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Business Operations of Agrodealers and Their Participation in the Loan Market in Nigeria

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Contents

Tables

Figures

ABSTRACT

The weaknesses in the financial and technical capacity of Nigeria's agrodealers came to light when many of them could not provide the financial backing for their role in distributing inputs under the growth enhancement support scheme. They are also not adequately equipped, organized, or buoyant enough to be able to access adequate loan facilities from commercial banks. These weaknesses underscore the need to examine the various aspects of agrodealership financing and to unravel agrodealers' participation in the loan market. It is also important to look at the extent to which agrodealers are credit rationed in order to articulate suitable financing mechanisms that will enable them to discharge their responsibilities in a sustainable fashion. This study employs primary data collected through structured questionnaires from 300 agrodealers and uses a Tobit type-II model for the analysis. The results show that interest rate, debt, value of asset, membership of trading association, and source of credit are major determinants of loan demand. Agrodealers need to organize themselves into input trading associations to enhance their creditworthiness and to unleash the inherent social capital and information advantages for improved agrodealership financing. Moreover, diversification of product coverage by agrodealers and a value-chain approach that links internal financing in the form of trade credit within the agro-input sector, with external financing from the commercial banks, are strongly recommended.

Keywords: agrodealers, loan demand, credit rationing, value-chain financing

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ABBREVIATIONS AND ACRONYMS

ATA	agricultural transformation agenda
CACS	commercial agriculture credit scheme
CFA	Cooperative Finance Agency
CPP	crop protection product
ECOWAS	Economic Community of West African States
FMARD	Federal Ministry of Agriculture and Rural Development
GES	growth enhancement support
IFDC	International Fertilizer Development Corporation
IITA	International Institute of Tropical Agriculture
LGA	local government area
MANR	Ministry of Agriculture and Natural Resources
NASC	National Agricultural Seed Council
NGO	nongovernmental organization
NIRSAL	Nigerian Incentive-based Risk Sharing System for Agricultural Lending
NSS	National Seed Service
SME	small- and medium-scale enterprise

1. INTRODUCTION

Despite the efforts of the Nigerian government to transform the agricultural sector, modern inputs that are critical to the attainment of the desired outcomes are not available in the right quantity, quality, and price. Although the agricultural sector has been recording positive growth rates recently, the input distribution system has been in a parlous state. The inputs at the disposal of an average farmer remain grossly inadequate and are anything but modern—being of low quality and sub-optimal productivity. The agricultural transformation agenda (ATA) introduced in 2011 seeks to tackle the inefficiencies in the distribution of key inputs, making them more readily available and affordable. In this regard, the agrodealers are assigned a critical role, especially in implementing the growth enhancement support (GES) scheme, which took off in 2012. Under this scheme, farmers are to benefit directly from an innovative e-wallet electronic system of delivering subsidized inputs.

A major policy stance underpinning GES implementation was the federal government's withdrawal from the procurement and distribution of fertilizers and improved seeds in 2011, which it did in a bid to decontaminate the input distribution system and promote effective service delivery. The commercial banks, fertilizer importers and major distributors, seed companies, and agrodealers are now the key private-sector groups to be relied upon for successful implementation of GES. However, the disappointments created by the private sector during the first year of GES implementation should provoke a research investigation into the operations of agrodealers to prevent a situation in which a weak, unorganized, and financially incapacitated private-sector group agrodealers tends to scuttle a strong policy commitment and stymie investment and growth in the agricultural sector. GES implementers were disappointed that agrodealers did not deliver adequate inputs to farmers as expected and that some of the delivered inputs reached farmers quite late, contrary to expectation. Moreover, the financing from commercial banks to enable agrodealers to finance the procurement of inputs from suppliers was much lower than expected.

Over the years, though there have been attempts to develop agrodealership, the level of organization and capacity improvement attained is far from adequate for agrodealers to cope with the responsibility required for effective distribution of inputs. The weaknesses in their financial and technical capacity came to the limelight when many of them could not provide the financial backing for their role in the distribution of inputs under the GES scheme. They are also not adequately equipped, organized, or buoyant enough to be able to access loan facilities from commercial banks. The initial challenges witnessed in GES implementation are a clear indication that a weak private-sector group that is expected to activate a key component of ATA must itself undergo commensurate transformation if its expected role is to be performed creditably.

The foregoing raises the question of which aspects of agrodealership financing need to be transformed for effective input distribution in the country. What are the main sources of finance for the operations of agrodealers, and how reliable are they? What is the nature of agrodealer operations, and what challenges do they face? What variables influence agrodealers' decisions to borrow, especially in the face of severe risk rationing by commercial banks? For those who borrow, what factors determine their demand for credit? What sort of financial mechanisms will enable them to discharge their responsibilities in a sustainable fashion? Some of these questions appear to be quite simple, and yet they have been unasked and unanswered in the annals of Nigeria's agrodealership development. These questions must be resolved in order to engender a viable architecture of agrodealership financing and agricultural transformation in the country.

An investigation of the sources of financing and the factors influencing the demand for credit by Nigeria's agrodealers, as intended in this study, is warranted not necessarily because of the dearth of information about agrodealers but largely because of the lack of scientific analysis of the determinants of demand for credit by agrodealers and the decisions circumscribing their participation in the credit market. Agrodealership is gaining ground in Nigeria's agricultural development, especially within the broad paradigm of the federal government's agricultural transformation agenda. *Agrodealership* refers to the

business operations and related activities of agro-input dealers. Agrodealers are operators of small- and medium-scale enterprises (SMEs) who engage mainly in buying and selling agricultural inputs, such as fertilizer, seeds, chemicals, and so on, and who ensure the delivery of such inputs to farmers, even at the grassroots level. Agrodealer development became entrenched into the Nigerian agricultural sector in the early 2000s in the aftermath of the vigorous campaign to redefine the public sector's role in procuring and distributing agricultural inputs. In many parts of the world, the campaign has led to the evolution of a strong agrodealer movement that has helped shape the delivery of green revolution, especially in many African countries. In Nigeria, the most developmental project relating to agrodealership was motivated, designed, and implemented by external agencies to demonstrate the significance of a strong agrodealer community and interlinkages with other sectors of the economy.

The intervention of the development partners was based on three inter-related arguments:

1. The heavy involvement of the government in producing, procuring, and distributing inputs has been inefficient and has restricted private-sector investment to the barest minimum, especially because the use of the inputs was promoted with nontargeted and poorly managed subsidies.
2. The market is public-sector driven, and the government is the preferred client of major private-sector input companies, making it virtually impossible for both the government and private input suppliers to provide satisfactory services to farmers.
3. It is unrealistic and unethical for the federal government to perform a regulatory role in the input sector while also performing a significant role as an operator in the market. In addition, this regulatory role is not comprehensive and effectively performed. For instance, the regulation of the fertilizer and crop protection product (CPP) sectors has been focused at the point of entry into Nigeria and not at the point of sale in rural markets. This enables large quantities of adulterated or subquality products to be sold to farmers without consequence. The National Agricultural Seed Council's strict regulation of the seed sector tends to prevent international seed companies from entering the market, rather than ensuring the quality of domestically produced seed. The point is that the regulation must be comprehensive and must not focus on one area of the market to the neglect of the others. Regulation at the entry point is as crucial as prescribing and ensuring compliance with standards in the domestic market.

The project designers regarded the multiple roles of the federal and state governments in distributing and regulating agricultural inputs as having distorted and undermined the development of a healthy input market. This was the context in which the Alliance for a Green Revolution in Africa awarded International Fertilizer Development Corporation (IFDC) a grant in July 2008 to conduct the three-year Nigeria Agrodealers Support Project (NADSP). The NADSP was designed to boost the capacity of private-sector agrodealers to provide more quality inputs and services to farmers. The project was officially launched in October 2008 and was later extended through October 2011. The project's goal was to increase the agricultural productivity and incomes of one million smallholder farmers by increasing the availability, accessibility, and affordability of quality seeds and other agricultural inputs in rural areas. The main project activities were fourfold:

- *Agrodealer capacity building*. NADSP provides training and technical assistance to more than 2,000 agrodealers to strengthen their technical and business capacities. It also helped them expand business linkages with input suppliers and extend their retail networks to provide more farmers with modern agro-inputs and sound scientific advice. Specifically, the project inter alia compiled the first comprehensive directory of agrodealers in 16 states and conducted a census of agrodealers and a survey of their operations and needs.
- *Institutional strengthening*. NADSP encourages agrodealers to join already-established trade associations and provides them with the organizational training to serve members

and customers effectively in order to lobby for policy reform and to generate revenue for financial self-sufficiency.

- *Technology transfer*. NADSP convinces agrodealers of the economic and goodwill returns from providing value-added services to farmers. The project trains agrodealers, via their trade associations, in how to conduct field demonstrations and soil testing and how to promote better agricultural practices.
- *Financial support.* The project facilitates agrodealers' access to credit for business development through risk-sharing arrangements. NADSP works with banks, microfinance institutions (MFIs), and other credit institutions to improve their understanding of the needs of agrodealers and opportunities for lending. They also work with agrodealers to make them more credit-worthy.

One of the important lessons from the project is the need to address the poor financing of agrodealers' operations. The comprehensive survey of agrodealers in nine states, undertaken in 2010, revealed that most agrodealers are small and poorly financed, with half considered mobile "tabletop" dealers with no significant storage capacity. These dealers need to be brought into a supply network because they are an important part of the value chain and they are often farmers' only source of inputs. Indeed, one of the main challenges of the project was the reluctance of commercial banks to participate in the NADSP-budgeted $500,000 credit guarantee program. This failure implied that the project was unable to leverage that fund as anticipated in order to help agrodealers gain access to the credit they needed to expand their businesses. The problem was only partially resolved (and only then at a late stage of the project) when MFIs and suppliers agreed to provide credit to dealers. Invariably, out of the 410 agrodealers targeted to benefit from the credit arrangements, about 28 percent could still not have access to credit (IFDC 2012).

Objectives

The broad goal of this study is to examine the constraints facing agro-input dealers in securing credit for their operations and to stimulate policy attention toward relaxing those constraints. The aim is to ensure that the private sector's role, as envisaged in the government's agricultural transformation agenda, is not undermined by inadequate financing. The specific objectives are fivefold.

1. Examine the challenges and opportunities for agrodealership financing in Nigeria.
2. Analyze the business operations of agrodealers and their sources of finance.
3. Analyze the demand for agrodealer business loans agrodealers and the factors influencing their borrowing decisions.
4. Ascertain the extent to which agro-input dealers are credit rationed and substantiate the key determinants.
5. Proffer policy measures for improved agrodealership financing and demand for credit in Nigeria.

Types and Sources of Data

Data for this study were collected as part of a bigger project on agricultural financing in Nigeria, which involved a survey of farmers and agrodealers. One state was selected from each of the zones on the basis of prominence in small-scale agriculture, the level of involvement of agrodealers in input distribution, and the involvement of formal credit institutions in agricultural financing in general and agrodealership financing in particular. The six states covered in the survey were Sokoto (northwest), Bauchi (northeast), Benue (north-central), Ogun (southwest), Ebonyi (southeast), and Cross River (south-south). The survey of agrodealers was designed separately and supervised by the author. It lasted five months, from February 2013 to June 2013. The primary data were collected by enumerators who were recruited and trained by the author during the survey exercise. Data collection was carried out using well-structured

questionnaires, which were administered on a cross-section of agrodealers in all six geopolitical zones of the country. The questionnaire was designed to elicit information on key areas of agrodealership, such as business activities, operational costs and main constraints, sale of agro-inputs, sources of finance, demand for loans, and the socioeconomic characteristics of the agrodealers.

Procedurally, lists of agrodealers were obtained from the relevant agrodealer registration units of the Ministry of Agriculture and Natural Resources (MANR) and the Agricultural Development Project (ADP) in each state. A random sample of 50 agrodealers was selected to give a total of 300 agrodealers included in the study. A tracer methodology was adopted in locating the selected agrodealers. This methodology involved obtaining the contact addresses of agrodealers from the registration units and supplying those addresses to the enumerators to trace out the agrodealers in their various locations within each of the selected states. The enumerators traveled out of the state headquarters and visited the agrodealers to administer the questionnaires. The agrodealers were traced to a total of 100 towns across the states included in the study. The proportion of each state in the total population of the six states was used as weights in subsequent analysis to ensure representativeness of the sample.

The questionnaire was designed to make agrodealers who applied for loans, those whose loan requests were granted or denied, and those who did not apply easily distinguishable. Reasons for not applying for loans and for being denied a loan were also obtained to assist in the characterization of their borrowing and rationing status. The loan data for respondents who were granted loans were obtained from those dealers and crosschecked against the figures obtained from the lenders during the survey. This procedure of determining the actual borrowing status of the respondents circumvents the bottleneck often faced by analysts using survey data who are not able to obtain the actual amount of loans obtained by households due to the difficulties surrounding the release of such data by lenders. This crosschecking is the advantage of a rigorous data collection exercise of this nature, in which the borrowers and lenders must authenticate the loan data. For instance, in a study by Diagne (1999), the actual amount borrowed, which could have turned out to be the realized amount of the expected maximum amount the lenders could have granted, was not collected during the survey. Invariably, the analysis of credit demand had to be restricted to the amount expected rather than the amount realized. Although the survey focused on the demand side, the author argued that for a relatively large survey, it was not feasible to interview the lender and obtain the actual amount for each loan transaction.

Literature Review

Empirical Literature on SME Credit Demand and Rationing

The policy relevance of any investigation into agrodealers participation in the credit market is examined from the perspective of the analytical techniques adopted for credit demand and rationing, as well as the nature and quality of available data. In this connection, previous studies focusing specifically on agricultural SMEs are generally scanty—and nonexistent in the case of Nigeria. However, relevant analytical techniques for investigating the issues of credit demand and rationing among SMEs, both in developing and developed countries, are well established in the literature. From the empirical literature, it can be concluded that the key variables that influence loan demand and rationing among SMEs are of three categories. The first category relates to the entrepreneur's (borrower's) characteristics, including age, gender, education, ethnicity, experience, and personal wealth. The second category relates to the enterprise characteristics, including age of business, size, profit, and collateralizable assets (real and financial). The third category relates to the loan characteristics, including loan maturity period and multiplicity of loan sources.

Regarding the personal characteristics of entrepreneurs, previous studies show that entrepreneur characteristics, such as the owner's age, gender, ethnicity, education, experience, and personal wealth, determine financial constraints pertaining to SMEs (Maziku 2012). The gender dimension of access to formal credit, in particular, has always been a concern to many analysts—it is widely known that women entrepreneurs in many developing countries have highly restricted access to business loans. This finding, according to Morris and Meyer (1993), accounts for the reliance of women micro and small entrepreneurs on informal sources of finance, such as money lenders, rotating savings and credit associations, and friends and relatives, for their economic activities. Indeed, the fact that formal financial institutions have not been receptive to women entrepreneurs in terms of meeting their credit needs remains a lingering problem in private-sector development in many economies (Ahiawodzi and Sackey 2013). In the case of loan demand, Mayada, Baydas, and Meyer (1994) examined the demand for loan by 447 entrepreneurs participating in a special microenterprise program in Ecuador. The authors found that highly educated entrepreneurs who hold high school diplomas or above seem to demand larger loans, just as male entrepreneurs demand larger loans than do female entrepreneurs. The authors also found that women are subject to loan size rationing to a greater extent than men are—that is, women obtain smaller loans than men. However, the extent to which this finding is due to requests for smaller loans rather than credit rationing by banks is not clear. The authors concluded that if entrepreneurs hope to be successful in borrowing, they need to participate actively in financial markets and generate information that lenders find useful in making loan decisions.

Studies of personal characteristics have also been conducted in developed economies and have come up with mixed results. Cavalluzzo, Cavalluzzo, and Wolken (2002) found that African American business owners and females who applied for credit within three years of their survey were more likely than others to be denied credit. Blanchflower, Levine, and Zimmerman (2003) used several sample splits and compared regression results for groups of firms that differ in the extent to which personal wealth should influence loan decisions; they found no statistically significant effect of gender. Moreover, Cavalluzzo, Cavalluzzo, and Wolken (2005) investigated the role of race, ethnicity, personal wealth, and gender in the United States and found that ethnicity, gender, and personal wealth are associated with probability of loan denial. In the same vein, Muravyev, Talavera, and Schäfer (2009) examined whether financial institutions discriminate against entrepreneurs on the basis of gender. They found some evidence that female-managed firms, as compared with male-managed counterparts, are less likely to obtain a bank loan. In addition, analysis suggested that female entrepreneurs are charged higher interest rates when loan applications are approved. In addition, Mijid (2009) found that, in the United States, women-owned firms have higher loan denial rates and lower application rates than their male counterparts. In the United Kingdom, Han (2008) analyzed the influence of business and entrepreneur characteristics on financial constraints perceived by SMEs. The study revealed that entrepreneurs' characteristics such as education, experience, and personal wealth have a strong impact on the severity of financial problems faced by SMEs. Likewise, Irwin and Scott (2010) investigated barriers to raising bank finance faced by UK SMEs; specifically, they looked at the impact of personal characteristics such as ethnicity, gender, and education. They found that, though statistically insignificant, women respondents found it easier to raise finance than men.

The second category of studies has also provided evidence from both developing and developed countries about the effects of firm characteristics on loan demand and rationing. Mayada, Baydas, and Meyer (1994) showed a positive relationship between profits and loan demand. According to the authors, their findings about profits as a significant variable imply that lenders tend to make loan decisions based more on profits than on assets, possibly because many microenterprise loans are made with co-signer guarantees as collateral rather than physical assets. In Italy, Guiso (1998) employed cross-sectional data on a sample of manufacturing firms to assess firms' access to credit. The study showed that the probability that a firm will be denied credit does not appear to depend on the amount of collateralizable assets (either real or financial). In deciding their credit policy, banks seem to react to the level and composition of firms' liabilities. Invariably, a large share of short-term financial liabilities considerably increases the probability of a firm being credit constrained. With data from a sample of 140 Argentine

firms, Bebczuk (2004) examined the determinants of access to bank credit by SMEs in Argentina. The results indicate that the relationship between the firms' profitability and their probability of obtaining loans is positive, whereas firm size and expectations of higher investment or exports did not have any significant influence on a firm's probability of getting a loan. Although a higher level of liquidity is found to have lowered the probability of obtaining a loan, a higher debt ratio increases the probability of getting a loan based on the possibility that prior access to loans gives potential lenders a positive impression of the borrower. In Belgium, Voordeckers and Steijvers (2008) showed that more than 50 percent of SMEs are credit rationed. They also showed that smaller, faster-growing firms with insufficient financial strength and lack of collateral are more credit rationed for short-term debt. On the other hand, smaller and younger enterprises with slow growth, poor internal financial sources, and deficiency of tangible assets to guarantee the repayment of debt are subject to generally higher credit rationing of long-term debt, despite their higher added value and return on assets ratio than unconstrained firms. Using enterprise survey data from Kosovo, Krasniqi (2010) examined the determinants of obtaining bank finance conditional upon applying. The results show that commercial banks base their decision to loan to firms primarily on the basis of collateral. However, profitability as a measure of firm performance does not seem to be sufficient attraction for banks to allocate credits. Hashi and Toçi (2010) also examined the impact of firm characteristics on SMEs' perceived financing constraints in southeast Europe. They found that compared with the group of larger firms, small firms are more likely to be refused a loan and face greater difficulties in accessing both short- and long-term loans from banks. In South Africa, Fatoki and Smit (2011) investigated the constraints to credit access by new SMEs from commercial banks. The results indicated that collateral, business information, managerial competencies, and networking are important constraints to credit access from commercial banks.

In terms of the effects of loan characteristics, De Bodt, Lobez, and Statnik (2005) examined the determinants of credit rationing in Belgium. They found a positive relationship between credit availability and the duration of the lending relationship. In Italy, Angelini, Di Salvo, and Ferri (1998) conducted a similar study using a dataset of 1,095 firms. They found that firms with short relationships (fewer than three years) are more likely to be credit constrained. They also found that Italian companies working with fewer financial entities achieved better credit availability. Hernández-Cánovas and Martínez-Solano (2007) investigated how the choice between single or multiple banking relationships affects credit availability. The results show the existence of rationing, since a substitution relation has been found between trade and bank credit. The results also indicate that those SMEs that work with fewer financial intermediaries obtain fewer funds.

