

Exchange Rate Risk Management Practices among Agricultural Firms in Kenya

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Abstract

Varying exchange rates expose firms involved in international transactions to exchange rate risk. The purpose of the study was to find out how Kenyan agricultural firms manage exchange rate risk exposure. This study used a cross-sectional descriptive study whose aim was to describe the exchange rate risk management practice among Kenyan agricultural firms involved in the export of principal crops, namely tea, cut flowers, and coffee. It was found that Kenyan agricultural firms were aware of the risk posed by exchange rates variability and majority had established risk management function to deal with this and other risks. Risk management functions were mainly domiciled in the finance/accounting departments and at the board of directors' level. Transaction and operating exchange rate risk exposures were the most prevalent; hence, most firms considered the effects of exchange rate risk on sales, profitability, and cash flows as the most important. About 63% of the agricultural firms were setting budget exchange rates but mainly used them for corporate budgeting rather than for exchange rate risk management. About 30% of the firms were identifying and estimating exchange rate risk exposure in advance and taking appropriate hedge position. Sensitivity analysis, goal-seeking analysis, and past trends and experiences were the main techniques used to estimate exchange rate risk exposure in advance. Nearly, all the agricultural firms were using currency substitution and natural hedging techniques, such as matching and invoicing in foreign currency to manage exchange rate risk exposure. Only a small proportion of about 7% were constantly using over the counter currency derivatives. The main challenges faced by agricultural firms in managing exchange rate risk were high exchange rates volatility, inability to adjust prices to compensate for adverse movements, difficulties in arranging hedge contract with banks, and difficulties in getting well-skilled financial risk management labor.

Keywords: Foreign currency; Exchange rates; Exchange rate risk; Exchange rate risk management; Derivatives

Introduction

Since the end of the fixed exchange rate system of the Bretton Woods in 1971, exchange rate risk (ERR) management has become increasingly important in the international financial market. The Bretton Woods system was replaced by the floating (flexible) rate system in which exchange rates are determined by forces of demand and supply. The floating exchange rate system has frequent changes influenced by numerous external factors. Frequent currency fluctuations expose firms to ERR [1]. Papaioannou [2] has noted that in the last decade, there has been an unusual occurrence of a large number of currency crises. These fluctuations and currency crises have led to the increasing importance of ERR management in firms as a prudent approach to reducing vulnerabilities from major exchange rate movements.

Literature Review

Corporate risk management is an important aspect of a firm's overall business strategy. The principal objective of risk management is to eliminate the probability of adverse outcomes such as financial distress or inability to carry out an investment strategy [3]. ERR is an integral component of market (systematic) risks faced by firms. Market or systematic risk is the possibility of adverse outcome affecting all entities in a given economy. Firms that engage in international transactions, such as selling products or purchasing inputs, and involve foreign currency cash flows are exposed to ERR [4]. The primary role of ERR management is to minimize the variability in cash flows and accounting earnings, arising from the firm's operational activities and characteristics [2]. It is important to note that well-developed financial markets are an important pillar to effective risk management in firms [5].

In response to ERR, advanced economies have developed effective risk management products such as options, forwards and futures. But although many developing countries have initiated programs aimed at deepening and broadening their financial markets, there has been little development in the area of risk management products. Failure to develop risk management products have left many entities in developing countries exposed to many market risks, key among them being ERR [5]. In Africa, only South Africa has well-developed risk management products including exchange-traded derivatives [6]. In Kenya, the financial markets have significant structural weaknesses, including weak legal framework, poor governance, and insufficient infrastructure, which have contributed to high interest rate spreads, inadequate financial intermediation, and heightened risks [7].

