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Project Office Hampden Square, 4800 Montgomery Lane, Suite 600, Bethesda, MD 20814 • Telephone: (301) 913-0500
Telex: 312636 • Fax: (301) 652-3839

THE CONTRIBUTION OF AGRIBUSINESS TO NATIONAL INCOME AND EMPLOYMENT IN JORDAN

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Authors: **Ismael Ouédraogo, Ph.D., Abt Associates Inc.**
Rosemary Hyson, Abt Associates Inc.

Prime Contractor: **Abt Associates Inc.**, 55 Wheeler Street, Cambridge, MA 02138 • (617) 492-7100

Subcontractors: **Harvard Institute for International Development**, Harvard University, One Eliot Street, Cambridge, MA 02138 • (617) 495-9779
Food Research Institute, Stanford University, Stanford, CA 94305-6084 • (415) 723-0693
North Carolina State University, Department of Economics and Business, Box 7645, Raleigh, NC 27695-7645 • (919) 515-3107
Abel, Daft & Earley, 1410 King Street, Alexandria, VA 22314 • (703) 739-9090
International Science and Technology Institute, 1129 20th Street, NW, Suite 800, Washington, D.C. 20036 • (202) 785-0831
International Food Policy Research Institute, 1200 17th Street, NW, Washington, D.C. 20036 • (202) 862-5600

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PREFACE

USAID/Jordan has retained the Agricultural Policy Analysis Project, Phase II (APAP II) "...to measure the contribution agribusiness makes toward gross domestic product and employment. This information will be used in the agricultural sector assessment and implementation plan as well as serve as a baseline to monitor progress and change."

The A.I.D./Near East Bureau financed the initial work to develop the methodology that was used, after further refinements, to estimate the contribution to national income and employment in Jordan.

EXECUTIVE SUMMARY

Agribusiness in Jordan represented an average of 29 percent of Gross Domestic Product (GDP) and contributed 58 percent of its growth during the period 1987-91. The share of the agricultural sector of GDP presented in traditional sectoral analysis underestimates the importance of agriculture in Jordan. The concept of agribusiness, including agriculture and agriculture-induced activities, reflects better the total contribution of agriculture to the economy. Although this concept is widely recognized, because of the lack of information on the size and performance of agribusiness, crucial macroeconomic and sectoral policy decisions continue to be based on the traditional sectoral shares of GDP.

The purpose of this study is to measure the contribution of agribusiness to gross domestic product and employment in Jordan, as part of the agricultural sector assessment and implementation plan, and to serve as a baseline to monitor progress and change.

Definition and Components of Agribusiness

Following Davis and Goldberg, who propagated the concept, *agribusiness* is defined to include agricultural production and activities that are induced by or depend on agriculture. For the purpose of analyzing its contribution to national income, agribusiness has been defined to include:

- agricultural production of food and fiber;
- supply of the following goods and associated services: inputs, equipment, infrastructure, and energy (fertilizer, chemicals, machinery, water, and electricity) for agricultural and agroindustry;
- agroindustrial processing of food and fiber, including food, beverages, tobacco, textiles and clothing, leather, wood, and paper products; and,
- agribusiness services, which include transportation, storage, and sometimes processing of food and fiber, trade and distribution of produce and processed food and fiber, and other agribusiness support services.

Measuring the Size and Performance of Agribusiness

Analysts have usually relied on input-output (I/O) models in their attempts to systematically measure the size of the agribusiness, or food and fiber system. Unfortunately, I/O tables require considerable expense, expertise, and time. The information is often obsolete by the time the table is finalized for analysis. For example, it took five years to complete the first I/O table for Jordan.

An alternative to I/O analysis is to disaggregate activities in national accounts and estimate the share of agribusiness in these activities. This study used available data from the

Department of Statistics, the Ministry of Agriculture, and information gathered from interviews with agribusiness operators to estimate these shares. This method refines the authors' previous attempt that used a limited set of secondary data to measure the contribution of agribusiness to national income and employment in countries of North Africa and the Near East.

Size and Importance of Agribusiness in Jordan

Contribution to GDP. Under traditional definitions of national accounts, agriculture only comprised 6 percent of national income during the period 1987-1991. When activities are disaggregated and regrouped as the agribusiness sector, the share of this sector is more than four-fold, an average of 29 percent. Services remain dominant overall, as non-agribusiness services account for more than half of GDP under both systems. The largest shift is evident in the industrial sector, where the share of non-agribusiness industry is only 17 percent of national income, compared to the 30 percent contribution of traditional industrial activities. Agribusiness' contribution to GDP is fairly evenly spread between agricultural production, agroindustry, agricultural inputs, equipment, energy, and services.

Contribution to Employment. Applying the sectoral share of agribusiness to a breakdown of employment indicates that agribusiness represents proportionately less of total employment than national income. A true comparison, however, cannot be made since no data were available for employment in the agricultural sector itself. Still, in setting priorities for development and growth, it is important to be able to draw parallels between the sectors contributing to national income and their implications for employment.

Contribution of Agribusiness to Growth of GDP. The importance of agribusiness in Jordan can also be assessed by its contribution to economic growth. Analyzing the traditional sectors of GDP from 1987 to 1991, agriculture provides the smallest contribution (11 percent) to growth behind industry and services. This study shows, as is illustrated in the tables below, that the *agribusiness* sector —at 58 percent— contributed the largest share to economic growth over the same period.

Contribution to National Income and Economic Growth of Traditional Sectors, 1987-1991 Averages

Measures	Agriculture	Industry	Services	GDP
Share	6.4%	30.4%	63.2%	100.0%
Growth	12.5%	8.4%	6.0%	---
Weighted Growth	0.8%	2.5%	3.8%	7.1%
Contribution to GDP's Growth	11.2%	35.6%	53.2%	100.0%

Contribution to National Income and Economic Growth of Agribusiness and Other Sectors, 1987-1991 Averages

Measures	Agribusiness	Non-Agribusiness Industry	Non-Agribusiness Services	GDP
Share	29.0%	17.1%	54.0%	100.0%
Growth	14.3%	0.8%	5.4%	---
Weighted Growth	4.1%	0.1%	2.9%	7.2%
Contribution to GDP's Growth	57.8%	1.8%	40.4%	100.0%

Contribution of Domestic Production to Food and Fiber Products. An inquiry into the domestic content of agribusiness products provides further insight into the nature of the intersectoral linkages that characterize the agribusiness sector. Although it is difficult to examine the entire sector, it is feasible to investigate the contribution of domestic production in key activities in agroindustry, such as food processing. Increasing the domestic content of agribusiness, however, will add value to the economy only if the added domestic production reflects the country's comparative advantage.

Policy Environment of Agribusiness in Jordan

In recent years, a few world-wide conditions have greatly affected not only agribusiness, but the whole of Jordan's economy—the 1991 Gulf crisis, the regional peace negotiations, the collapse of the Soviet Union and ensuing creation of new and independent states in Central Asia and Eastern Europe, and the formation of the single European market. All these conditions affect the trade of Jordan's agribusiness products. In addition to their impacts on commerce, markets and prices, these regional situations also affect tourism, and consequently, the food service component of agribusiness.

The on-going Jordan Agricultural Sector Assessment and Implementation Plan exemplifies the interest that the Kingdom puts on agricultural production. The size of the agribusiness sector and its contribution to economic growth warrant a broadening of this assessment to the other components of agribusiness. A limited series of interviews suggest that government could enhance the dynamic growth of the agribusiness sector by facilitating the communication of market information and opportunities in Jordan and abroad and by assisting entrepreneurs to develop the capacity to exploit, where appropriate, such opportunities.

Policy Implications and Recommendations

The findings of this study indicate that agribusiness plays an important role in the economy of Jordan. Its share of national income is greater than that of non-agribusiness

industry, and its contribution to the growth of the economy over 1987-1991 was the largest of all sectors. Macropolicy decisions in Jordan should take these measures into account instead of basing them solely on traditional sectoral shares, which underestimate the total importance of the agricultural sector in the economy.

Key Areas for Monitoring Progress and Change in Agribusiness

In addition to agricultural production and agricultural export performance indicators, key areas for monitoring progress and change can be identified by analyzing the performance of major components of the agribusiness sector. Beyond the measures given in this report, some strategic areas to monitor include:

- Technology development for irrigated agriculture to maximize the efficient use of water resources in Jordan.

- The evolution of food processing industries.

- Competitive imports, which show the potential for increase of domestic production to satisfy either final demand or the requirements for processing of food and fiber products, if not in quantity then in quality.

Recommendations

The findings of this study reinforce the notion that the linkages between agriculture and related industry and service sector activities comprise a significant portion of national income and economic growth. Consequently, these activities bear a better understanding by policymakers to promote overall growth and develop the agribusiness sector.

The Ministry of Agriculture is well suited to play a key coordinating role with other ministries and between the public and private sector in the development of agribusiness. A few aspects of this role are suggested below.

- To strengthen the relationship between agriculture and other sectors, the on-going policy dialogue regarding the agricultural sector may be broadened to include input and equipment suppliers, and operators in food processing, hotels and eating places, and local traders and exporters of food and fiber products in addition to those in crop, livestock, and forestry production.

- The participation of private agribusiness operators is essential to the design and implementation of sound policies for the promotion of agribusiness activities in Jordan. The perceived constraint of some agribusiness operators is that they lack information about market opportunities in domestic and export markets. Efforts should be made to improve market information.

- On-going efforts to pursue joint ventures should be continued. Such joint ventures would assist Jordanian agribusinesses produce output to meet standards in the different markets, as well as identify and assist in the entry to particular niche markets.

- The monitoring of progress and change in agribusiness will be facilitated and timely if data can be obtained, either from the Department of Statistics, other government institutions, or organizations that better reflect the relationships between different sectors.

1. INTRODUCTION

Policymakers need information on the importance and performance of macroeconomic sectors to institute policies to promote economic development. Analysts have traditionally made available to policymakers, based on national accounts statistics, information about three sectors of the economy: agriculture, industry, and services. These sectoral measures suggest that over the course of economic development the share of agriculture declines in national income and employment generated, while the shares of industry and services increase. Based on these sectoral shares, policy recommendations are often made to de-emphasize agriculture in favor of industry and services. For example, in evaluating structural adjustment in Tunisia, the World Bank (1992) argued that "Tunisia surely has to seek a development path emphasizing industry and services. . . Normally, agriculture's role should be to shrink its share of GDP in an orderly way. . . " While the report goes on to support certain selected agribusiness activities as part of development strategy, the statements underscore the importance of being able to clearly identify the relative importance of food and agriculture-related industry and services in development.

1.1 Shortcomings of the Use of Traditional Sectoral Shares of GDP

The use of these sectoral shares of GDP for policymaking decisions, however, is fraught with shortcomings. One major limitation of these traditional measures is that they do not account for the interdependency, which increases as the economy expands, between agriculture and other economic activities. Manufacturing, usually the most dynamic sector in industry, produces for and depends on other sectors of the economy, including agriculture. The service sector supports other "productive" sectors, including agriculture. Because of the increasingly interdependent modern economy, a benign neglect of agriculture and agriculture-induced activities would have detrimental consequences for other sectors and the entire economy.

By overlooking the interdependency between agriculture and other activities, the traditional categorization of economic sectors into agriculture, industry, and services fails to capture key aspects of the process of economic growth. As economic development proceeds, specialization increases and many food and fiber-related activities previously performed by farm operators are increasingly handled by off-farm enterprises. For example, agricultural producers increasingly make use of purchased inputs such as fertilizers, pesticides, irrigation, equipment, and machinery. When such off-farm activities (farm input supply, financing, transportation, output processing, storage, and distribution) were performed by farm operators, they were implicitly accounted for in the measured income of the agricultural sector. In modern economies, these same activities are accounted for in the industrial and service sectors of national income accounts. Partly because of this method of accounting, the apparent share of agriculture in GDP diminishes as economies grow.

As consumers' incomes grow, they can afford more than the necessities represented by basic food and fiber products. Consumers with increased disposable incomes purchase foods and fiber products with higher value added, such as processed foods that are made available to consumers in appealing forms and at convenient locations.

Thus, many related value added activities, upstream and downstream from production agriculture account for an increasing part of economic growth. The ensuing increased off-farm production, which makes processed foodstuffs and fiber more readily available to consumers, further reduces the share of agriculture in GDP as the economy expands.[1] However, the declining share of agricultural production in the economy does not diminish the strategic importance of this sector to the economy, if the range of activities that depend on or are induced by agriculture as the economy expands are taken into consideration.

1.2 Objectives of the Study

The underlying thesis behind this study is that *the agriculture sector in Jordan is much more important to the economy than the traditional measure of its share of GDP would indicate.* Food and fiber production and other agriculture-related industries and services are critical to the economic growth process in Jordan, but their link to agriculture is masked in traditional national income accounts. One needs to define a sector that captures the backward and forward economic linkages that are set in motion by agriculture. Equally important, one needs to measure the importance of these linkages between agriculture and other activities to provide decisionmakers with better yardsticks with which to allocate scare resources for broad-based, sustainable development. Balis (1992) at AID/Near East Bureau observed that "the common practice of collecting and reporting the macroeconomic data for developing countries is not consistent in the treatment of the agribusiness sector, and frequently obscures the importance of this sector."

The objectives of this study are to:

- Collect from various sources secondary data, cross-checked with the U.N. International Standard Industrial Classification (ISIC) of All Economic Activities to categorize agribusiness and other sectors of GDP.

- Discuss with appropriate officials and professionals the structure and composition of the agribusiness sector and its linkages to other sectors, and collect information on current policies being implemented that directly affect the agribusiness sector.

- Estimate the shares of agribusiness activities in the various sectors and subsectors of the economy using appropriate methods of computation and estimate the economic contribution made by agribusiness and other sectors toward GDP and employment.

