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# **Parallel Markets for Agriculture in a West African Setting: Origins and Distributional Effects**

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# Parallel Markets for Agriculture in a West African Setting: Origins and Distributional Effects

by Detlev Puetz\* and Joachim von Braun\*

## Introduction\*\*

There is widespread dissatisfaction with the intervention of parastatal and public sector institutions in agricultural output procurement and input supply, especially in Sub-Saharan Africa. The situation in The Gambia/West Africa -the case analyzed in this paper- is no exception. Price and other market interventions in agricultural commodity markets frequently lead to situations where official markets fail to meet demand for inputs at prevailing official prices. Taxed output prices, on the other hand, often discourage farmers from supplying official market outlets. Whenever governments impose such controls over quantities or prices, parallel markets arise to evade these controls (7). The costs of operating in parallel markets and the nature of risks facing traders are important determinants of the quantities traded inside and outside the official system and the prices paid on the parallel market. Parallel commodity markets that appear as an illegal alternative to official, state-controlled markets often involve additional costs and risks for market participants. The Gambian groundnut market is a case in point. But some parallel markets may be officially tolerated or even approved of where governments perceive their complementary function or plan to initiate a transition towards market liberalization. The Gambian fertilizer market is an example.

Like many other countries, The Gambia has made efforts to develop and stimulate the private sector to take over functions of agricultural input and output marketing. This usually takes time and creates frictions, at least in transitional periods where governments reduce their interventions only gradually and have substantial continuing influence on unofficial markets. The evolution of private markets -or the legalization process of existing parallel markets- remains closely interrelated with activities on the official markets. In such situations improved knowledge about interactions of official and parallel markets is critical for appropriate policy design, i.e., the scheduling of the adjustment process and the definition of the role of the public sector in agriculture in countries at different stages of development.

# 1. The Study

## 1.1 Study Questions

In analyzing how official and parallel markets evolve and interact in this African setting, this paper empirically addresses three major questions:

1. Devarajan, Jones, and Roemer (6) point out that wherever official and parallel markets coexist, participants shift their supply or demand from one market to the other until the expected marginal benefits in both market activities are the same. Behavior on these markets is determined by price differentials, penalties, and other transaction costs involved in getting access to the respective market. In such markets, equilibrium will be reached when these transaction costs equal the price differences of the commodity on the parallel market and the official (controlled) market. Basic relationships are traced empirically for the Gambian groundnut market. Differential producer prices in The Gambia and neighboring Senegal have led to an active parallel market involving the smuggling of groundnuts into Senegal. *What determines the coexistence of official and parallel markets and the share of produce marketed to each of them?*
2. Excess demand on a particular market may not necessarily be met by the parallel market and a market disequilibrium may result. Bevan et al. (2) observe that penalties and costs of collecting information can lead to parallel market prices below equilibrium. In the Gambian market for fertilizer, delivery failures and restrictive distribution and credit policies have rationed fertilizer supply. But it seems that the excess demand is only partly met by the parallel market. *What factors may keep a parallel market -created by government interventions- from clearing in the short run?*
3. Much of the parallel market research to date is focused on efficiency of market operations and related economic costs. Very little, however, is known about the income distribution effects of parallel markets in different socio-economic settings. Since parallel market participation -and thereby potential gains- by certain groups of households may differ, we ask: *What are the distributional effects of parallel market activities, especially the impact on the rural poor?*

The empirical evidence presented in this paper is based on two household surveys conducted by the authors between 1985 and 1988.<sup>1</sup> The study area is located in the center of The Gambia, 270 kilometers east of the country's capital, Banjul. The survey was not designed to address the issue of parallel markets specifically, but the results contain information useful for assessing the outcome of government interventions that create parallel markets and permit the analysis of distributional effects of parallel markets in this setting.

An initial section of this paper examines the market institutions and reviews the policy decisions that led to parallel markets. In the second part, empirical evidence is provided on market outcomes in terms of prices and quantities traded on each market and the distributional impact of parallel market activities.

## **1.2 Study Setting In The Gambia**

More than 90 percent of the Gambian population lives in rural areas and is highly dependent on agriculture. In this small anglophone enclave in francophone Senegal, no place is farther than 25 kilometers away from the Senegalese border, and there are close ethnic linkages between the two nations. As in neighboring Senegal, groundnuts -produced on smallholder farms- are the core of the agricultural economy, providing more than 80 percent of The Gambia's (official) export earnings and nearly 80 percent of farmers' cash income, which makes groundnut marketing a major activity. The average annual per capita income in the study area was about US \$ 140 in 1986, ranging from US \$ 48 in the poorest to US \$ 227 in the highest income quartile.

Mechanization levels in this land-abundant savannah agriculture are low, and major production constraints include scarcity of farm implements, quality groundnut seeds, and fertilizer. In this environment efficient marketing systems, notably for inputs, assume a vital role for growth and equity.