Approaches to Exchange Rates Risk Management

Firms can take two broad approaches to ERR management, namely avoidance and active management. In taking the avoidance approach, firms avoid dealing in foreign currency by trading within a country or territory with a common currency. The active management approach does allow firms to engage in international trade involving multiple currencies. The active approach consists of both risk aggregation and

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decomposition. Risk aggregation involves taking different offsetting positions that reduce overall risk exposure. Risk decomposition attempts to isolate specific sources of exposure and mitigate or eliminate their effect on firms [8]. ERR can actively be minimized using a wide selection of options. Papaioannou [2] suggest that a great variety of instruments have been generated by the ingenuity of the financial engineering industry to help firms deal with ERR. Firms can use currency derivative tailored to suit their need (over the counter (OTC) derivatives) or standard derivative (exchanges traded). In addition, firms can make use of risk reducing techniques such as payment nettings, prepayments, leading and lagging, and price adjustment to manage ERR exposure [1].

Exchange Rate Risk Management

Butler [9] defines ERR as the risk of gain or loss in the value of business activity or investment that results from changes in the exchange rates of world currencies. This definition recognizes the effects of ERR on a firm's cash flows, assets, liabilities, profitability, and the overall value of the firm. ERR exposure has two broad classifications, namely economic and accounting exposures [10]. Economic exposure affects firms' present and future cash flows. Economic exposure is also concerned with the effects on firms' competitiveness arising from exchange rates fluctuation. For example, for Kenyan tea exporters, if the Kenyan shilling (Kes) strengthens (appreciates) against the US dollar (USD) and if the exchange rates of other tea-exporting countries such as Sri Lanka remain unchanged, Kenyan exporters will receive less shillings unless they are able to adjust their prices upward. If Kenyan tea exporters raise their prices to cover cash flow shortfalls, they are likely to lose customers to Sri Lanka. Economic exposures are further subdivided into transaction and operating exposure. Transaction exposure relates to effects of exchange rate fluctuation on short-term receipts and payments while operating exposure deals with effects on a firms competitiveness and profitability [11]. Accounting or translation exposure is concerned with effects of restating foreign operations in terms of domestic currency on assets and liabilities. Assets and liabilities such as cash, debtors, and creditors that are translated at the current exchange rate are considered to be exposed [10].

High degree of adverse exposure to ERR can have serious earnings implications that can lead to business failure. For example, Abor [1] notes that Ghanaian firms with high import contents were adversely affected by exchange rate volatilities. Most firms had to adjust prices upward, leading to loss of customers. In Kenya, electricity bills have a component of "forex adjustment," implying that the Kenya Power & Lighting Company (KPLC) passes on exchange rate losses to the final consumer. Such a strategy can work due to KPLC monopoly status. But the strategy has an adverse effect, leading to higher electricity cost, which is bad for business and households. Exchange rates especially in developing countries can be volatile with significant effects on a firm's earnings, cash flow and balance sheet [9]. Exchange rates changes are known to be unpredictable and follow a random walk process [12].

The success of any firm trading in foreign-exchange market depends on how well it manages ERR exposure [13]. Firms with significant exchange rates exposure need to establish a sound and systematic risk management framework. Allen [8] and Papaioannou [2] have recommended ERR management best practice with the following key elements:

- (a) Identification and measurement of ERR exposure
- (b) Development of an ERR management strategy

- (c) Creation of a centralized entity in the firm to deal with ERR
- (d) Development of a system of ERR management controls
- (e) Establishment of a risk oversight committee

In a study on ERR management practice among Ghanaian firms, Abor [1] found that about 55% of the firms had a department or person responsible for ERR management. Ghanaian firms mainly managed ERR by adjusting prices to cover exchange rate losses. Most of the firms did not use hedging techniques mainly because of failure to develop overall corporate risk management and also because of the underdeveloped nature of financial markets.

Van Horne [14] has proposed four types of derivative contracts used to hedge ERR exposure. The four are futures, forward, options and swaps. Futures and options are exchange traded while forwards, nonstandardized options and swaps are arranged to suite specific hedging situations. In a study on ERR management among nonfinancial US firms, Papaioannou [2] found that currency derivatives were the main hedging instruments used by most firms. Over the counter (OTC) forward were the most commonly used instruments. The tendency of the US firms to use OTC currency forwards rather than OTC options or swaps was mainly attributed to the relative high liquidity and depth of forward markets. The most commonly used method of evaluating the riskiness of their foreign exchange positions was value at risk (VaR) techniques.