- Estimate the contribution of domestic production of food and fiber to the value added in the agribusiness sector.

[1] Obviously, the share of agriculture may also diminish because of poor performance in the agriculture sector itself. In part, this may be explained by weaknesses in the agribusiness sector, for example, inefficiencies in input distribution and output marketing.

This report is organized as follows. Chapter 2 discusses the definition and the components of an agribusiness sector. Chapter 3 presents approaches for measuring agribusiness' contribution to income and employment. Chapter 4 presents the major findings of the study, including the contribution of agribusiness to GDP and employment; the contribution of domestic food and fiber to agribusiness development; and key areas to monitor progress and changes in agribusiness sector. Conclusions, implications for policy, and recommendations are presented in Chapter 5. Additional detail on the method and the data base developed during the course of this study are presented in the appendix.

2. DEFINITION AND COMPONENTS OF THE AGRIBUSINESS SECTOR

Davis and Goldberg (1957) coined the term *agribusiness* and defined it as "the total sum of all operations involved in the manufacture and distribution of farm supplies; production operations on the farms; and the storage, processing, and distribution of farm commodities and items made from them." They had argued that the traditional economic sectors artificially set apart the farm sector from activities that, in most part, were performed by farm operators traditionally in the U.S. (and still today in many developing economies). Furthermore, in many developing countries one finds that farm-household members engage in wholesaling and retailing of agricultural produce and prepared foods as a natural extension of farming. Many of these activities are in the informal sector and are, unfortunately, not recorded in national accounts. When they are recorded in the formal sector, however, these activities are traditionally considered part of the service or industry sector.

The term *agribusiness* is now widely used by analysts and decisionmakers, although some have used more restrictive definitions. For example, in its narrowest sense, agribusiness includes only agroindustries, those "enterprises that process materials of plant or animal origin" (Austin, 1992) into food, beverages, tobacco, textiles, wood, paper, and leather products. Another, still narrow definition, adds those industries that manufacture agricultural inputs and farm machinery to those involved in agroprocessing, but still excludes agricultural production and related activities in the traditional service sector.

It remains most common, however, to use *agribusiness* based on Davis and Goldberg's broad definition to include the traditional agriculture sector and all activities that are induced by, or closely dependent on, agriculture. The "food and fiber system" in the U.S. (Lee et al., 1987), as in Pakistan (Ali et al. 1989), represents agribusiness broadly defined. A previous agribusiness strategy assessment for A.I.D. noted that agribusiness represents "the chain from input producers and farm suppliers, assemblers, processors, wholesalers, brokers, importers, exporters, retailers, and institutional distributors to consumers, as well as such functions as research and development, transportation, packaging, storage, promotion, financial services and a variety of government activities, including regulation" (Newman et al., 1989). This definition of agribusiness better accounts for the total contribution of agriculture-related activities to the economy.

For the purpose of measuring the contribution of agribusiness to GDP and employment in Jordan, this study focuses on the agribusiness sector defined to include four components:

- agricultural production of food and fiber;
- supply of the following goods and associated services: inputs, equipment, infrastructure, and energy (fertilizer, chemicals, machinery, water, and electricity) for agriculture and agroindustry;

- agroindustrial processing of food and fiber, including food, beverages, tobacco, textiles and clothing, leather, wood, and paper products; and,

- agribusiness services, which include transportation and storage of food and fiber, trade and distribution of produce and processed food and fiber, and other agribusiness support services, including government services.

Because the measurement of agribusiness in Jordan is a novel area of investigation, a few points need added emphasis. Our definition of agribusiness is consistent with that of Davis and Goldberg, who coined this word, and that of USDA, which uses the term food and fiber sector. In both instances, agriculture is part of agribusiness. Including food and beverages in agribusiness also follows common practice. Food and beverages are agroprocessing activities, which are considered wholly part of agribusiness. In turn, agroprocessing activities are part of agroindustry, which is an important component of agribusiness. The inclusion of a wide array of economic activities in agribusiness, or food and fiber sector, is implied in the I/O framework, which is used to estimate the contribution of the agribusiness sector to GDP and employment. Our inclusion of mining activities in agribusiness is in line with these models as seen in the USDA's calculation of the contribution of the food and fiber sector to GDP that includes also mining of fertilizer products (Austin, 1992, p. 11). Furthermore, agribusiness includes the contribution of both export activities and imported inputs, as does GDP. The rationale is that both exports and imported inputs add value to the economy. For example, we readily accept that value added in agriculture should include the contribution of agricultural exports, even if these exports contribute to agribusiness in other, importing countries.

3. AN APPROACH FOR MEASURING THE CONTRIBUTION OF AGRIBUSINESS TO GDP AND EMPLOYMENT

Although agribusiness, or the food and fiber system, is now widely recognized as an important contributor to a country's economy, this importance tends to carry little effective weight in policymaking in developing countries. Crucial macroeconomic policy decisions continue to be based on the shares of traditional sectors of GDP: agriculture, industry, and services. Lack of information on the size and performance of the agribusiness sector undoubtedly constrains policymakers in instituting appropriate policies and allocating adequate resources for agribusiness development. In general, methodological problems and data availability frustrate the attempts to measure the contribution of agribusiness to national income and employment. The methodologies presented in this chapter, however, represent practical approaches that accommodate these constraints and provide policymakers with a concrete sense of the importance of agribusiness in Jordan.

3.1 Input/Output Model

Analysts in the U.S. have relied on the input-output (I/O) framework to measure the importance of the agribusiness sector (Davis and Goldberg, 1957) or food and fiber system (Lee et al., 1987; and Lee, 1992). In Pakistan, Ali and colleagues (1989) also used a similar approach to measure the contributions and interlinkages of the food and fiber system in Pakistan.

The I/O model analyzes the interdependence among industries in an economy and thus provides an appropriate framework to measure the size of the agribusiness sector. The procedure (see Appendix A) is as follows (Lee et al., 1987). Given a final demand for food and fiber products in the economy, one can derive the levels of outputs that are necessary for economic activities to satisfy this demand (by multiplying the inverse of the I/O coefficient matrix by the vector of final demand). Then multiplying these levels of outputs by their input/output coefficients in value added and employment, one determines the total contribution of agribusiness to national income and employment in the economy.[2] Because of the interdependence among industries, fulfilling this demand requires the contribution of most economic activities, even if in small amounts. By regrouping these activities in some fashion, one can show the composition of the contribution of agribusiness to the economy (Table 3.1).

It is an extremely arduous task, however, to prepare the table of input-output coefficients which describe the relationships between inputs and outputs and forms the core of the framework. This task requires a detailed survey of major economic activities, a series of involved manipulations of intermediary tables, and a careful reconciliation of the information tabulated (Narapalasingam, 1989). The thousands of operators' reported purchases must balance with their reported sales of goods and services. This process is an expensive endeavor,

[2] Under an I/O structure, value added and its components are fixed proportions of outputs.

consuming enormous amounts of time and expertise. For these reasons, I/O tables can be produced only several years apart. In the U.S., and as recommended by the U.N. to developing countries, the exercise is undertaken every five years. Unfortunately the time lag to make the I/O table available to analysts often takes more. The most recent U.S. I/O tables are from 1977 and 1982; the 1987 I/O table has not been made available to analysts as of March 1993. The Pakistan study noted above, used I/O tables from 1975/76 and 1984/5.

TABLE 3.1
COMPOSITION OF U.S. AGRIBUSINESS, 1989

Agribusiness Activities	VA_{AgBus}	Labor
Farming	9%	12%
Food processing	11%	6%
Manufacturing inputs	14%	12%
Transport, wholesaling, retailing	32%	32%
Eating places	9%	18%
Other	25%	19%

Shares of the 16% of GDP and 17% of employment in the U.S. contributed by agribusiness.

Source: Austin (1992), based on USDA data.
Total differs from 100 because of rounding.

Regardless of the size of the country, it takes time to collect data and, especially, to reconcile the information (Miller and Blair, 1985). Even in small countries, the complexity of building an I/O table puts considerable strains on available resources. It took five years to finalize the 1987 I/O table for Jordan (Department of Statistics, 1992). In the interim, Jordan has experienced such changes in economic conditions—first in 1988 and then in 1991 with the Gulf crisis—which prevent the coefficients used for the 1987 model from being applied to other years or easily adjusted.

The primary concern with using I/O models is that by the time the table is finalized for the analysis to proceed, the data may be already outdated, in spite of several methods used to readjust the coefficients. Another important concern in most developing countries is the limited number of people trained in constructing and manipulating I/O models (in academia, the statistical agency, and/or ministry of economy or planning). If enough individuals are not trained in using the model, I/O tables will not only take longer to produce, they will also have limited practical value. Thus, at present, an I/O model does not appear the most practical method to measure the size of agribusiness in Jordan.

3.2 Alternative to I/O Model: Disaggregating and Reclassifying National Accounts

An alternative to the I/O model is to disaggregate activities of traditional industry and service sectors and appropriately reclassify them into components of the agribusiness sector. Allen and Dy (1990) used such a method in the Philippines, using field observations to reclassify activities into the agribusiness sector to measure the contribution of agribusiness to national

income.[3] However, they provide little information on their approach, especially about the importance of agribusiness in the service sector. In an earlier study, Ouédraogo, Newman, and Hyson (1993) developed a practical approach that uses available secondary data to measure the contribution of agribusiness to GDP and employment in a few North African and Near East countries. This approach has been improved in the present analysis of the contribution of the agribusiness sector to Jordan's economy. Given more disaggregated and detailed information on national accounts, this iteration explicitly derives shares of agribusiness in energy, construction, and activities in the service sector. In the earlier study, lack of data forced an implicit derivation of the agribusiness shares for activities in energy, construction, and services.

3.2.1 Conceptual Approach: Share of Agribusiness in Economic Activities

We define α_i as the share of agribusiness in the generation of value added of the ith disaggregated activity, while β_i represents a similar share of employment. The contribution of agribusiness to GDP in the ith activity is the share of agribusiness times the value added in this activity. Employment is treated in a like fashion. Summing up these contributions across all disaggregated activities provides the total contribution of agribusiness to GDP and employment. Alternatively, the total contribution of agribusiness to value added (VA_{AgBus}) can be estimated as the aggregate share of agribusiness (α_{AgBus}) times total value (VA_{Tot}), and its contribution to employment (EMP_{AgBus}) as the aggregate share of agribusiness (β_{AgBus}) times total employment (EMP_{Tot}):

$$VA_{AgBus} = \sum(\alpha_i VA_i) = \alpha_{AgBus} VA_{Tot} \qquad 3.1$$

$$EMP_{AgBus} = \sum(\beta_i EMP_i) = \beta_{AgBus} EMP_{Tot} \qquad 3.2$$

β_{AgBus} and α_{AgBus} are weighted averages, the weights being value added and employment, respectively, across all disaggregated activities or sectors of the economy. If activities could be sufficiently disaggregated so that one could decide that it is either all agribusiness (1) or not (0), then α_i and β_i would be the same for each ith activity (either 1 or 0). By extension, if groups of activities are homogenous, one could assume that α_i and β_i will also be the same (here between 0 and 1).[4] The aggregate shares of agribusiness in total value added and employment

[3] In all three cases (Austin, Ali, and Allen and Dy), the agribusiness sector includes agriculture or the farming sector. In Pakistan, Ali et al. estimated that agribusiness contributed 48.6 percent to value added and 69 percent to employment in 1984-85.

[4] Through experience, practitioners have estimated that homogenous or kindred products have the same ratio of value added to value of production, with the implication that the factor payments (wages, rent, interest, profit) in these activities tend to be similar.

still take different values because they are calculated using different weights (value added and employment).

The task is to determine the share of agribusiness at the ith activity level (α_i or β_i) and then at the aggregate level for value added (α_{AgBus}) and employment (β_{AgBus}). The approach used in this study is to estimate the individual α_i for all activities in traditional industry and service sectors of national accounts. At this level of disaggregation, we assume that alpha is equal to beta.

3.2.2 Step-by-Step Procedure: Estimating the Shares of Agribusiness in Activities

An ideal procedure would have been to estimate simultaneously the share of agribusiness in all economic sectors to account for their interdependence, using the following relationship:

$$Agribusiness_j = \frac{\sum \alpha_i x_{ij}}{X_j} \qquad 3.3$$

where,

$Agribusiness_j$	= Share of agribusiness in the jth activity or sector,
α_i	= Share of agribusiness in the ith activity,
x_{ij}	= Purchase of output of the jth activity or sector by the ith activity
X_j	= Total output of the jth activity or sector, and
i	= Every discrete economic activity, such that $i \neq j$.[5]

This procedure requires a system of simultaneous equations, which is tantamount to building an I/O table. The available national account statistics do not allow this procedure for all activities. Because of these limitations, we resort to disaggregating and estimating the value added from agribusiness in each of the nine sectors of national accounts statistics—agriculture, mining, manufacturing, energy, construction, trade, transportation, financial and business services, and government and community services—one sector at a time.

To disaggregate GDP, the United Nations' International Standard Classification for All Economic Activities is used.[6] Since many countries, including Jordan, classify value added data

[5] Meaning that the use of one sector's own output (for example in energy) is unrelated to agribusiness.

[6] For more detailed description of the classification system and its categories, refer to United Nations Statistical Office, Department of Economic and Social Affairs, 1990.

according to this system, it facilitates organization of the data and cross-country comparisons. Within each of the nine sectors, activities are disaggregated up to four levels of further detail.[7]

A justification of this stepwise procedure also rests on the underlying assumption that energy, construction, and services can be viewed as supportive activities of the production of food and fiber products and their inputs and equipment, all of which occur in agriculture, mining of fertilizer materials, and manufacturing of agribusiness products, their inputs, and equipment. However, using the I/O model parallel, the shares of agribusiness derived from this procedure should be viewed more as primary direct links among agriculture and induced activities rather than the combined direct and indirect effects of agribusiness in the economy. From this perspective, one can assume the contribution of agribusiness derived from this procedure would be somewhat lower than one derived from an I/O analysis. This procedure schematically works through each sector as described below.