## **2. Market Features**

For more than a decade agricultural input and output markets have been dominated by a parastatal marketing board and the Gambian Cooperative Union (GCU), with both institutions subsidized through a variety of special project funds and access to interest-free loans. Only recently, in the course of a structural adjustment program, did the government adopt a policy of deregulation and privatization for input and cereal markets, but the groundnut market remained state-controlled.

### **2.1 Groundnut Market Operations**

The state marketing board, a monopsony, licenses buyers and agents to purchase and collect groundnuts in the countryside to deliver them to the board's processing factory in the capital. In the last decade GCU, the parastatal enterprise, has emerged as the largest licensed buyer. Decreasing marketing allowances and multiple subsidies to GCU have driven private buyers out of the market: their share declined from nearly 60 percent of the marketed groundnut volume in the 1974-1976 period to less than 20 percent today.

GCU's 85 primary cooperative societies and stores cover the whole country. In the study area GCU is the only official groundnut buyer on the Gambian side of the border; it operates four stores near the main roads along the river Gambia where farmers take their groundnuts for sale. These places happen to be as far as 10 kilometers away from some of the most productive groundnut-producing villages in the survey. For many of these farmers, Senegalese cooperative buying points across the border are even closer.

Official prices for groundnuts are set annually by the government and are uniform across the country. The state marketing board, with its monopsony for purchasing and exporting groundnuts, guarantees these producer prices to each farmer. In making these price decisions, the government takes into consideration the world market prices and Senegalese procurement prices.

## **2.2 Fertilizer Market Operations**

Fertilizer markets were liberalized in early 1986. Before that the state marketing board controlled all fertilizer imports into The Gambia (there is no fertilizer production in the country itself) and its national retailing through licensed sellers. Prices were fixed by the government.

But even after deregulation there remains some important state fertilizer trading: due to large carryover stocks and continued government handling of fertilizer imports - which consist mainly of international donations- the government has remained the only importer of fertilizer. A system of an annual fertilizer auction run by the government and open to any interested party replaced former licensing procedures. But private traders at the national level so far have not shown any interest in retailing fertilizer. In 1987 this left GCU as the only bidder at the auction and the only national retailer of fertilizer in The Gambia.

## **2.3 Seasonality and Imperfections**

The two markets analyzed in this paper have one important feature with high impact on parallel market outcomes: both groundnuts and fertilizer marketing are highly seasonal, confined to relatively short trading periods of about three months for groundnuts and less than two months for fertilizer. This means that agents need to make their market assessments during a very short time period, the more so since interventions vary from year to year and increase the uncertainty about market behavior in a given season.

Market assessments are also complicated by limited market transparency and high transaction costs in this rural setting, thereby increasing market imperfections. Although a wide variety of trading activities take place (trading of consumer goods,

including cereals, and reexporting), the public policy of favoring GCU has left only a small number of private agents who could handle agricultural trade without major investments in transport, storage, and distribution/collection systems.

Fertilizer has a high marginal productivity in the study area and farmers are aware of this fact (4). Yet, demand for fertilizer is restricted by farmers' liquidity constraints at the time of need in the growing season. In addition, production risks -especially after the recent drought experience- may keep risk-averse farmers from using scarce cash resources for fertilizer purchases. Thus, especially for the poorest farmers, demand for fertilizer is closely tied to access to credit. Altogether in 1987, 41 percent of fertilizer for groundnuts and coarse grains was received as a loan and some 8 percent as a gift, while 51 percent was paid for in cash.

#### **2.4 The Creation of Parallel Markets for an Output (Groundnuts) and an Input (Fertilizer)**

A parallel market is a structure generated in response to those government interventions that create a situation of excess supply or demand in a particular product or factor market (8). By imposing price and market controls and indirectly taxing the country's major agricultural export commodity, groundnuts, the Gambian government generated a surplus supply of groundnuts at the tax-exclusive price. On the fertilizer market, restrictions of the quantities traded through the official marketing system created a surplus demand at the subsidized price for this important production input. As a result, parallel markets arose for both groundnuts and fertilizer to avoid these controls and to equate supply and demand.