Although the problems associated with the access of SMEs to credit and the extent to which they are credit constrained have engaged the attention of analysts in general, there has been limited focus on SMEs in the agricultural sector, especially in agrarian economies of Africa, where agriculture stands a better chance of being the bedrock and springboard for industrial development. Even at a general level, studies focusing on the personal characteristics of entrepreneurs and the specific characteristics of SMEs as determinants of loan demand and rationing are indeed rare in Nigeria. Recently, however, Adesua-Lincoln (2011) explored the access of Nigerian female entrepreneurs to finance based on a survey of 132 female-owned firms. The findings reveal that Nigerian female entrepreneurs are particularly constrained by their weak financial base and lack of collateral. Many of the women in the study resorted to internal sources of finance for their start-up and working capitals.

This study focuses particularly on agrodealers—the small- and medium-scale entrepreneurs involved in the business of trading agricultural inputs, such as fertilizers, seeds, and crop protection products. The most recent intervention to develop the agrodealer sector in Nigeria—the NADSP project—covered 2,000 agrodealers, and its benefit in terms of access to inputs was extrapolated to cover one million farmers. However, under the ATA, five million farmers are to be registered annually from 2011 to 2015, giving a total of 20 million farmers during the current administration's four-year tenure. Given that a large number of farmers who will require modern inputs for the achievement of the ATA objectives far exceed the target number to be registered and given that they will all require the services of agrodealers, the ground so far covered in terms of developing agrodealership is grossly limited. In addition, access to

formal financing remains highly restricted. Following the launch of the ATA in 2011, the federal government announced its complete withdrawal from fertilizer procurement and distribution and made a clarion call on the private sector to take up the full responsibility. A major bottleneck that militated against prompt response to such a wake-up call was the nonavailability of adequate financing by the agrodealers. To date, there is no proper understanding of the nature of financing of the operations of agrodealers, their sources of credit, the factors underpinning their decisions to borrow, and determinants of demand for formal credit. This is a major lacuna to be filled by this study. The analysis of demand for loan by agrodealers and the understanding of their marketing, operational, logistics, and financial constraints (hitherto unresearched) will be useful for making policy decisions that will transform the agrodealer sector for the benefit of all stakeholders.

2. OVERVIEW OF INPUT POLICIES AND PROSPECTS FOR AGRODEALERSHIP PERFORMANCE IN NIGERIA

The ongoing transformation in the agricultural input procurement and distribution system in which agrodealers are assigned a prominent role reflects the federal government's high level of commitment and political will to implement input policies that have been on the implementation agenda from time immemorial. Even then, the policies have to be redesigned in some respect and polished with modern ideas and unparalleled commitment to ensure that they achieve the desired objectives. The major inputs involved are fertilizers, seeds, and crop protection products (herbicides, insecticides, and so on).

Brief Overview of Input Policies

Overview of Fertilizer Policy

With massive government involvement in agricultural production during the Third Plan Period (1975–1980), input policy was prominent, especially regarding fertilizer. Prior to this period, procurement and distribution of fertilizer fell within the purview of state governments until the federal government established the Fertilizer Procurement and Distribution Division within the Federal Ministry of Agriculture as the central procurement and distribution unit. About two decades after the inception of the Third Plan, various arrangements involving the participation of the federal government and the states in the transportation and distribution of fertilizer emerged. Specifically, although the federal government was involved in procuring fertilizer, states were involved in the transportation and distribution of imported and domestically produced fertilizers. Between 1977 and 1996, the federal government implemented an annual program of fertilizer procurement and distribution to the states. Fertilizer depots were established at various locations to serve as distribution points for this purpose.

In the 1980s, when statewide agricultural development projects were on stream, farm service centers were available to supply inputs to small-scale farmers at the district and village level in various parts of the country. At that time, only a few farmers were enlightened enough to realize the importance of modern inputs; thus extension agents were involved in disseminating information about the use of improved varieties of seeds and fertilizer. Activities of extension agents created awareness among a large number of farmers, thus increasing the demand for fertilizer and other inputs. In addition to enlightening farmers on the use of modern inputs, some of the ADPs included departments of agro-input supply, which were involved in distributing inputs across the states. For instance, in Bauchi state, such a department metamorphosed later into the Bauchi State Agricultural Input Supply Company, following a privatization attempt by the government. The company took over the input warehouses and stores of the ADP but later could not break even. The staff had to be reabsorbed into the government payroll, even as the company continued to operate as a parastatal of the MANR, selling inputs to small-scale farmers.

With inadequate supply and rising costs of inputs, farmers' access had to be promoted and maintained through a subsidy policy, with the overall objective of attaining self-sufficiency in food production and ensuring food security in the country. The subsidy policy was subjected to review from time to time. By and large, public-sector involvement in the fertilizer sector was fraught with monumental abuses and deficiencies, including delays in the arrival of inputs, poor-quality fertilizers, diverting fertilizer consignments for the use of unintended agents, the creation of artificial scarcity, and the use of the fertilizer policy as a political weapon. Fertilizer importation and distribution became a politically attractive business, and only a small proportion of farmers benefited directly from the input procurement and distribution policies. With time, the federal government realized that the fiscal burden of the subsidy policy was unsustainable. Various reform measures were taken to remedy the situation, including the temporary withdrawal of fertilizer subsidy in 1997. To address the effect on demand by farmers, the government reduced the import tariff on fertilizers from 10 percent in 1996 to 5 percent in 1997.

Following the return to civilian administration in 1999, the subsidy was reintroduced but at a reduced rate of 25 percent the import tariff was further reduced from 5 percent to 0 percent in 2000. The value-added tax (VAT) and excise duty were also abolished. However, the reform process failed to accord any priority to the development of institutional capacity and building the necessary human capacity for efficient and transparent delivery of services in the sector. Consequently, fertilizer use decreased from more than 500,000 nutrient tons in 1994 to approximately 100,000 nutrient tons in 1999 (IFDC/IITA/WARDA 2000). The reform measure that had started in 1994 culminated in the launch of a national fertilizer policy for the country in 2006 to facilitate farmers' timely access to an adequate quantity of both organic and inorganic fertilizers of an appropriate quality and at affordable prices. The policy also emphasized the liberalization of the procurement and distribution of fertilizer, the entrenchment of transparency and marketing efficiency in a competitive environment, and the reliance on the private sector to play a leading role in the sector. By 2008, the federal government announced its intention to disengage from direct involvement in fertilizer procurement and distribution as soon as a suitable alternative could be identified. That same year, the IFDC, in collaboration with the Federal Ministry of Agriculture and Rural Development (FMARD), piloted a fertilizer voucher program (FVP) in Kano and Bauchi States, with gradual expansion in 2009 and 2010. The program demonstrated that a voucher system of fertilizer subsidy administration was feasible and that small-scale farmers could benefit directly from such a system, as long as it was managed by the private sector. Indeed, the private sector and some states have since assumed greater responsibilities for production, procurement, and marketing activities. Most of the states have established blending plants to increase the local supply of blended products, while others procure fertilizers from the main private-sector producers and importers at market prices and distribute them to farmers at subsidized prices. In 2011, the FVP was adopted as a policy instrument nationwide and formed the basis for the design of the GES scheme under the ATA to target beneficiaries through the electronic system and private-sector distribution channels.

Overview of Seed Policy

The Third Plan period also witnessed policy articulation for the development of the seed sector, beginning with the creation in 1975 of the National Seed Service (NSS), which had a mandate for producing foundation and certified seeds, as well as for arranging seed certification. Due largely to farmers' increased awareness of the superiority of improved seeds over traditional varieties, the demand for improved seeds was so high that it could not be met by the NSS. The ADPs had to render a helping hand by producing improved seeds and by multiplying on their own seed farms improved seeds they could obtain from the NSS, research institutes, and emerging private seed organizations (Echekwu 1991). A major seed industry development framework was mooted in 1992 through the formulation of the national seed policy and the promulgation of the National Agricultural Seed Decree (Decree No. 72). The decree was established by the federal government to promote and stimulate increased access to improved high-yielding seeds and to regulate and control the registration of released varieties. The decree gave a legal backing to the seed policy by regulating the various aspects of seed production, marketing, and quality control activities in Nigeria. The 1992 national seed policy sought to (1) support varietal improvement, testing, registration, release, and multiplication of released varieties; (2) improve the quality of seeds sold to farmers; (3) reorient operations of public-sector agencies along commercial lines; and (4) encourage private-sector participation in seed operations through appropriate policies and promoting activities.

The decree, on the other hand, was targeted at ensuring improved administration and regulation of the seed industry through the instrumentality of the National Agricultural Seed Council (NASC). As enunciated in the decree, the NASC is expected to perform the following functions: (1) analyze and propose programs, policies, and actions regarding seed development and the seed industry in general, including legislation and research on issues relating to seed testing, registration, release, production, marketing, distribution, certification, quality control, importation and exportation of seeds, quarantine regulations as well as supply and use of seeds in Nigeria; (2) propose an improved management system and procedure relating to the administration of seed activity and advise the federal government on the

organization, management, and proper financing of seed programs; (3) analyze the market and prices of seeds; (4) control, supervise, and approve the activities of the committees established by or pursuant to the decree; (5) advise the national research system on the changing pattern of seed demand and farmers' needs; (6) monitor and evaluate the achievement of the national seed system and recommend improvements; (7) encourage the formation or establishment in Nigeria of seed companies for the purpose of carrying out research, production, processing, and marketing of seeds; and (8) perform such other related functions as may be required of the council (FRN 1992). The decree established four bodies under the NASC to facilitate the development of the seed industry: the NSS unit, the Crop Variety Registration and Release Committee, the Seeds Standards Committee, the Seed Industry and Skill Development Committee, and the Department of Training, Information, and Seed Extension. Each body has specific responsibilities for attaining the objectives of the national seed policy.

Despite the existence of a well-formulated seed policy with extensive coverage of issues and succinctly articulated objectives, the achievement recorded in the development of the seed industry has been much less than expected. The national seed policy is in line with regional and international standards and makes provisions for the withdrawal of public-sector agencies in favor of the private sector in key areas of the seed industry. However, achievements in terms of development of the seed industry are below international standards. Both the public and private sectors have not demonstrated the desired strength (financial or administrative) to surmount the existing obstacles and to effectively discharge the responsibilities assigned to them. Evidences abound attesting to the fact that the various bodies charged with the responsibilities associated with effective implementation of the seed policy have not performed creditably. Widespread use of traditional seed varieties continues unabated among the majority of small-scale farmers. Problems persist on seed production, seed marketing, quality control, and farmer utilization. Local seed varieties still dominate due to the inadequate production and ineffective distribution of certified improved seed varieties, the slow release of improved varieties, and a poor information-dissemination network. Hence, the policies and programs on seed input are yet to be implemented to any significant extent. The main constraints include low production of breeder seeds, poor seed certification and quality control arrangements, lack of resources for training and information dissemination, reduced activity of the NSS unit due to delayed and inadequate funding, poor seed distribution networks, and rural infrastructures (Joshua 1997; NSS 2000; Kormawa, Okorji, and Okechukwu 2002).

The 2001 agricultural policy emphasized the need for the government to mobilize, encourage, and give incentives to the organized private sector to actively participate in the production of seeds, seedlings, brood-stock, and fingerlings and to be involved in outgrower mobilization for the production of commercial seeds. To strengthen the liberalization of the production of breeder and foundation seeds, the National Assembly passed into law an amendment bill in 2011. This law seeks to regulate seed production, quality, and marketing, with the aim of encouraging private investment in seed technology development (breeding), multiplication, and distribution, while allowing the NASC to focus on the specification of standards and quality control. Against the backdrop of the new law, the existing seed policy has been substantially reviewed to produce a new policy that aligns with the Economic Community of West African States (ECOWAS) seed harmonization regulation. The new policy, which was approved by the National Council on Agriculture in 2012, is to encourage intraregional technology transfer and eliminate cumbersome approval processes for imported seed technology from ECOWAS member states. The policy clearly defines the roles of the public and private sectors, with the former focusing on regulatory functions of registration, inspection, certification, and variety release, whereas the latter is to invest in seed technology development, seed multiplication, and marketing. To date, however, seed supply remains grossly inadequate. The arrangements for seed certification and quality control have not been firm. The release of new varieties has been sluggish due to administrative and technical bottlenecks, which have afflicted the performance of relevant institutions. Moreover, underfunding, ineffective coordination of public-private partnerships in seed production, and persistent delays in releasing available funds for research and quality control activities have clogged the wheel of progress.

Overview of CPP Policy

Of all the agricultural inputs, the agrochemicals, or CPPs, such as herbicides, insecticides, fungicides and so forth, have not witnessed as much specific policy attention and political maneuvers in the distribution network as compared with the other inputs. The government's intention to partner with the private sector to redress the inadequate supply and high cost of CPPs was explicit in its agricultural policy document of 2001. According to this document, the federal government was to facilitate the manufacture of agrochemicals and promote their production by the private sector. It was also the government's policy to ensure the protection of users and the environment through appropriate pesticide legislation (Olomola 2003). For this reason, the National Agency for Food and Drug Administration and Control came up with the Pesticide Registration Regulations of 2005, in exercise of its power under the Drugs and Related Products Act of 1996. These regulations stipulate that no pesticide is to be manufactured, formulated, imported, exported, advertised, sold, or distributed in Nigeria unless it has been registered in accordance with the provisions of these regulations. Samples of pesticides for registration may, however, be manufactured, formulated, or imported with the approval NAFDAC.

Despite the provisions of existing laws and registration regulations, many unqualified agents continue to distribute CPPs, and farmers face exorbitant market prices even for unwholesome products. Existing pesticide laws have not been effectively enforced, and the monitoring and implementation of pesticide regulations have been weak. For instance, some pesticides, such as aldrin, binapacryl, captafol, chlordane, chlordimeform, DDT, dieldrin, dinoseb, ethylene dichloride, heptachlor, lindane, parathion, phosphamidon, monocrotophos, methamidophos, chlorobenzilate, toxaphene, merix endosulphan, delta-hexachlorocyclohexane, and ethylene oxide, have been banned in Nigeria after having caused deaths there (Inalegwu 2008), yet some of them are still found in the Nigerian market (Adegbola, Bamishaiye, and Olayemi 2011). Many CPP retailers lack proper training and often claim ignorance of the rationale of some governmental regulatory actions. In addition, some of these retailers are not in a position to identify products that have expired or that have been adulterated or banned. The implication is that farmers, who are themselves unskilled in the application of chemicals, bear the brunt of using chemicals with doubtful potency. On the one hand, farmers spend more for lower returns, and on the other hand, they face the health hazards of harmful chemicals. Furthermore, the scare and skepticism often associated with announcements of harmful consequences of misused chemicals and fatalities resulting from abused regulatory procedures can lead to a reduction in the demand for agrochemicals, which may adversely affect the operations of agrodealers.

The need to expand the network of agro-input suppliers to ensure a timely, adequate, sustainable input supply system led to the development of agrodealers in the late 1990s. This process involved identifying marketers already in the business of agricultural input supply and those with potential interest, organizing necessary training, and linking those marketers with banks for possible financing. As noted earlier, the IFDC, working with ADPs, played a critical role in this intervention. The input marketers (agrodealers) are expected to procure inputs from various companies and sell to farmers. The intervention has generated considerable awareness about the development gaps in the agrodealer sector, including the skill gaps, financial constraints, and infrastructure deficits. Nonetheless, the involvement of agrodealers in the distribution of inputs to small-scale farmers over the past decade provides an opportunity for the government to have a willing private-sector partner to take part in the transformation of agro-input distribution, which is being vigorously pursued under the ATA. The following section examines the available opportunities for agrodealer participation and the emerging challenges.

Opportunities for Improved Agrodealership Performance

Availability of Private-Sector Companies with Experience in Importing and Marketing Agricultural Inputs

Since the inception of democratic governance in 1999 and the Nigerian government's proclamation that the development of the nation's economy would be private-sector driven, the agricultural sector has witnessed increased participation by the organized private sector. The rising performance of this sector since that time, as well as the reform of the input supply system, created opportunities for improved supply of agricultural inputs by the private sector. Indeed, evidence suggests that after liberalization of the fertilizer market in 1997, private-sector companies have acquired considerable experience in managing the production, importation, and marketing of agricultural inputs. These companies have been making dependable business connections with both local and international financial and market institutions and have established long-term beneficial and dependable business relations with local and foreign banking systems. There is also a considerable potential in the product and input marketing at the grassroots. According to IFDC/IITA/WARDA (2000), prominent among the companies and distribution agents that have been operating in a competitive agricultural input markets are (1) fertilizer, seed, and CPP companies engaged in the manufacture, importation, and marketing of modern agricultural inputs; (2) bulk commodity companies with considerable experience and facilities for importing and marketing bulk commodities similar to fertilizers; (3) Nigerian importing companies that have dependable connections with local and foreign international suppliers and financial institutions; and (4) state-supported limited liability companies with considerable potential for improved efficiency and wider coverage after privatization.

Capacity for Imports and Marketing of Agricultural Inputs

Many companies have supplied fertilizers to governmental agencies in the past, and many more have demonstrated capacities to supply through imports. Large fertilizer companies are now available with capabilities to import fertilizers on a large scale, thus benefiting from economies of scale. These companies include Notore Chemical Industries Ltd., Golden Fertilizer Company Ltd., African Agro Products Ltd., Candel Company Ltd., Nitromobil International Nigeria Ltd., and Tak Continental Ltd. However, these companies will need support in gaining access to finance for imports, letters of credit, and networking in the global market.

Rapidly Developing Retail Outlets

Most of the agribusiness firms involved in input marketing cooperated with the states to use existing farm service centers (FSCs) as their retail outlets. Many states have also established product marketing and input retailing cooperatives to provide service to their members. Another approach to input retailing is the use of community-based farmer groups that act as agents to distributors of agricultural inputs in Kano state. The United Nations Development Programme (UNDP) and many other nongovernmental organizations (NGOs) are vigorously promoting community-based farmer groups as agents of change, technology transfer, and agricultural input market development. These facilities and emerging networks need to be expanded and modernized to improve the efficiency and coverage of the country's agricultural input markets.

Policy Emphasis on Agrodealers' Services under the ATA

According to the ATA, the agrodealers are relied upon to distribute inputs to a large number of farmers registered for the GES scheme. According to the design, state governments are to identify suppliers of inputs (fertilizers, seeds, chemicals) among companies registered and recognized by the Federal government. (For example, in Bauchi state, the companies include Notore, Elephant Group, West African Cotton Company Ltd., Golden Fertilizer Company Ltd., and Kaffo Mines Ltd., among others.) The

suppliers are expected to supply agreed quantities based on the number of registered farmers. The suppliers are to deliver to agrodealers at redemption centers (warehouses) in the local government areas (LGAs). The warehouses are owned either by the state government or by the agrodealers. Upon delivery, agrodealers are supposed to pay the suppliers fully, according to the quantity supplied. The farmers will then get alerts on their phones from Cellulant, an agency employed by the government to handle this aspect of the transaction. The agency requests the farmers to go to a particular agrodealer in a particular location to pay and collect two bags of fertilizer (one bag of nitrogen-phosphorous-potassium [NPK] fertilizer and one bag of rea) as provided for in the GES policy. The farmer is to pay a subsidized price of 5,500 naira (₦5,500) for the two bags and collect 25 kg of seed (rice or maize). This amount represents 50 percent of the cost of the fertilizers. Upon submission of the completion of delivery certificate by the agrodealers to FMARD, the federal government will pay the balance of 50 percent to the agrodealer's account.

This design could not be strictly followed in 2012 during GES implementation due to the challenges associated with financing the agrodealers' activities. It was envisaged that the government would introduce agrodealers to commercial banks for the purpose of financing their transactions with input suppliers. The banks gave a condition that the agrodealers should provide 15 percent equity contribution in financing the business operations. However, many of the agrodealers could not cope with this condition and were, therefore, unable to pay the suppliers fully as planned. Different approaches were adopted to deliver the inputs to the farmers in 2012. In one scenario, the suppliers played the role of agrodealers. They brought the inputs to the state and supplied them to appointed agents in the LGAs, who then sold to the farmers. The agents either rented warehouses or used government warehouses as redemption centers. Farmers went to these centers upon receiving an alert, paid 50 percent, and collected their inputs. Suppliers prepared the completion of delivery certificate to be endorsed by the state commissioner of agriculture and director of the state's FMARD office. The certificate was then forwarded to FMARD in Abuja, where arrangements would be made for the supplier to claim the balance of 50 percent.

In another scenario, the agrodealers were supposed to pay the suppliers 50 percent of the cost of the input upon delivery; then the federal government would pay the balance of 50 percent. The agrodealers were to supply farmers with the inputs required, and the farmers would pay 50 percent to the agrodealers to enable the dealers to recoup their money. In 2012, the major challenge with this scenario was that agrodealers could not even pay the suppliers upon delivery as anticipated. Thus, the farmers could not be supplied at the right time. A way out was the agreement by suppliers to allow agrodealers to pay some deposit, after which they would be allowed to receive supplies based on request. When agrodealers sold input to farmers, payment was made directly to the suppliers' accounts so that they could recoup the balance of their money.