Agricultural Production of Food and Fiber (01). Alpha is taken to be 100 percent. This sector includes fishing and forestry in addition to crop and livestock production.

Mining (02). Alpha is equal to the value added from mining of fertilizer materials over the total value added from mining.[8] In the case of Jordan, these materials are almost exclusively phosphate and salt mining for potash.

Manufacturing (03). Alpha is 100 percent in food, beverages, and tobacco activities. In textiles, the share of agribusiness is the proportion of natural fibers used in spinning, weaving, wearing apparel, and leather goods. In wood products, the share of agribusiness in furniture and upholstery also depends on the proportion of natural ingredients in these activities.

Due to the way the classification groups products in the chemical sector, different approaches are necessary to estimate the subsector's α_i. The subsector includes both outputs that require agricultural products for raw materials, such as soap, and products that are inputs to agricultural production and agroindustry. To complicate the situation, the data groups most of these products with other non-agribusiness outputs, and no further details on value added, even for a particular product, are available. By contacting manufacturers of agribusiness products, however, it was possible to obtain information on the gross output of that product for the entire economy.

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[7] The extent of disaggregation depends on the type of activity and the data available. For example, it is not necessary to disaggregate the agriculture sector at all, because 100 percent of their activities are in the agribusiness sector. In other cases, even disaggregating to four levels of the ISIC does not make certain activities distinctly agribusiness or non-agribusiness. For such cases, additional estimations are required to determine the share of agribusiness for that ISIC category.

[8] The inclusion of mining activities in agribusiness is in line with USDA's calculation of the contribution of the food and fiber sector to GDP (Austin, 1992, p. 11).

In Jordan, the products using agricultural raw materials included soap, matches, and candles, although soap proved to be the only activity of consequence. The proportion of soap's output to gross output for the ISIC category in which it was grouped, multiplied by the percentage of agricultural raw materials, 100 percent, serves as the alpha for soap. Similar methods were used to estimate the share of plastic materials in agribusiness.

The value of soap output had to be separated from the manufacturer's total output, then using market share information, the total value of soap output in Jordan was calculated. After discussions with the principal manufacturer, it was determined that 100 percent of the soap's ingredients came from animal or vegetable products. Therefore, assuming homogeneity, the share of agribusiness value added in ISIC category 3523—the category which includes soap—equals the proportion of soap to total output for category 3523.[9]

The agricultural inputs produced in Jordan include fertilizers, pesticides, medicine for livestock, plastic pipes and parts for irrigation systems, plastic sheets for mulch and plastic houses, and plastic crates for food products. Fertilizers and pesticides, grouped in their own category, can easily be assigned a share of 100 percent. For inputs such as plastics, their value added is grouped with similar non-agribusiness products. Interviews with manufacturers and industrial specialists provided background information to calculate the percentage of agribusiness products in the total output for the ISIC category, which was used as a proxy of the agribusiness share in this activity. Alphas for the remaining subsectors—non-metallic mineral products, basic metal industries, and other manufacturing—were determined to be zero.

For petroleum refineries and repairs of machinery and equipment, the *Industrial Survey* lists the amount of these items purchased by mining and manufacturing activities according to the ISIC classification.[10] Alpha α_j for each of these activities is calculated according to Equation 3.4, listed below.[11]

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[9] If only 80 percent of the soap's ingredients were from animal or vegetable products, then the share of agribusiness from soap production would be 80 percent of the ratio of soap output to output for the ISIC group it is reported in.

[10] Repairs of machinery and equipment are classified in the service sector according to the ISIC Revision 2 classification. In Jordan, however, these activities are included in the industrial sector and are thus included here as well.

[11] Although this appears similar to Equation 3.3, Equation 3.4 does not employ column vectors and matrices, which still allows a solution for α_j despite gaps in the data set. These "gaps" occur when there is no information regarding activity i's spending on activity j. Equation 3.3 requires a data set with no gaps.

$$\alpha_j = \frac{\Sigma \alpha_i x_{ij}}{y_j} \qquad 3.4$$

where,

α_j = agribusiness content of activity j
α_i = agribusiness content of activity i that purchases or uses j
x_{ij} = expenditure by activity i on j
y_j = total value of production for activity j
j = ISIC category of economic activities in manufacturing, energy, construction, business services sectors; such that $i \neq j$.

The calculation of α_j for petroleum and repairs of machinery and equipment completes the set of alphas for agriculture, mining and manufacturing. These shares of are used to determine the shares of agribusiness in the remaining sectors, again, using Equation 3.4.

Energy (04). The *Industrial Survey* provides data on expenditure by activities in the industrial sector and total output of both electricity and water (y_j). The agribusiness share of energy was determined by using Equation 3.4, where i represents different economic activities within the agriculture, mining, and manufacturing sectors.

Construction (05). Equation 3.4 was also used to estimate alpha for the construction sector. Data for the purchase of construction sector services—new buildings and additions/improvements—by agriculture, mining, and manufacturing activities served as a proxy for the agribusiness share of construction. For 1988, such information was included in the *Industrial Census* for mining and manufacturing at the same level of disaggregation as value added for the manufacturing sector.[12] For lack of additional information, we have assumed a similar share of agribusiness for the entire 1987-1991 period. The agriculture survey only recently began to collect information on construction by farmers other than their own-account asset formation. This data is not yet available, and hence the exclusion of the amount of construction of agricultural production units (barns, storage facilities, irrigation canals) results in a slight underestimation of the construction sector's contribution to agribusiness.

Trade, Hotels and Restaurants (06). The two distinct components of this sector—trade and hotels and restaurants—require two different methods to calculate α_i. For the **wholesale** and **retail** trade activities, the national accounts statistics provide value added from trade by type of good for 1990 and 1991. The categories of traded goods correspond approximately with agribusiness shares developed for the production of agricultural and industrial goods. These

[12] For those familiar with the ISIC system, all value added data from the manufacturing sector was broken down to the fourth level of the ISIC classification.

agribusiness shares for production are applied to the corresponding category of wholesale or retail trade. The share of agribusiness for each trade category is multiplied by value added for trade. Summing up the agribusiness trade across the different categories and then dividing by total value added for wholesale and retail trade yields respective alphas for these activities. Due to the lack of data for 1987-1989, the weighted average of the 1990 and 1991 alphas for wholesale and retail trade were used for these years. These numbers must be treated with caution, however, since the period coincides with the Gulf crisis, when the embargo, blockades, and finally the war itself placed significant constraints on the volume and income derived from trade during this period.

With regard to **restaurants** and **hotels**, the share for restaurants is 100 percent and a proxy was used for hotels. This proxy was the share of hotel revenues derived from food and beverage services, including catering, restaurants, and room service. Hotel managers responding to an informal survey suggested that food and beverage services account for approximately 25 percent of all hotel revenues in Jordan.

Transportation, Storage, and Communication (07). Data from the *Industrial Survey* for each year lists the amount spent by each activity in the mining and manufacturing sectors on transportation and storage (all types) and communication. Using Equation 3.4, the share of agribusiness in both can be calculated. The estimates for α_i in both the transportation and communication sectors are biased downward, however, since no data are available on the use of these services by agriculture.[13]

Financing, Insurance, Real Estate, and Business Services (08). Diverse data sources for this sector requires several different methods to calculate the α_i for this sector's activities. Certain items, such as data processing and software consulting, have shares of 0 percent. For others, such as real estate, financial institutions, and equipment leasing, the data available for expenditures on these services cannot easily be used to determine the share of agribusiness. Instead, it is assumed that these activities provide services to different sectors in proportion to those sectors' shares of the rest of the economy. Therefore, the alpha for real estate, financial services, and leasing of machinery and equipment is approximated by the proportion of agribusiness in other sectors of the economy to total GDP. Alphas for the remaining activities in this sector, legal services, advertising, insurance, and accounting, are calculated using Equation 3.4 and data from the *Industrial Survey*. Again, no information was available for the agricultural sector's use of such services, although it is likely to be small.

Community, Social, and Personal Services (09). Community services in Jordan are made up of government services, non-profit private services, and household provided services. Value added in this sector is estimated not from the value of output but from factor payment, i.e., compensation of employees and depreciation. The share of agribusiness in government services is approximated by the proportion of compensation of employees in activities linked to

[13] The surveys for both the agriculture and transport sector were revised in 1992. The surveys' results were not available at the time of the study, but are potential sources of information to improve future estimations.

agribusiness. The agribusiness activities most easily identifiable include: the Ministry of Agriculture, agriculture vocational training programs, faculties of agriculture at the universities, provision of infrastructure and other services to agribusinesses in industrial cities, and the government-funded activities of the Jordan Cooperative Organization (JCO). The majority of the services in this sector relevant to agribusiness are provided by the government.[14]

Alpha is taken to be zero for household provided services, and only the non-profit activities contributing to agribusiness are business associations and labor unions concerned with agribusiness-related activities. The percentage of these associations' activities which focus on agribusiness are assumed to reflect the relative importance of agribusiness activities in the economy. Therefore, the proportion of agribusiness in *industrial* activities over total GDP is the proxy used for the share of agribusiness in business and labor organizations.[15]

The value added data was assembled in tabular worksheets by sector, where the agribusiness shares were assigned and/or calculated. Results from the sectoral spreadsheets fed into a table for the entire economy. This table also enabled calculation of aggregate shares at the subsectoral and sectoral levels. The set of shares, α_i and β_i are then applied to value added and labor data to determine the contribution of agribusiness to GDP and employment, according to the formulae in Equations 3.1 and 3.2. The tables of results in Appendix B, in addition to giving results, provide examples of the ISIC classification used and demonstrate the final computation of value added.

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[14] Although such community services as education and health care, according to the ISIC, are to be classified with their corresponding private sector activities in categories under "Community Services," the Hashemite Kingdom of Jordan does not combine the two. Rather, publicly-financed community services appear in the category, "Producers of Government Services" when GDP is given by sector. Therefore, such activities as the training of agricultural specialists at the universities will appear as a percentage of value added in the "Producers of Government Services" sector.

[15] The activities of business associations and labor unions are concentrated in the industrial sector, which is why agriculture and services are excluded. The extent to which these organizations' activities relate to agribusiness still bears further investigation.

4. SIZE AND IMPORTANCE OF AGRIBUSINESS IN JORDAN

Agribusiness in Jordan represented an average of 29 percent of Gross Domestic Product (GDP) and contributed 58 percent of its growth during the period 1987-91. The results of the analysis show quite clearly that agribusiness is a significant contributor to national income and economic growth in Jordan. Although agricultural production consistently has the smallest share of GDP, when economic activities are recombined to group agriculture and its related activities together in the agribusiness sector, the share increases four times as much. The first part of this chapter discusses the relative importance of agribusiness to national income and employment and presents a brief characterization of the more significant activities contributing to the agribusiness sector. The following section examines agribusiness' contribution to economic growth. The chapter concludes with a further look at the use of domestic agricultural products in the food and fiber industry.

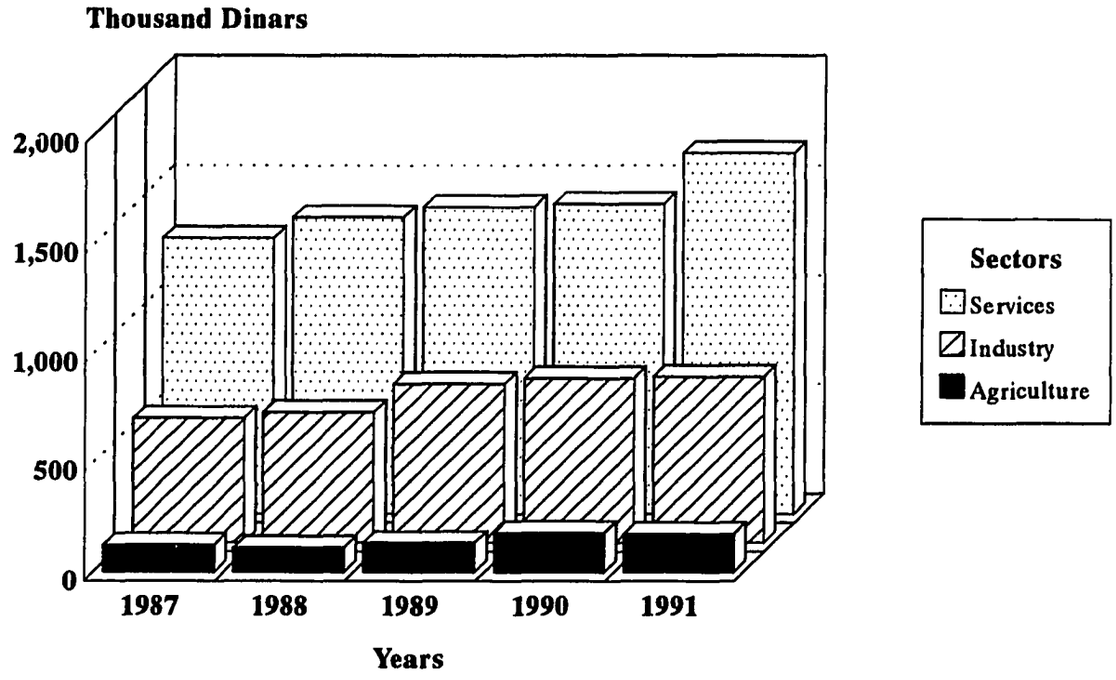
4.1 Contribution of Agribusiness to National Income: Traditional Sectors vs. Agribusiness

Under traditional definitions of national accounts, agriculture represented the smallest sector and contributed, on average, 6.4 percent to GDP. The service sector dominates the economy, comprising 63 percent of GDP, while industry's share is approximately 31 percent. When activities are disaggregated and regrouped into agribusiness, the proportion of national income derived from agribusiness averages 29 percent over the 1987-1991 period.