##### **2.4.1 Groundnuts**

During the mid-1980s both The Gambia and Senegal embarked on structural adjustment programs that included large price increases for groundnuts. The goal was to improve the terms of trade for the agricultural sector. But in both countries this policy raised domestic prices above the world market level (the nominal protection rates, that is the ratio of domestic to world market prices, were close to 2 in 1986/87). Subsidies were needed under these conditions -and partly provided by international donors- to facilitate the export of groundnuts. Since 1984/85, the Gambian groundnut price has been between 73 and 84 percent of the Senegalese price (see Table 1). There has always been an outflow of groundnuts, especially from the villages close to the border, but very favorable price differentials in 1987/88 and a purchase ceiling of the marketing board combined to stimulate the outflow. In the 1987/88 season, limited subsidy funds in The Gambia forced the government to decrease guaranteed prices, thereby increasing the price differential to Senegal. But even at a lower price level the government was unable to guarantee the price for the country's total groundnut output and established a purchasing ceiling that covered only about two-thirds of the

estimated marketing volume for the year. Because groundnuts sold to the parallel Senegalese market save The Gambia expenses on the export subsidy, the government did not attempt to prevent smuggling or to enforce sales to the cooperative.

**Table 1: Groundnuts price ratio In The Gambia and Senegal and fertilizer subsidy and use, 1981/82-1987/83**

Year	Groundnuts- Price Gambian/Senegalese	Fertilizer Subsidy Per Unit  (percent)	Fertilizer Consumption  (tons)
1981/82	102.0	72.0	12,135
1982/83	108.0	77.0	8,357
1983/84	94.0 <sup>a</sup>	63.0	9,582
1984/85	79.0 <sup>b</sup>	31.0	12,066
1985/86	82.0	22.0	4,738
1986/87	84.0	26.0	4,080
1987/88	73.0	17.0	2,435

Source: Computed from various unpublished sources of Ministry of Agriculture and Gambian Cooperative Union.

<sup>a</sup> Down to 75 percent when the local currency was devalued during the trading season.

<sup>b</sup> After price increases in The Gambia during the trading season.

The Gambian Cooperative Union (GCU), on the other hand, has some vested interest in official market sales because its marketing allowance increases with the volume marketed. GCU also needs to recover input loans from farmers, which is easier when groundnuts are sold to the cooperative. Thus GCU put pressure on farmers to market to the official channel.

A semi-legal parallel market thus evolved which tolerates parallel structures on the Gambian side and attempts to safeguard its procurement system on the Senegalese side. The Senegalese government in 1987/88 tried to discourage Gambian sales by ordering stores along the border to close down, demanding Senegalese identification documents from groundnut sellers, and increasing its border controls. But the border is long, and during the course of the trading season most of these measures could not be fully enforced or were offset by bribes. Moreover, Senegalese groundnut-buying agents had an incentive to purchase Gambian nuts, since their allowances also depend on the volume of groundnuts purchased.

## 2.4.2 Fertilizer

The creation of the parallel structures in the fertilizer market has different causes from those in the groundnut market. In the past five years, fertilizer use in The Gambia has declined by 75 per cent. Although some of this decline can be attributed to lower demand in response to sharp nominal price increases (largely induced by the removal of subsidies, see Table 1), most of it is a result of delivery failures, restrictive distribution policy of the official fertilizer retail system, and failure to involve private marketing at large.

First, in 1985 a national fertilizer crisis developed when a fertilizer grant was provided to the country by an international donor, and at the same time the institutional responsibility for the logistics of fertilizer marketing in The Gambia changed. This led to a disruption of supply, since fertilizer shipments arrived in the country too late for the 1985/86 cropping season. In the end, only carryover stocks from previous years were used during that season, resulting in substantial production losses for the country (4). In this situation of limited short-term supply, farmers had to compete for scarce fertilizer on a parallel market. Although unauthorized fertilizer trading was officially illegal at that time, there was little enforcement to actually discourage trading of small quantities.

Then, second, more disruptions and uncertainty followed when fertilizer markets were officially deregulated in 1986/87. But the official marketing system was maintained, and until now, private traders who were invited to take over part of the retail trade have not embarked on fertilizer marketing. On the other hand, government and GCU policies restricted fertilizer supplies to the cooperative's primary societies despite ample supplies in government stores. As a matter of policy, annual allotments to each of GCU's 85 primary societies are based on its sales the year before and are adjusted downward for outstanding loan repayments from each society. Until 1985 GCU had provided loans under generous interest and repayment conditions. Individual loan defaulters did not lose access to new loans as long as their primary cooperative society maintained a certain collective repayment rate. With the structural adjustment program this policy changed in 1986, and individual loan defaulters have since been strictly excluded from further loans. The new credit policy also limited new input loans to the amount individual farmers had received the previous year, and only cooperative members who actually got credit the year before are eligible for new credit.

Tightening access to credit had an adverse effect on overall input use, since GCU did not put out special contingencies for cash sales. Thus in 1987 GCU purchased only 3,000 tons of fertilizer in the public auction (for total fertilizer consumption, see Table 1). Fertilizer shortages and excess demand remained symptomatic for the fertilizer market. At the local level a parallel fertilizer market exists but is limited in size, since private traders -operating interregionally- have not gotten involved.

Table 2 summarizes events in market operations and interference which contributed to the creation of parallel markets for groundnuts and fertilizer.