Under GES, the agrodealers are expected to derive their benefit from the commission granted by input suppliers. In 2012, agrodealers bought fertilizer at ₦4,900 per bag to be sold to farmers at ₦5,500, implying that the agrodealers had a commission of ₦600 per bag. The farmers' paid ₦5,500 for two bags, implying that they paid ₦2,750 per bag, and the federal government paid the balance of 50 percent to the agrodealers. The 50 percent balance is contributed in equal proportion of (25 percent each) by the federal and state government. If the agrodealers could not pay the suppliers fully, they forfeit their role in the distribution channel as intermediary between supplier and farmer. Rather they work as temporary staff of the suppliers. In this case the suppliers took the risk of selling to the farmers directly and recovering the balance of their money from the government - a role originally designed for agrodealers. Such agrodealers worked for the suppliers to supervise and sell inputs at the redemption centers. In Bauchi state, where this case was reported, the commission received by agrodealers under such an arrangement ranged from ₦150 to ₦250 per bag of fertilizer.

Agrodealers can change input suppliers if they are not satisfied with the business relationship. For instance, in Bauchi state, the agrodealer Cooperative Finance Agency (CFA) received its input supply from Kaffo Mines in 2012; but in the 2013 dry season rice production, it used Elephant Group instead. They changed suppliers due to the proximity of the former compared to the latter. The Elephant Group

has a depot in Bauchi that can easily be reached by CFA, which is also based in the town. Kaffo Mines, however, is based in Niger state, where it produces fertilizer and then distributes to redemption centers in Bauchi state.

The agrodealers that participate in the GES scheme have the opportunity to interact with stakeholders in the scheme and to receive information about the nature of incentives, the pricing and payment mechanisms, and the modalities for input distribution and delivery to farmers. They also have opportunities to interact with state governments, which also play crucial roles in the scheme's implementation. In some states, the number of suitable agrodealers has been increasing. For instance, the Cross River state government organized the registration of agrodealers in 2012. The state government used radio announcements to call on interested agricultural companies throughout the state to submit applications and register with the MANR to become agrodealers in the state and to participate in the GES scheme, especially for the purpose of fertilizer storage and distribution to farmers. Altogether, 37 enterprises registered in 2012; that number increased to 45 in 2013. Some of these agrodealers have warehouses of their own; however, the majority of them rent and use government fertilizer warehouses available in all 18 LGAs in the state.

The federal government arranged for Cellulant to train agrodealers in each of the states. In Cross River State, the training workshop was held during the first week of April 2012. Participants were informed about the concept of the GES scheme and about the responsibilities of actors, such as input suppliers and commercial banks, who also sent representatives to the workshop. After registration and training, the agrodealers were introduced to four companies that served as fertilizer suppliers in the Cross River State in 2012—Tak Continental Company Ltd., Golden Fertilizer Company Ltd., Springfield Agro Ltd., and Notore. Typically, all financial transactions between agrodealers and input suppliers passed through commercial banks. A crucial aspect of the transaction was determining the price at which fertilizer would be delivered to agrodealers. A meeting involving the participating commercial bank (United Bank for Africa) in the case of Cross River State, officials of the state MANR, input suppliers, and agrodealers was convened to agree on the fertilizer price per truck (30 metric tons). The arrangement was that the commercial bank would finance the agrodealers to enable them to purchase fertilizer from the suppliers. This arrangement failed in 2012, which disrupted the fertilizer distribution schedule in the state. With the lack of finance from the bank, agrodealers could not purchase fertilizer from suppliers, and many registered farmers could not be supplied. Only one of the input suppliers (Springfield) agreed to supply the agrodealers on payment of 50 percent of the amount due. This situation caused considerable delay in distributing fertilizers to farmers in Cross River State.

In 2013, the commercial banks staged a comeback. A lending framework was prepared with strict procedures for loan processing and delivery to agrodealers. The initial skepticism among suppliers about whether the government would fulfill its 50 percent payment obligation was not restricted to Cross River state. In Bauchi state, five suppliers were identified, but only one participated in 2012. In 2013, many companies embraced the scheme, in part because they had confirmed the government's commitment to pay according to the schedule, and in part due to the clearly laid-down lending framework and incentives agreed upon by the participating banks and the Nigerian Incentive-based Risk Sharing System for Agricultural Lending (NIRSAL) (Table 2.1)

Table 2.1 Summary of GES lending framework, 2013

Scheme description	To provide funding for agrodealers (fertilizers) and seed companies under the 2013 growth enhancement support scheme
Target market	• Agrodealers (fertilizers)—Lenders can only lend to agrodealers registered in the GES database, which is managed by Cellulant.
	• Seed companies registered in the GES database managed by Cellulant.
Lender opportunity	₦60 billion in loans required to finance agrodealers who shall serve a target of five million farmers across Nigeria
Credit line limit for interest subsidy	Lines of credit to borrowers shall not exceed ₦400 million. (For loans above ₦400 million, access to rebates shall be on a case-by-case basis, with the final decision resting on the joint NIRSAL-FMARD-GESS team.)
Equity contribution	By agrodealers (fertilizers): 10% (This was 25% in 2012.)
Loan tenor	Flexible and aligns with planting season—For the wet season, loans issued in March 2013 should be fully paid off by September 2013, whereas dry season farming will be from November 2013 to March 2014, and so forth.
Interest rate	18% per year (This includes NIRSAL 1% credit risk guarantee fee.) The borrower shall be granted 50% subsidy on interest paid on a monthly basis to all borrowers in good standing, per the repayment schedule agreed upon by the lender and borrower.
Disbursement mode	Disbursement of funds will be made directly to the fertilizer supplier upon delivery of fertilizers to the agrodealers' stores.
Loan disbursement process	• Borrower (agrodealer) shall obtain an invoice or similar instrument for inputs from the supplier and provide this to the lender.
	• Risk manager shall process the loan request from the agrodealer for approval through the normal credit-approval process.
	• The lender shall issue a standard letter of comfort to the supplier (via the borrower) to confirm intention to pay.
	• Upon the lender's approval of the line of credit, the lender will credit the borrower's account (create a loan) but block disbursement.
	• Fund outflows from the borrower's account will commence once the invoice supply chain manager confirms that the supplier has delivered the supplier invoice or a similar instrument.
	• The lender will pay the supplier directly, based on the invoice.
Collateral/support	• NIRSAL guarantee of 75%, including principal and interest accrued therein (NIRSAL is to issue a 75% portfolio guarantee to each lender.)
	• Receipt of 10% of the facility amount as equity contribution
	• Personal guarantee of company's managing director/chief operating officer
	• Warehouse inventory or warehouse receipts to be managed by appointed supply chain manager
	• Insurance to cover stock financed by lender to be provided by NAICOM–accredited insurance company
Repayment/source	Proceeds of sale of commodities or other sources
Supply chain management	FMARD appointed IFDC to lead two other supply chain managers (Jetlink Ltd. and Ecalpemos Technologies Ltd.), which will monitor inflow of inputs and warehouses and periodically report stock levels to lenders, guarantors, and Cellulant for inventory control, collateral management, and cash-flow reconciliation.

Source: Author's compilation from fieldwork in individual states.

Note: NIRSAL = Nigerian Incentive-based Risk Sharing System for Agricultural Lending; FMARD = Federal Ministry of Agriculture and Rural Development; GESS = growth enhancement support scheme; NAICOM = National Insurance Commission IFDC = International Fertilizer Development Corporation.

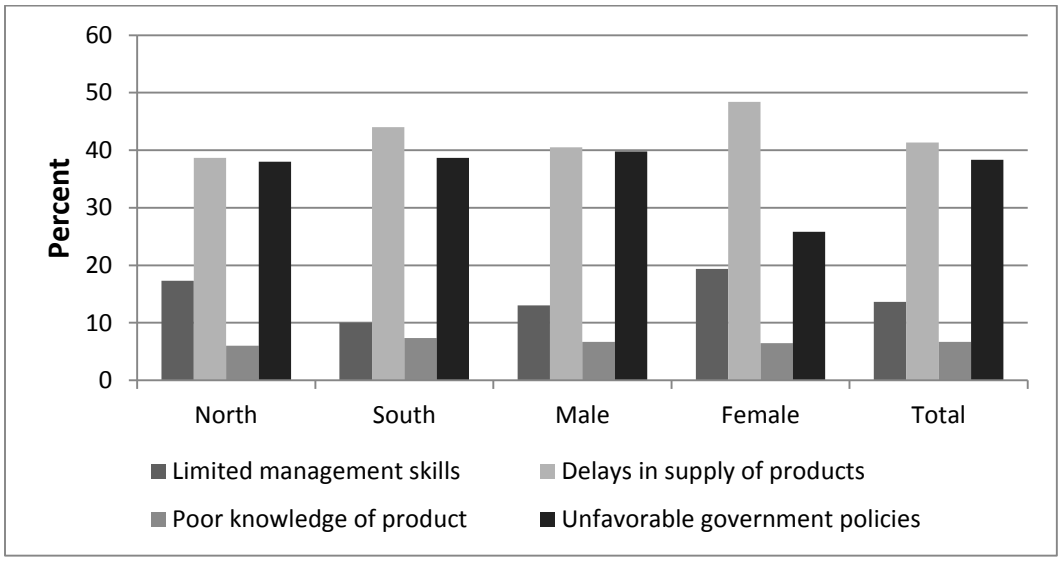
Constraints on Agrodealership Performance

The performance of agrodealers is constrained by myriad factors, which can be analyzed in five categories: operational constraints, logistical constraints, marketing constraints, infrastructure constraints, and financial constraints. The analysis below considers the nature of these constraints and variations by location and gender of agrodealers.

Operational Constraints

Chief among the factors affecting the operations of agrodealers are delays in the supply of products, unfavorable government policies, limited management skills, and poor knowledge of product characteristics, in that order. Delay in the supply of products is far more pronounced in the south than in north and among female than male agrodealers (Figure 2.1). The problem of inadequate skills needed for financial management, business planning, marketing, and forecasting of demand and supply is greater in the north than in the south and among female agrodealers than their male counterparts. Time is of the essence as far as agricultural activities are concerned. Delays arising from input supply can have adverse consequences on farm operations and productivity. More often than not, the delays occur because the required funds for necessary business transactions are not readily available, especially for imported inputs. In the case of seeds, several institutional constraints create scarcity in the domestic market. For instance, delays in the release of improved seed varieties affect the availability of certified seeds, and the low level of use by contract farmers who have the requisite skills limit the quantity of commercial seeds that are available in the market.

Figure 2.1 Comparison of agrodealers' operational constraints by region and gender



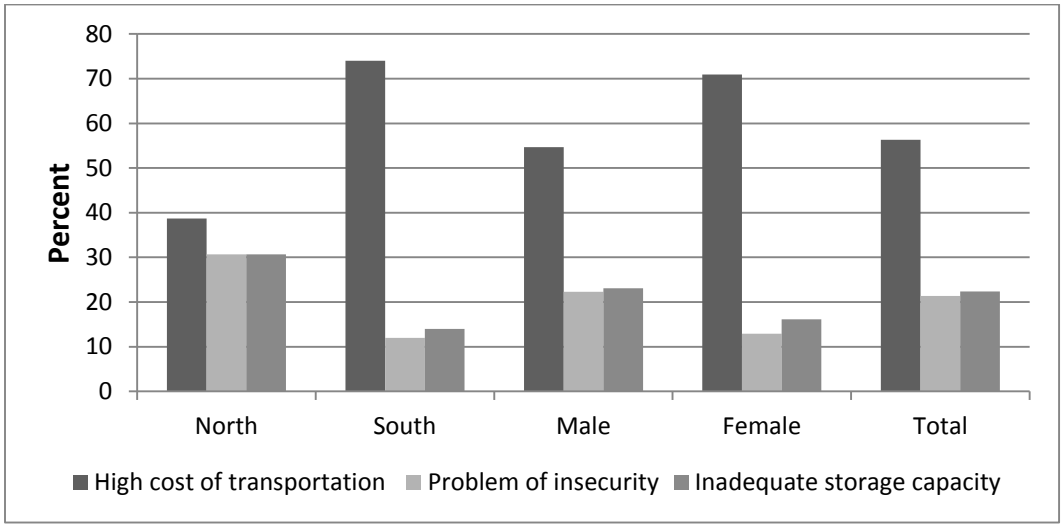
Source: Author's graph using 2013 survey data.

The major policy issues that are of great concern to agrodealers are the weak regulatory framework for the control of product quality and for preventing anticompetitive behavior of importers and major distributors. The availability of adulterated products in the market frustrates the business of genuine dealers due to the tendency to lose customers and face reduction in turnover. Similar effects have also been experienced due to the government's inability to effectively monitor and enforce existing regulations, thereby resulting in the sale of expired chemicals by some unscrupulous agrodealers.

Logistical Constraints

Three agrodealership constraints are logistical in nature. The most critical is the high cost of transportation, followed by insecurity, both of which hamper free movement of goods at the desired periods; the third constraint is inadequate storage capacity. The high cost of transportation is more constraining in the south than in the north, whereas the two other constraints bite harder in the north than in the south. The gender disparity in these challenges follows a similar pattern. Females are hit harder by high transportation costs than are males, whereas males face higher security risk and have more limiting storage capacity than females (Figure 2.2). The higher transportation cost being borne by women occurs because they tend to operate in rural areas, where distance and poor road conditions are likely to cause transport owners to charge higher fares. The close relationship between the pervasiveness of insecurity and inadequate storage capacity and the above-average records of these problems in the north are not totally surprising. Where insecurity is more serious, there may be a lower inclination for agrodealers to acquire storage facilities in several places to enhance access by customers. There may also be increased hesitation, especially among small dealers, to invest in large stocks of fertilizers and other costly inputs. These circumstances may discourage expansion of storage capacity and may deepen the penetration of dealer networks in vulnerable areas.

Figure 2.2 Comparison of agrodealers' logistical constraints by region and gender



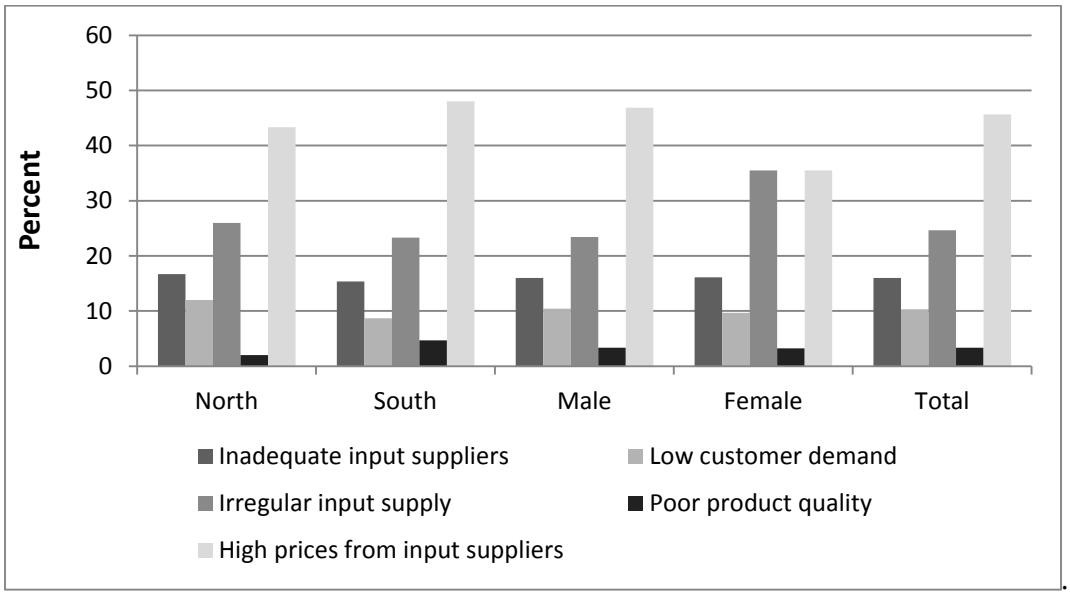
Source: Author's graph using 2013 survey data.

Marketing Constraints

The performance of agrodealers in terms of meeting the aspirations of the ATA will depend on the extent to which the input market is purged of the endemic deficiencies that prevent effective competition and access by all categories of input users across the country. The main problems are inadequate number of input suppliers, irregular input supply, poor quality of supplied inputs, high prices charged by input suppliers, and low customer demand for some inputs. The most serious problem is high prices charged by input suppliers, followed by irregularity of supply, inadequate input suppliers, and low customer demand for some inputs; all of these are related problems reflecting the imperfect competition of the market. Although the poor quality of product is not as pervasive as the other problems, it is more problematic in the south than in the north. In addition, inputs are more expensive in the south than in the north. The problems of irregularity of supply, inadequate input suppliers, and low customer demand are more pronounced in the north than in the south (Figure 2.3). The low effective demand is symptomatic of a sector-related conundrum in terms of the possibility of agrodealers' turnover being adversely affected by

farmers' limited purchasing power. This implies that efforts aimed at improving the input distribution system may not yield the desired outcome, unless there is a simultaneous transformation of the output marketing system to enhance farmers' access to remunerative output markets and to stabilize their income.

Figure 2.3 Comparison of agrodealers' marketing constraints by region and gender



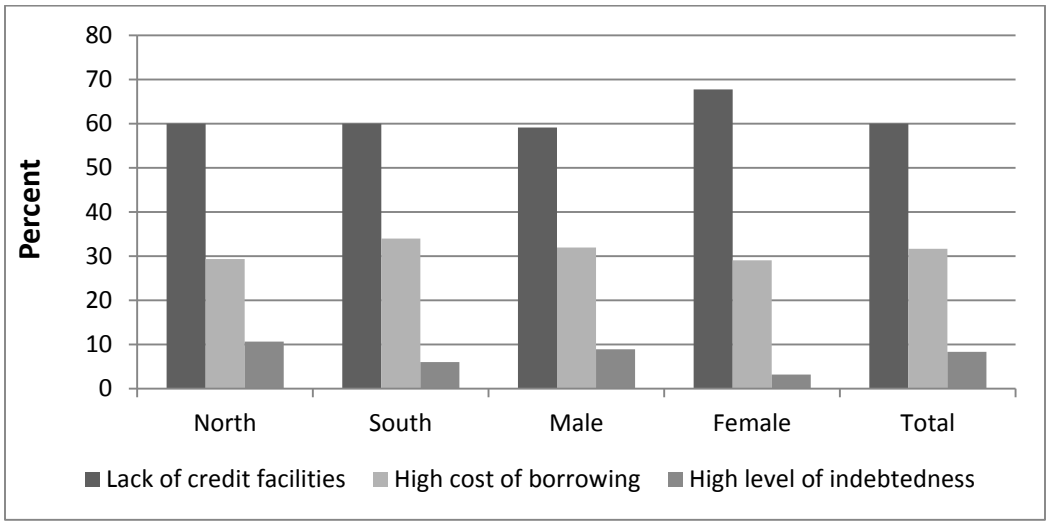
Source: Author's graph using 2013 survey data.

Financial Constraints

The weak financial capacity of actors in the agrodealer sector is widely recognized by agricultural development practitioners and policymakers. Prior to inception of the ATA, growth in private-sector involvement in the input distribution system was curtailed by lack of access to finance for extensive development of input distribution networks. It seemed easier for a camel to pass through the eye of a needle than for agrodealers to obtain finance for imports or to commence a new business in agro-input distribution.

According to IFDC/IITA/WARDA (2000), unfavorable bank lending terms, high interest rates (25–30 percent), stringent collateral requirements, and 100 percent down payments for a letter of credit made the import of fertilizers an extremely risky business. Therefore, many private-sector participants invested in high turnover and low-gestation-period commodities. It is little wonder, therefore, that the federal government and operators in the financial sector made concerted efforts to support agrodealership financing in the wake of GESS implementation in 2012. Nonetheless, the greatest challenge faced by dealers in discharging their responsibilities in 2012 was an acute shortage of financial capital. As shown in Figure 2.4, the lack of credit facilities was the most widespread financial constraint faced by agrodealers across the country in 2012; this constraint affected females more than males. Some agrodealers who had already incurred some debt did not find it easy to secure additional debt capital due to the high cost of borrowing.

Figure 2.4 Comparison of agrodealers' financial constraints by region and gender



Source: Author's graph using 2013 survey data.