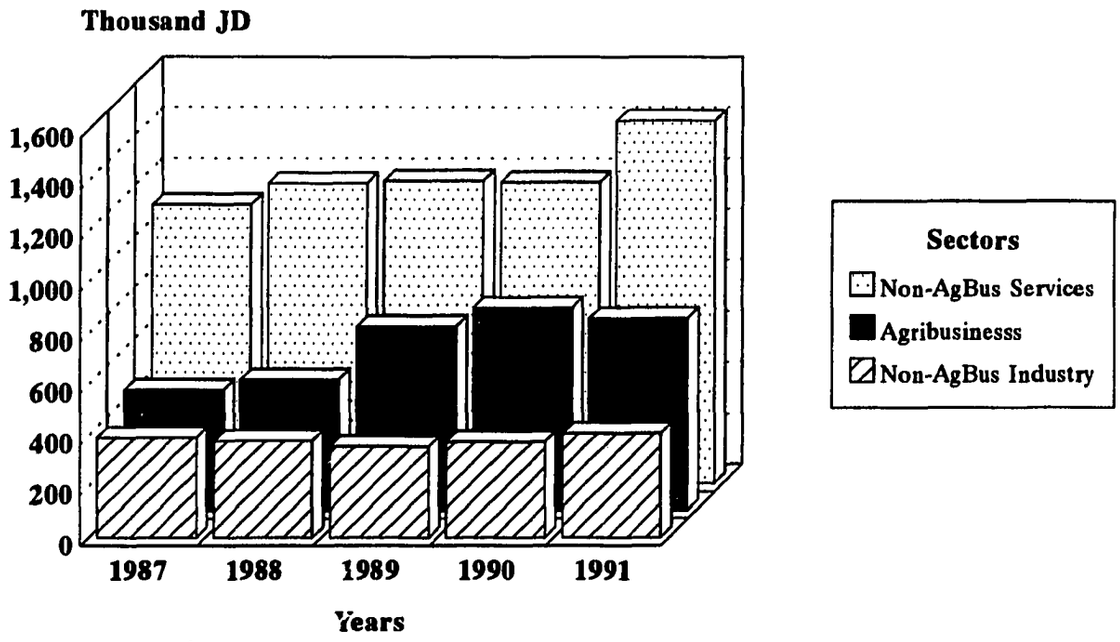
Figure 4.1 illustrates the striking contrast in contribution to GDP when agriculture and its related activities are reclassified into the agribusiness sector. The agribusiness sector, instead of non-agribusiness industry, becomes the second most important activity in the economy. The sector's contribution to national income ranges from 24 to 34 percent from 1987 to 1991, peaking out at 34 percent in 1990. Non-agribusiness services are dominant, comprising 54 percent of GDP. It is likely that this share is an overestimation, however, encompassing a few percentage points that rightly belong to the agribusiness sector. A lack of data on services consumed by agricultural producers, particularly with regard to transportation and storage, prevented value added for these services from being transferred to the agribusiness sector.

Although the service sector dominates Jordan's economy, it is the industrial sector that is most affected when activities are reclassified in the agribusiness sector. The sharp drop in industry's share of GDP as agribusiness mining and manufacturing activities are separated out testify to agribusiness' strong relation to the industrial sector. In terms of traditional sectors, industry represents 30 percent of GDP; however, this proportion drops to 17 percent without such activities as manufacturing of agricultural inputs or food processing.

FIGURE 4.1
Jordan: Traditional Sectors of GDP
Value Added at Current Prices, 1987-1991



Jordan: Contribution of Agribusiness to GDP
Value Added at Current Prices, 1987-91



4.1.1 Relative Shares of Value Added, 1987-1991

An examination of the growth paths of activities in the traditional sectors and the agribusiness sector further demonstrate the dynamic nature of the sector. Although the percentage of agricultural production in Jordan's GDP is not consistently declining as in other developing countries, the share remained relatively unchanged until 1991, when it dropped from 7.6 to 6.7 percent of GDP. It is entirely possible that this drop resulted from the Gulf conflict, which cut Jordanian producers off from traditional markets in Iraq, Saudi Arabia, and other Gulf states. Agribusiness grew significantly between 1988 and 1990, but dropped both in absolute terms and as a percentage of GDP from 1990 to 1991.[16] Beyond the decline in agricultural production, the drop in value added from phosphate and fertilizer mining and wholesale and retail trade. These activities appear to have been most affected by the drop off in agricultural trade activity caused by the Gulf War. Agribusiness value added in industry grew continuously over the period, but the only truly significant increase was between 1988 and 1989. Non-agribusiness industry, however, declines both in absolute terms and as a proportion of GDP from 1987-91. The shift in pattern for non-agribusiness industry implies that much of the growth experienced by the industrial sector came from its agribusiness activities. In contrast, the recombination of value added had little effect on the service sector's pattern of growth, suggesting that the separation of agribusiness services from other service sector activities had little impact on the service sector's growth.

4.1.2 Components of Agribusiness (VA_{AgBus})

An examination of the different components of agribusiness can better characterize the nature of the sector and the relative strengths of the interaction between different economic activities and agriculture.

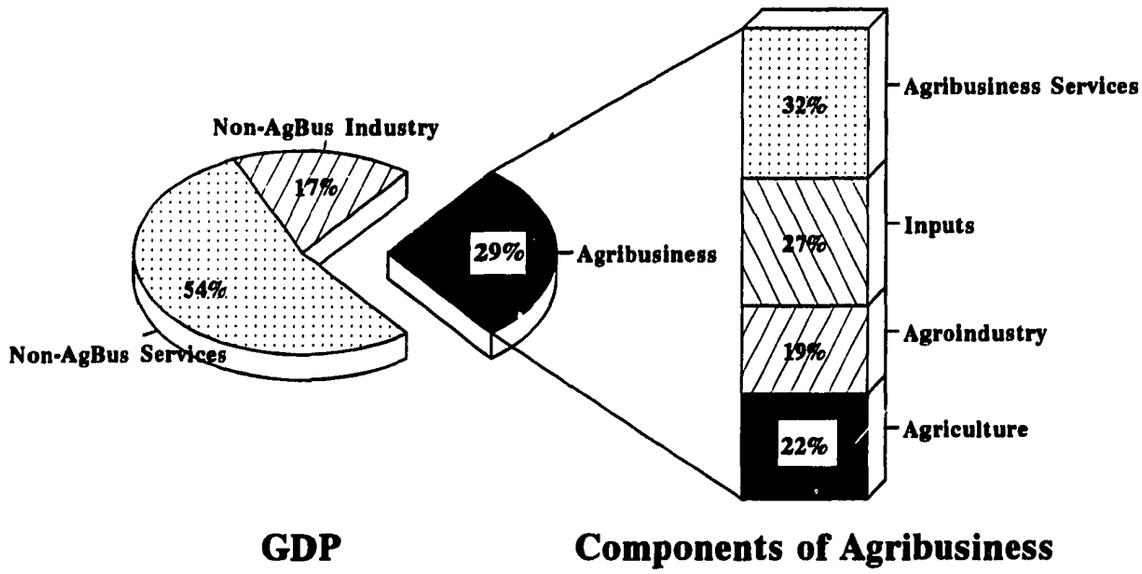
The agribusiness sector has been broken down into four components. The agricultural production component is simply value added from the agriculture sector under the traditional definition of National Accounts. Agroindustry includes food, beverage, and tobacco processing; textiles; wood products; and paper products. Chemicals, plastics, machinery and equipment, energy, and construction are grouped together in inputs and chemical products. The fourth component is services, which includes trade, restaurants and hotels, transport, communications, financial and business services, government services, and non-profit services.

As illustrated in Figure 4.2, the shares of the agribusiness sector are relatively evenly spread across the different components. The base of the agribusiness sector, agricultural production, represents 22 percent of agribusiness' value added. Agribusiness' two industrial components—agroindustry and inputs/equipment—comprise 46 percent of agribusiness' value added and together account for the largest share of VA_{AgBus}. With such a large proportion of VA_{AgBus} coming from these components, it is not at all surprising that non-agribusiness industry

[16] In addition to the absolute decrease in agribusiness' value added, total GDP rose rather than fell over the period, thus reducing α_{AgBus} even further.

becomes the smallest sector in the economy when agribusiness is broken out from the traditional sectors. Agroindustry contributes 17 percent to VA_{AgBus} and agricultural inputs, chemical products and energy constitute 29 percent of VA_{AgBus}. Although services are overwhelmingly dominant in the traditional sectors of the economy, agribusiness services only represent 32 percent of VA_{AgBus}. Part of the low proportion of agribusiness services can be attributed to a lack of data on services provided to agriculture which prevented their reclassification into agribusiness' value added.

FIGURE 4.2
Jordan: Components of Agribusiness Value Added, 1987-1991, Average



Abt Associates Inc., APAP II

Table 4.1 presents another look at these components, according to the categories defined by Austin (see Table 3.1). Given the importance of phosphate mining in Jordan, a seventh category for this activity was made from the "other" category. Compared to similar components of the U.S. agribusiness sector given in Table 3.1, the proportion of agricultural production in Jordan's agribusiness is more than twice the share of farming in the U.S. Food processing's 14 percent represents a slightly larger share of agribusiness' value added in Jordan than the U.S.'s 11 percent. Most of this share comes from tobacco products (7%), followed by food products (5%), and beverages (2%). Overall, the bulk of agribusiness value added in Jordan is still

derived from primary sectors such as agriculture and mining, a pattern more characteristic of developing countries. In contrast, value added in the U.S. agribusiness sector is mainly derived from activities using agricultural products as raw material, such as trade, retailing, food service, and agroindustry. The food processing, food service, and activities in the "other" categories were solid performers over the 1987-1991 period, and the only segments of the agribusiness sector not to suffer losses in value added from 1990 to 1991.

TABLE 4.1
COMPOSITION OF AGRIBUSINESS SECTOR IN JORDAN, 1987-1991, average

Agribusiness Activities	VA_{AgBus}
Farming	22.2%
Food Processing	14.3%
Manufacturing Inputs	4.4%
Transport, wholesaling, retailing	15.3%
Eating Places	3.6%
Mining	20.3%
Other	19.9%

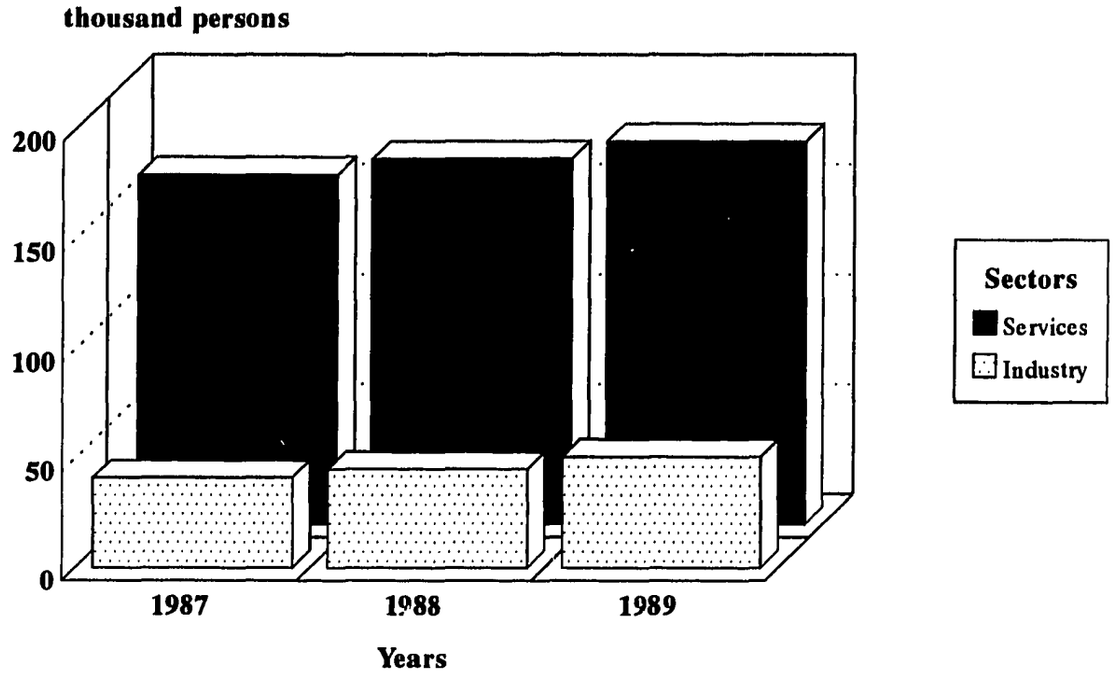
Overall, value added of the agribusiness sector is 29% of GDP. "Other" includes textiles, wood and paper products, rubber products, energy, construction, communication, financial and business services, government-funded activities in support of agribusiness, and community/social services. (Austin, 1992)