**Table 2: Calendar of events contributing to creation of parallel markets in The Gambia 1985-1987**

August 1985	Late arrival of fertilizer shipments drastically decreases availability in 1985 and creates large carry-over stocks for 1986.
December 1985 to July 1986	Gradual implementation of the Structural Adjustment Program.
December 1985	Official groundnut prices start to be subsidized but less than in Senegal. This policy is maintained throughout 1986/87 and induces sales to Senegal.
May 1985	Fertilizer marketing is liberalized. Restrictive fertilizer credit policy is introduced and reduces fertilizer acquisition by smallest farmers.
June 1986	Fertilizer is auctioned in an attempt of privatization but the Gambia Cooperative Union (GCU) turns out as the only buyer.
August 1986	Fertilizer is directly sold to farmers by the Gambian Marketing Board at dumping prices.
July 1987	Second fertilizer auction with GCU as the only buyer. The private sector continues to stay away from the fertilizer market.
December 1987	A reduction of Gambian groundnut subsidies widens price differential with Senegalese groundnut market. The Gambian Marketing Board limits local groundnut purchases at the official price to two-thirds of the expected Gambian market volume. Farmers' sales to Senegal increase further.

**Note:** The cropping season in The Gambia lasts from June to November, groundnuts are traded between December and February.

### **3. Market Outcomes at the Farm Level**

#### **3.1 Causes for Coexistence of Official and Parallel Markets**

##### **3.1.1 The Output Market**

During the 1987/88 season, 53 percent of all groundnuts marketed in the study area were sold outside the official Gambian market, either taken directly by farmers to

Senegal or sold, illegally, to unlicensed middlemen in The Gambia. Average prices on the parallel market were 34 percent higher than on the official Gambian market. As these prices are exogenously fixed and guaranteed by the respective governments, demand for groundnuts is either completely elastic (as in Senegal) or elastic in the range of a rationed procurement quantity (as in The Gambia).

Why in this situation do official and parallel markets coexist, that is, why do farmers sell groundnuts at lower prices in The Gambia to official procurement stores? The answer to this question can be derived from a comparison of costs and profit on the parallel versus the official market.

Farmers receive higher prices for groundnuts on the parallel market in Senegal, but may incur higher marketing costs and risks on the parallel markets. Farmers will supply to the parallel market outlet as long as incremental transaction costs (*in addition* to those incurred on the official market) are lower than price differentials. Direct transaction costs include transport, costs for collecting marketing information, and bribes. But there is also a variety of indirect costs that farmers need to consider. The timing of marketing may turn into a crucial cost factor if farmers' time opportunity costs and/or capital interest rates are high. It is common that farmers must wait longer for their revenue when they market their produce in Senegal; Senegalese restrictions and controls tend to be toughest at the beginning of the trading season and collecting market information (e.g., for finding a border trader or a safe passage across the border with one's own produce) takes time. Also, modes of payment are different: GCU traditionally pays cash at delivery, while the Senegalese often pay with coupons to be cashed in several weeks later.

Indirect costs of marketing in Senegal also rise with a potential loss or reduction of business standing with the Gambian cooperative. Close contacts with the cooperative often reduce marketing time and other transaction costs (e.g., so called "weighing losses" at delivery) and facilitate access to future inputs and credit. In addition, farmers expect a premium to offset the risk of fines or even confiscation of produce, depending on their risk aversion.

Transaction costs and the risk premium vary from farmer to farmer—leading to individual differences in expected rents to be gained by parallel marketing. Some farmers may not gain at all since their additional costs can be higher than the additional revenue. These differences in transaction costs, risk aversion, and market imperfections lead to the coexistence of parallel and official markets.

Three different situations can be distinguished that lead to different choices by farmers for supply to official, parallel or both markets: first, those firms with marginal transaction costs less than the price differential will abandon the official market completely, and price controls will have no effect on them. Thirty-nine percent of farmers in the sample sell exclusively on the parallel market. Their risk of being caught on the parallel market does not decrease with quantity traded on the official market, although not trading on the official market increases their indirect transaction

costs on the parallel market because they may forgo some indirect benefits of official market participation (e.g., enhanced options for getting input access). Moreover, as there seem to be no significant diseconomies of scale for trading on the parallel market, marginal revenue does not decrease with sales.

Second, those firms with marginal transaction costs above the price differential will sell exclusively to the official market. This group comprises 53 percent of surveyed farmers.

A third group of 8 percent of farmers split sales: their indirect benefits from selling on the official market decrease with the quantity sold, as they will obtain these benefits once they sell a certain quantity. This simultaneously *decreases* their incremental indirect transaction costs for selling on the parallel market. Thus they will sell at the official market until these costs are less than the price differential and then switch to the parallel market.