From the foregoing analysis of the opportunities and constraints on the business operations of agrodealers, it is clear that improved financing does not depend only on resolving the inadequacy of capital. Management of that capital is also critical. Thus, skill gaps in financial management, business planning, and inventory management must be bridged. Finance will not substitute for missing markets, nor will it be the panacea for the critical infrastructural deficits, poor storage facilities, social insecurity, and low effective demand by agrodealer customers, which may have long-term adverse effects on equity financing by agrodealers. Although efforts to mobilize external finance will be desirable, internal funds within the input distribution network are required pari passu for sustainable financing of agrodealership in the country. The accumulation of such funds will depend on agrodealers' operational capabilities and performance, including the profitability of their enterprises.

3. BUSINESS OPERATIONS OF AGRODEALERS AND THEIR SOURCES OF FINANCE

This section characterizes agrodealers on the basis of key socioeconomic variables, the type of agricultural inputs they deal in, and their sources of finance. The characterization helps decipher the regional and gender distributions of agrodealers. This analysis is important in that it will help spawn evidence that will moderate the design of agrodealership incentives that are nuanced in accordance with regional and gender peculiarities, rather than the usual panterritorial, gender-insensitive policies that have militated against the development of agrodealership in the country.

Socioeconomic Characteristics of Agrodealers

The socioeconomic standing of agrodealers is apt to provide a good understanding of their business operations and the nature of their participation in the credit market. Some of the important variables to be considered in the case of the 300 agrodealers included in the study are education, secondary occupation, membership in agrodealer associations, savings, level of indebtedness, value of asset, and age. As shown in Table 3.1, the sample includes only a few female agrodealers, and the distribution varies remarkably between the north and the south.

Table 3.1 Distribution of respondents by gender and geographical location

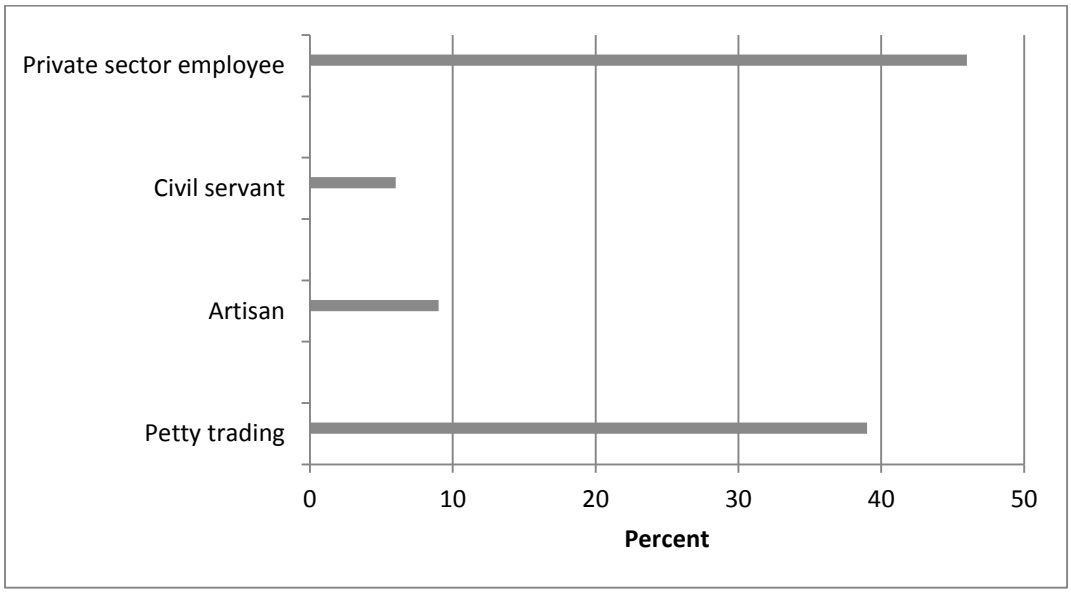
Region	Male	Female	Total
North	147	3	150
South	122	28	150
Total	269	31	300

Source: Author's survey data, 2013.

The majority of the agrodealers (41 percent) completed the secondary education course, 6 percent have no formal education, and about 20 percent have postsecondary education. As shown in Figure 3.1, some agrodealers attended primary and secondary schools without completing the course. Due to the nature of the agrodealers' educational background, they have various forms of secondary employment opportunities, both in the private and public sector, though at the lower rung of the ladder. Some agrodealers are also involved in informal-sector activities as artisans and petty traders. As shown in Figure 3.2, 46 percent are in the private sector, 39 percent are petty traders, 9 percent are artisans, and 6 percent are in the public sector.

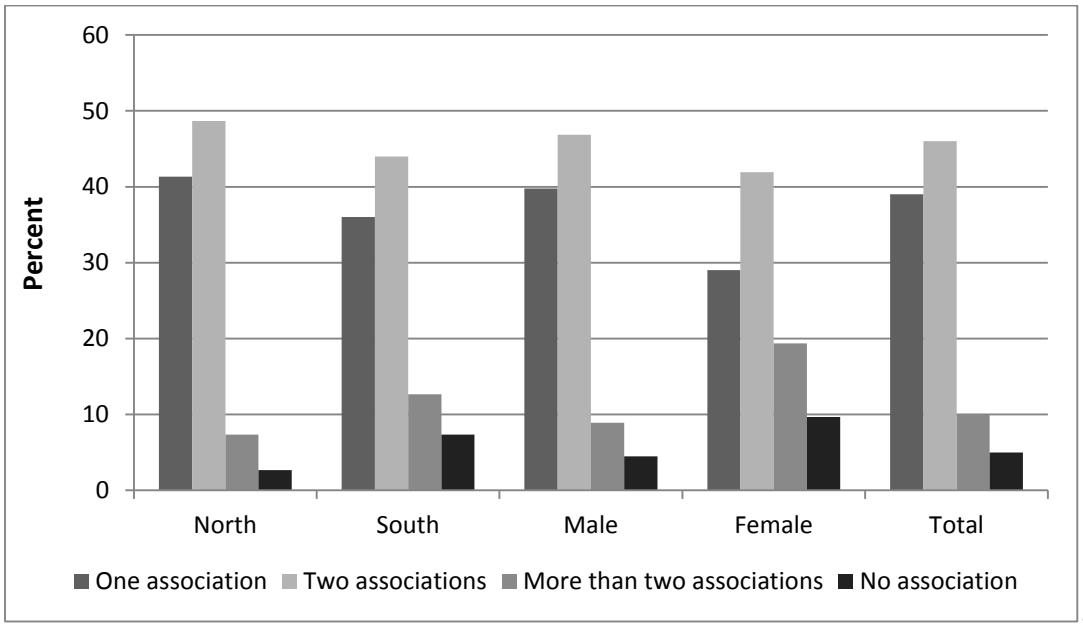
In view of the generally low educational background, access to information and operational experience can be gained through membership in agrodealer associations at various levels of coordination. The agrodealers have recognized the need to belong to traders' associations relevant to the input groups in which they deal. It is generally realized that membership in such associations is a key to the door of opportunities and government incentives, judging by their previous experience in this regard. The majority of agrodealers (46 percent) belong to two associations, 39 percent belong to only one association, and 10 percent belong to more than two associations. Only 6 percent belong to no association. There are interesting variations in this overall picture, however, based on the region and gender of the agrodealers. As shown in Figure 3.3, the proportion of agrodealers who belong to either one or two associations is higher in the north than in the south.

Figure 3.2 Distribution of agrodealers by type of secondary occupation



Source: Author's graph using 2013 survey data.

Figure 3.3 Comparison of agrodealer membership in associations by region and gender



Source: Author's graph using 2013 survey data.

The proportion of agrodealers who do not belong to any association is lower in the north than in the south, whereas the proportion that belongs to more than two associations is higher in the south than in the north. In general, therefore, membership in agrodealer associations is relatively higher in the north than in the south, whereas the diversity of membership is more prevalent in the south than in the north. This finding indicates the tendency of southern agrodealers to have greater combination of inputs, which they sell to farmers, than is the case in the north. This finding is of significant policy relevance, as it points to the need to nuance the design of training programs for agrodealers across the regions and to redefine the curriculum to be consistent with the inherent product diversity among them.

Fortunately, with an average age of about 47 years, age is still on the side of the agrodealers to acquire the necessary skills for the development of their business operations, including the skills to manage external funds to which they may have access. This study found that those who have no access to loans are younger, less educated, and less indebted than their borrower counterparts. The difference in their levels of education and value of asset does not have any statistical significance. As shown in Table 3.2, however, those who have no access to loans have significantly higher levels of savings than their borrower counterparts.

Table 3.2 Comparison of socioeconomic variables among agrodealers in Nigeria

Variable	Borrowers	Nonborrowers	All agrodealers	t-test of difference	
				t-statistic	Prob > |t|
Age (years)	50.82	45.18	46.85	–3.628	0.000***
Education (years)	11.44	11.21	11.28	–0.229	0.819
Savings (₦)	930,537.1	3,276,027	2,580,198.0	2.255	0.024**
Debt (₦)	254,134.8	51,194.31	111,400.00	–5.446	0.000***
Asset value ()	551,696.6	742,280.1	685,740.3	1.071	0.285

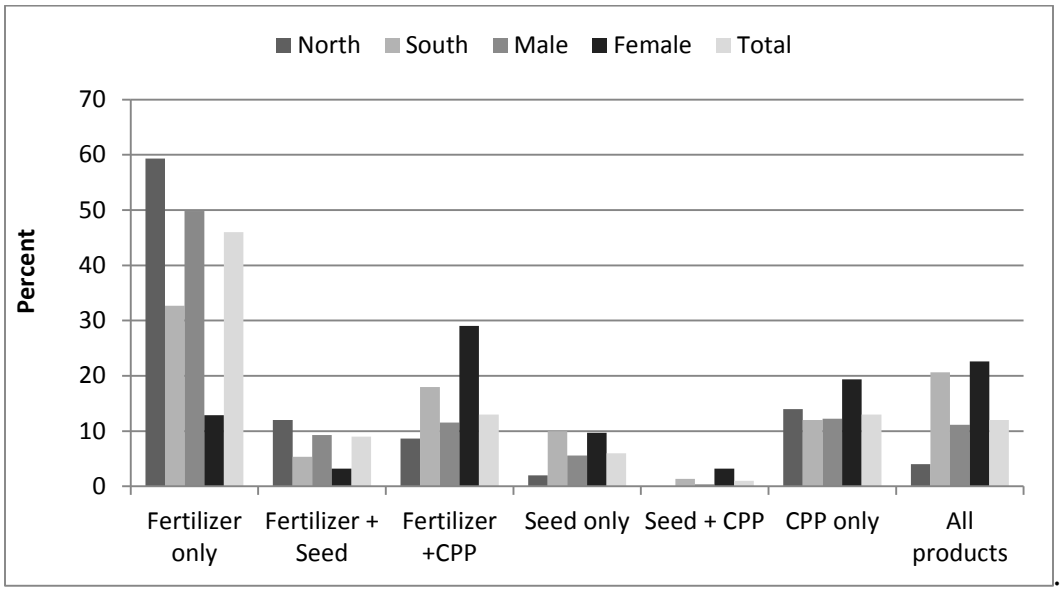
Source: Author's computation.
Note: *** significant at the 1 percent level, ** significant at the 5 percent level

Business Operations of Agrodealers

The trading business of buying modern agricultural inputs from producers, importers and major distributors for sale to small-scale farmers is the core of agrodealership. *Agrodealers* can be characterized as dealers in fertilizers, seeds, or CPPs or any combination of these three products. This study found that the majority of the agrodealers (46 percent) deal in fertilizers only, whereas only 12 percent sell all three products. Another 13 percent sell fertilizers and CPPs, 9 percent sell fertilizers and seeds, 6 percent sell seeds only, and 13 percent sell CPPs only. The proportion that combines the sale of CPPs with seeds is only 1 percent.

Gender and regional differentiations are clearly reflected in the pattern of agrodealership in Nigeria (Figure 3.4). The proportion of those who deal only in fertilizers is higher in the north than in the south and among males than females. A similar pattern is observed among those who sell both fertilizers and seeds. The reverse is the case for those with a combination of fertilizers and CPPs, seed and CPPs, and those who deal in seed only. In these three cases, females have a higher proportion than men; the proportion is also higher in the south than in the north. Agrodealers who specialize in the sale of CPPs only are in higher proportion in the south than in the north, just as women have a higher proportion than men.

Figure 3.4 Combination of inputs sold by agrodealers by region and gender



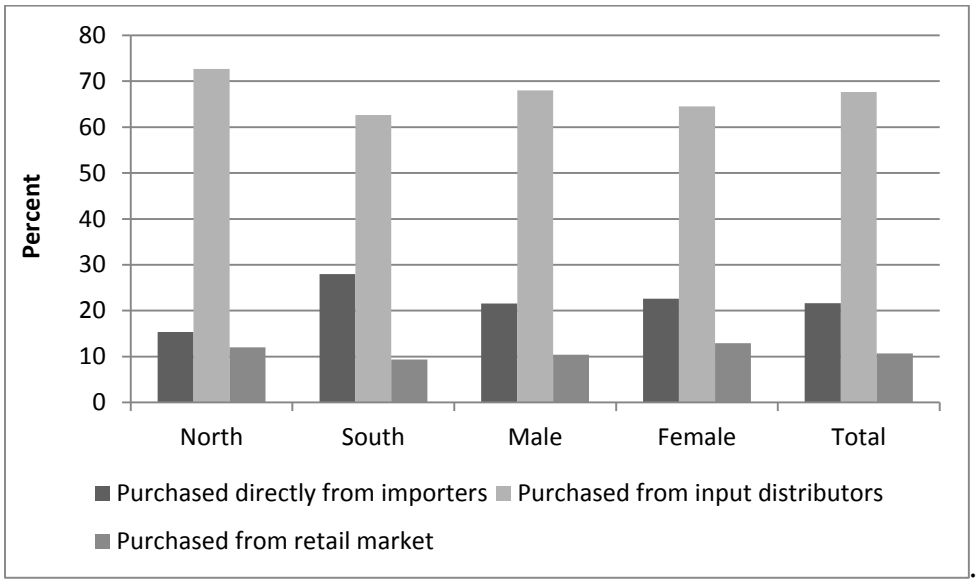
Source: Author's graph using 2013 survey data.
Note: CPP = crop protection product.

There are three main advantages of combining the sale of all three key agricultural inputs. It ensures regular cash inflow from farmers planting different types of crops, improves the build-up of turnover, and expands the outreach of customers. This study found that the proportion of agrodealers selling all three inputs is far higher in the south than in the north, just as it is much higher among women than men. Areas and dealers with such diversity of business operation are likely to better address cash-flow problems and expand market share than situations in which the focus is on only one product. The dominance of women in various combinations of agrodealership is remarkable. This finding makes it imperative for policymakers to ensure that any policy incentive for the development of agrodealership in the country gives due recognition to the participation of women, regardless of their scale of operation.

Source of Input Supplies to Agrodealers

Agrodealers procure inputs from three main sources: importers, input distributors, and the retail market. The majority of agrodealers (68 percent) purchase their inputs from distributors, 22 percent purchase from importers, and only 10 percent purchase from the retail market. The proportion of agrodealers patronizing input distributors is higher in the north than in the south, whereas the proportion that purchase inputs directly from importers is higher in the south than in the north. The proportion of agrodealers that purchase inputs from the retail market is also higher in the north than in the south (Figure 3.5). There is no remarkable gender differentiation in the procurement of inputs by agrodealers, though the proportion of females who patronize the retail market is slightly higher than males. Both male and female agrodealers depend largely on distributors for the supply of their inputs.

Figure 3.5 Sources of agrodealers' inputs by region and gender



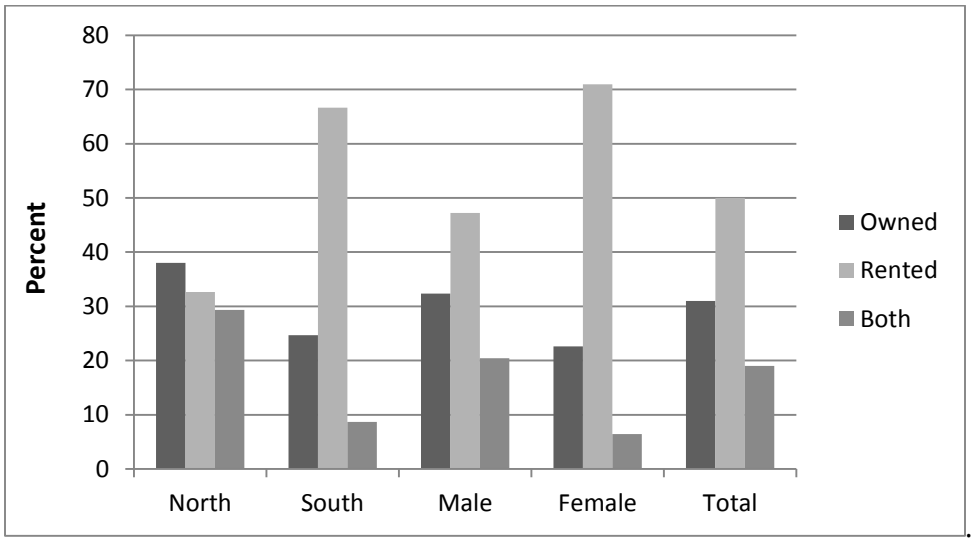
Source: Author's graph using 2013 survey data.

Input Storage Capacity

Availability of storage facilities is crucial for the business of agro-input distribution and sales. With regard to fertilizers, a warehouse is actually in vogue, especially in view of its bulky nature compared to the other inputs. During the several years that government was involved in the procurement and distribution of fertilizers, a number of warehouses were constructed across the country; these warehouses are readily available for the use of agrodealers especially those who are new to the business. About 50 percent of agrodealers rent the warehouses used for their businesses, another 31 percent own their warehouses, and 19 percent use both owned and rented warehouses (Figure 3.6).

The proportion of agrodealers that own their warehouses is much higher in the north than in the south. In the south, there is a heavy reliance on rented warehouses. The pattern of acquisition and use of warehouses shows clear variation between male and female agrodealers, reflecting differences in availability of storage facilities. The proportion of male agrodealers who own their warehouses and use both owned and rented warehouses is much higher than for their female counterparts. Female agrodealers rely largely on rented warehouses. On average, an agrodealer has two warehouses with about 620 metric tons of storage capacity. This capacity has built up over a period of 13 years of agrodealership, during which an agrodealer has covered an average of 780 farmers for the sale of various agricultural inputs (Table 3.3).

Figure 3.6 Agrodealers' acquisition of warehouses by region and gender



Source: Author's graph using 2013 survey data.

Table 3.3 Comparison of some business characteristics of agrodealers in Nigeria

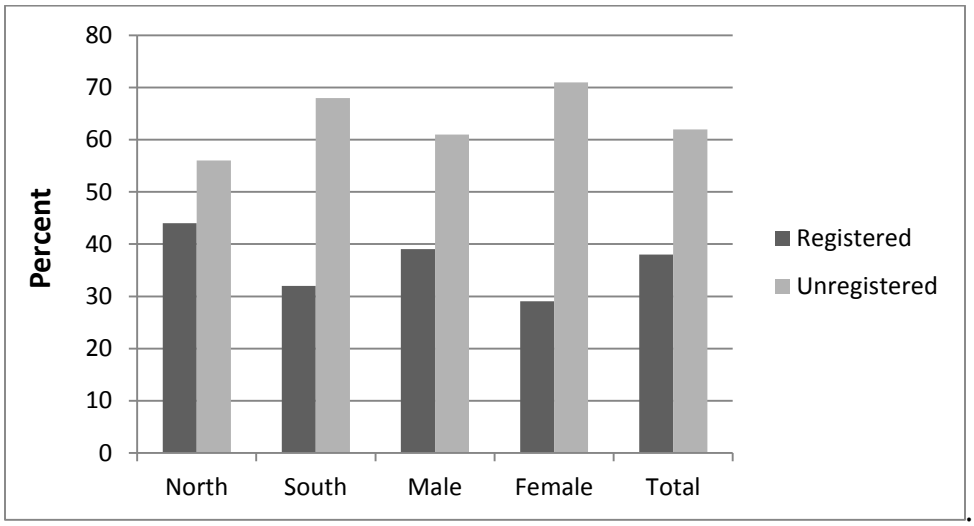
Variables	Borrowers	Nonborrowers	All agrodealers	t-test of difference	
				t-statistic	Prob > |t|
Business experience (years)	12.08	12.82	12.59	0.704	0.482
Number of warehouses	1.72	2.13	2.01	1.716	0.087*
Warehouse storage capacity (metric tons)	703.44	584.26	619.61	–0.230	0.818
Customer outreach	458.59	915.92	780.25	3.385	0.000***

Source: Author's computation.