Source: Authors' calculations

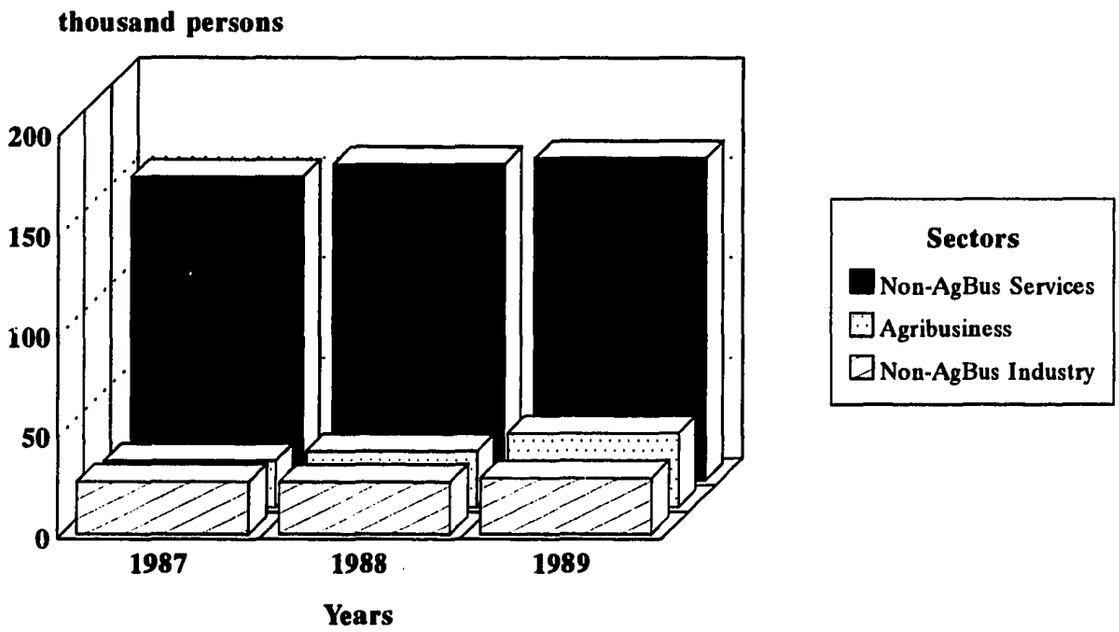
4.2 Contribution of Agribusiness to Employment

Applying the sectoral shares of agribusiness to a breakdown of the non-agricultural employment indicates that agribusiness contributes less to employment than to GDP. The percentage of the non-agricultural work force employed in agribusiness ranges from 11 to 16 percent of total employment, with an average of 13 percent. Data constraints, including the exclusion of the agriculture sector from employment data, prevent a true comparison with agribusiness' contribution to national income. In addition, the most recent year for which the non-agricultural data were available was 1989. If data were available for agriculture, one would expect agribusiness's contribution to employment to increase. The concentration of employment in the service sectors, where $ß_i$ ($\alpha_i = ß_i$) is particularly low, also accounts for the low contribution of agribusiness to employment. As Figure 4.3 illustrates, there is very little change in service sector employment when the agribusiness sector activities are separated out. In contrast, the employment in industry falls by more than half.

FIGURE 4.3
Jordan: Employment by Traditional Sectors 1987-1989, excluding agriculture



Jordan: Agribusiness in Employment 1987-1989, excluding agriculture



4.3 Contribution of Agribusiness to Jordan's Economic Growth

The importance of a sector can also be assessed by estimating its contribution to the economic growth of the country (Kuznets, 1969).[17] The contribution of a sector to the overall growth of GDP depends on the growth rate of this sector and its share of GDP. Based on Kuznets' formula, this relationship is as follows:

$$\frac{dP_i}{dP} = \frac{r_i P_i}{dP} = \frac{r_i \frac{P_i}{P}}{\sum r_i \frac{P_i}{P}} \qquad 4.1$$

where

dP_i/dP = Contribution of the ith sector to the growth of GDP,
P_i = Value added of the ith sector,
P = Total GDP,
P_i/P = Share of GDP of the ith sector,
r_i = Growth rate of the ith sector, and
i = Agribusiness, non-agribusiness industry, and non-agribusiness services.

This relation is often estimated to compare the contribution of sectors to economic growth at different periods.[18] We are interested here in the average contribution of sectors to the growth of the economy over the limited period, 1987-1991, for which we have data. Simply put, the contribution of a sector to the growth of GDP is the growth rate of this sector weighted by its share of GDP over a period. Tables 4.2 and 4.3 show the contributions of the agricultural production sector and agribusiness to economic growth in Jordan from 1987-1991.[19]

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[17] We are indebted to Stephanie Wilson of Abt Associates Inc. for suggesting this analysis.

[18] Coppin (1992) and Nissam (1992) hold opposite views on whether one should use arithmetic or geometric mean of growth rates, and beginning or end-period of sectoral shares in applying such an analysis. For the purpose at hand, we use *average* sectoral shares and geometric mean of growth rates, estimated by ordinary least squares. Using arithmetic growth rates affects only marginally the results.

[19] Note that for the traditional sectors (Table 4.2), the growth rate of GDP estimated directly by OLS yields an almost identical result, 7.12 percent, to that estimated by summing up the weighted growth rates of sectors. We used this information to normalize the sectoral growth rates in Table 4.3, where summing up sectoral weighted growth rates yielded a slightly different growth rate for GDP because of a weaker coefficient of determination in the regression for non-agribusiness industry. The statistical results of all other sectors were significant despite the limited number of observations.

TABLE 4.2
Contribution to Economic Growth of Traditional Sectors, 1987-1991 Averages

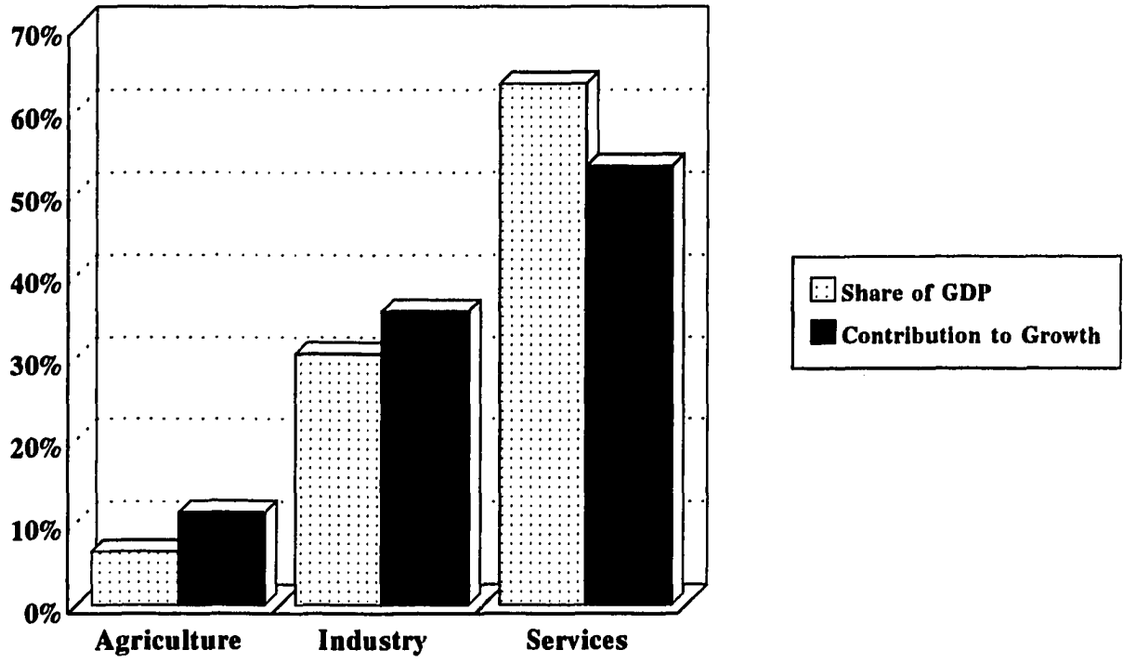
Measures	Agriculture	Industry	Services	GDP
Share	6.4%	30.4%	63.2%	100.0%
Growth	12.5%	8.4%	6.0%	---
Weighted Growth	0.8%	2.5%	3.8%	7.1%
Contribution to GDP's Growth	11.2%	35.6%	53.2%	100.0%

TABLE 4.3
Contribution to Economic Growth of Agribusiness and Other Sectors
1987-1991 Averages

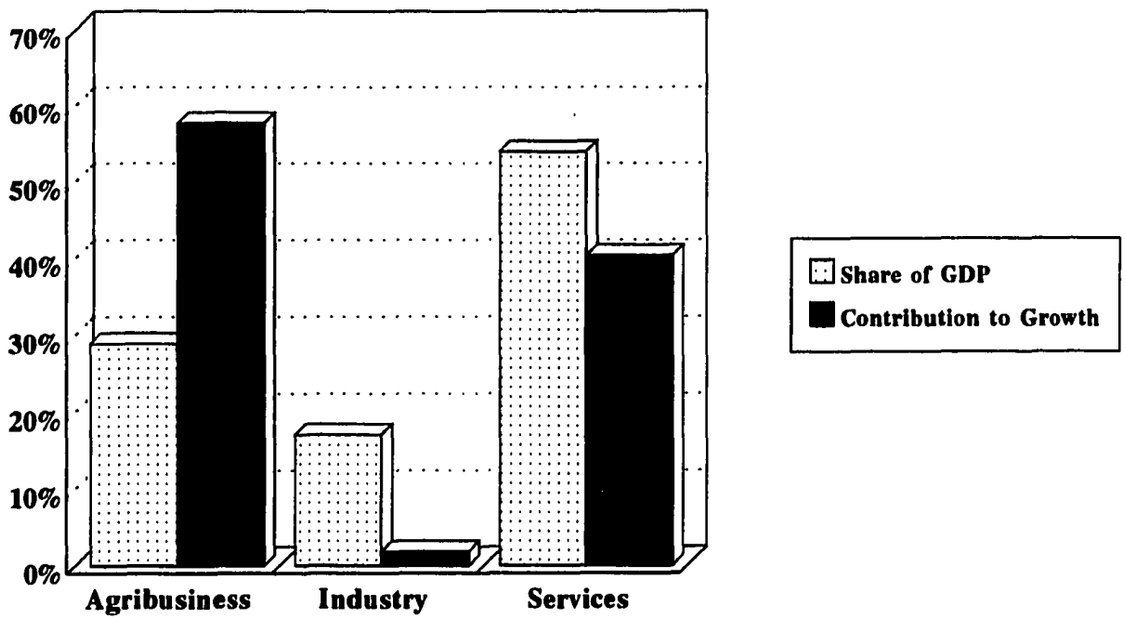
Measures	AAgribusiness	Non-Agribusiness Industry	Non-Agribusiness Services	GDP
Share	29.0%	17.1%	54.0%	100.0%
Growth	14.3%	0.8%	5.4%	---
Weighted Growth	4.1%	0.1%	2.9%	7.1%
Contribution to GDP's Growth	57.8%	1.8%	40.4%	100.0%

Between 1987 and 1991, value added in agricultural production grew faster than that for any other sector in Jordan. One would expect a strong multiplier effect of this growth throughout the economy. Yet, the analysis of the contribution of traditional sectors to the growth of GDP does not give full credit to agriculture for its role. According to these measures, the contribution to economic growth of agricultural sector thus estimated was the smallest (about 11 percent) of all sectors over this period. When one looks at agribusiness, however, the contribution of agribusiness to Jordan's economic growth over this period becomes the largest (approximately 53 percent) and is more than the other two sectors combined. Figure 4.4 presents the contrast between the traditional and the agribusiness system-approach perspective of the contribution of agriculture and related activities to Jordan's economy. These figures strongly suggest that the growth in the traditional industry sector is due in large part to food and fiber-related manufacturing activities: processing of food and fiber production and the manufacture of inputs and equipment for agriculture and other related activities.

FIGURE 4.4
Jordan: Sectoral Shares and Contributions to Growth of GDP Traditional Sectors, 1987-1991



Jordan: Sectoral Shares and Contributions to Growth of GDP Agribusiness and Non-Agribusiness Sectors, 1987-1991



4.4 Sensitivity Analysis

The Ministry of Agriculture and the USAID Mission have expressed a strong interest in the contribution of an agribusiness sector that excludes some activities such as mining of fertilizer products and manufacturing of wood products. Mining of fertilizer products is an important activity in Jordan, but its products are mostly for export. Also manufacturing of wood products uses mostly imported raw materials[20]. Both the Ministry of Agriculture and USAID Mission want to assess the extent to which excluding these activities affect the contribution of agribusiness to the economy. The flexibility of the approach allows one to estimate agribusiness to suit specific purposes on hand. Table 4.4 shows that by excluding these activities, the agribusiness sector still contributes an average of 22.62 percent to GDP over the period 1987-1991. Excluding these activities in the industry sector has a relatively small impact on the contribution of agribusiness to GDP because agribusiness services is the largest component of the agribusiness sector in Jordan. However, the contribution of agribusiness to the growth of GDP is significanlty reduced and becomes the second largest, an average of 35.6 percent, behind services (41.7 percent) but still above industry (22.7 percent).

TABLE 4.4

Illustrative Sensitivity Analysis: Agribusiness Excluding Activities In Mining of Fertilizer Products and Manufacturing of Wood Products. Shares of GDP, 1987-1991

Sectors	1987	1988	1989	1990	1991	Average
Agribusiness	20.75%	20.80%	23.00%	25.24%	22.76%	22.62%
Industry[1]	23.44%	22.36%	24.65%	24.53%	22.18%	23.42%
Services[1]	55.80%	56.84%	52.36%	50.23%	55.05%	53.96%

[1] Non-Agribusiness Industry and Non-Agribusiness Services.