Most of The Gambia's parallel groundnut market consists of local trade; farmers themselves, or friends in the village, take groundnuts across the border and sell them directly to the Senegalese stores. Individual farmers often find it difficult to assess total transaction costs and risk and may face a variety of logistical constraints for taking their produce to Senegal. In this situation middlemen -private traders- running a parallel market inside The Gambia can reduce these costs and risks because of economies of scale and specialization. As a matter of fact, private local traders, mostly from Senegal, moved in on tractors and donkey carts and purchased groundnuts from farmers in Gambian villages, mainly those farther away from the border. But this happened only relatively late in the trading season, and only 3 percent of the marketed produce was sold to these middlemen.

In a later section, we will analyze the characteristics of those farmers who participate in the parallel market under these conditions.

### **3.1.2 The Input Market**

At the local level, GCU provides fertilizer only to cooperative members, either for cash or on credit. Usually allocations depend on how much members received the year before and whether outstanding loans have been settled. In principle the allocation system provides costless access to rationed quantities for those consumers who are qualified. In reality, however, costs may sometimes be incurred when supplies are scarce, and better information about arrival of supplies at the local store or favors for officials can improve the chance of receiving a fertilizer allocation or increase the amount.

After receiving their assignments, many cooperative members with access to supplies then retail fertilizer to other farmers, often family members, friends, or neighbors who have no direct access to GCU allocations. The recipients may have chosen not to be

cooperative members (there is an annual membership fee) or may have defaulted on earlier loans. This creates part of the parallel market outside the official one. It should be noted that this re-trading of procured quantities from the cooperative via relatives and friends is a personalized market in which sellers do not completely exploit scarcity rents because of family ties and obligations. The non-official market is also supplied by fertilizer that often is illegally leaked from cooperative or government stores or carried over from the last season's supplies. This is a less "personalized" section of the parallel market.

The parallel fertilizer market, which is a result of access limitations to the official fertilizer market, is limited in its scope because large amounts of its supplies are obtained through the cooperative, at least in the short term, and farmers with access to the cooperative consume much of their allotments themselves. The 1987 survey finds that 33 percent of the fertilizer consumed in the end originated from sources outside the official cooperative system. On this parallel market 24 percent was provided by fellow household members, 45 percent by friends and neighbors, and 30 percent by local traders.

### 3.2 Market Clearance in Parallel Market Structures

Marginal returns to *fertilizer* are substantially above prices.<sup>2</sup> Farmers are aware of this and many reported that they would have liked to purchase more at the prevailing price than they were able to find. Similar statements were made during the 1985 shortage. Thus there are apparent market clearing problems despite the existing parallel market.

Counterintuitively, during the 1987 season we do *not* see average parallel market prices rise above official cooperative prices - a situation similar to that in 1985.<sup>3</sup> This is the case for both cash and credit sales. Two factors explain this unexpected similarity of observed official and parallel market prices:

First, when farmers retail to family members, friends, and neighbors they can hardly charge more than they paid themselves. In this Muslim society, charges of usury are serious. Since part of the parallel market fertilizer comes from stocks acquired in past seasons, they may even charge only the original prices that happen to be lower than current official prices. It is, however, not uncommon to interlink cash sales with other transactions to circumvent customs, e.g., tying them to labor or other obligations of the recipient. In this case the effective price the buyer has to pay differs from the cash price measured in the survey. This instrument of interlinkage is also used to sell to persons with cash liquidity constraints. Such contracts of interlinkage and complications arising from the assessments of actual prices in such situations have been described by Bardhan (1) and Porath (10).

Second, in the more "commercialized" part of the parallel market there is a risk element that keeps prices down: the fertilizer market in the past has been

characterized by official market interventions favoring the consumers. Such interventions often come all of a sudden in the middle of the trading season, e.g., fertilizer is sold at dumping prices (as happened in 1986) or credit conditions change and constraints are relieved (as in 1985). Such experiences encourage consumers to adopt a "wait and see" attitude. The uncertainty about such interventions makes consumers reluctant to buy early in the season at a high price.

Traders with fertilizer in stock at the beginning of the season can only lose by these interventions, unless they carry their stocks over to the next year, which would entail high capital costs and uncertainty. Since these traders receive much of their supply from illegal channels -often far below current official prices- they still make a profit charging at or slightly below official prices. Traders' interest in selling early and consumers' interest in buying late lead to supply/demand imbalances during the season. Thus, partial markets at certain times within the season may well be in equilibrium. But this is not the case in an ex-post view of the seasonal market and its average price and demand.