Kenya's exchange rate system

Kenya's exchange rate system has developed along the general macroeconomic policies adopted since independence. The economy in the 1960s and 1970s was predominantly characterized by controls in virtually all key sectors, including exchange rates. The balance of payment deficits that had remained relatively low in the 1960s and early 1970s reached unprecedented levels mainly due to the effect of the second world oil crises in 1978-1981. By 1982, the pressure from balance of payment deficit rendered the fixed exchange rate system untenable. The government embarked on structural adjustment program and as an intermediate step, adopted a crawling exchange rate system. A crawling system was characterized by periodic exchange rate adjustments to reflect relative inflation rate between two countries. The crawl period lasted from 1982 to 1993 and was characterized by continuous depreciation of the Kenya shilling. From 1993, Kenya began to adopt the floating exchange rate system [15].

Kenya adopted the floating exchange rate system after the repeal of the Exchange Control Act in 1994 [16]. In a perfect float system, exchange rates are freely determined by forces of demand and supply, with no single market participants being able to influence exchange rates. But the Central Bank of Kenya exerts significant influence and does intervene to reduce short-term volatility by buying and selling foreign currencies. Therefore, Kenya has a managed float exchange rate system [7]. Were et al. [15] have observed that exchange rates under the floating system have been more volatile than had been anticipated, with frequent large month-to-month variability. The volatility exposes firms in the economy to ERR. But despite the risks inherent in the shift to floating exchange rate system, it was necessary to allow for greater international trade and access to international financial markets. Globally, there has been pressure by various international institutions such as World Trade Organization (WTO) and the International Monetary Fund (IMF) towards reduced role of government in market regulation and toward increased economic liberalization [17].

The role of agriculture in the Kenyan economy

The Kenyan economy is primarily based on agriculture. Agricultural commodities constitute the largest proportion of Kenya's exports [18,19]. According to the Export Processing Zone Authority (2005), agricultural sector accounts for 24% of Kenya's gross domestic product (GDP) and employ about 75% of the population either directly or indirectly. Agricultural activities include crop production and animal husbandry. Tea is the leading foreign-exchange earner, with horticulture ranking second and coffee, third. Other significant sources of foreign exchange are tourism, manufacturing, and nongovernmental organization (NGO) receipts from abroad [20].

In 2003, the Kenyan government developed a 10-year strategy to transform agricultural activities into more profitable and internationally competitive ventures. The strategy aims at reducing poverty and unemployment especially in the rural areas by improving productivity and efficiency. The 10-year strategy includes provision of affordable credit to farmers and tax reforms. In the fiscal year 2005/2006, the government injected 1.5 billion shillings in the Agriculture Finance Corporation (AFC) for lending to farmers. In the fiscal year 2006/2007 budget, the Minister for Finance removed value added tax (VAT) on transportation of unprocessed agricultural products and on farm implements such as tractors [20].

Tea, cut flowers, and coffee firms

As noted earlier, tea is the leading foreign-exchange earner. Nyangito [21] notes that the bulk of tea earnings (59.7%) are attributable to small-scale farmers whose production and marketing is managed through the Kenya Tea Development Agency (KTDA). The rest of tea production and marketing is done by large-scale plantation private or public firms. Kenya is currently the leading exporter of cut flowers to the European Union (EU), with a market share of 31%. Due to the capital intensive nature of the industry, the main producers are large-scale plantation farmers. The Kenya Flower Council (KFC) members, an association of large-scale firms, account for 70% of the total output. Coffee now lags behind tea and horticulture in foreign-exchange earnings. However, it remains a major export crop in the Kenyan economy and government policy is to increase its production. According to the Coffee Act of 2001, Coffee Board of Kenya (CBK) regulates the coffee industry by licensing various players such as growers, millers, and coffee exporters. Exporters are the firms licensed to market coffee on behalf of growers (producers).

