipulate the outcome. Also, the government exaggerated the available supply of funds, causing price first to fall and then, after the pipeline developed, to rise rapidly. We may therefore, reject the hypothesis that the auction was not subject to government intervention. The government could have stabilised the exchange rate by stabilizing WAF, especially since adjustment is slow.

It was also hypothesised that the auction led to an increase in exports. This is difficult to measure because the auction was only over a period of 18 months, and export promotion is subject to long period lags in production. There is, however, no recorded significant increase in exports.

The last hypotheses states that the auction led to an

increase in the rate of inflation. Based on the findings, we may accept the hypothesis and conclude that although the increase in the rate of inflation was mainly due to the devaluation, the excess demand for money and the import price index also had significant effects on the rate of inflation.

By way of conclusion, we would say that, while the auction seemed to be the best route to take for Zambia, the government and the funding agencies were not dedicated enough to make it work. The major source of instability, according to our findings, is the availability of funds. The auction was under funded, this led to the escalating depreciation of the kwacha beyond acceptable levels.

The under funding of the auction is evident in the auction results. When the hypothetical 22 million U.S\$ was sold, the price of the U.S\$ in Zambian kwacha fell dramatically. This serves to indicate that if funding was increased, the Zambian auction could have stabilised and/or reached convergence.

The government did not control the money supply during the auction, there was too much money growth relative to GDP growth, this led to inflationary pressures. While exchange rate depreciation undoubtedly helped fuel the growth of

government spending, money supply expansion was also a critical factor, the government used the auction as an excuse for its policy errors and attributed all the increase in inflation on the auction. If the government had maintained a firm control of the money supply, the rate of inflation would undoubtedly have been lower.

CHAPTER 6

CONCLUSION AND POLICY IMPLICATIONS

While Zambia's problems can be traced from both external and internal factors, the fall in the price and production of copper seems to stand out as one of the major sources of the crisis. However, domestic policy errors must take some of the blame. Copper mining had its boom days and the government did not have a foresight to provide for the future in case the copper boom ended. There were many signals, for instance in the late 1960's when copper prices dropped and later recovered in the early 1970's. The government could have started diversifying the economy then, in a way which would reduce dependence on both copper and imports when it still had the means to earn foreign exchange.

The diversification that the government embarked on did not reduce the copper dependence, instead, it resulted in increased dependence. The industries that were being developed during the copper boom were not capable of generating foreign exchange to the same extent they used foreign exchange. In other words, the import content of these industries was very high making them dependent on copper earnings and defeating the whole purpose of the exercise.

The foreign exchange auction was a result of Government and foreign agencies searching for an appropriate foreign exchange arrangement that would improve the country's export earning capacity through a stable exchange rate. It was also established by the IMF and World Bank that the Zambian government had maintained over valued exchange rates that were detrimental to the economy. Therefore the auction was designed to correct the over valued exchange rates by letting the exchange rate be responsive to the forces of supply and demand.

The decontrol of the foreign exchange market relaxed the control on the movement of capital. Under the auction anybody with kwacha could obtain foreign exchange with no questions asked. Similarly, those with money outside the banks were encouraged to have their money deposited in the banks with no questions asked. However, this was not enough to stimulate the inflow of capital, as capital flows are not only governed by decontrol of exchange rates and interest differentials, but also by political stability and a history of consistent government policies that improve confidence in government. Investor sense of security requires more than just the decontrol of foreign exchange.

Despite the auction's espoused objectives, all but one were not accomplished. The auction on it's own could not

achieve all the stated objectives without appropriate complementary government policy mix and a strong political commitment. For instance, during the auction, the government failed to control the money supply. The excess demand for money contributed to inflationary pressures which was one of the reasons that the auction became politically unsustainable. Therefore, the government's failure to implement supplementary policies may have contributed to the failure of the auction. Also, the auction period was too short for some of the objectives to be realised; for example the improvement in non copper exports. The supply response of non-traditional exports is generally inelastic, often being governed by forces other than the exchange rate such as weather, credit availability and penetrability of overseas markets. This is not to argue that exchange depreciation is irrelevant for export diversification, only that it needs to be proceeded with cautiously in line with other improvements in non-price incentives if export diversification is to succeed.

The government depended on foreign assistance in the form of grants and loans in order to sustain the auction. The availability of these funds depended on the government's relationship with the donors and the conditional agreements. This made it very difficult for the government to make foreign exchange available on time as stated in the

objectives. By August 1986 the foreign exchange pipeline had developed and there was a waiting period of at least ten weeks before a successful bidder could get the foreign exchange. Zambia's foreign exchange cash flow is not enough to fund an auction without external finance, unless there is an improvement in alternative foreign exchange earnings or a positive shift in the copper industry, which is less likely.

The auction chronology indicates that the government was not very knowledgeable about the auction. This is reflected in the pattern of decision making during the auction. Rules and regulations changed almost every week. This led to a confusion among bidders and increased speculation. It also shows that the government was not confident enough to run the auction. To avoid abrupt changes in the rules and regulations governing the auction, the government could have reviewed different types of auctions, set the rules and made them known to the public well before implementing the auction. The pre auction evaluation could have also allowed the government to examine the reliability of the sources of funding to determine whether or not the auction was financially possible. The empirical results in chapter five indicate that the auction was under funded, and this was one of the major sources of instability.

The auction proved politically and financially

unsustainable. The rate of inflation that was attributed to the auction was unbearable and this led to a lot of pressure on the government. The shortages of essential commodities were also attributed to the auction and the devaluation. Historically, the shortages were there even before the auction. It became convenient to blame all problems on the auction while neglecting to implement proper policies. The findings in chapter 5 verify that the government neglected to control the money supply among other policies. Hence blaming the auction alone for the hardships during that period does not hold; the auction was not supported by appropriate policies.

Some critics argue that the country had very little experience in dealing with such an arrangement for foreign exchange management. The institutions in the country were not capable of adapting to such an arrangement. While the auction had very sound objectives, critics of the auction system argue that nothing was done to change the structural bottlenecks of the economy. The Zambian economy is very dependent on imported raw materials and the industries are very capital intensive such that it would take more than just the exchange rate to change the situation.

The government and the funding agencies ignored the fact that Zambia was a small developing country without developed

financial institutions. Without the independent financial institutions the country was not ready for a floating exchange rate. During the foreign exchange auction, foreign exchange transactions were still centralised in the central and commercial banks. There were no licensed foreign exchange dealers or a forward market for kwacha (Zambian currency). In this case we may conclude that the market structure was an imperfect one in which to allow supply and demand to determine price and hence, it could be argued that the foreign exchange auction was not appropriate for Zambia.

Since Zambia's trade is quite diversified, pegging to SDR would be the best feasible exchange rate arrangement, but with the decline of the copper industry, Zambia should seriously start looking for alternative ways of generating foreign exchange and reducing the import content of industrial inputs, otherwise there will be no foreign exchange to manage.

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