The *groundnut* market was also temporarily in disarray in the 1987/88 procurement season, but for very different reasons than the input market: after reaching the purchase ceiling set by the government, official Gambian procurement was interrupted because of fiscal constraints. Thus farmers temporarily had only the option of the parallel market across the border. This "pushed" into the parallel market farmers who otherwise -for the earlier-stated reasons of transaction costs, risk, etc.- would have marketed on the official channel in The Gambia. This situation--different from the fertilizer market case--cannot be interpreted as a basic market clearance problem, since the parallel market in the end absorbed the excess supply. The temporary breakdown of the official channel, however, induced additional costs that apparently--as shown in the next section--had unequal distributional effects. This is because the official channels are normally used by the poorer farmers to a greater extent.

In 1987 one obvious constraint on the parallel fertilizer market's ability to equate demand and supply efficiently was the limited local supply, since private traders failed to participate in interregional fertilizer trading. Partial market liberalization has resulted in inefficiencies and a lack of private sector interest in fertilizer marketing for various reasons.

First, unstable pricing and market policies in the past and subsidies to the official marketing channel have increased uncertainties about the future market development. Second, continued interventions on the groundnut market spill over on the "liberalized" fertilizer market: fertilizer trading requires substantial investments in transport, storage, and distribution networks. The same network could be used for marketing outputs if the groundnut market were simultaneously liberalized. Fertilizer trading costs would then be drastically reduced because of economies of scale. Given the importance of credit for input purchases, legal groundnut marketing would also facilitate private traders' loan recovery, thereby limiting loan defaults and encouraging private loans. Third, opportunity costs of working capital for traders in The Gambia are

high, and investments in reexport (smuggling to Senegal) or local retailing of other consumer goods may promise higher returns.

In a case described by Bevan et al. (2) the risk for traders involved in advertising their goods and finding out more about customers' reservation prices kept parallel markets from clearing. Traders' risk is also a driving factor on the Gambian fertilizer market: the erratic and unpredictable nature of government interventions in the fertilizer market itself and in linked other markets (i.e., groundnuts and credit) increases risks for private agents -acting on the parallel market, which in the end leads to limited parallel market supply and to prices below clearing prices.

In a similar way, the uncertainties about interventions and risk on the groundnut market-combined with the short trading period-prevented the prompt establishment of more effective parallel market institutions that could have considerably reduced costs of parallel marketing. Thus a lack of appropriate institutions -in the form of private traders- reduces the ability of the parallel market to effectively compensate consumers and producers for state market interventions.

The degree of market uncertainty makes the Gambian groundnut and fertilizer markets different from the Senegalese cereal market described by Morris and Newman (9), with its very active trading by intermediaries. The Senegalese cereal market provides ample local demand, basically throughout the year, especially since traders can provide cereals to consumers below official prices (as reported by Morris and Newman, 9). This reduces the marketing risk for intermediate cereal traders in Senegal. In The Gambia, on the other hand, high risks on the seasonal and intervention-prone groundnut and fertilizer markets keep the participation of intermediaries low.

### **3.3 Parallel Market Participation and Equity Effects**

As hypothesized earlier, different categories of farmers face different costs and risk functions in participating on the parallel groundnut and fertilizer markets. Who, in the end, sold on the parallel market and who could not make use of parallel market rents? A clear picture emerges for the groundnut market when sample households are arranged by income classes: households in the poorest quartile participate in the parallel market to a much smaller extent (17 percent) than households in the richest quartile (71 percent) (Table 3). The story is not so clear-cut in the fertilizer market, although in this case the richest households are more involved in the parallel market than are other households.

In the following regression analysis, we assess factors that determine the share of *groundnuts* that individual farmers sell on the parallel market (see Table 4). The results show that villagers close to the border sell a much larger share of their groundnuts on the parallel Senegalese market (64 percent more than in the non-border villages). Their transaction costs are lower because of comparatively low

transportation costs. Another reason is that family relations to Senegalese villages are helpful in getting access to information about Senegalese market conditions and risks and may directly improve market access in this closely knit society. Farmers who received credit from the Gambian cooperative sell 11 percent less on the parallel market (see variable COOPCRED in table 4). This underlines the importance of maintaining a close business relationship with the cooperative. Many of these are farmers who actually split their sales on official and parallel markets.

**Table 3: Participation in parallel markets, by income groups, 1987/88**

	Share of Total	Income Quartile			
		Lowest	Lower Medium	Upper Medium	Highest
		(percent)			
Groundnuts					
Official	47.0	83.0	81.0	58.0	29.0
Parallel	53.0	17.0	19.0	42.0	71.0
Fertilizer					
Official	67.0	70.0	72.0	70.0	60.0
Parallel					
Own household members	8.0	4.0	5.0	8.0	7.0
Friends, relatives	15.0	16.0	9.0	10.0	17.0
Local traders	10.0	7.0	9.0	8.0	12.0
Source: IFPRI-PPMU surveys, 1987/88.					