Given the importance of agricultural activities in Kenya, and their exposure to ERR, the purpose of this study was to determine exchange risk management practices of farms in Kenya. The focus was mainly on firms dealing tea, cut flowers and coffee, this being the main foreign currency earners in Kenya.

Research Methodology

Research design

Since this study sought to describe ERR management practice among agricultural firms in Kenya, a descriptive research design was the most appropriate. Cramer and Howitt [22] have suggested that descriptive studies are analyzed using descriptive statistics. Descriptive statistics include tabulation and organization of data in order to demonstrate their main characteristics and involves use of techniques such as measures of central tendency, measures of dispersion, correlation and graphical presentation. The population for this study was firms in the tea, cut flowers and coffee sectors. The target population comprised of 18 tea farms, 51 cut flowers farms and 47 coffee farms. This target population

comprised of farms in diverse geographical regions, such as Kericho, Nanyuki, Thika, Athi River, Naivasha, Nyahururu, Limuru, Nairobi and Mombasa. Some firms had their head offices in the same location as the production areas while others were in major urban centers such as Nairobi and Mombasa. Out of the 116 farms, 39 farms formed the sample. Both primary and secondary data were collected. Primary data were on ERR management practice among tea, cut flowers and coffee firms in Kenya. Secondary data was obtained from the Central Bank of Kenya (CBK). The data were that of average monthly exchange rates for USD, GBP, EUR and JPY from January 1993 to December 2006. The exception was the EUR which was introduced in 1999; hence, the EUR exchange rates were from January 1999 to December 2006. Primary data were collected by the way of self-administered questionnaire and telephone interviews.

Results and Discussion

Response rate

Out of the 39 firms contacted, 27 (69.23%) responded. The tea sector had the highest response rate while the cut flowers sector had the least response rate. A number of respondents especially in the cut flowers sector declined to give any form of response on the ground that the information sought was confidential. Table 1 is a summary of the response rate by sector.

Senior persons in finance or accounting departments were the main respondents. In a number of firms, the Chief Executive Officer was the respondent due to the perceived sensitivity of the information sought.

Frequency of export

All the firms contacted consistently exported their products. Eleven firms (40.74%) exported their products daily. One of the firms listed under "others" on Table 5 indicated that they were exporting at least four days every week. Eight (72.73%) cut flowers firms constituted the highest number of those exporting daily. Ten firms (37.04%) mainly drawn from both coffee and tea sectors indicated they exported on a weekly basis. All the firms that were exporting on a monthly basis were in the coffee sector. Two (7.41%) of the firms, drawn from the coffee sector indicated that they had no specific export patterns. One of the two firms specified that they were exporting "several times per year." The frequency of export is largely determined by the production volume and shelf life of a commodity. Frequency of export is an indicator of a firm's export intensity and by extension the degree of exposure to ERR. Table 2 shows the frequency of export by sector.

	Sector			Total
	Coffee	Cut Flowers	Tea	
Sample size	16	17	6	39
Responses	11	10	6	27
Response rate	68.75%	58.82%	100.00%	69.23%

Table 1: Response Rate by Sector.

Sector	Frequency of Export				Total
	Daily	Weekly	Monthly	Others	
Coffee	1	5	3	2	11
Cut flowers	8	1	0	1	10
Tea	2	4	0	0	6
Total	11	10	3	3	27
% of total respondents (27)	40.74%	37.04%	11.11%	11.11%	100.00%

Table 2: Frequency of Export.

Export intensity

When asked to indicate the proportion of export earning to total sales, 25 (92.59%) of the firms reported that they had export constituting more than 75% of their total sales. One of the respondents further specified that exports constituted 100% of total sales. Another respondent specified that exports constituted 75-80% of total sales. The remaining two (7.41%) firms had exports as a percentage of total sales of between 50 and 75%. These export proportion to sales indicates that the respondent firms had high export intensity. High export intensity means that the firms had high potential for ERR exposure.