Note: Customer outreach refers to the average number of customers reached by an agrodealers, *** significant at the 1 percent level, * significant at the 10 percent level

Nonetheless, the agrodealer sector remains largely informal, with only about 38 percent of agrodealer businesses being officially registered as business enterprises. This characteristic of the agrodealer sector shows that it is still largely underdeveloped. The sector will require substantial upgrading if it is to be in a position to effectively perform the role assigned to it under the current ATA. As shown in Figure 3.7, the proportion of unregistered agrodealers is higher in the south than in the north. The proportion is also higher among females than males. This finding indicates regional and gender peculiarities that require greater attention in the development of agrodealers. Regional and inter-regional gaps must be filled and gender and transgender gaps must be addressed to ensure that an increasingly higher number of agrodealers are empowered to attain a viable business registration status in the not-so-distant future.

Figure 3.7 Registration status of agrodealers by region and gender



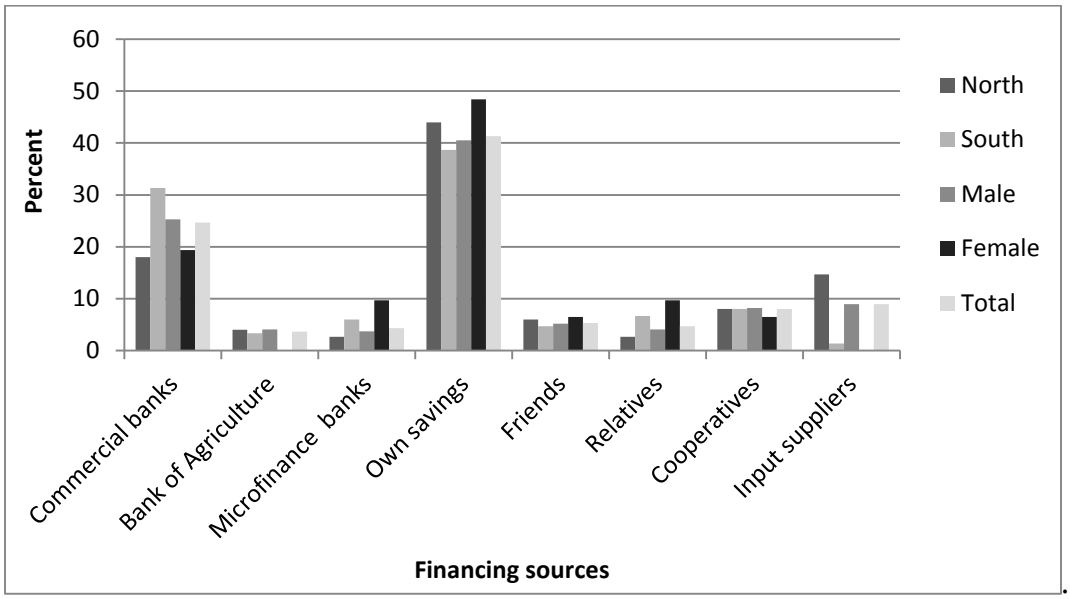
Source: Author's graph using 2013 survey data.

Sources of Finance for Agrodealer Business Operations

Agrodealers source funds to finance their operations from both formal and informal sources. The informal sources include cooperatives, relatives, and friends. However, only a limited amount can be obtained from these sources because of the informal sector's generally unfavorable economic environment. Because of the widely recognized limited financial capability of the informal sector, the government and banking sector are developing incentives to assist agrodealers in financing their participation in the ATA. Thus, the emphasis is placed on the formal sector, while analyzing the demand for loans in the ensuing Section 4.

As shown in Figure 3.8, neither the two sources of finance has served as a remarkable source of finance for agrodealers. The majority of agrodealers, in both the north and south, tend to rely on personal savings to finance their business operations, though this is more prevalent in the north than in the south. Females, in particular, rely greatly on internal funds and on funds from relatives, cooperatives, and friends, in that order. In the formal sector, the commercial banks, the Bank of Agriculture (BOA), and microfinance banks are the main sources of finance. Of these three sources, commercial banks seem to have the highest patronage from agrodealers, in both the north and the south, though more so in the south.

Figure 3.8 Agrodealers' financing sources by region and gender



Source: Author's graph using 2013 survey data.

The proportion of males who patronize commercial banks is higher than females. The BOA is not patronized by female agrodealers. Microfinance banks rank next to commercial banks in their supply of loans to agrodealers. The demand for loans from microfinance banks is higher among female agrodealers than for their male counterparts, just as it is higher in the south than in the north. An in-depth consideration of the factors influencing the demand for formal loans is undertaken in Section 4.

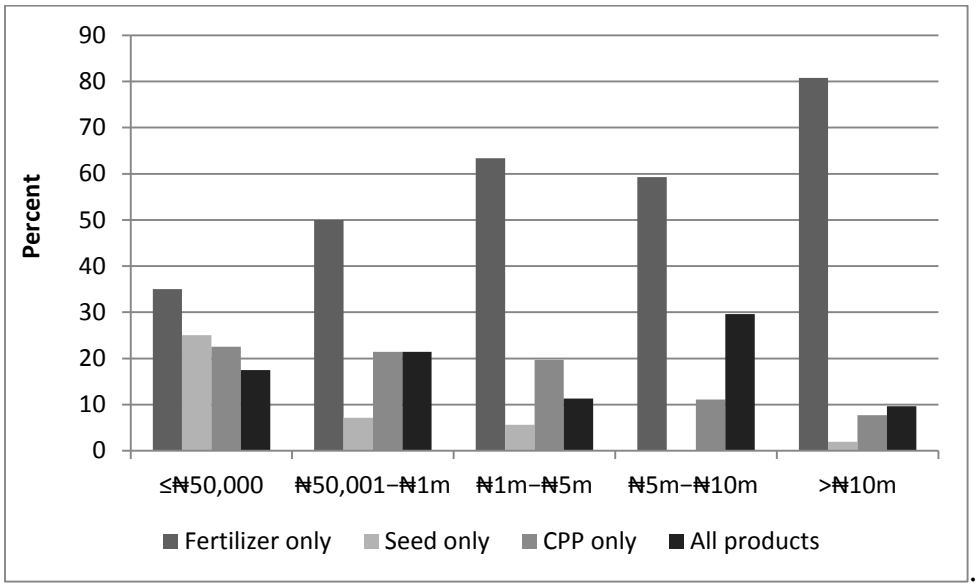
Performance of Agrodealers

The performance of agrodealers is examined by analyzing the distribution of turnover based on the type of input combination they focus on (Figure 3.9) and their operating profit. The turnover is also examined in accordance with the region and gender of agrodealers (Figure 3.10).

Agrodealers' Turnover

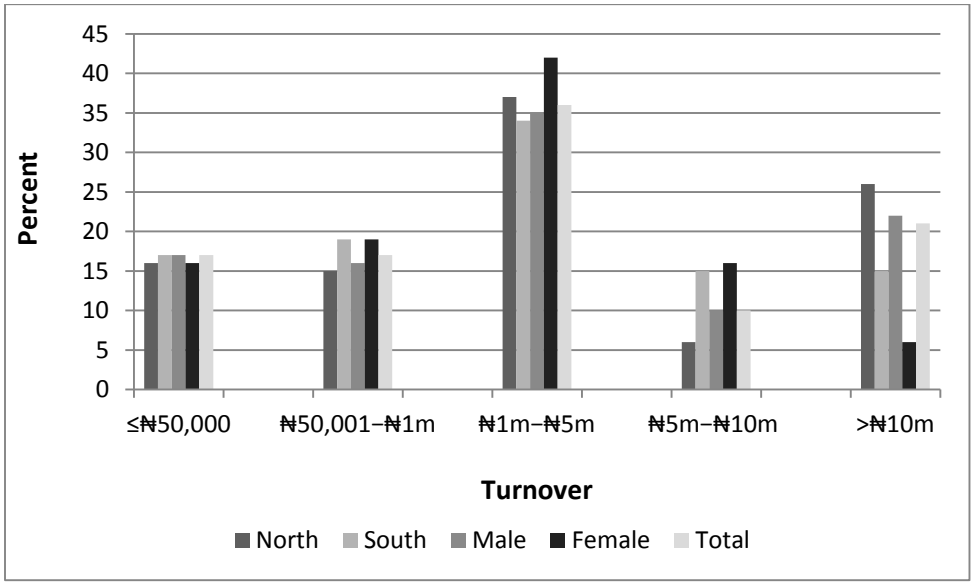
Five categories of turnover can be used to classify agrodealers into micro-, small-, medium-, or large-scale enterprises. Micro-scale operators have turnover in the range of at least ₦50,000. Small-scale enterprises are within the range of more than ₦50,000 up to ₦1.0 million. Medium-scale enterprises are within the range of ₦1.0 million and ₦10 million. Those whose turnover is above ₦10.0 million are regarded as large-scale operators. For all categories of enterprises, the proportion of agrodealers dealing in fertilizers is the highest (Figure 3.9). This finding is expected, because fertilizer has been at the core of Nigeria's agrodealership development since the voucher system of distribution in the mid-2000s. Indeed, this input has been the most important in the government's subsidy policy from time immemorial.

Figure 3.9 Dealership status and turnover of agrodealers



Source: Author's graph using 2013 survey data.

Figure 3.10 Agrodealers' turnover by region and gender



Source: Author's graph using 2013 survey data.

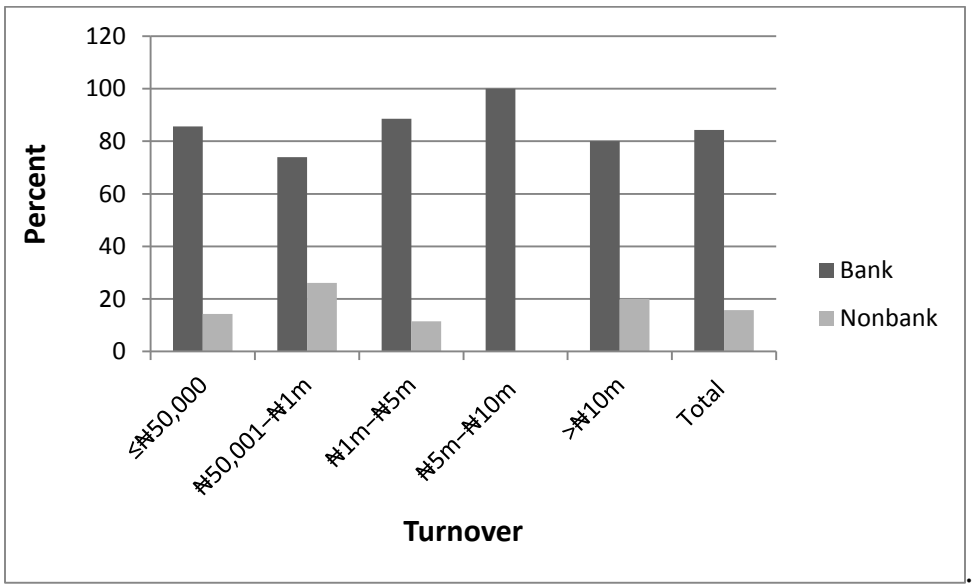
The key point emerging from Figures 3.9 and 3.10 is that the diversity of coverage of input to be sold to farmers diminishes with increases in the scale of operation. In the case of fertilizer, specialization increases with the scale of operation. The proportion of agrodealers at the micro-scale level selling only fertilizers is about 35 percent; this proportion increases to 50 percent at the small-scale level, 62 percent at the medium-scale level, and 80 percent at the large-scale level. These findings imply that large-scale operators are far more interested in selling fertilizers than other inputs. In the case of seed, the proportion of agrodealers selling only seed at the micro-scale level is 25 percent, decreasing to 7 percent at the small-scale level, 6 percent at the medium-scale level, and only 2 percent at the large-scale level. So far,

agrodealers operating at the medium-scale level—especially those whose turnover ranges between ₦5.0 million and ₦10.0 million—have the highest proportion of operators (30 percent) selling a combination of all inputs (fertilizers, seeds, and CPPs) to small-scale farmers. Thus, there is a need to encourage the medium-scale category of dealers to be more involved in the sale of all categories of inputs in order to improve the coverage of farmers in different parts of the country. It will also be necessary to encourage large-scale operators to diversify their operations so that a higher proportion of operators (rather than just 2 percent) can deal in more than one input; doing so would help improve the availability of modern inputs and use by farmers.

The analysis of turnover on the basis of region and gender shows that there is no perceptible variation at the micro-scale level. At the small-scale level, the proportion of agrodealers selling between ₦50,000 and ₦1.0 million is higher in the south than in the north, just as the proportion of females in this range is higher than males (Figure 3.10). At the medium-scale level, the proportion of agrodealers at the lower-medium level is higher in the north than in the south, whereas at the upper-medium level, the proportion in the south is higher than in the north. At the medium-scale level, in general, the proportion of females is higher than males. At the large-scale level, the proportion of agrodealers that sell more than ₦10.0 million is far higher in the north than in the south, just as the proportion of males far exceeds that of females. Therefore, efforts to ensure greater diversification of product coverage will need to be much more intensive in the north than in the south. In the same vein, efforts aimed at expanding the scale of agrodealer operation in terms of financial incentives and skill development will need to be far more inclusive than hitherto has been the case, especially to level the playing field for female agrodealers.

It is expected that agrodealers should be able to increase their turnover if external funds are injected into the sector to finance business operations. Although the proportion of agrodealers with access to formal finance is still generally low, the proportion of the loans supplied by banks to agrodealers of different categories of turnover is higher than that of nonbanks (Figure 3.11). The micro- and small-scale operators obtain loans largely from microfinance banks, whereas those at the upper medium-scale and above have access to loans from commercial banks. Nonbank formal sources include various institutional arrangements made by state governments for on-lending under the commercial agriculture credit scheme (CACS). Although the scheme was launched in 2009 and large-scale agribusiness farms took advantage of it right away, implementation of the on-lending component, in which state governments could borrow ₦1.0 billion for on-lending in their states, did not commence in some states until 2011 and 2012.

Figure 3.11 Agrodealers' turnover by sources of loan



Source: Author's graph using 2013 survey data.

Agrodealers' Operating Profit

The involvement of the private sector in agrodealership is being done to enable agrodealers to operate profitably. The government subsidy is targeted at farmers directly, whereas agrodealers are allowed to receive market prices. Agrodealers need to demonstrate to potential creditors—especially commercial banks—that agrodealership is a profitable business. This section examines revenues from the sale of the various products and the associated operational costs. As shown in Table 3.3, the average revenue from fertilizer is ₦14.3 million, followed by CPPs (₦1.864 million) and seeds (₦0.871 million). Out of the total revenue of ₦17.0 million, the average share of fertilizer is 70 percent, followed by CPPs (21 percent) and seeds (9 percent).

Table 3.3 Comparison of profitability among agrodealers in Nigeria (in ₦millions)

Variable	Borrowers	Nonborrowers	All agrodealers	t-test of difference	
				t-statistic	Prob > |t|
Sales of fertilizer	5.03	18.2	14.30	2.935	0.003***
Sale of seeds	2.34	0.25	0.87	–1.729	0.085*
Sale of CPPs	2.77	1.48	1.86	–1.156	0.248
Total value of sales	10.10	20.00	17.00	2.071	0.039**
Transportation costs	0.18	0.75	0.58	3.350	0.000***
Labor costs	0.08	0.12	0.11	1.795	0.074*
Other costs	0.04	0.03	0.03	–0.995	0.320
Purchase of fertilizer	2.71	15.50	11.70	3.403	0.000***
Purchase of seeds	0.58	0.19	0.31	–2.951	0.003***
Purchase of CPPs	1.13	0.80	0.90	–0.792	0.429
Total operating costs	4.55	17.3	13.50	3.284	0.001***
Operating profit	7.07	3.41	4.49	–1.387	0.167

Source: Author's computation.
Note: *** significant at the 1 percent level, ** significant at the 5 percent level, * significant at the 10 percent level.

On the other hand, the total operating cost is ₦13.5 million, out of which the share of fertilizer averaged 61 percent, followed by CPPs at 21 percent, and seeds at 9 percent. The costs of labor, transportation, and others account for 11 percent. The operating profit realized by agrodealers in 2012 stood at an average of ₦14.495 million.

In sum, the analysis of the characteristics of agrodealers and operational performance show that they are of middle age and low educational background. Small-scale entrepreneurs operate largely in the informal sector and tend to belong to input trading associations. By and large, agrodealership, as revealed in this study, is virtually synonymous with trade in fertilizers. Large-scale entrepreneurs in particular are far more interested in fertilizer than other inputs such as seeds and CPPs. This category of agrodealers need to be encouraged to diversify their operations so that the proportion of operators that deal in more than one input can be higher than is presently the case. This change is apt to enhance the availability and use of modern inputs by small-scale farmers in the country.

Moreover, regional variations and gender disparity in some of these features indicate the advisability to refrain from a unified approach in designing remedial measures. Specifically, capacity-building activities for agrodealers need to be nuanced across the regions and should be sensitive to gender peculiarities. It will also be necessary to redefine the curriculum of training programs for associations and individuals to reflect the diversity of products being traded by agrodealers.

Agrodealers have attempted to cope with their technical and financial inadequacies through membership in input trading associations, reliance on their meager savings, limited use of debt capital, and trading in a combination of inputs. Combining the sale of all three key agricultural inputs ensures regular cash inflow from customers (farmers) who are planting different types of crops and improves the build-up of turnover and outreach of customers in general. Nonetheless, a financial upgrade beyond the meager financial capability of the present crop of agrodealers is a prerequisite in order to attain the expected standard of input supply under the country's ongoing ATA. In terms of the few agrodealers who

participate in the loan market, they have greater preference for commercial banks than other formal sources. With improved managerial skill and a consistent enabling environment, it is expected that the banking sector should be able to design appropriate financial products for effective agrodealership financing. Evidently, the business is quite profitable—a feature that should place agrodealers in a position of strength for transformation into viable clients for external financing. Section 4 analyzes agrodealers' participation in the loan market, with an emphasis on the factors influencing their decision to participate and the determinants of loan demand.

4. AGRODEALERS' BORROWING DECISIONS AND DEMAND FOR BUSINESS LOANS

The role of agrodealers in providing key inputs such as seeds, fertilizers, chemicals, and equipment is critical for effective functioning of the value chains of several agricultural commodities in Nigeria. Sometimes agrodealers even provide technical knowledge to their customers, though action in this regard is still grossly limited. The low level of equity capital and the low scale of operation of a majority of agrodealers imply that the availability of credit from external sources will go a long way toward sustaining their performance. Loans are required to provide working capital for acquiring and stocking needed inputs to be supplied to farmers in adequate quantities and at the right time. Financially empowering agrodealers should make it possible for them to provide trade credit to farmers and thus spawn a new dimension in private-sector financing of small-scale agriculture in the country. In light of the foregoing, it is important to stress that liberalization of the input procurement and distribution market and assignment of a crucial role to agrodealers in the input supply chain require the assurance of an internal and external flow of funds for proper functioning of the supply chain. Against this backdrop, it is instructive to analyze the factors that influence agrodealers' decisions to participate in the loan market.

Theoretical and Analytical Framework

Econometric Model of Loan Demand by Agrodealers

The analysis of demand for business loans encompasses the participation in the loan market and the factors that prompt agrodealers to decide to borrow from formal sources. Aside from the determinants of loan demand, such factors are crucial in understanding the functioning of the loan market and interpreting agrodealers' prospects of relying on it agrodealers for business financing. This implies that in addition to estimating a loan demand model, a choice model that describes whether an agrodealer decides to borrow must be estimated, because the decision to borrow will affect the outcome of participation (amount of loan obtained) in the loan market.