4.5 Domestic Production of Food and Fiber in Agribusiness

Developing countries often raise concerns about perceived negative impacts of imported food and fiber products. Because of Jordan's limited natural resources but strategic geographic position, imported and re-exported goods and services figure prominently in trade statistics. However, Jordan's imported and re-exported goods and services contribute real value-added to

[20] Note that mining fertilizer products can be considered a forward linkage of agricultural production and is included in the U.S. agribusiness sector (USDA cited by Austin, 1992). Also, exporting agribusiness products contributes to economic growth. Similarly, activities may process imported inputs to add value to the domestic economy.

the economy. Re-exports of products can be used to fulfill contract obligations (El-Jafari, 1992) and thus maintain crucial commercial ties with importing countries. Also many of the imported goods and services are used by residents to produce other goods and services for domestic and foreign consumption. When national accounts are disaggregated and activities regrouped into the agribusiness sector, the value added measured in this sector, as in all others, obviously reflects the contribution of some imported and re-exported goods and services.

Although imports are crucial to Jordan's economy, it remains legitimate to attempt to lessen their impact by instituting policies and implement programs to enhance the country's comparative advantage in the production of strategic goods and services. For the purpose at hand, the concern is whether Jordan has the comparative advantage that would allow it to increase the *domestic content* of agribusiness products. The domestic content of agribusiness may be operationally defined as the proportion of raw materials supplied by domestic sources. Conceptually, one can apply this definition to all agribusiness products, inputs, machinery/equipment, farm products, agroindustry products, and even the extent to which value added in agribusiness services are performed for domestic products. Given the data limitations, however, it is operationally simpler and more feasible to focus on food and fiber products. Thus, we will be concerned by the domestic content of the food and fiber products offered to agroindustries and final consumers.

Increasing the domestic content of food and fiber products has strategic significance, but to have a sustainable, beneficial impact on the economy, the added domestic production should result from the best use of domestic resources. For example, given Jordan's limited natural resource endowment but appropriate mix of labor and capital productivity, Jordan may be better off importing cotton to manufacture textile products, than attempting to produce cotton in order to increase the domestic content in this fiber activity.

4.5.1 Measuring the Domestic Content of Food and Fiber Products

To measure the domestic content of food and fiber products, one needs to know the quantity and/or value used of the locally produced raw materials in the food or fiber product. This information, however, is sketchy and scattered across national accounts and trade statistics. There is lack of a one-to-one correspondence between food and fiber production statistics in the ISIC codes and trade statistics under the standard international trade classification (SITC) and the Brussels Tariff Nomenclature (BTN) codes. This lack of correspondence occurs because it is easier to unambiguously distinguish products that are traded across borders than outputs of a firm that produces several goods and services.

Specific surveys of operators are required to determine the share of domestic content in the raw materials used by activities in the agribusiness sector. Such surveys could not be accomplished in the limited time allowed for this study. To gain insights into this matter, however, a limited survey of a few firms was conducted in the greater Amman area.

4.5.2 Domestic Content of Selected Agribusiness Products

The domestic content of agribusiness products appears to be highest in food and tobacco processing. According to the persons interviewed, all tobacco material is supplied by domestic production. Raw materials for the tomato canning plant also come from domestic sources. In recent years, Jordan succeeded in producing all major fruits and vegetables that it used to import a few years ago. In terms of food and beverage services, the hotels surveyed indicated that a large portion of their food products were procured from local sources.

In textiles, however, Jordan imports a large portion of its purchased inputs. Two exceptions are leather products and the manufacture of army blankets from coarse domestically produced wool. Otherwise, all the natural fibers used in spinning, weaving, knitting, carpets, and apparel manufacturing must be imported. Jordan produces no cotton, and the wool produced is coarse and primarily for industrial use.

In the case of another agroindustrial product, soap, the animal tallow and vegetable oil are all imported. Vegetable oil is produced in Jordan, but it is of food grade rather than industrial quality and therefore, not economical to use for soap manufacturing. There may be potential for tallow to be supplied domestically; however, no plant exists to transform the by-products of meat processing, which are currently discarded, into tallow.

These limited investigations merit further elaboration through more systematic surveys to determine the domestic content of food and fiber in agribusiness, especially in food and beverages. For activities of economic or strategic significance, after estimating its domestic content, one then should look at *competitive imports* (imports that compete with domestic production) for an indication of the potential for growth in domestic production. Competitive imports, however, must be net of exports of similar products to fully indicate the potential for domestic growth. A country may export and import similar products for a variety of reasons. There may be, for example, a difference in quality; products may be supplied at different times by local and foreign producers; volume of local supply may be too small to satisfy local demand; or it may be easier to export raw materials to a neighboring country rather than supply domestic demand.

5. POLICY ENVIRONMENT OF THE AGRIBUSINESS SECTOR

The policy environment for Jordan's agribusiness sector is shaped both by domestic and international conditions that have direct bearing on the behavior of entrepreneurs in Jordan. This section provides only a brief account of these elements. A separate, more specific study is required to conduct a systematic assessment of policies affecting agribusiness in Jordan to recommend actions to encourage the growth of this sector.

5.1 World-Wide Policy Environment Affecting Agribusiness in Jordan

Jordan has an open economy and plays an important role in regional and world politics, and consequently is affected by international political and market conditions. Among many of these conditions, a few stand out in recent years for their far-reaching impacts on Jordan: the 1991 Gulf crisis, the unsettled Palestine question, the EEC single market, and the collapse of the Soviet Union and ensuing creation of potential new markets and trade partners in Eastern Europe and the newly independent states. All these elements have trade implications for Jordan's agribusiness products.

The 1991 Gulf crisis was accompanied by the breakdown of trade relations between Jordan and its traditional export markets in the Gulf states, especially Iraq, Saudi Arabia, and Kuwait. Prior to 1991, Jordan exported some 600,000 tons of fruits and vegetables per year. this figure dropped to 300,000 tons in 1992 (Al Lozi, 1993). Also, the unsettled political and economic situation in the occupied West Bank and Gaza strip has strained trade relations between Jordan and these territories, especially after Jordan was forced to sever legal and administrative ties with the territories (El-Jafari, 1992). To fulfil its contract obligations with Gulf states, Jordan used to import produce from the West Bank and Gaza for re-export (El-Jafari, 1993). Regarding the European single market and its implications to Near East countries' agricultural exports, Newman et al. (1993), note that "the future of special agreements, including market access quota, and tariff treatment of other countries currently outside the EC will be important to future market opportunities for NE exporters."

The unsettled regional political climate also affects tourism, and consequently, purchases from the foodservices industry. A portion of food service value added is generated by hotel guests. Growth in tourism, which is widely expected if long-lasting peace is achieved in the region, will increase the demand for food products in eating places and thus induce greater agricultural production and food processing activities in Jordan.

The creation of the single European market has done little to improve Jordan's export prospects to that region.[21] Although opportunities exist for highly specialized niche products,

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[21] Constraints to and opportunities for Jordanian agricultural exports to European markets are discussed in a recent APAP II report by Newman, Erbacher, and Fung (1993): *The European Market & Near East Agricultural Exports: Trends, Trade Barriers, and Competition.*

Jordanian agricultural exports have difficulty meeting many of the grading and quality standards of the typical European markets. Limited and unreliable air cargo space also hinders export prospects. There is, however, room for the Government to assist producers in meeting quality standards and to communicate market information regarding particular niche opportunities for agricultural products. Such niche products already enjoying success include Turkish peppers (popular in Germany) and particular vegetables that few countries are able to supply during certain weeks of the year (Al Lozi, personal communication).

On a more positive note, there are promising indicators for Jordan to export produce to new markets in Central Asia and Eastern Europe in exchange for meat products and manufactured goods. The exploitation of this potential is hampered by the political instability and the extremely constrained supply of hard currency in these new states. Still, efforts are being made through the Government and the Agricultural Marketing Organization to establish commercial ties and fully exploit these market opportunities as conditions in these countries stabilize.

5.2 Agribusiness Policy Environment in Jordan

The policy environment of the agricultural sector in Jordan has received considerable scrutiny in recent years. The Policy Analysis Unit set up by the Ministry of Agriculture reflects the commitment of the Kingdom of Jordan to improve the policy environment for this sector. Recently, the Ministry of Agriculture sponsored a workshop to discuss policy issues in rainfed agriculture, irrigated agriculture, range management, and forestry.

This workshop followed several other studies, notably the FAO/MOA National Workshop (1991), the World Bank (1990) assessment "Toward an Agricultural Policy for Jordan, 1989," USAID/Jordan's "Project Paper of the Agriculture Marketing Development Project" (1993). The policy issues raised in these studies include market liberalization; promotion of agricultural exports; encouragement of increased private sector participation in policy formulation; and redefinition of the role of government to concentrate on the formulation of policies, monitoring, and implementation for proper adjustment. The implications of these policy issues are not limited to agricultural production and concern other components of the agribusiness system as well.

The size of the agribusiness sector in Jordan and its contribution to economic growth warrant an in-depth policy inventory of this sector. An investigation of the policy environment of agribusiness would include the participation of agribusiness operators in Jordan. Such an in-depth assessment is beyond the scope of this study. The authors, however, have conducted limited interviews with agribusiness entrepreneurs to provide some insights and working hypotheses regarding the larger food and fiber system.

For example, although it was encouraging to learn that the food service industry used a high percentage of locally procured supplies, only part of this is due to any implicit attraction of those particular goods or loyalty to local produce. Rather, local procurement is driven by

cost considerations, due to restrictions on the prices charged for items at restaurants. Such restrictions preclude any price differentiation for premium quality products, since more expensive foodstuffs or particular items with higher value added cannot command the same profit ratio or in some cases, recoup their costs. Therefore, the current pricing policies push the domestic content of value added generated by restaurants higher than it might ordinarily be. At the same time, the price limits discourage serving food or beverages with higher value added and thus restrict the growth of value added. Nonetheless, there has not yet been a deliberate attempt to embrace the perspective of the agribusiness sector, possibly because the size and importance of this sector had not yet been measured.

Two major manufacturers of agricultural equipment reported that their expansions are constrained by the relatively low-level of use of modern agricultural equipment by local farmers. To grow, these firms have relied thus far on exports, mostly to neighboring Arab countries. However, recent events have cut equipment manufacturers off from strong export markets in Iraq and Saudi Arabia, and these manufacturers have come to realize that a healthy development of their industry must be solidly grounded in the domestic demand for their products.

Manufacturers reported that the relatively smooth regulatory environment for trade compared to those in neighboring Arab countries is a plus for conducting business in Jordan. A significant constraint appears to be the failure of available capital to find its way to productive agribusiness investment projects. Many entrepreneurs voiced ideas for agribusiness projects, but said that the lack of capital prevented the pursuit of these activities. In contrast, others testified that too much investment went into the same activities, which created a saturation problem. For example, much of the capital repatriated from the Gulf states was invested in production of traditional agricultural crops. Coupled with the closure of export markets in the Gulf states, the markets for tomatoes and cucumbers were completely saturated, and large portions of the crop went to waste. It appears also that the number of smaller workshops producing manufacturing equipment has sharply increased, possibly beyond what a healthy competition could bear, according to one equipment manufacturer.

Agribusiness entrepreneurs in the textile industries are confronted with aging technology in their attempt to improve export competitiveness. Recently the large spinning manufacturer invested in equipment with increased productivity but slightly lower, although industry-wide accepted quality. Since then, however, demand had swung back to the previous higher quality, leaving the manufacturer with the wrong type of equipment. Manufacturers of weaving and apparel have been unsuccessful in their attempt to compete in international markets because their equipment could not produce products to world-quality standard.

The picture emerging from the interviews is one of lack of clear policy direction and agribusiness assistance provided by government. Because of it size and limited natural resources, however, it would be unwise to push domestic production of goods and services where Jordan does not have a comparative advantage simply to increase the domestic content of food and fiber products.

6. CONCLUSIONS AND RECOMMENDATIONS

This study is a continuation of an effort to refine a practical approach for measuring the size and contribution performance of agribusiness in Jordan. This approach is suggested as an alternative to I/O models, which require costly surveys and data manipulations and whose information is often obsolete by the time it is analyzed. The approach used in this study is based on annual national statistics and is available to Jordanians to use and update as more and better information becomes available.

The findings of this study confirm that *the importance of agriculture and agriculture-related activities is far greater than the sectoral share of agriculture in traditional national accounts*. The agribusiness sector contributed, on average, 28 percent to gross domestic product in 1987-1991, second to services. Furthermore, over this period, agribusiness' contribution to the growth of the country's economy was the largest, followed by services and industry.

Several implications can be derived from these findings, in terms of key areas to monitor change and progress. The demonstrated importance of agribusiness in Jordan should serve to encourage policy dialogue among ministries, government agencies, and the private sector, in order to fully tap Jordan's agribusiness potential and so that it might continue to play a dynamic role in overall economic growth.

6.1 Key Areas for Monitoring Progress and Change

In addition to agricultural production and agricultural export performance indicators, key areas for monitoring progress and change can be identified by analyzing the performance of major components of the agribusiness sector. For example one critical area for monitoring is the technology used in irrigated agriculture. Because of perceived inefficient use of water resources in Jordan, the increased use of efficient irrigation equipment is an important indicator of progress being made in irrigated agriculture. The findings suggest that irrigation equipment represents a small share of the total agricultural inputs manufactured in Jordan, although an increased number of farms are using modern equipment. In monitoring this area, attempts would be made to understand the determinants of the use of this technology to help manufacturers best respond to the needs of Jordanian farmers.

Monitoring the importance of agribusiness, however, raises the issue of the contribution of domestic agricultural production to the processing, other manufacturing, and service activities included in the sector. This particularly an issue in Jordan, where much of the produce for processing of textiles is imported. Specific surveys, tailored to selected, important components of agribusiness are required to monitor the domestic content of agribusiness. To complement these surveys, information already collected in Jordan on agricultural production and trade of agricultural production can be recombined to determine the importance of competitive imports. Competitive imports show the potential for increase of domestic production to satisfy either final

demand or the requirements for processing of food and fiber products, if not in quantity then in quality.