Export destinations

On the question of export destinations, most firms indicated that they exported to more than one region. Europe was the most common destination with 26 (96.30%) firms. Asia and the Middle East were second to Europe at eleven (40.74%) firms each. One of the respondent who indicated Asia as one of their export destinations further specified Japan as the specific destination. Ten (37.04%) firms indicated they exported to the American continent and five (18.52%) exported to the African region. Therefore, the direction of Kenyan agricultural export is heavily skewed towards the European continent, a situation that enhances risk exposure to firms. According to Cherunilam [10], some of the ways to manage ERR exposure is to diversify markets and billing currencies. Hence, in addition to diversifying export markets, agricultural firms need to diversify billing currencies to reduce vulnerability to exchange rate fluctuation.

Currency of export receipts

In response to the question of the export-billing currency, 21 (77.78%) firms received their export earnings in USD. All respondents from the coffee sector received their payments exclusively in the USD. Nine out of 10 respondents from the cut flowers sector receive export payments in EUR, an indication that EUR receipts were predominant. The predominant receipt in EUR was mainly because the cut flowers sector predominantly exported to the EU. This means that the Kenya Agricultural farms mainly dealt with USD and EUR. Mueller has noted that the EUR has become increasingly attractive for currency diversification and an increasing number of central banks are shifting to the EUR as a currency of choice to hold part of their international reserves.

Foreign currency obligations

Asked to state whether their firms had any obligations payable in foreign currencies, twenty two (81.48%) respondents answered in the affirmative while the rest said they did not have such obligations. Some of the obligations were recurrent while others were one-time payments. Examples of recurrent foreign currency obligations as indicated by the respondents were payments to consultants, purchase of fertilizers, chemicals and packaging materials. A number of firms especially in the coffee sector paid their main suppliers in foreign currencies. Payment to consultants was common in the cut flower sector due to stringent fresh produce standards imposed by the European Union, a key export destination for Kenyan fresh flowers. Examples of foreign currency payments made occasionally were those of a capital nature including greenhouse materials (for construction of greenhouses) and machinery.

Twenty (74.07%) firms had obligations payable in USD, 11 (40.74%) firms had obligations payable in EUR while seven (25.93%) firms had obligations payable in GBP. One (3.70%) firm had obligations

payable in JPY while the rest had obligations payable in other foreign currencies. Having foreign currency obligations is good as firms can settle those obligations using export proceeds before conversion. Settling one currency payable with receivables of the same currency provides a natural and cost effective hedge against ERR exposure [11].

Import intensity

Respondents were asked to indicate their firms' proportion of foreign currency obligation to total sales. Twelve (44.44%) firms had foreign currency obligations of less than 25% of total sales. Seven (25.93%) firms had foreign currency obligations of between 25 and 50% of total sales. One of the firms in the 25-50% (Table 10) category specified 50% as the proportion of foreign currency obligations to total sales. The other two categories, that is, 51-75% and over 75% had two (7.41%) and one (3.70%), respectively. One of the coffee-exporting firms with over 50% foreign currency obligations specified that they do not import but pays for coffee supplied in USD to avoid conversion and resulting risks. Payment to coffee growers in foreign currency was not a common practice. The result means that agricultural firms' products had relatively low import intensity.

Comparing import and export intensity, it can be observed that more than one half of total exports earnings are potentially exposed to ERR. Agricultural firms were using export earnings to settle foreign currency obligations before conversion, thus reducing ERR exposure through matching inflows and outflows.

Frequency of foreign currency-denominated payments

On the question of how often agricultural firms were making foreign currency denominated payments, 11 (50%) of the respondent firms were making such payments on a monthly basis. Seven (32%) of the firms were making foreign currency payments weekly while the rest (18%) had either no specific patterns or had other timings for those payments. As the responses suggest, almost all the foreign currency denominated payments were of short-term nature and of known value. Damodaran [4] suggested that because of the lower cost of hedging short-term ERR exposure, firms can use derivatives such as options and forwards to hedge trade payables.