Let D^* be the loan demand of an agrodealer based on his own valuation of his credit need, and let D be the market demand based on a lender's assessment of his creditworthiness. An agrodealer participates in the loan market if $D > D^*$, otherwise he is not considered a participant. In the sample, there is observation on D for those who participate in the market, but there is no observation on D for nonparticipants. For agrodealers not in the loan market, all that is known is that $D^* \geq D$. In other words, the sample is incidentally censored, and yet the need often arises to use the sample data to estimate the coefficients in a regression model explaining both D^* and D. This challenge underscores the need to model the sample selection process explicitly. A Tobit type-II model is employed to address the inherent selectivity bias. This model associated with data whose values of the regressand are not available for some observations, even though values of regressors are available for all observations (Gujarati 1995; Wiboonpongse, Sriboonchitta, and Chaovanapoonphol 2006). The dependent variable has zero values for a substantial part of the survey data but is positive for the rest of the data. The model for the regression equation can be specified as

$$d_i^* = x_i\beta_i + \varepsilon_{1i}, \quad (1)$$

where x_i *is* a vector of exogenous variables and d_i^* is the value of loan obtained by the *i*th agrodealer. To characterize the borrowing status of the agrodealer in terms of whether the person borrows, or not, a second equation, which is a binary choice model, is specified as

$$b_i^* = z_i\gamma_i + \varepsilon_{2i} \quad (2)$$

$$d_i = d_i^*, b_i = 1, if b_i^* > 0 \quad (3)$$

$$d_i \text{ not observed}, b_i = 0, if b_i^* \leq 0, \quad (4)$$

where b_i^* is a latent endogenous variable and z_i is a vector of exogenous variables determining whether an agrodealer will borrow. If b_i^* is greater than a threshold value of zero, then b_i, the observed dummy variable, is 1; otherwise, $b_i = 0$. The regression equation observes value d_i (value of loan) only for $b_i = 1$ (that is, for the borrowers). The distribution assumption for the unobserved errors $(\varepsilon_{1i}, \varepsilon_{2i})$ is a bivariate normal with expectation zero, variances σ_1^2 and σ_2^2, and covariance σ_{12}. The signs and magnitude of the estimated coefficients may differ across equations (1) and (2).

The model is estimated in accordance with the Heckman (1979) two-step procedure. The estimation is based on the following regression:

$$d_i = x_i\beta_i + \sigma_{12}\,\lambda_i(z_i\hat{\gamma}_i) + \nu_i, \tag{5}$$

where $\lambda_i = \frac{\phi(z_i\gamma_i)}{\Phi(z_i\gamma_i)}$ is Heckman's lambda, otherwise known as the inverse Mills' ratio; $\phi(.)$ is the standard normal density function; and $\Phi(.)$ is the standard cumulative distribution function. The estimation task is to use the observed variables (d, **x**, b, **z**) to estimate the regression coefficients **β** that are applicable to the sample of agrodealers whose values of *d* equal both 1 and 0. The contents of the λ_i term are estimated by a first-step maximum likelihood probit model regression of b_i on z_i. The second step is to estimate the regression model using ordinary least squares with the estimated bias term (inverse Mills' ratio) as an explanatory variable. A positive coefficient on the inverse Mill's ratio suggests that unobservables in the probit equation that increase the probability of participating in the loan market also increase the amount of the loan obtained (Heckman 1979; Halkos 2007; Pastrapa 2009).

The predictors included in the probit model are indicated as follows:

$$b_i = \gamma_o + \gamma_1 AGE + \gamma_2 DEBT + \gamma_3 SAVINGS + \gamma_4 CUSTOMER + \gamma_5 REGION + \gamma_6 ASSOC + \varepsilon_{1i}.$$

The estimating equation for loan demand has the following variables:

$$d_i = \beta o + \beta_1 IR + \beta_2 SAVINGS + \beta_3 ASSET + \beta_4 REGION + \beta_5 LSOURCE + \varepsilon_{2i},$$

where d_i is the value of the loan and b_i is a dummy variable with a value of unity if the agrodealer is a borrower and zero otherwise. AGE is the age of the agrodealer in years, DEBT is the amount owed, SAVINGS is the amount saved before loan application, CUSTOMER refers to the number of farmers patronizing the agrodealer, and REGION is a dummy variable for geographical location with a value of unity if the agrodealer operates in the northern part of the country and zero otherwise. The variable ASSOC is also a dummy with a value of unity if the agrodealer belongs to at least one agrodealer association and zero otherwise. LSOURCE refers to the source of formal loans with a value of unity if the source is a bank and zero otherwise. The variable IR refers to interest rate, and ASSET is the value of key physical assets owned by the agrodealer.

Theoretical and Analytical Framework for Credit Rationing

Conventionally, credit rationing is broadly defined as a situation in which the demand for loans exceeds the supply of loans at the going interest rate. According to Jaffee (1971), *credit rationing* is defined as the difference between the quantity of loans demanded and the quantity of loans supplied at the ruling interest rate. Stiglitz and Weiss (1981) theorized that excess demand for credit resulting in credit rationing can be explained in terms of short-term or long-term disequilibrium. It is viewed in the short term as a temporary disequilibrium phenomenon characterized by an exogenous shock in the economy; there is also stickiness in the price of capital (interest rate), so that there is a transitional period during which credit rationing occurs. Long-term credit rationing is explained by institutional constraints imposed by government policies and other regulatory actions. In their theoretical justification of credit rationing, the authors built a model that shows a competitive equilibrium—that is, banks compete through the choice of interest rates that maximize their profits such that there are interest rates at which demand for loanable funds equals supply of loanable funds. However, such interest rates cannot be regarded as equilibrium interest rates, because at those interest rates, banks could increase their profits, if they so desire, by lowering the interest

rates charged to borrowers. Consequently, the authors concluded that it may not be profitable to raise the interest rate or collateral requirements when a bank has an excess demand for credit; instead, banks deny loans to potential borrowers. Thus, according to the authors, *credit rationing* refers to circumstances in which either (1) among loan applicants who appear to be identical, some receive loans and others do not, and the rejected applicants would not receive a loan even if they offered to pay a higher interest rate; or (2) there are identifiable groups of individuals in the population who, with a given supply of credit, are unable to obtain loans at any interest rate, even though they would if they had a larger supply of credit.

In his conceptualization, Padmanabhan (1981) emphasized loan size and considered credit rationing as a situation in which borrowers receive a smaller amount of loan than they requested at a given loan rate. Jaffee and Stiglitz (1990) further broadened the classification and identified three aspects of credit rationing: (1) a situation in which a borrower may receive a loan of smaller amount than desired, (2) a situation in which some individuals cannot borrow at the interest rate they consider appropriate based on what they perceive to be their probability of default, and (3) a situation in which a borrower may be denied credit when a lender thinks of not being able to obtain its required return at any interest rate. Specifically, in the case of agricultural and rural credit, several years of investigation of the phenomenon have resulted in a better understanding of the various ramifications leading to occasional refinement of the underlying theory. Credit rationing in rural and agricultural communities of developing countries is particularly endemic due to the prevailing market environment, which operates outside the neoclassical world of perfect completion (which, in reality, hardly exists anywhere). The basic problem is information asymmetry, which fundamentally results in credit rationing either in the form of outright refusal of a loan or in granting smaller amounts than requested. Basically, the nonreliance on the price mechanism to equilibrate loan demand and supply implies that lenders must contend with a number of problems in order to operate profitably in the loan market. They need to ascertain what kind of risk the potential borrower is (adverse selection) and ensure proper use of the loan based on agreed-upon terms to ensure compliance with the repayment schedule (moral hazard). Moreover, they need to effectively supervise the loan once made and either design methods to force the borrower to repay if he or she becomes reluctant (enforcement) or design institutional arrangements to provide incentives for prompt recovery of loans when due (Olomola 1996; Ghatak and Guinnane 1999).

Further refinements of the theoretical justification for credit rationing to address some of these problems have emerged in recent literature and are beginning to be subjected to empirical investigation (Guirkinger and Boucher 2008; Boucher, Carter, and Guirkinger 2008; Boucher, Guirkinger, and Trivelli 2009; Khantachavana et al. 2012). In this connection, Guirkinger and Boucher (2008) built a model that shows that collateral requirements imposed by lenders in response to asymmetric information can cause not only quantity rationing but also transaction cost rationing and risk rationing. Quantity rationing derives from supply-side restrictions and borrowers' inability to meet collateral requirements of lenders; quantity rationing may be in the form of outright loan refusal or of granting loan amounts smaller than requested. Transaction cost rationing arises from the high cost of loan processing, monitoring, and recovery. Risk rationing arises in situations in which potential borrowers are unwilling to access a loan, even if it were available to them, because they fear the risk of being indebted and possibly losing the assets pledged as collateral (Boucher, Carter, and Guirkinger 2008). Farmer-borrowers who are risk rationed, as opposed to their quantity-rationed counterparts, voluntarily decide not to participate in the loan market, even though their projects would be feasible in a competitive markets for loans.

In their study, Boucher, Carter, and Guirkinger (2008) made clear distinctions among quantity rationing, transaction costs rationing, risk rationing, and price rationing. Theirs is one of the few studies to make a concrete attempt to place risk rationing in a theoretical context that holistically considers the various sources of credit constraints, including quantity and price rationing. Their model of risk rationing is based on asymmetric information that leads to loan contracts with high collateral contracts, such that farmers who default will lose productive assets. Thus, these farmers will self-ration out of the market in order to preserve capital. On quantity rationing, the authors indicated that financial wealth is liquid and can be committed as collateral to secure production loans, whereas productive wealth is land, which can also be used as collateral. They showed that an increase in financial wealth tends to relax quantity

rationing, whereas an increase in land endowment—whether it is titled or untitled—will also relax quantity rationing. On risk rationing, the authors postulated that the financially wealthy will be risk rationed. They also argued that there is a relationship between risk rationing and productive wealth, in that exploiting the land with risky activity yields a higher return. As farm size increases, returning to safe activity becomes increasingly costly. However, those who are land wealthy will choose to participate in the credit market and fully exploit their productive asset (land).

Despite the relevance of the theoretical framework of Boucher, Carter, and Guirkinger (2008) to the understanding of agricultural credit rationing in developing countries, it has not been applied to African agriculture. So far the only application of the framework has been in respect of small-scale farmers in China and Mexico (Khantachavana et al. 2011, 2012). Our study seeks to subject the basic propositions of this theoretical framework to empirical investigation in the Nigerian context, using data that are meticulously gathered for this purpose following the elicitation procedures and analytical techniques adopted in the aforementioned empirical assessment of the model outside Africa. Consistent with this theoretical framework, three categories of credit rationing are considered in the analysis:

1. Quantity-rationed or supply-side-constrained farmers: May be either an applicant who was refused a loan or a nonapplicant who knew that he would be rejected. A quantity-rationed farmer faces a binding credit limit; therefore, the limiting constraint comes from the supply side. As noted earlier, a quantity-rationed farmer is expected to have excess demand.
2. Risk-rationed farmers: Do not face a binding limit and therefore do not have excess demand for credit. The limiting constraint comes from the demand side. Their demand is lower because of the risk-sharing rules associated with the loan contract.
3. Price-rationed or unconstrained farmers: May either borrow or not and are satisfied with the loan amount at the price offered. Price rationing can be external or internal. External price rationing can occur if the lender raises interest rates or transaction costs, so that free choice along the credit demand curve results in a utility-maximizing position. Internal price rationing occurs when a borrower chooses (or not) to borrow at fair market prices and transaction costs. In this context, price rationing is determined by cost-quantity trade-offs along the demand curve.

Econometric Model of Credit Rationing among Agrodealers

In the econometric analysis, credit rationing is described by a series of dichotomous variables defining the possible categories of rationing. Typically, the rationing status of farmers is characterized by the unobserved latent counterpart of the observed variable captured in the survey. It can be expressed implicitly as

$$y_i^* = x'_i\beta_i + \varepsilon_i. \tag{8}$$

The observed variable is y_i, which equals 1 if $y_i^* > 0$, in which case a farmer belongs to a particular rationing category; otherwise, it is zero. x_i is a vector of explanatory variables, β_i represents coefficients to be estimated in the model, and ε_i represents the error term. Three aspects of credit rationing are modeled in the analysis: quantity rationing, risk rationing, and price rationing. The equations for the three models are expressed as follows:

$$y_{1i} = \alpha_i x_i + e_i \tag{9}$$

$$y_{2i} = \beta_i x_i + \mu_i \tag{10}$$

$$y_{3i} = \gamma_i x_i + \nu_i, \tag{11}$$

where y_{1i} is a dichotomous variable with a value of unity for quantity-rationed farmer *i* and zero otherwise. In the same vein, y_{2i} has a value of unity for a risk-rationed farmer *i* and zero otherwise, whereas y_{3i} has a value of unity for a price-rationed farmer *i* and zero otherwise. The x_i represents a vector of explanatory variables; α_i, β_i, and γ_i, are coefficients to be estimated, while e_i, μ_i, and ν_i are random error terms. The explanatory variables included in the model are farm size, household size, farming experience, share of farm income in total income, nonfarm income, savings, educational attainment, gender, marital status, borrowing status, and location (region) of the farmers. All explanatory variables are assumed to be exogenous or predetermined at the time of loan application.

The choice of explanatory variables is based on some considerations. For instance, the presence of credit rationing is determined both by supply and demand; thus, explanatory variables should also include observable characteristics that guide lenders' decisions. This is particularly important for factors such as collateral availability or the reputation of the borrower, which are likely to mitigate or worsen effects of asymmetric information. Moreover, consumption choices of household members should also be considered, because they are equally likely to affect the household's perceived rationing status. The included variables reflect these considerations and play different roles in accordance with our a priori expectations. Land (farm size) is taken as an indicator of collateralizable wealth, which is expected to play a key role in the loan market, especially in the presence of asymmetric information. The years of farming practice indicate the farmer's experience. Ordinarily, one would expect that more years of farming experience would imply a lower probability of being credit rationed. The years of school represent educational attainment. It is expected that the higher the educational attainment, the lower the probability of being credit rationed. The effect of household is ambiguous, because it is possible that a higher number of household members may both increase (through increased consumption) and decrease (through generation of unearned income) the liquidity shortage. Marital status is an indicator of the farmer's reputation. In the reckoning of lenders, a married farmer is held in a higher esteem than one who is single. This social status, in addition to the economic benefits that may be conferred on farmers by being married, is expected to make it less likely for married farmers to be credit rationed than their unmarried counterparts.

The analysis employs the seemingly unrelated probit model. This type of model is highly recommended in the recent literature in the study of credit rationing and other studies, regardless of whether the dependent variable is continuous or binary (Khantachavana et al. 2011; Doherty, Dee, and O'Neill 2012; Korosteleva, Isachenkova, and Rodionova 2012; Nilakantan et al. 2013). Considering the general tendency of formal lenders to discriminate against small-scale farmers in their loan operations, there is no gainsaying the fact that the same socioeconomic characteristics of the small-scale farmers will have influence on their rationing status. In other words, the variables that affect quantity rationing can also affect risk rationing and price rationing, though the effects should be different. It is thus conceivable that the model will be characterized by cross-equation correlation in error terms. Estimating each model as a separate equation will, therefore, lead to inefficient coefficients. Under a seemingly unrelated probit model, the error structure captures such potential correlations in the equations for the three credit-rationing categories, and the equations can be jointly estimated. However, the correlations can still be accommodated regardless of whether the variables in the equations are the same (Greene 1997). A positive sign of the correlation coefficient is consistent with the unobserved heterogeneity in the discriminatory (rationing) tendency against the farmers. However, a negative value for the coefficient is consistent with the interpretation that factors that constrain farmers to be in a particular rationing category may make them less likely to be in another category. Despite the plausibility of the assumption of error terms being correlated, if empirical analysis confirms diagonality of the error covariance matrix (implying that there is no cross-equation correlation of errors), then fitting a series of single equation probit models will be as efficient as estimating the three equations together as a seemingly unrelated probit model.

Arising from contemporary theoretical literature on credit rationing among small-scale farmers in the context of developing countries (Boucher, Carter, and Guirkinger 2008), this analysis is guided by two working hypotheses: (1) quantity rationing is decreasing in financial wealth and productive wealth, and (2) risk rationing is decreasing in financial wealth and productive wealth. Financial wealth is

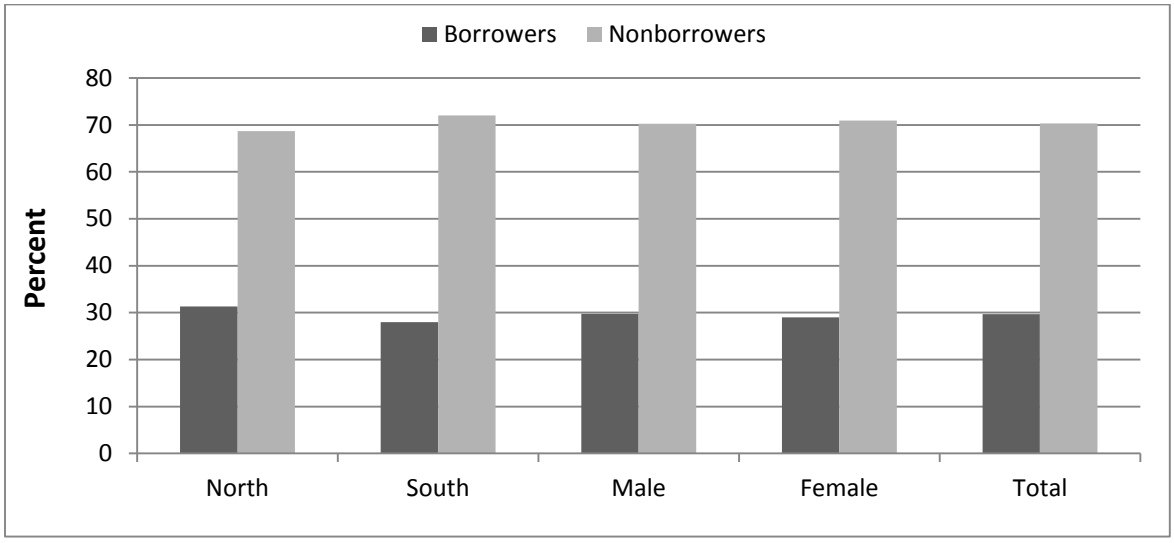
represented by nonfarm income, share of farm income in total income, and savings; productive wealth is represented mainly by farm size and other related variables, such as household size, education, and farming experience. The results of the econometric analysis are presented later in this section (in the discussion of borrowing decisions and demand for loans) and in Section 5 (in the discussion of the determinants of credit rationing).

Results of the Econometric Analysis

Agrodealers' Participation in the Loan Market

The level of participation of agrodealers in the formal loan market is still below expectation. Out of the sample of agrodealers included in this study, only 30 percent are borrowers; the remaining 70 percent are nonborrowers. As shown in Figure 4.1, there seems to be no perceptible difference between the level of participation of male and female agrodealers. Even on a regional basis, there is only a slight increase in the proportion of borrowers in the north compared with their counterparts in the south.

Figure 4.1 Borrowing status of agrodealers by region and gender



Source: Author's graph using 2013 survey data.

The reasons for the limited flow of external funds into the agricultural input supply chain are not farfetched. More often than not, the banks have always been at the receiving end of the blames. On the demand side, there is a need to examine the decisions of agrodealers and ascertain the factors that influence their decisions and whether some elements of these factors also determine their demand for loans. An in-depth analysis of these issues prompted the estimation of the probit model. The results are presented and discussed in this section. As shown in Table 4.1, the significant predictors of participation in the loan market are age, debt, customer outreach, membership in associations, and asset value. Table 4.2 shows the marginal effects of these variables. The variables that seem to have no significant effects are agrodealers' business experience, educational attainment, and location (region). The results show that the probability to participate in the loan market is higher among agrodealers who belong to trading associations than their counterparts who are not affiliated with any such associations. There is also a higher probability among older agrodealers to decide to borrow, as compared with younger ones. Agrodealers with higher asset values and larger customer outreach may decide not to borrow, whereas those whose level of indebtedness is rising are likely to decide to participate in the loan market. The change in probability of participation is indeed extremely slim with regard to debt and asset value as

compared with the observed changes in the case of age, membership in an association, and customer outreach. This finding is evident in the marginal effects, which are far more perceptible in the case of the three latter sets of variables than the former set. For instance, an additional year of age is apt to raise the probability of being in the loan market by 5.3 percentage points. In addition, if an agrodealer belongs to a trading association, the probability of participating in the loan market is apt to increase by about 21.9 percentage points. Moreover, a marginal increase in customer outreach may reduce the borrowing probability by 0.04 percentage points.

Table 4.1 Probit model of agrodealers' participation in the loan market

Variable	Coefficient	Standard Error	P[|Z| > z]
Dependent variable: Agrodealers' borrowing status (dummy)			
Age (years)	0.161***	0.046	0.000
Value of assets (₦)	–8.72e–07**	4.07e–07	0.032
Agrodealership experience (years)	–0.035	0.064	0.579
Educational attainment (years)	0.064	0.059	0.288
Debt (₦)	1.20e-05***	2.62e–06	0.000
Membership in association	0.940**	0.500	0.060
Region (north/south dummy)	–0.051	0.217	0.815
Customer outreach (number)	–0.0011**	0.0005	0.041
Constant	–2.736***	0.598	0.000
Log likelihood = –150.11			
LR $chi^2(8)$ = 64.60			
Prob > Chi^2 = 0.000			
Pseudo R^2 = 0.18			
Number of observations = 300			

Source: Author's computation.
Note: *** significant at the 1 percent level, ** significant at the 5 percent level, * significant at the 10 percent level.