These areas of investigation will complement information already being collected or envisaged in Jordan, for example in the USAID-financed Agriculture Marketing Development Project and other trade promotion activities, including agricultural production, trade and re-export of agricultural products, and policy measures attached to conditionalities of structural adjustment loans or non-project assistance programs.

6.2 Recommendations

The findings of this study reinforce the notion that the linkages between agriculture and related industry and service sector activities comprise a significant portion of national income and economic growth. Considering this importance, agribusiness sector activities and developments bear greater understanding by policymakers to ensure its continued contribution to overall development.

The Ministry of Agriculture is well suited to play a key coordinating role with other ministries and between the public and private sector in the development of the agribusiness sector. To strengthen the relationship between agriculture and other sectors, the on-going dialogue regarding the agricultural sector may be broadened to include input and equipment suppliers, food processing, hotels and eating places, local traders and exporters of food and fiber products in addition to those in farming, livestock production, and forestry. Furthermore, appropriate counterparts at the Ministry of Trade and Industry, the Ministry of Tourism, financial institutions, the Jordan Cooperative Organization and other appropriate associations, and academia should be brought into a network to generate strategies for development of the agribusiness sector. However, the ensuing workshops and consultations would have to be structured in manageable groups to produce useful results.

The participation of private agribusiness operators is essential to the design and implementation of policies for the promotion of agribusiness activities in Jordan. The perceived constraint of some agribusiness operators is that they lack information about market opportunities in domestic and export markets. The Ministry of Agriculture could work with other ministries and institutions, for example, chamber of commerce and trade associations, to solicit ideas from agribusiness entrepreneurs and provide better information about agribusiness market opportunities for Jordanians, in both domestic and export markets.

USAID/Amman has initiatives to help Jordanian officials and private entrepreneurs work together and establish business contacts when they tour potential export markets. To complement the Mission export promotion efforts in Jordan itself, the tourism industry offers the opportunity to promote Jordanian products to visitors so they may in turn act as goodwill ambassadors of Jordanian products when they return home. Establishing contacts with selected tourists is also a way of developing market intelligence about consumers' preferences in potential

import markets. The Ministries of Agriculture and Tourism may jointly develop activities to effectively tap this potential.

On-going efforts to pursue joint ventures should be continued. Such joint ventures would assist Jordanian agribusinesses produce output to meet standards in the different markets, as well as identify and assist in the entry to particular niche markets.

The monitoring of progress and change in agribusiness will be facilitated and timely if data can be obtained, either from the Department of Statistics, other government institutions, or organizations that better reflect the relationships between different sectors. The Department of Statistics has been effectively supportive and genuinely interested by the approach used in this study. As a supplier of information, the Department of Statistics is extremely pleased to see its product being used to help institute policies in Jordan. The Ministry of Agriculture can build on this goodwill to strengthen collaboration with the Department of Statistics so that national statistics are collected with the agribusiness perspective. It is hoped that, ultimately, as the Department produces information on traditional sectors, it will also produce statistics that show the contribution of agribusiness to national income.

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Appendix A

Measuring the Size of Agribusiness by I/O Analysis

For the contribution of agribusiness to value added, we have[22]:

$$VA_{AgBus}=v(I-A)^{-1}D_f=vX$$

Where

VA_{AgBus} = an n x 1 vector of agribusiness value added originating from each sector of the economy,

v = an n x 1 diagonal matrix of value added coefficient per unit of sector output,

$(I-A)^{-1}$ = an n x n I/O total requirements matrix,

X = an n x 1 vector of sector outputs needed to satisfy final demand, and

D_f = an n x 1 vector of total final demand for food and fiber products.

Similarly, for the contribution of agribusiness to employment, we have:

$$EMP_{AgBus}=w(I-A)^{-1}D_f=wX$$

Where

EMP_{AgBus} = an n x 1 vector of agribusiness labor compensation originating from each sector of the economy,

w = an n x 1 diagonal matrix of labor compensation coefficient per unit of sector output,

To show persons employed, labor compensation must be converted to employees.

[22] Based on Lee et al. (1987).

APPENDIX B

Value Added, Shares, and Agribusiness Value Added
Jordan, 1987-1991

JORDAN: Traditional Sectors of GDP, 1987-1991
(Value Added at Current Producer Prices, thousands of dinars)

Year	Agriculture	Industry	Services	Total GDP
1987	123,382	570,369	1,260,707	1,954,457
1988	110,722	597,835	1,357,339	2,065,896
1989	131,744	717,834	1,402,740	2,262,318
1990	179,635	751,901	1,417,141	2,348,677
1991	174,300	759,887	1,650,977	2,585,164

Source: Department of Statistics, Hashemite Kingdom of Jordan

JORDAN: Contribution of Agribusiness to GDP, 1987-1991
(Value Added at Current Producer Prices, thousands of dinars)

Year	Agribusiness	Non-Agribusiness Industry	Non-Agribusiness Services	Total GDP
1987	472,026	391,776	1,090,656	1,954,457
1988	511,619	380,065	1,174,211	2,065,896
1989	720,192	357,652	1,184,474	2,262,318
1990	792,132	376,818	1,179,727	2,348,677
1991	752,759	409,228	1,423,177	2,585,164

Source: Authors' calculations

JORDAN: Components of Agribusiness, 1987-1991
(Value Added at Current Producer Prices, thousands of dinars)

Year	Agriculture	Agroindustry	Inputs/Energy/ Equipment	Agribusiness Services	Total Agribusiness
1987	123,382	92,135	86,458	170,051	472,026
1988	110,722	102,935	114,835	183,128	511,619
1989	131,744	123,033	247,150	218,266	720,192
1990	179,635	142,111	232,971	237,414	792,132
1991	174,300	149,583	201,076	227,801	752,759

Source: Authors' calculations

JORDAN Contribution of Agribusiness to GDP

Value added, by sector, 1987-91	1987	1988	1989	1990	1991
01 Agriculture	123,382	110,722	131,744	179,635	174,300
02 Mining	64,120	76,587	191,417	193,638	156,243
03 Manufacturing	336,249	359,148	384,017	399,463	432,890
Agroindustry					
31 Food, beverages, tobacco	72,805	79,242	91,736	107,543	112,347
32 Textiles	11,656	14,610	19,677	24,478	28,910
33 Wood products	8,290	9,317	12,717	11,750	13,306
34 Paper products	11,385	14,548	16,688	21,373	24,558
Agricultural Inputs and Chemical Products					
35 Chemicals	135,154	136,909	119,002	105,471	118,180
36 Plastics	54,036	58,572	55,405	60,615	63,643
38 Machinery/equipment	17,494	17,659	28,320	29,762	30,896
951 Repairs of machinery and equipment	10,724	13,728	19,733	16,472	19,997
Other manufacturing					
37, 39 Other	14,705	14,563	20,739	21,999	21,053
04 Energy	44,000	43,700	45,700	47,200	45,054
05 Construction	126,000	118,400	106,700	111,600	125,700
06 Wholesale/Retail Trade; Hotels & Restaurants	276,973	258,257	177,976	170,498	255,767
07 Transportation and Communication	287,216	305,463	369,853	369,565	387,483
08 Business Services	303,414	348,718	392,171	388,221	475,517
09 Producers of government and community/social services	393,105	444,901	462,740	488,858	532,211
Total GDP	1,954,457	2,065,896	2,262,318	2,348,677	2,585,164

Source: Department of Statistics, Hashemite Kingdom of Jordan

Share of Agribusiness in Economic Activity	1987	1988	1989	1990	1991
01 Agriculture	100.00%	100.00%	100.00%	100.00%	100.00%
02 Mining	91.80%	95.62%	98.24%	97.42%	97.33%
03 Manufacturing	33.58%	37.90%	45.33%	43.99%	43.56%
Agroindustry					
31 Food, beverages, tobacco	100.00%	100.00%	100.00%	100.00%	100.00%
32 Textiles	46.41%	46.34%	45.71%	42.56%	34.89%
33 Wood products	91.21%	92.80%	93.21%	91.45%	91.61%
34 Paper products	55.86%	56.89%	62.61%	62.71%	60.91%
Agricultural Inputs and Chemical Products					
35 Chemicals	13.35%	21.29%	35.89%	25.94%	27.06%
36 Non-metallic mineral products	0.00%	0.00%	0.00%	0.00%	0.00%
38 Machinery/equipment	1.35%	2.62%	1.62%	2.45%	3.21%
951 Repairs of machinery and equipment	23.31%	26.09%	39.96%	33.53%	30.15%
Other manufacturing					
37, 39 Other	0.00%	0.00%	0.00%	0.00%	0.00%
04 Energy	10.25%	14.29%	13.33%	18.39%	17.09%
05 Construction	1.83%	1.83%	1.83%	1.83%	1.83%
06 Wholesale/Retail Trade; Hotels & Restaurants	40.30%	43.55%	63.54%	75.54%	43.57%
07 Transportation and Communication	2.28%	2.41%	2.34%	1.94%	2.85%
08 Business Services	15.19%	15.86%	21.23%	22.29%	18.70%
09 Producers of government and community/social services	1.48%	1.79%	2.86%	3.04%	3.08%
Total GDP	24.15%	24.77%	31.83%	33.73%	29.12%

Source: Authors' calculations

Value Added from Agribusiness	1987	1988	1989	1990	1991
01 Agriculture	123,382	110,722	131,744	179,635	174,300
02 Mining	58,864	73,236	188,050	188,638	152,077
03 Manufacturing	112,909	136,121	174,088	175,720	188,578
Agroindustry					
31 Food, beverages, tobacco	72,805	79,242	91,736	107,543	112,347
32 Textiles	5,409	6,770	8,994	10,419	10,088
33 Wood products	7,561	8,646	11,854	10,746	12,190
34 Paper products	6,360	8,277	10,449	13,404	14,958
Agricultural Inputs and Chemical Products					
35 Chemicals	18,037	29,143	42,711	27,356	31,975
36 Plastics	0	0	0	0	0
38 Machinery/equipment	237	462	458	729	992
951 Repairs of machinery and equipment	2,500	3,581	7,886	5,524	6,028
Other manufacturing					
37, 39 Other	0	0	0	0	0
04 Energy	4,512	6,244	6,090	8,680	7,701
05 Construction	2,308	2,169	1,955	2,044	2,303
06 Wholesale/Retail Trade; Hotels & Restaurants	111,611	112,467	113,089	128,790	111,446
07 Transportation and Communication	6,547	7,367	8,665	7,188	11,052
08 Business Services	46,080	55,314	83,255	86,552	88,921
09 Producers of government and community/social services	5,813	7,980	13,257	14,885	16,382
Total GDP	472025.	511619.	720192.	792132.	752758.

Source: Authors' calculations

JORDAN Estimation of Contribution of Agribusiness Industry and Services to Employment*

Employment, by sector, 1987-91	1987	1988	1989
02 Mining and Quarrying	7,246	8,050	6,773
03 Manufacturing	23,828	28,625	34,595
04 Energy	4,554	4,540	4,643
05 Construction	5,696	3,945	4,873
06 Wholesale/Retail Trade; Hotels & Restaurants	10,379	9,608	10,841
07 Transportation and Communication	11,257	12,336	11,861
08 Business Services	9,736	10,725	11,144
09 Producers of government and community/social services	127,649	133,474	140,317
Total Employment	200,345	211,303	225,047

Source: Table 4/1/10, Statistical Yearbook 1991, Hashemite Kingdom of Jordan, Department of Statistics

Share of Agribusiness in Economic Activity	1987	1988	1989
02 Mining and Quarrying	91.80%	95.62%	98.24%
03 Manufacturing	33.58%	37.90%	45.33%
04 Energy	10.25%	14.29%	13.33%
05 Construction	1.83%	1.83%	1.83%
06 Wholesale/Retail Trade; Hotels & Restaurants	40.30%	43.55%	63.54%
07 Transportation and Communication	2.28%	2.41%	2.34%
08 Business Services	15.19%	15.86%	21.23%
09 Producers of government and community/social services	1.48%	1.79%	2.86%

Source: Authors' calculations

Employment in Agribusiness	1987	1988	1989
02 Mining and Quarrying	6,652	7,698	6,654
03 Manufacturing	8,001	10,849	15,683
04 Energy	467	649	619
05 Construction	104	72	89
06 Wholesale/Retail Trade; Hotels & Restaurants	4,182	4,184	6,889
07 Transportation and Communication	257	298	278
08 Business Services	1,479	1,701	2,366
09 Producers of government and community/social services	1,888	2,394	4,020
Total Employment by Agribusiness	23,030	27,845	36,597
Agribusiness as a Percentage of Total Employment	11.50%	13.18%	16.26%

Source: Authors' calculations

*As no data on employment in agriculture were available, all figures are exclusive of employment in the agriculture sector.