Foreign currency bank accounts

Agricultural firms were asked to state if they operated foreign currency bank accounts. Twenty-six (96.30%) of the respondent firms indicated that they operated foreign currency bank accounts. Only one (3.70%) firm was not operating a foreign currency bank account. The results imply that currency substitution was common among Kenyan agricultural firms. According to Elkhafif [23], currency substitution is the act of holding foreign currency-denominated deposits at local commercial bank in addition to local currency deposits. It happens when the local currency does not adequately fulfill all the functions of money. Currency substitution is also known as dollarization. Agricultural firms were using currency substitution to avoid conversion thereby hedging against ERR exposure.

Presence of risk management functions

Asked if their firms had a function responsible for risk management, 15 (55.56%) respondents said they had a risk management function within the organization. The rest did not have a risk management function. The tea sector had the highest proportion of firms with risk management functions while the coffee sector had the least. The tea sector had relatively larger firms than the other two sectors which

could explain the higher proportion of firms with risk management functions. The cut flowers sector had the second highest proportion of relatively large firms while the coffee sector had the highest proportion of relatively smaller firms. Hence, larger firms had a higher probability of having a risk management function than smaller firms. The results are consistent with those of El-Masry [3] who found that large UK firms had well organized risk management functions and that smaller firms were not actively managing financial risks as they considered benefits to exceed the cost. Local firms had a higher proportion of firms with risk management function than multi-national firms. Subsidiaries of multinational firms would have been expected to have risk management functions. The finding could indicate that risk management for a number of multinational subsidiaries was handled at the head office located abroad hence making it unnecessary to have one locally. Abor [1] found that a number of multinational subsidiaries had their risk management coordinated from head offices of the parent firms.

In response to the question of where the risk management function was located within the organization structure, the highest number of firms, seven (46.67%) had the function as a section within the finance/accounting department. Three (20.00%) firms had the function in the board of directors and a similar number in the CEOs office. Two (13.33%) firms had the function within treasury department. One respondent specified that the function was among the directors (owner entrepreneurs were responsible for risk management) while another said, "an insurance section within finance department; the company is small". The location of the function in the organization structure can give indication of the importance attached to risk management. From the responses, it can be observed that the respondent firms recognize the significance of risk management as an integral part of overall corporate management.

Roles of the risk management function

Respondents were asked to specify the focus (main areas of risk management) of their risk management function. The results indicate that all the risk management functions were responsible for managing several risks that were considered important to the firms. ERR had the highest frequency, followed by interest rates and commodity prices risks.

Significance of exchange rate risk and management

Respondents were asked to rank various risks in the order of importance. Overall, ERR was ranked first, followed by commodity price variations, interest rate variations and general risks (insurable risks) were ranked last. The ranking imply that the agricultural firms considered ERR as their most significant risk.

Effects of exchange rate risk on agricultural firms

Respondents were asked to indicate if exchange rate fluctuations affected their firms in a significant way. Twenty-three (85.19%) respondents said ERR affected their firm in a significant way while four (14.81%) said it did not. Among those who thought ERR was not significant said so because they had structured their operations in such a way that ensured minimal currency conversions, for example paying main suppliers in the same currency as export receipts.

Effects of exchange rate fluctuation on cash flows and the income statement elements such as sales and profit were rated as the most important. ERR effects on the balance sheet and foreign currency loans were mentioned by few respondents. Most firms cited more than one

consequence of ERR. Effects of ERR on cash flows and profits are more obvious than effects on the balance sheet, which are of long-term nature. These findings are consistent with those of a study by Papaioannou [2] who suggested that since management performance is measured more frequently on profitability, management tend to focus on what directly affect profitability.

There were many additional comments on the effects of ERR on firms. On the effect of ERR on the balance sheet, monetary assets and liabilities (working capital items) such as stocks and dues to creditors were cited as the most significant. When the Kenya shilling weakens against a foreign currency, obligations denominated in that currency becomes more expensive. Similarly, the value of cash held in a foreign currency changes in Kenya shilling terms according to the direction of exchange rate with that currency.