Table 4.2 Marginal effects of the variables in the probit model

Variable	Coefficient	Standard Error	z]
Age (years)	0.053***	0.015	0.000
Value of assets (₦)	–2.88e–07**	0.000	0.033
Agrodealership experience (years)	–0.011	0.021	0.580
Educational attainment (years)	0.021	0.019	0.288
Debt (₦)	3.97e–06***	0.000	0.000
Membership in association	0.219***	0.069	0.002
Region (north/south dummy)	–0.017	0.071	0.815
Customer outreach (number)	–0.0004**	0.0002	0.040

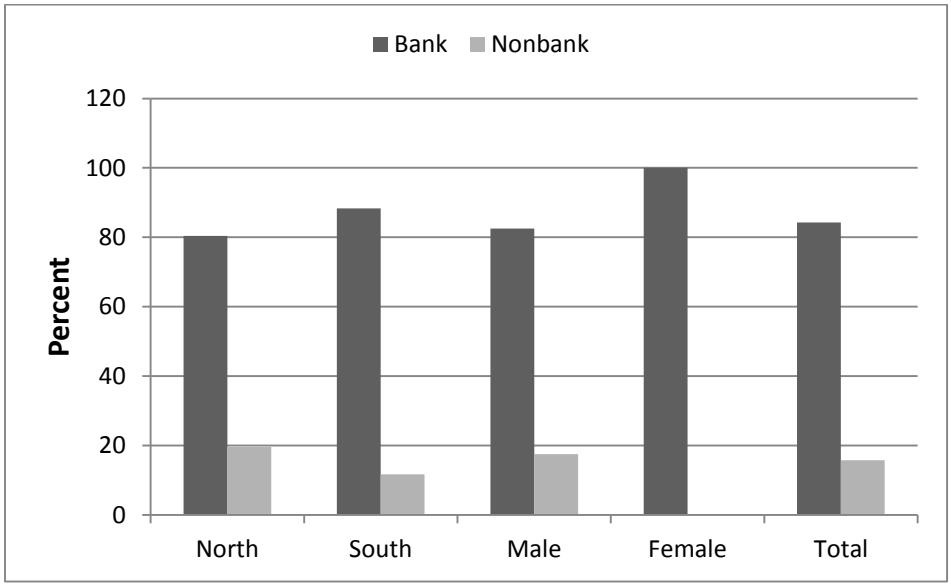
Source: Author's computation.
Note: *** significant at the 1 percent level, ** significant at the 5 percent level, * significant at the 10 percent level.

The residence area or region, which is not significant in this study, shows a stark contrast between the effect of area of residence in a developing country like Nigeria and that of developed countries. When applied in probit models on the participation in loan market as a proxy to capture the risk level, region has been found to be significant as an important factor affecting the decision to apply for a loan. According to Magri (2003), the explanation for such a finding is that in regions where the level of background economic risk is stronger, the consumer might be less inclined to ask for a loan.

Demand for Business Loans by Agrodealers

In 2012, agrodealers obtained loans from three types of banks: commercial banks, microfinance banks, and the BOA. About 84 percent of agrodealers obtained loans from banks, whereas 16 percent obtained loans from nonbank sources (Figure 4.2) which are on-lending schemes of various state governments. Female agrodealers relied solely on banks, unlike their male counterparts, who have access to both sources. The fact that females are not observed to have access to nonbank sources stems from the limited number of female agrodealers participating in the loan market. Out of the borrowers in the sample, only 10 percent are females. The problem seems more a general lack of access rather than deliberate exclusion from the on-lending schemes. Moreover, demand for loans from nonbank sources in the south is below the national average, as compared with the situation in the north. This finding could be due to variations in the implementation mechanisms of the on-lending schemes. More important, some southern states did not bother to seize the opportunity offered by the terms of the CACS and simply preferred not to borrow the amount (up to ₦1.0 billion) meant for on-lending.

Figure 4.2 Sources of agrodealer loans by region and gender



Source: Author's graph using 2013 survey data.

The determinants of demand for loans are examined on the basis of the Tobit type-II model (earlier specified). The results of the two-step Heckman sample selection correction analytical procedure are presented in Table 4.3, while the elasticity coefficients are presented in Table 4.4. The adjusted standard error for the demand equation regression is given by sigma ($\hat{\sigma}$ = 1.0703); the correlation coefficient between the (unobserved) factors that determine selection into the loan market and the (unobserved) factors that determine demand for loans is given by rho ($\hat{\rho}$ = 0.7970). The statistic labeled lambda, which is the estimated nonselection hazard or inverse Mills' ratio (lambda = sigma x rho), is positive and statistically significant, which suggests that the error terms in the selection (probit) and demand (regression) equations are positively correlated as expected (because the selection process is nonrandom). Evidently the (unobserved) factors that make participation in the loan market more likely have a tendency to be strongly associated with higher loan demand. Fitting the loan demand model through a direct application of ordinary least squares (OLS) to the sample would mean that the selectivity bias is ignored and would have resulted in biased and inconsistent estimates. It is not in all cases that an empirical analysis of this nature will justify the application of a Tobit type-II model; much depends on the nature of the data and the relevance of the predictors. In a similar analysis (Wiboonpongse, Sriboonchitta,

and Chaovanapoonphol 2006), the coefficient of the lambda statistic was not found to be significant; therefore, the null hypothesis that there is no correlation between the error terms in the selection probit and demand equations could not be rejected. The significance of lambda and other test statistics, as well as the estimated coefficients as shown in Table 4.3, indicates that the estimation of a Heckman selection model in this study is justified.

Table 4.3 Results of Heckman selection correction model of loan demand by agrodealers in Nigeria

Estimated demand model	Coefficient	Standard Error	P > |t|
Dependent variable: Amount of formal loan obtained (semi-log specification)			
Interest rate (%)	–0.148**	0.073	0.042
Age (years)	0.118	0.077	0.125
Value of assets (₦)	1.89e–06**	1.14e–06	0.098
Agrodealership experience (years)	–0.030	0.083	0.716
Debt (₦)	6.95e–06***	3.08e–06	0.024
Membership in association	1.004	0.928	0.279
Credit source	1.386***	0.250	0.000
Constant	7.448***	1.668	0.000
Estimated Selection Model			
Age (years)	0.157***	0.046	0.001
Value of assets (₦)	–9.02e–07**	4.13e–07	0.029
Agrodealership experience (years)	–0.058	0.066	0.381
Educational attainment (years)	0.052	0.059	0.372
Debt (₦)	1.23–-05***	2.66e–06	0.000
Membership in association	0.945**	0.508	0.059
Region (north/south dummy)	–0.022	0.217	0.917
Customer outreach (number)	–0.0012**	0.0005	0.030
Constant	–2.657***	0.599	0.000
Mills			
Lambda	0.853*	0.508	0.094
Rho	0.7970		
Sigma	1.0703		
Wald chi^2 (7) = 46.65			
Prob > chi^2 = 0.0000			

Source: Author's computation.
Note: *** significant at the 1 percent level, ** significant at the 5 percent level, * significant at the 10 percent level

Table 4.4 Elasticity coefficients of the variables in the Heckman selection correction model

Variable	Coefficient	S.E.	z]
Interest rate (%)	–0.052**	0.025	0.043
Age (years)	0.089	0.062	0.151
Value of assets (₦)	0.021*	0.012	0.085
Agrodealership experience (years)	–0.006	0.016	0.718
Debt (₦)	0.012**	0.005	0.043
Membership in association	0.093	0.089	0.295
Credit source	0.114***	0.023	0.000

Source: Author's computation.
Note: *** significant at the 1 percent level, ** significant at the 5 percent level, * significant at the 10 percent level.

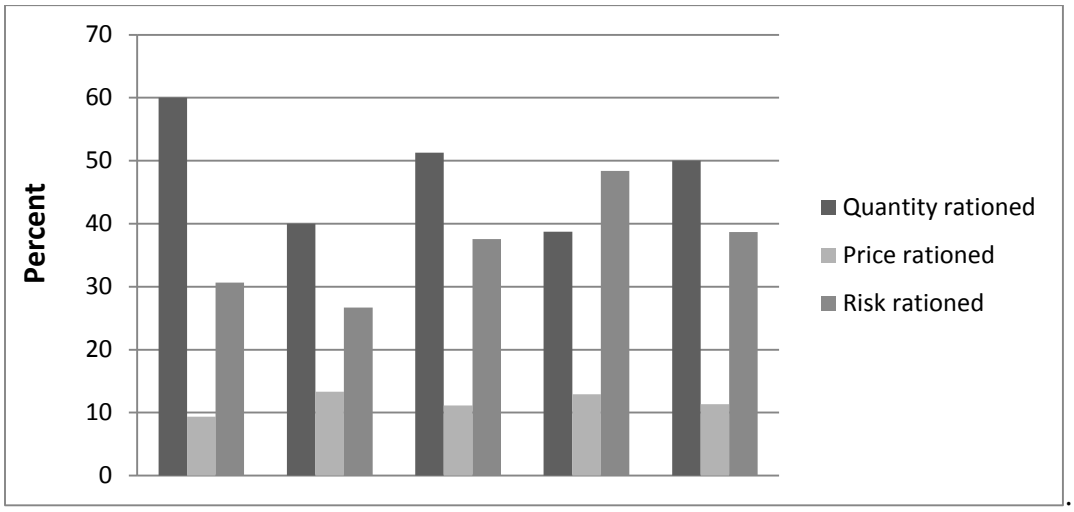
The results show that four out of the seven variables included in the regression equation are significant determinants of demand for loans. These variables are interest rate, debt, value of asset, and source of credit. The coefficients of age, business experience, and membership in association are not statistically significant, even though age and membership in association have a significant influence on the decision to participate in the loan market. The elasticity coefficients of the variables in the demand model show that, as expected, the coefficient of interest rate is negative and statistically significant. The results show that an increase in the rate of interest by 1.00 percent is associated with a reduction of 0.05 percent in the value of a loan. A change from nonbank to commercial bank sources is associated with an increase of 0.11 percent in the value of a loan. In addition, if the amount of debt increases by 1.00 percent, it is likely to be associated with 0.01 percent increase in the demand for a loan (Table 4.4). The implications of these findings for improved financing of agrodealership are quite succinct: Financing from commercial bank sources should be strengthened, because it is apt to provide better access to a higher value of loan than nonbank sources. Moreover, the role of membership of input trading association in enhancing the creditworthiness of agrodealers is crucial. This fact should be vigorously promoted in the country to unleash the inherent social capital and information advantages for improved agrodealership financing.

5. THE NATURE AND DETERMINANTS OF CREDIT RATIONING FACED BY AGRODEALERS

Nature of Credit Rationing

The survey asked questions that made it possible to infer respondents' credit-rationing status based on Boucher, Guirkinger and Trivelli (2009). Price-rationed applicants are those who borrowed and were happy with the amount they received. A quantity-rationed applicant was rejected a loan. A nonapplicant is the most difficult to classify. This person might not have applied because of three reasons: the possibility and knowledge that an application would be rejected (quantity rationed); the fear of losing collateral (risk rationed); or having enough money and no need to borrow (price rationed). On the basis of this definition, for the purpose of analyzing their agrodealership status and their performance and distribution on the basis of region and gender, agrodealers are classified into three credit-rationed categories: risk rationed, quantity rationed, and price rationed. In an ideal situation, entrepreneurs would be satisfied with the loan market if they were price rationed. Either they would make do with their equity capital, or when they desire to have debt capital, they would be sure of having access to the amount they need. However, this study found that agrodealers have not developed to a point at which they can attain such a level of satisfaction. Instead, agrodealers are still being considerably quantity rationed and risk rationed (Figure 5.1). In general, out of the three categories of agrodealers experiencing credit rationing, the proportion of those who are price rationed is the lowest across the country. The proportion is lower in the north than in the south, implying that agrodealers are more satisfied with their credit situation in the south than in the north. About 60 percent of the agrodealers in the north are quantity rationed, whereas in the south, the proportion is 40 percent.

Figure 5.1 Comparison of credit rationing status of agrodealers by region and gender



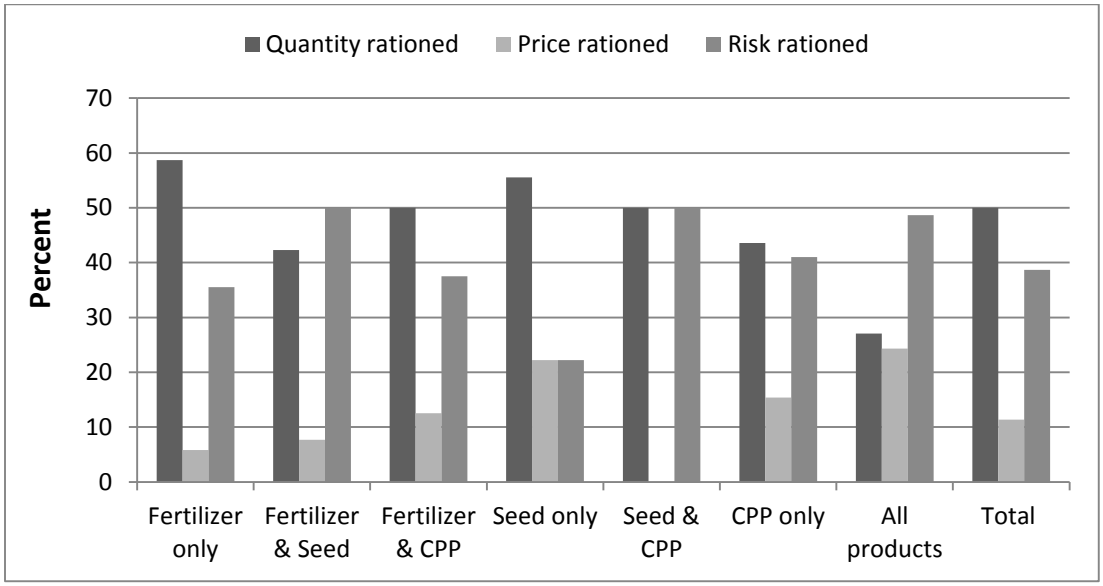
Source: Author's graph using 2013 survey data.

A similar pattern of risk rationing is also prevalent between the two regions—that is, it is higher in the north than in the south. The gender disparity in credit rationing is intriguing. In terms of the proportion of agrodealers that are price rationed, there seems to be no imperceptible difference. Rather, the differentiation occurs in the two other categories. Males are more quantity rationed than females, whereas females are more risk rationed than males. This finding appears to unmask the fundamental issue of collateralization of loans that has bedeviled female access to formal credit in the country in general—that is, potential women borrowers may actually not apply for loans for fear of losing collateral.

Credit Rationing and Agrodealership Status

A pragmatic way of gaining insight into the prevalence of credit rationing among agrodealers is to ascertain which dimension of the problem applies to their various business categories. The results reveal that (1) agrodealers who sell only fertilizers are the most quantity rationed, (2) those who sell seeds and CPPs are either quantity rationed or risk rationed, (3) those who sell a single product face more quantity rationing than any other form of rationing, and (4) those who sell all products face more risk rationing than any other form. This latter group also have the highest proportion of price-rationed agrodealers and the least proportion of those who are quantity rationed (Figure 5.2). The results imply that diversification of product coverage by agrodealers is likely to enhance their credit rating.

Figure 5.2 Credit rationing and agrodealership status

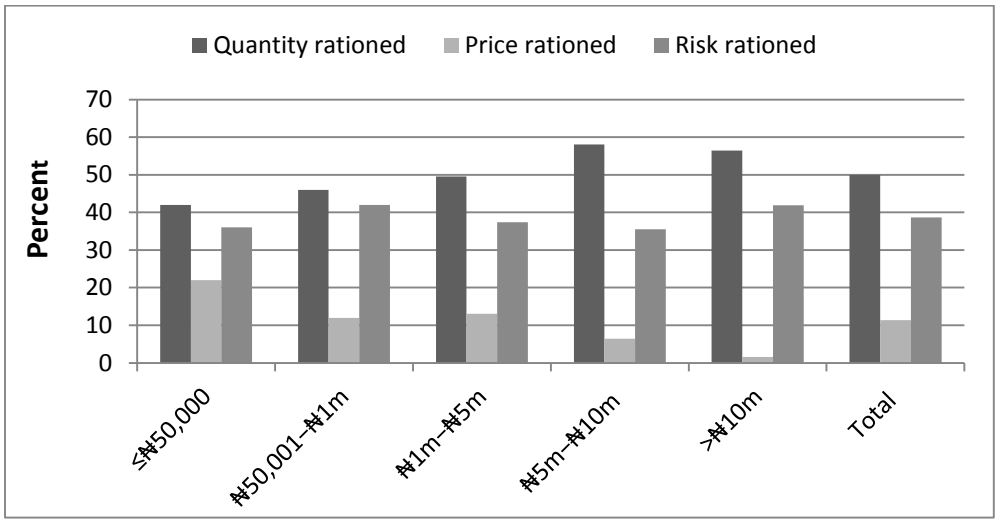


Source: Author's graph using 2013 survey data
Note: CPP = crop protection product.

Credit Rationing and Agrodealers' Turnover

Agrodealers have different levels of performance, which may also influence their credit needs and access. The essence of this analysis is to examine whether credit rationing is a general problem among agrodealers or whether it is peculiar to certain categories of agrodealers. The results reveal that credit rationing is prevalent among all agrodealers, regardless of the scale of operation or the total value of sales (turnover). Indeed, quantity rationing increases as the level of turnover increases (Figure 5.3). This finding corroborates the outcry in 2012 from the agrodealer sector regarding the refusal of commercial banks to extend the required credit facilities in support of agrodealers' participation in distributing agro-inputs under the GES scheme.

Figure 5.3 Credit rationing and agrodealers' turnover

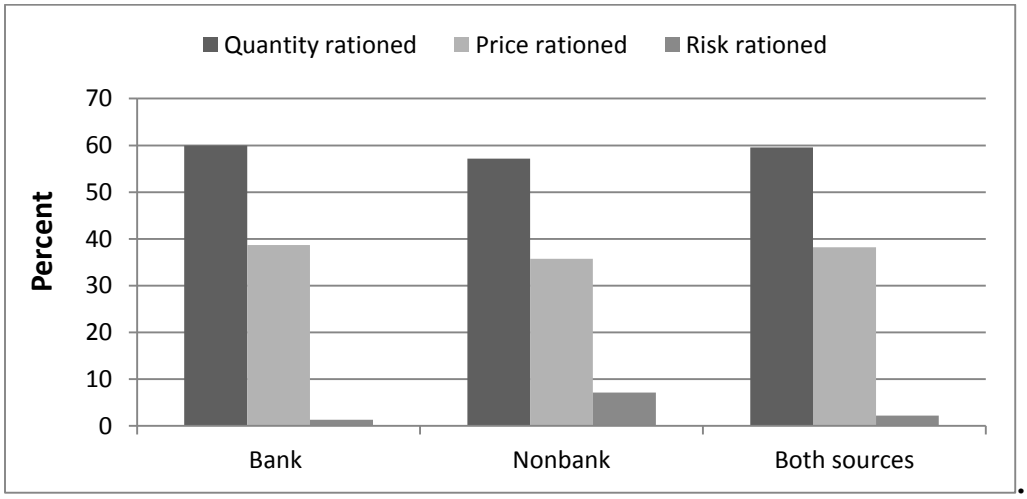


Source: Author's graph using 2013 survey data.

Is Credit Rationing by Formal Lenders Prevalent Only in the Banking Sector?

The distribution of agrodealers by source of credit shows that rationing is pervasive, regardless of credit source. In other words, agrodealers are credit rationed by lenders from both banks and nonbank institutions. The proportion of agrodealers that are quantity rationed is higher in banks than nonbanks, whereas the proportion of risk-rationed agrodealers is higher in the case of nonbank institutions than banks (Figure 5.4).

Figure 5.4 Loan rationing status of agrodealers by sources of loan



Source: Author's graph using 2013 survey data.

Determinants of Credit Rationing

Credit rationing among agrodealers is further examined to ascertain the key determinants. The analysis employs the seemingly unrelated regression model. It is broadly hypothesized that credit rationing is significantly influenced by value of asset, savings, debt, business experience, customer outreach, membership in trading association, gender, borrowing status, and location (region) of the agrodealers. The

analysis is guided by two specific hypotheses: (1) quantity rationing is decreasing in financial wealth and productive wealth, and (2) risk rationing is decreasing in financial wealth and productive wealth. Financial wealth is represented by value of assets and savings, whereas productive wealth is represented by business experience, customer outreach, and membership in trading association.