The advantage of early selling is crucial for migrant farmers (MIGRANTW in table 4). These people often leave the area for their home villages after the sale of their crop. They will avoid the risk of losing their main source of annual income -the groundnut money- in an illegal transaction. The same applies to those farmers who experienced low cereal yields and urgently need money for food purchases. They cannot afford to embark on the more risky and time-consuming border trade. Thus cash constraints and imperfect credit markets raise the supply to the official market. On the other hand, women farmers trade more in the parallel markets (FEMALE in table 4); women, especially from the Wolof community, are very active in village and inter-village food and commodity trading.

When we correct for these factors, the analysis also shows that a farmer's volume of groundnut output does not play a significant role in participation on the parallel

markets (see GNSOLDKG in table 4). This result suggests that there are no diseconomies of scale; marginal costs for marketing on the illegal market do not rise with volume.

**Table 4: Determinants of groundnut share sold on the parallel market  
(Dependent variable: PARALLSH)**

Independent Variable	Parameter	
GNSOLDKG	+1.174E-05	(0.70)
BORDER	+0.635	(20.35)
FEMALE	+0.064	(1.97)
MIGRANTW	-0.175	(-3.66)
COOPCRED	-0.109	(-2.43)
(Constant)	0.224	
R		0.409
Degrees of freedom		712
F-value		100.06

Note: Numbers in parentheses represent t-statistic.

Definition of variables:

PARALLSH = share of groundnuts sold on the parallel market by individual farmer,

GNSOLDKG = total groundnuts sold, in kilograms,

BORDER = dummy = 1, for villages close to the border,

FEMALE = male = 0; female = 1,

MIGRANTW = dummy = 1, if groundnut seller is a migrant worker,

COOPCRED = dummy = 1, if farmer received any credit from the Gambian cooperative during the same cropping season.

When we trace the development of *fertilizer* use in upland crops from 1984 to 1987 (see Table 5), we find that, while overall fertilizer use went down by more than 50 percent during that period, the share of low-income groups in total fertilizer consumption fell continuously. In 1987 the two bottom income groups still consumed 37 percent of all fertilizer, but for 1987 this figure went down to only 25 percent.

Much of this relative decline in access of the poor to fertilizer is a consequence of limitations in credit access. Fertilizer cash purchases are lowest in the poorest income groups: 44 percent versus 57 percent in the top income group. For loans, however, farmers depend significantly on the official marketing system, while on average 41

percent of all fertilizer was sold on credit, the credit share varies from 60 percent for sales by the cooperative and 17 percent from families and friends to a mere 1.5 percent at local traders.

A variety of factors limits the supply of agricultural credit on local markets: covariate production risks in agriculture (for details, see 3), problems related to charging interest in a Muslim society, and high opportunity costs for alternative use of capital are among the most important.

Since poorer farmers need credit more than rich ones to buy fertilizer, the government's restrictive credit policy, introduced in 1986, had a higher impact on the poor. Even though the policy itself limited official credit access similarly for all income groups -this was because loan defaults did not differ very much across groups- the upper income groups were better able to redirect their demand to the parallel market and pay cash for fertilizer.

As a result, in the case of fertilizer, negative equity effects of differential access to the parallel fertilizer market are mainly a result of liquidity constraints and restrictions on the credit/capital market.

**Table 5: Fertilizer use in 1984, 1985, and 1987 for identical households in all upland crops, by income group**

Year	Consumption	Share by Income Quartiles			
		Lowest	Lower Medium	Upper Medium	Highest
	(kg)	(percent)			
1984	52,600	17.0	20.0	24.0	39.0
1985	21,835	15.0	20.0	24.0	41.0
1987	24,014	10.0	15.0	32.0	43.0

Source: IFPRI/PPMU surveys, 1985/86 and 1987/88.

#### 4. Conclusions

In The Gambia, as in many African countries, with widespread state intervention (often of an erratically changing nature), limited market information and high transaction costs because of a lack of infrastructure, and complex public versus private sector interaction, parallel markets are the normal rather than the exceptional

case. This paper explains three basic issues in the context of the complex reality of parallel market structures.

First, official and parallel markets coexist because of both price and non-price factors. Even when price differences between official and parallel markets are large, the supply to the official market can be high because information costs, risk in the parallel market, liquidity considerations, and other transaction costs limit supplies to the parallel market. The Gambian groundnut market is a case in point.

Second, specific circumstances may, even in the context of prevailing parallel market structures, prevent efficient market clearing. Personalized markets -quite relevant for local trading in this African setting- on the one hand, and traders' risks in an environment of unpredictable official market operations, on the other, can be underlying causes for these indications of inefficient market clearance. The Gambian fertilizer market gives us an example of such a situation.