In response to the statement: Exchange rate fluctuations affect the company in a significant way, 21 (77.78%) either strongly agreed or agreed with the statement. Those who were neutral and who disagreed were three (11.11%) each. This means that most farms were negatively affected by the changes in exchange rates.

Setting budget-exchange rates

In responding to the question as to whether their firms were setting budget exchange rates, 17 (62.96%) of the respondents said their firms regularly set budget exchange rates while 37.04% (10) said they did not. Firms that indicated that they regularly set budget exchange rates were using historical average exchange rates ranging from six months to one year as the basis for setting budget rates. The assumption inherent in using historical averages to forecast future rates is that past trends will continue into the future, which may not always hold. Of those who set budget exchange rates, they did so on any of the four periods, namely monthly, quarterly, semiannually and annually. Shorter durations, such as quarterly, are better than longer ones for purposes of ERR management, as they help firms adjust more frequently to new exchange rate directions. Papaioannou [2] proposed that budget rates need to be close to the spot rate.

Technique used to measure ERR exposure

Firms were asked to state if they regularly identified and measured ERR exposure in advance. A total of eight (29.63%) firms said they regularly identified possible sources of exposure and attempted to measure (estimate) the possible effects of ERR to the firm's revenue and payments in advance. The rest of the firms said they were not identifying or measuring possible effects of exchange rate movements on the firm. According to Harrington and Niehaus [24] unidentified exposure leads to an implied risk retention decision that may not be optimal. Firms need to first identify and measure risk exposure then determine the most optimal way to deal with the exposure.

Firms indicated they identified and estimated ERR exposure in advance were asked to specify the techniques they were using. The various techniques used were as follows:

- (a) "What if" analysis: Refers to sensitivity analysis using various exchange rate movements' scenarios. For example, varying the Kes-exchange rate with the USD at different magnitudes and calculating the impact on profit margins.
- (b) Using a financial model that returns various exchange rate scenarios given the target return on equity (ROE). This is a goal-seeking technique that start with a target/predetermined

financial results and then vary exchange rates until the desired target result is achieved.

- (c) Weights various economic and political drivers as well as comparison with Central Bank of Kenya forecast information. This technique is not based on a mathematical model. The technique relies on the experience and judgment of the risk manager to determine the possible effects of exchange rate fluctuation on the firm.
- (d) Using past trends and experience to identify and measure future possibilities. As in technique (c), this technique is dependent on the experience and judgment of the risk manager. It also assumes that the past is a good predictor of the future.

After estimating the possible effects of various exchange rate movements, these firms took appropriate positions to hedge future adverse exchange rate movement outcomes. Estimating possible future adverse effects of exchange rate movements on a firm is a useful step in choosing an appropriate hedge position.

Strategies and techniques used to manage ERR exposure

Since there were very few agricultural firms with subsidiaries outside Kenya, economic exposures were the prevalent types of ERRs. Allen [8] has noted that risk managers make use of various risk management strategies depending on the prevalence of a certain type of risk and the size of the firm. The most commonly used strategy was currency substitution by the way of invoicing in foreign currency and operating foreign currency bank accounts to avoid conversion into the local unit. Nearly, all the firms had foreign currency bank accounts where sales proceeds were deposited and foreign currency payments made. Matching technique by the way of using foreign currency receipt to settle foreign currency obligations was the second most common technique with about 56% of the firms using it. Eight (29.6%) firms said they were adjusting prices to offset adverse exchange rate movements. Fourteen (51.85%) of the firms made use of currency derivatives to manage ERR exposure.

The prevalent choice of natural hedging techniques by agricultural firms is consistent Madhura [11] who suggests that since currency hedging is often expensive, natural hedging such as matching are often used. Other methods of managing foreign currency risks included buying and selling main commodities in the same currency and negotiation of exchange rates with banks before conversion.