Table 5.1 presents the estimated coefficients of the seemingly unrelated probit regressions for the three categories of rationed agrodealers, and Table 5.2 presents the elasticity coefficients. The results show that quantity rationing significantly depends positively on savings, customer outreach, membership in trading association, borrowing status, and geographical location (region). Risk rationing depends negatively on savings, customer outreach, region, membership in trading association, and borrowing status and depends positively on business experience. This study finds no statistically significant difference in the probability that agrodealers will be credit rationed on the basis of value of asset, debt, and gender, judging by the nonsignificance of the coefficients of these variables in the estimated equations. To ascertain whether credit rationing is more severe in terms of shortfall in the amount of loan received, as compared with the amount requested, than in terms of agrodealers being rejected outright, the model includes the borrowing status of agrodealers as an independent variable. The result shows that there is a higher probability of agrodealers being given an amount of loan lower than what has been requested than of being rejected outright, judging by the positive sign and significance of the coefficient. In other words, quantity rationing manifests more predominantly in terms of agrodealers being given less of a loan than they requested, rather than being rejected or not applying because they know they will be rejected.

Table 5.1 Results of seemingly unrelated regression for agrodealers' credit rationing

Variable	Estimated ,model		
	Quantity rationed	Price rationed	Risk rationed
Value of asset (₦)	–0.023	–0.001	–0.004
	(0.024)	(0.013)	(0.019)
Savings (₦)	0.018***	–0.003	–0.013**
	(0.007)	(0.003)	(0.005)
Debt (₦)	–0.0007	0.002	–0.003
	(0.0056)	(0.003)	(0.004)
Business experience (years)	–0.026	–0.016	0.062**
	(0.040)	(0.021)	(0.032)
Customer outreach (number)	0.072***	0.004	–0.077***
	(0.026)	(0.014)	(0.022)
Region (north/south dummy)	0.154**	–0.058*	–0.088*
	(0.065)	(0.034)	(0.052)
Membership in association (dummy)	0.274**	–0.027	–0.242**
	(0.133)	(0.071)	(0.108)
Borrowing status (dummy)	0.155**	0.356***	–0.529***
	(0.066)	(0.035)	(0.054)
Gender (dummy)	0.019	0.004	–0.017
	(0.095)	(0.051)	(0.077)
Constant	–0.086	0.082	1.287***
	(0.277)	(0.148)	(0.225)
No. of observations	300	300	300
F-stat	5.34	14.22	18.17
R^2	0.14	0.30	0.35
Prob.	0.0000	0.0000	0.0000
Breusch-Pagan test of independence: $Chi^2(3) = 241.44$ $Prob > Chi^2 = 0.0000$			

Source: Author's computation.
Note: *** significant at the 1 percent level, ** significant at the 5 percent level.

Table 5.2 Elasticity coefficients of the estimated seemingly unrelated regression

Independent variables	Elasticity coefficient	Standard Error	P > |t|
Value of asset (₦)	–0.498	0.518	0.337
Savings (₦)	0.343***	0.125	0.006
Debt (₦)	–0.004	0.030	0.889
Business experience (years)	–0.024	0.037	0.516
Customer outreach (number)	0.565***	0.214	0.008
Region (north/south) (dummy)	0.151**	0.064	0.018
Membership in association (dummy)	0.509**	0.249	0.041
Borrowing status (dummy)	0.090**	0.039	0.021
Gender (dummy)	0.034	0.167	0.836

Source: Author's computation.
Note: *** significant at the 1 percent level, ** significant at the 5 percent level.

With regard to risk rationing, the results reveal that more risk-rationed agrodealers are found among the borrowers than among nonborrowers. This finding implies that risk rationing is more prevalent among borrowers than nonborrowers. Agrodealers in the latter category are risk rationed in that they did not obtain a loan for fear of losing collateral or because they did not even have collateral to offer. On the other hand, risk-rationed borrowers did not use all the loans they obtained for fear of losing their collateral. Intuitively, the unused portion could be set aside to service the loan if they were to face a difficult cash-flow situation in order to avoid default and foreclosure on their collateral. In conclusion, this study rejects the hypothesis that quantity rationing is decreasing in financial wealth and productive wealth; instead, it accepts the alternative, because quantity rationing significantly depends positively on financial wealth (proxied by savings) and productive wealth (proxied by customer outreach and membership in trading association). However, the author accepts the hypothesis that risk rationing is decreasing in financial wealth and productive wealth, based on the finding that risk rationing depends negatively on savings, customer outreach, and membership in trading association.

6. SUMMARY, POLICY IMPLICATIONS, AND CONCLUSIONS

This study seeks to examine the constraints and opportunities for agrodealership financing in Nigeria, analyze the business operations of agrodealers, and ascertain the factors influencing their participation in the loan market—especially their borrowing decisions and determinants of loan demand. The goal is to proffer policy measures for improved agrodealership financing for effective input distribution under the country's agricultural transformation agenda. The constraints are analyzed under four main categories: operational, logistical, marketing, and financial. In the econometric analysis of agrodealer participation in the loan market, it was hypothesized that factors such as age, geographical location, membership in trading associations, savings, customer outreach, and level of indebtedness have significant effects on their borrowing decisions. With regard to loan demand, the hypothesis was that interest rate, savings, value of asset, region, membership in trading association, and sources of loan are significant determinants. This section presents the main findings, policy recommendations, and conclusions.

Main Findings

Opportunities and Constraints on Agrodealership

The economic liberalization policies of Nigeria's government over the past decade have created some opportunities within the private sector to permit entrepreneurs to play an active role in the agricultural input distribution system. These opportunities should be recognized even in the presence of legendary constraints that seem to have stymied rapid development in the system. The identified opportunities include (1) availability of private-sector companies with experience in importing and marketing agricultural inputs, (2) a growing private-sector capacity for importing and marketing agricultural inputs, (3) a rapidly developing retail outlet for agro-inputs, and (4) policy emphasis on agrodealers' services under the ongoing ATA. These opportunities need to be reinforced; at the same time, the overwhelming constraints militating against the development of the agrodealer sector need to be diagnosed and tackled.

Specifically, the financial constraints facing agrodealers will have to be addressed before these dealers can participate effectively in the input market in accordance with the targets set by the ATA. To enhance agrodealers' overall performance in carrying out their operations, it will also be necessary to relax the operational, logistical, and marketing constraints they face. This study found that the problem of inadequate skills needed for financial management, business planning, marketing, and forecasting of demand and supply is more severe in the north than in the south and more severe among female agrodealers than their male counterparts. This finding implies that varying intensities of remedial measures will apply in different geographical domains, taking due cognizance of gender disparities in skill gaps.

With regard to input marketing, the main marketing problems are inadequate numbers of input suppliers, irregular input supply, poor quality of inputs supplied, high prices charged by input suppliers, and low customer demand for some inputs. Moreover, to ensure effective agrodealership, certain policy-related hurdles must be surmounted, such as the weak regulatory framework for controlling product quality and for preventing anticompetitive behavior of importers and major distributors. The availability of adulterated products in the market frustrates the business of genuine dealers due to the tendency to lose customers and face reduction in turnover. Similar effects have also been experienced due to the government's inability to effectively monitor and enforce existing regulations, thereby resulting in the sale of expired chemicals by some unscrupulous agrodealers.

Some Features of Agrodealers' Business Operations

Nigeria's agrodealer sector remains largely informal, as evidenced by the fact that only 38 percent of agrodealer businesses are officially registered as business enterprises. This characteristic of the agrodealer sector shows that it is still largely underdeveloped. The sector requires substantial upgrading if it is to be in a position to effectively perform the role assigned to it under the current ATA.

Gender and regional differentiations are clearly reflected in the pattern of Nigeria's agrodealership. This study found that the proportion of agrodealers selling all three inputs (fertilizer, seed, and CPPs) is far higher in the south than in the north, just as it is much higher among women than men. Areas and dealers with such diversity of business operation are likely to better address cash-flow problems and expand market share than situations in which the focus is only on one product. The dominance of women in various combinations of agrodealership is remarkable. To ensure that an increasingly higher number of agrodealers are empowered to attain a viable business registration status in the not-so-distant future, regional and inter-regional gaps must be filled, and gender and transgender gaps must be addressed. It is imperative for policymakers to ensure that any policy incentive for the country's agrodealership development gives due recognition to the participation of women, regardless of their scale of operation.

The proportion of agrodealers who do not belong to any association is lower in the north than in the south, whereas the proportion who belong to more than two associations is higher in the south than in the north. In general, therefore, membership in agrodealer associations is relatively higher in the north than in the south, whereas the diversity of membership is more prevalent in the south than in the north. This finding indicates the tendency of southern agrodealers to have a greater combination of inputs, which they sell to farmers, than is the case in the north. This finding is of significant policy relevance, as it points to the need to nuance the design of training programs for agrodealers across the regions and to redefine the curriculum to address the inherent product diversity among them.

The results also show that the diversity of coverage of input to be sold to farmers diminishes with increases in the scale of operation. In the case of fertilizer, specialization increases with scale of operation. The proportion of agrodealers at the micro-scale level selling only fertilizers is about 35 percent; this proportion increases to 50 percent at the small-scale level, 62 percent at the medium-scale level, and 80 percent at the large-scale level. This finding implies that large-scale operators are far more interested in selling fertilizers than other inputs.

Agrodealers' Participation in the Loan Market

The results show that the probability of participating in the loan market is higher in the north than in the south. The probability is also higher among agrodealers who belong to trade associations than counterparts who are not affiliated with any such associations. In addition, agrodealers who have personal savings to rely on for their business operations may decide not to borrow, whereas those whose level of indebtedness is rising are likely to decide to participate in the loan market. The decision to participate in the loan market is crucial; however, having access to a loan is by far a more important issue in that other variables must be considered in making that decision a reality. The results show that five of the seven variables included in the regression equation are significant determinants of a demand for a loan. These five variables are interest rate, debt, value of asset, membership in a trading association, and source of credit. The other two coefficients—savings and region—are not statistically significant, even though they have a significant influence on the decision to participate in the loan market. As expected, the geographical location of a borrower is unlikely to be a major criterion for having access to formal loans; it is not surprising that it is not a significant determinant of loan demand.

Factors Influencing Credit Rationing among Agrodealers

An important feature of the loan market is the existence of various forms of loan rationing. About 60 percent of agrodealers in the north are quantity rationed, whereas in the south, the proportion is 40 percent. A similar pattern of risk rationing is also prevalent between the two regions—that is, it is higher in the north than in the south. There is also considerable gender disparity in the loan rationing phenomenon. Males are more quantity rationed than females, whereas females are more risk rationed than males. This finding tends to substantiate the fundamental issue of collateralization of loans that has bedeviled female access to formal credit in the country in general—that is, potential women borrowers may actually not apply for loans for fear of losing collateral, especially in situations where they have no control over landed property, which is commonly required as collateral in formal loan transactions.

This study found that quantity rationing increases as the level of turnover increases, which indicates that some agrodealers are yet to be in a position to comply fully with the commercial banks' requirements for credit access. Even though agrodealers are credit rationed by banks and nonbank lending institutions, the nature of rationing varies. The proportion of agrodealers that are quantity rationed is higher in banks than in nonbanks, whereas the proportion of those that are risk rationed is higher for nonbanks than for banks. Furthermore, the results show that quantity rationing manifests more predominantly in terms of agrodealers being given a lower loan than they requested, rather than being rejected or not applying because they know they will be rejected. Moreover, risk rationing is more prevalent among borrowers than nonborrowers. Agrodealers in the latter category are risk rationed in that they did not obtain a loan for fear of losing collateral or because they did not even have collateral to offer. Risk-rationed borrowers, in contrast, did not use the entire loan they obtained for fear of losing their collateral.

Finally, the author rejects the hypothesis that quantity rationing is decreasing in financial wealth and productive wealth and accepts the alternative hypothesis. The author found that quantity rationing significantly depends positively on financial wealth (proxied by savings) and productive wealth (proxied by customer outreach and membership in trading associations). However, the author does accept the hypothesis that risk rationing is decreasing in financial wealth and productive wealth, based on the finding that risk rationing depends negatively on savings, customer outreach, and membership in trading associations.

Policy Recommendations

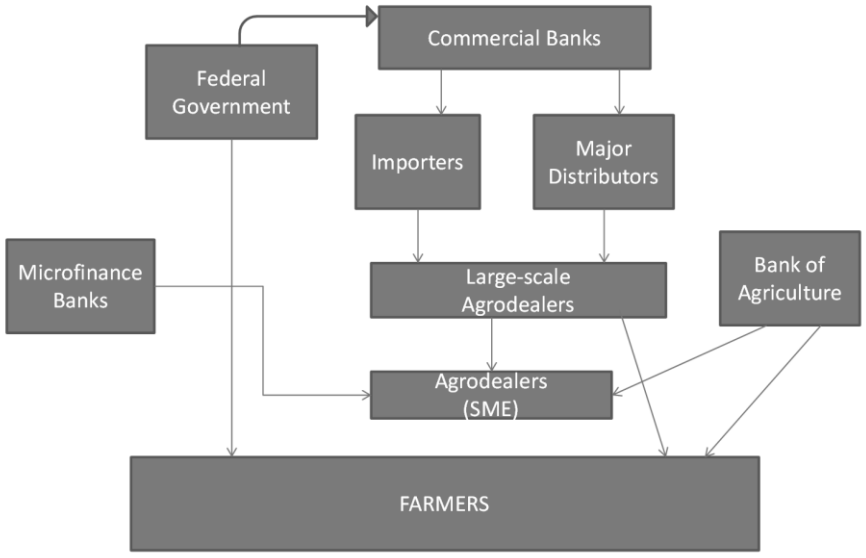
It is important to stress that the essence of a review of agrodealers' role in implementing the GES scheme is to provide evidence-based information for policy decisionmaking regard agrodealership financing in the overall interest of agricultural sector stakeholders. To my mind, overhauling agrodealership financing is warranted on the strength of the findings of this study. The federal government's strategy of moral suasion to convince the banking sector of the need for improved agrodealership financing is desirable and should continue unabated. Financing from commercial bank sources should be strengthened, because such financing is apt to provide agrodealers with better access to a higher value of loan than do nonbank sources. The following financing mechanisms and complementary measures are recommended for sustainable agrodealership financing in the country.

Value-Chain Financing

Agrodealers procure inputs from three main sources: importers, input distributors, and the retail market. The majority of the agrodealers (68 percent) purchase their inputs from distributors, 22 percent purchase from importers, and only 12 percent purchase from the retail market. To augment financing from the banking sector, key participants in the agro-input supply chain can provide some form of financing. The approach suggested here will involve the participation of commercial banks, importers, major input distributors, large-scale agrodealers, microfinance banks, the BOA, and small- and medium-scale agrodealers. The federal government is expected to play a facilitating role by providing incentives in the

form of loan guarantees to reduce the risk associated with commercial bank lending. This result can be achieved through the instrumentality of NIRSAL that is currently being implemented in the country. In this value-chain financing approach, not all players in the input distribution network will have to approach banks for loans. Rather, commercial banks will lend directly to importers and major distributors, who are expected to provide financial support to large-scale agrodealers in the form of trade credit. Large-scale agrodealers, in turn, will provide trade credit to agrodealers (SMEs) who are in need of financial support. The latter can also obtain loans directly from microfinance banks and the BOA. To strengthen effective demand from farmers and to expand agrodealers' turnover, financial support can also be extended from large-scale agrodealers to farmers. Farmers can also benefit directly from loans specially packaged by BOA to finance the purchase of modern inputs and thus complete the cycle of financial support of key actors in this value-chain financing approach (Figure 6.1).

Figure 6.1 Recommended agrodealership financing framework



Source: Author's creation.

Build Human Capital for Improved Agrodealership

As attempts are being made to modernize the distribution of agricultural inputs, there is also a need to develop the variety of skills required for effective performance of the distribution system. Business, financial management, and technical skills of key players, such as importers, wholesalers, and retailers, must be developed by implementing training programs in different parts of the country. Such programs can be financed through public-private-partnership (PPP) arrangements involving FMARD, commercial banks, development partners, and specialized NGOs. The technical training should cover all inputs, rather than focusing only on fertilizer. There is also a need to build human capital in the public sector to provide the regulatory framework and to strengthen the enforcement of extant rules regarding standards and quality control.

Support the Development of Agro-input Trading Associations

The role of membership in input trading associations in enhancing the creditworthiness of agrodealers is crucial. This role should be vigorously promoted in the country to unleash the inherent social capital and information advantages for improved agrodealership financing.

Curbing Agrodealers' Black Market

Effective monitoring of business operations of agrodealers involved in the GES scheme is crucial to prevent undue segmentation of the input market to the disadvantage of small-scale farmers. Essentially, there is a need to ensure that the inputs are redeemed in the true sense, rather than being allowed to be reallocated, repurchased, or repossessed in any way by any agent in the process of delivery to farmers. One way to sanitize the market is to ensure that registered farmers are genuine farmers. Another way is to ensure that GES-participating farmers are not only eligible but also have effective demand for the inputs.

Sustainability of Government Support for Input Market Transformation

Three policy actions are required to address the issue of sustainability of current reforms involving agrodealers and the general private-sector orientation of input procurement and distribution. Currently, the GESS is an incentive not only to farmers but also to importers, distributors, and suppliers. The first policy action is legislation to uphold recent reforms in the input sector, in general, and in fertilizer, in particular. policy actions have reached an advanced stage to prepare a new fertilizer bill that will effectively liberalize the fertilizer sector, facilitate private-sector involvement and investment, and provide for regulatory oversight. When passed into law, the new bill being crafted (the Fertilizer Quality Control Bill) will repeal the National Fertilizer Board Act and the Fertilizer (Control) Act and will provide a capacity for monitoring the importation, manufacture, and distribution of fertilizer and related products and for providing quality control and assurance for fertilizer products. The existing Federal Department of Fertilizer (under FMARD) is expected to be the implementing agency. It is expected that the National Assembly will expedite action to pass the bill before the end of 2014 so that implementation of the various provisions can start in earnest.

The second policy action involves the need to establish an exit strategy for financial support before it spawns an unbearable fiscal impact. In this connection, FMARD needs to intensify efforts to expand the network of agrodealers. Creating healthy competition in the input market through a substantial increase in the number of dealers and suppliers will prevail on agrodealers to keep input prices at competitive levels; this, in turn, will enhance effective demand by small-scale farmers.

The third action is for the federal and state governments to create incentives for increased domestic production of fertilizers and crop protection chemicals and to facilitate private-sector involvement in the production of certified seeds. For instance, the federal government, through the Nigeria chapter of the West Africa Agricultural Productivity Program, has designed strategies to support the upstream segment of the input supply chain of prioritized crops under the ATA. Under this program, public agencies (including universities and research institutes) and commercial firms are being mobilized and funded to increase the production of breeder and foundation seeds.

Conclusions

Nigeria's ongoing agricultural transformation agenda has a huge potential to create a considerable expansion in the quantity of modern inputs required by farmers and thus open a large window of demand for loans to finance the necessary transactions. The equity capital of agrodealers and finance from informal sources are grossly inadequate to bridge the financing gaps that have emerged since total liberalization of the input market in 2011. In particular, the nonformal sources of finance currently being explored by agrodealers cannot be relied upon for the development of a modern and competitive agro-input market that can support the vision of the ongoing ATA.

In light of the foregoing, it important to reiterate that liberalization of the input procurement and distribution market and assignment of a crucial role to agrodealers in the input supply chain require the assurance of an external flow of funds for proper functioning of the supply chain. Finance must flow from the banking sector, which is expected to be catalyzed through the instrumentality of NIRSAL, and from importers, distributors, and suppliers of inputs in the form of value-chain financing. However, to improve the functioning of the input market and to provide improved service delivery by agrodealers, finance-

related policies will not suffice. In fact, finance will not substitute for missing input markets, nor will it be the panacea for the critical infrastructural deficits, social insecurity, and low effective demand by agrodealer customers, which may have long-term adverse effects on profitability. Thus, skill gaps in financial management, business planning, and inventory management need to be bridged.

Furthermore, diversification of product coverage by agrodealers is likely to enhance their credit rating. In the same vein, efforts aimed at expanding agrodealers' scale of operation agrodealers in terms of financial incentives and skill development will need to be far more inclusive than hitherto has been the case, especially to level the playing field for female agrodealers. Finally, the low effective demand of customers is symptomatic of a sector-related conundrum in terms of the possibility of agrodealers' turnover being adversely affected by farmers' limited purchasing power. This implies that efforts aimed at improving the input distribution system may not yield the desired outcome, unless there is a simultaneous transformation of the output marketing system to enhance farmers' access to remunerative output markets and to stabilize their income. Policy actions in these areas should, therefore, be expedited, and evidence-based support to nurture the process is a strongly recommended area of further research.

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