Third, parallel market structures have an impact on income distribution, which depends upon proximity to trading points, endowment of market participants, liquidity of the participants, and -in an agricultural system in which production and marketing are influenced by gender differences in the division of labor and access to resources- also on gender. The location of farms close to the border becomes an advantage where exploitation of changing cross border price differentials may be a continuous feature. The Gambia-Senegal border trading is in that sense not atypical in the African context. Finally, there is a clear indication that the poorest households participate much less in parallel markets than do upper income groups.

The evolution of parallel market structures and their underlying imbalances suggests that long-term efficiency losses are the result of sequences of short-term disruptions-induced by instabilities in the official channels. This picture emerges especially for the fertilizer market. On the other hand, parallel markets can function as a savior for farmers, providing a fallback position or even enhanced incentives in an environment of unstable official procurement policies. This was the case with the Gambian groundnut market.

The policy mix of half-hearted market liberalization, with rapid dismantling of existing public marketing channels and changing strategies towards export orientation, has led to frequent supply/demand imbalances. Here parallel markets can only partly compensate for government interventions and are certainly second best compared with a more market-oriented policy. Most noteworthy in this regard is the spiral of declining fertilizer use in many African countries such as The Gambia. A detailed look at the development of the fertilizer market suggests that the underlying causes of this decline are more often policy failures than market failures.

## Summary

Price and market interventions in agricultural commodity markets frequently lead to parallel market structures. African markets are particularly rich in such structures, the efficiency and equity effects of which are poorly understood.

This paper addresses three questions:

- What determines the coexistence of official and parallel agricultural markets?
- What factors may keep a parallel market -created by government interventions- from effectively clearing, at least in the short run?
- What are the income distribution effects of parallel agricultural market activities in rural areas?

The questions are addressed in the context of the Gambian groundnut and fertilizer markets. It is found that official and parallel markets coexist because information costs, high risk, liquidity consideration and other transaction costs limit supplies to the parallel market. Personalized markets and traders' risks in an environment of unpredictable official market operations can be underlying causes of inefficient market clearances. The created parallel market structures in both the groundnut and the fertilizer market were found to have adverse effects for rural income distribution.

## Zusammenfassung

Staatliche Preis- und Marktinterventionen rufen in der Regel Parallelmärkte hervor, welche die durch Intervention verursachten Nachfrage- bzw. Angebotsüberhänge auszugleichen trachten. Die Allokations- und Verteilungseffekte solcher Parallelmärkte, die besonders häufig in Afrika auftreten, sind nur unzulänglich bekannt. Das vorliegende Papier beschäftigt sich daher - anhand der gambischen Märkte für Erdnüsse und Mineraldünger - mit folgenden Fragen:

- Wodurch wird die Koexistenz offizieller und paralleler landwirtschaftlicher Märkte bestimmt?
- Welche Faktoren können, zumindest kurzfristig, das Gleichgewicht von Angebot und Nachfrage auch auf Parallelmärkten mit freier Preisbildung verhindern?
- Welche Auswirkungen besitzen Parallelmärkte auf die Einkommensverteilung in ländlichen Regionen?

Für den Erdnußmarkt stellt sich heraus, daß sowohl der offizielle als auch der Parallelmarkt, trotz höherer Preise auf dem letzteren, von Bauern beliefert wurden, da

eine Reihe von Transaktionskosten wie z.B. Transport und Informationsbeschaffung, aber auch Risiko und Liquiditätsüberlegungen, das Angebot auf dem Parallelmarkt beschränken. Der parallele Düngemarkt bewirkte kein vollständiges Gleichgewicht zwischen Angebot und Nachfrage, da die Beziehungen zwischen Anbietern und Nachfragern zum einen häufig durch enge persönliche bzw. verwandtschaftliche Bindungen geprägt sind, und andererseits die Unvorhersehbarkeit staatlicher Eingriffe die Marktteilnehmer verunsichert. Sowohl auf dem Erdnuß- wie auch auf dem Düngemarkt hatten die parallelen Märkte nachteilige Auswirkungen auf die Einkommensverteilung der ländlichen Bevölkerung.

## Notes

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- \*\* The authors gratefully acknowledge comments on an earlier draft by Michael Roemer, colleagues at IFPRI and an anonymous reviewer.
- 1 For details on the survey, see von Braun, Puetz, and Webb (5).
- 2 Estimates by von Braun and Puetz (4) show, for example, in groundnuts, a marginal fertilizer productivity of 2.4 kilograms for each additional kilogram of fertilizer applied. In 1985 this was equivalent to an additional revenue of more than 5 Dalasi for each Dalasi spent on fertilizer (in 1987 prices, about 4 Dalasi).
- 3 Cash prices in 1987 (prices for 1985 in brackets) on the parallel market were D 0.71 (D 0.39) compared with D 0.84 (D 0.57) on the official market. For fertilizer acquired on credit, farmers paid D 0.92 (D 0.54) on the parallel market and D 1.01 (D 0.62) officially.

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