Prevalence of currency derivatives hedging

On the question of whether and how often firms made use of currency derivatives, 14 (51.85%) firms said they were using currency derivatives as one of the ERR management strategies. However, only two (7.41%) firms were consistently using currency derivatives to hedge against adverse exchange rate movements. Half of those using derivatives used them at selected times while the other firms said they rarely used derivatives. Forward contracts were more predominant with 11 (40.74%) firms using them compared to three (11.11%) firms that indicated to use over the counter currency options. In commenting on why currency derivatives are not commonly used to hedge against ERR, one respondent said; "currency hedging has still not been fully developed in Kenyan banks for customers to get advised effectively".

Pandey [25] suggested that forward contracts are a more available alternative in developing countries. Higher availability of forward contracts contributes to the relatively high liquidity and depth of forward markets. According to Papaioannou [2], studies have shown that

option contracts generate a better hedge than unhedged positions for currencies with considerable volatility. Therefore, Kenyan agricultural firms can benefit from well-developed currency options market.

Challenges of exchange rate risk management

Respondents were asked to enumerate challenges encountered in the process of protecting their firms against the effects of adverse exchange rate movements. Nineteen (70.37%) respondents cited unpredictability of the direction of exchange rate movements. Fourteen (51.85%) respondents said they experienced difficulties adjusting commodity prices to compensate for adverse rates movement. For coffee and tea, prices are determined at the auction, thus limiting the ability to adjust the USD sales price per unit. As a result, coffee and tea producers have few options in ERR management. Eight (29.63%) respondents cited high exchange rates fluctuation as a challenge. Difficulties in arranging currency derivative contracts with banks and getting well skilled risk management staff were also cited as challenges. Four respondents said their firms were not facing any significant challenge or they did not consider ERR as a significant risk. Most firms gave more than one challenge faced in the ERR management process.

High exchange rate volatility seems to be the main challenge faced by agricultural firms. Adjusting prices would lead to reduced competitiveness or is very difficult as firms are price takers. The results are similar to those of Abor [1] who found that most (78%) of Ghanaian firms cited frequent exchange rate changes as the main challenge. The other challenge was loss of competitiveness after adjusting prices.

Recommendations

- (a) Agricultural firms should seek to establish and strengthen risk management function as an integral part of business strategy. Suggested ways of strengthening the risk management function is to designate specific staff to handle risk management, sponsor them for specialized training to improve their skills and invest in risk measurement tools such as risk management computer software.
- (b) Kenyan agricultural firms should reduce export concentration to Europe by finding new markets to reduce risks inherent in doing business with that market. This will help the firms diversify trading currencies bearing in mind correlation and covariance relationships for various combinations of currency exchange rates with the Kenya shilling.
- (c) Agricultural firms should make use of budget exchange rates as hedging benchmarks and increase use of over the counter option contracts for hedging.

Recommendation for further study

Further studies would need to be done to understand how firms in other sectors of the economy such as tourism, manufacturing, and non-governmental organizations (NGOs) manage their ERRs. Research on ERR management practice among net importing firms such as oil importers would also need to be done. It would also be useful to find out the depth of the currency derivatives market in Kenya from a bank's perspective and the reasons for the resulting findings.

Conclusion

ERR management among Kenyan agricultural firms is gaining recognition with about 56% of the respondent firms having specific functions responsible for managing the risk. Agricultural firms regarded exchange rate fluctuation as the most importance risk. About

30% of the firms were estimating ERR exposure in advance using techniques such as sensitivity analysis, goal seeking analysis, and past experiences. Transaction and operating exposure were the most prevalent types of ERR. Natural hedging techniques such as currency substitution and matching were the most commonly used to manage ERR exposure. Derivative hedging had not well taken root, as only about 7% of the firms reported to consistently use them. High exchange rate volatility, difficulties in adjusting prices, arranging hedge contracts with banks and getting well-skilled risk management labor were the main challenges faced by firms in the process of ERR management. The overall exchange rate variability for the period under review was just over 15%. The GBP had the highest variability while the EUR had the least. The exchange rates had differing covariance and correlations hence firms could mitigate ERR by diversifying trading currencies.

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