JORDAN **Value Added at Factor Cost, by Economic Activity, according to the International Standard Industrial Classification of all Economic Activities**
(thousand dinars, current prices)

Division	Major Group	Category	Description	1987	1988	1989	1990	1991
01			AGRICULTURE, HUNTING, FORESTRY AND FISHING					
11			Agriculture, hunting, forestry and fishing	123357.7	110664.5	131670.1	179158.0	174300.0
12			Forestry and logging	0.0	0.0	0.0	0.0	0.0
13			Fishing	23.8	57.1	73.4	477.4	0.0
			TOTAL	123381.5	110721.6	131743.5	179635.4	174300.0
02			MINING AND QUARRYING					
	210		Coal Mining					
	290		Other mining	64120.0	76587.0	191416.9	193638.0	156243.0
		2901	Stone quarrying, clay and sand pits	5256.0	3351.0	3367.0	5000.0	4166.0
		2902	Mining of chemical and fertilizer materials	58864.0	73236.0	188049.9	188638.0	152077.0
		2903	Extraction of salt					
		2909	Mining and quarrying n.e.c.					
			TOTAL	64120.0	76587.0	191416.9	193638.0	156243.0
03			MANUFACTURING					
31			Manufacture of food, beverages and tobacco	72805.0	79242.0	91736.2	107543.0	112347.0
	311-2		Food manufacturing	18678.0	24467.0	36744.0	38609.0	38967.0
		3111	Slaughtering, preparing and preserving meat	0.0	-4.0	864.9	1179.0	1276.0
		3112	Manufacture of dairy products	2560.0	4462.0	5239.7	4477.0	3959.0
		3113	Canning and preserving of fruits and vegetables	641.0	1488.0	5409.1	6730.0	4205.0
		3114	Canning, preserving and processing of fish, crustacea and similar foods	0.0	0.0	0.0	0.0	0.0
		3115	Manufacture of vegetable and animal oils and fats	933.0	1194.0	2196.5	4303.0	5455.0
		3116	Grain mill products	3514.0	3477.0	7145.0	4132.0	4110.0
		3117	Manufacture of bakery products	4907.0	7982.0	10863.9	12548.0	12870.0
		3118	Sugar factories and refineries	0.0	0.0	0.0	0.0	0.0
		3119	Manufacture of cocoa, chocolate and sugar	2759.0	943.0	815.3	2339.0	2949.0
		3121	Manufacture of food products n.e.c.	2266.0	3025.0	2565.6	1242.0	2295.0
		3122	Manufacture of prepared animal feeds	1098.0	1900.0	1644.0	1659.0	1848.0
	313		Beverage industries	14258.0	12846.0	14039.8	18854.0	20194.0
		3131	Distilling, rectifying & blending of spirits; ethyl alcohol production from fermented materials	0.0	0.0	0.0	0.0	0.0
		3132	Manufacture of wines	2685.0	2592.0	3669.4	5747.0	5437.0
		3133	Manufacture of malt liquors and malt	0.0	0.0	0.0	0.0	0.0
		3134	Manufacture of soft drinks; production of mineral waters	11573.0	10254.0	10370.4	13107.0	14757.0
	314		Manufacture of tobacco products	39869.0	41929.0	40952.4	50080.0	53186.0
32			Textiles	11656.0	14610.0	19677.4	24478.0	28910.0
	321		Manufacture of textiles	4268.0	5967.0	9495.6	12960.0	14326.0
		3211	Spinning, weaving and finishing textiles	3379.0	4700.0	8009.3	10412.0	8938.0
		3212	Manufacture of made-up textile goods except wearing apparel	0.0	351.0	181.0	820.0	800.0
		3213	Manufacture of knitted and crocheted fabrics and articles	895.0	665.0	615.9	996.0	2222.0
		3214	Manufacture of carpets and rugs	-6.0	251.0	689.4	732.0	2366.0
		3215	Manufacture of cordage, rope, twine and netting	0.0	0.0	0.0	0.0	0.0
		3219	Manufacture of textiles n.e.c.	0.0	0.0	0.0	0.0	0.0
	322		Man. of wearing apparel, except footwear	4481.0	4962.0	6189.8	8571.0	9958.0
	323		Man. of leather and products of leather, leather substitutes and fur, except footwear and wearing appare	834.0	1364.0	1067.4	747.0	2421.0
		3231	Tanning and dressing of leather	492.0	384.0	859.6	537.0	1786.0
		3232	Fur dressing and dyeing industries	0.0	0.0	0.0	0.0	0.0
		3233	Manufacture of luggage, handbags and the like, saddlery and harness	342.0	980.0	207.8	210.0	635.0
	324		Manufacture of footwear, except vulcanized, moulded rubber or plastic footwear	2073.0	2317.0	2924.6	2200.0	2205.0

JORDAN **Value Added at Factor Cost, by Economic Activity, according to the International Standard Industrial Classification of all Economic Activities**
(thousand dinars, current prices)

Division	Major Group	Category	Description	1987	1988	1989	1990	1991
33			Manufacture of wood and wood products, including furniture	8290.0	9317.0	12717.3	11750.0	13306.0
		3311	Sawmills, planing and other wood mills	0.0	2606.0	4586.4	1876.0	2779.0
		3312	Manufacture of wooden and cane containers and small cane ware	1284.0	382.0	282.9	316.0	266.0
		3319	Manufacture of wood and cork products n.e.c.	0.0	612.0	419.0	415.0	286.0
		3321	Manufacture of furniture and fixtures, except primarily of metal	6726.0	4723.0	6226.0	8245.0	8788.0
		3322	Upholstery	280.0	994.0	1203.0	898.0	1187.0
34			Manufacture of paper and paper products, printing and publishing	11385.0	14548.0	16687.6	21373.0	24558.0
	341		Manufacture of paper and paper products	6360.0	8277.0	10448.7	13404.0	14958.0
		3411	Manufacture of pulp, paper and paperboard	622.0	601.0	4618.0	2812.0	1138.0
		3412	Manufacture of containers and boxes of paper and paperboard	2844.0	3634.0	3463.6	7392.0	6565.0
		3419	Manufacture of pulp, paper, and paperboard articles n.e.c.	2894.0	4042.0	2367.1	3200.0	7255.0
	342		Printing, publishing and allied industries	5025.0	6271.0	6238.9	7969.0	9600.0
35			Manufacture of chemicals and chemical, petroleum, coal, rubber and plastic products	135154.0	136909.0	119002.2	105471.0	118180.0
	351		Manufacture of industrial chemicals	7998.0	20811.0	43817.7	29319.0	33072.0
		3511	Manufacture of basic industrial chemicals except fertilizers	3248.0	3586.0	5597.0	5762.0	6198.0
		3512	Manufacture of fertilizers and pesticides	4750.0	16566.0	36358.9	19795.0	23831.0
		3513	Manufacture of synthetic resins, plastics materials and man-made fibres except glass	0.0	659.0	1861.8	3762.0	3043.0
	352		Man. of other chemical products	15838.0	18850.0	32267.0	27971.0	36373.0
		3521	Man. of paints, varnishes and lacquers	1684.0	1838.0	2136.5	2220.0	1896.0
		3522	Man. of drugs and medicines	7241.0	11158.0	18520.4	17562.0	21001.0
		3523	Man. of soap and cleaning preparations, perfumes, cosmetics and other toilet preparations	4387.0	5119.0	7204.9	6907.0	11975.0
		3529	Man. of chemical products n.e.c.	2526.0	735.0	4405.2	1282.0	1501.0
	353		Petroleum refineries	104562.0	89240.0	34076.5	36213.0	35083.0
	354		Man. of miscellaneous products of petroleum and coal	0.0	0.0	0.0	0.0	0.0
	355		Man. of rubber products	321.0	433.0	738.3	724.0	471.0
		3551	Tyre and tube industries	321.0	433.0	738.3	724.0	471.0
		3559	Manufacture of rubber products n.e.c.	0.0	0.0	0.0	0.0	0.0
	356		Man. of plastics products n.e.c.	6435.0	7575.0	8102.7	11244.0	13181.0
36			Manufacture of non-metallic mineral products, except products of petroleum and coal	54036.0	58572.0	55405.1	60615.0	63643.0
	361		Manufacture of non-structural non-refractory ceramic ware (pottery, china and earthenware)	1200.0	1110.0	78.8	2185.0	3408.0
	362		Manufacture of glass and glass products	1485.0	2724.0	3784.3	2151.0	1608.0
	369		Man. of other non-metallic mineral products	51351.0	54738.0	51542.0	56279.0	58627.0
37			Basic metal industries	14705.0	14563.0	20150.4	21999.0	21053.0
	371		Iron and steel basic industries	12096.0	10624.0	16576.9	16126.0	16069.0
	372		Non-ferrous metal basic industries	2609.0	3939.0	3573.5	5873.0	4984.0
38			Man. of fabricated metal products, machinery and equipment	17494.0	17659.0	28319.7	29762.0	30896.0
	381		Man. of fabricated metal products, except machinery and equipment	13610.0	10545.0	14593.1	15416.0	14811.0
	382		Man. of machinery except electrical	2033.0	3967.0	3934.5	6259.0	8514.0
		3821	Manufacture of engines and turbines	0.0	0.0	1516.1	0.0	0.0
		3822	Manufacture of agricultural and forestry machinery	469.0	428.0	0.0	586.0	492.0
		3823	Manufacture of metal and woodworking machinery	0.0	0.0	0.0	0.0	0.0
		3824	Man. of special industrial machinery & equipment except metal & woodworking machinery	0.0	0.0	0.0	0.0	0.0
		3825	Manufacture of office, computing and accounting machinery	0.0	0.0	0.0	0.0	0.0
		3829	Machinery and equipment except electrical n.e.c.	1564.0	3539.0	2418.4	5673.0	8022.0
	383		Man. of electrical machinery appartus, appliances and supplies	1447.0	2495.0	7288.0	7624.0	7388.0
	384		Man. of transport equipment	404.0	652.0	660.1	463.0	183.0
	385		Man. of prof. and scientific, measuring & controlling equip. n.e.c., and of photographic & optical goods	0.0	0.0	1844.0	0.0	0.0
39			Other manufacturing industries	0.0	0.0	588.2	0.0	0.0
951			Repair of machinery and equipment	10724.0	13728.0	19733.3	16472.0	19997.0
			TOTAL	336249.0	359148.0	384017.4	399463.0	432890.0

JORDAN **Value Added at Factor Cost, by Economic Activity, according to the International Standard Industrial Classification of all Economic Activities**
(thousand dinars, current prices)

Division	Major Group	Category	Description	1987	1988	1989	1990	1991
04			**ELECTRICITY, GAS AND WATER SUPPLY**					
41			Electricity, gas, steam	35100.0	35100.0	35100.0	35100.0	35100.0
42			Water works and supply	8900.0	8600.0	10600.0	12100.0	9953.6
			TOTAL	44000.0	43700.0	45700.0	47200.0	45053.6
05			**CONSTRUCTION**					
50			Construction	126000.0	118400.0	106700.0	111600.0	125700.0
			TOTAL	126000.0	118400.0	106700.0	111600.0	125700.0
06			**WHOLESALE AND RETAIL TRADE AND RESTAURANTS AND HOTELS**					
61			Wholesale trade	26888.1	8712.9	-72019.3	-80833.7	-28790.3
62			Retail trade	223516.2	217503.1	211523.8	205980.0	234776.0
63			Restaurants and hotels	26568.4	32040.6	38471.8	45351.6	49781.2
	631		Restaurants, cafes and other eating and drinking places	13921.3	16725.0	19222.1	19293.9	24495.7
	632		Hotels, rooming houses, camps and other lodging places	12647.1	15315.6	19249.7	26057.7	25285.5
			TOTAL	276972.7	258256.6	177976.3	170497.9	255766.9
07			**TRANSPORT, STORAGE AND COMMUNICATION**					
71			Transport and storage	244470.7	258016.4	312757.6	282815.9	289638.8
72			Communications	42745.1	47446.4	57094.9	86748.6	97844.0
			TOTAL	287215.8	305462.8	369852.5	369564.5	387482.8
08			**FINANCING, INSURANCE, REAL ESTATE AND BUSINESS SERVICES**					
81			Finanacial Institutions	70303.8	89122.7	109398.1	64748.0	91998.1
82			Insurance	17905.7	15193.2	15400.0	16620.3	20244.4
83			Real estate and business services	215204.3	244402.4	267373.3	306852.3	363274.6
	831		Real estate	214000.0	234560.8	253600.0	290904.3	353184.5
	832		Business services except machinery and equipment rental and leasing	495.0	9284.1	13573.3	15630.2	9925.0
		8321	Legal activities		3587.3	3484.4	2911.5	2991.1
		8322	Accounting, bookkeeping and auditing activities: tax consultancy		3500.2	2274.5	2564.7	1479.7
		8323	Data processing and tabulating service activities				109.4	365.1
		8324	Engineering, architectural and technical service activities			5614.4	7179.5	4158.9
		8325	Advertising service activities	495.0	2196.6	2200.0	2865.1	829.8
		8329	Business service activities, except machinery and equipment rental and leasing n.e.c.					100.4
	833		Machinery and equipment rental and leasing	709.3	557.5	200.0	317.8	165.1
			TOTAL	303413.8	348718.3	392171.4	388220.6	475517.1
09			**COMMUNITY, SOCIAL AND PERSONAL SERVICES**					
91			Producers of government services	383700.0	402266.6	427887.0	444931.2	471335.7
92			Sanitary and similar service activities					
93			Social and related community services	897.4	33634.7	28258.6	35415.0	49300.7
	931		Education service activities	NA	19033.1	17842.1	21165.2	32162.8
	932		Research and scientific institutes	NA	0.0			
	933		Medical, dental, other health and veterinary services	0.0	13683.4	9803.3	13302.6	16100.9
		9331	Medical, dental and other health service activities		13683.4	9803.3	13302.6	16100.9
		9332	Veterinary activities		0.0			0.0
	934		Welfare institutions					
	935		Business, professional and labour associations	897.4	918.2	613.2	947.2	1037.0
	939		Other social and related community services	0.0	0.0	0.0	0.0	0.0
94			Recreational and cultural services	3855.6	3517.2	1590.2	3521.5	4044.5
95			Personal and household services	4651.5	5482.8	5003.8	4990.3	7529.7
96			Extraterritorial organizations and bodies					
			TOTAL	393104.5	444901.3	462739.6	488858.0	532210.6
GDP at Market Prices				1954457.3	2065895.6	2262317.6	2348677.4	2585164.0
			Imputed Bank Service Charges	39.3	49.5	55.3	39.9	53.7
			Import duties and taxes	330.3	317.0	261.8	337.2	359.3
GDP at Factor Cost				1954087.7	2065529.1	2262000.5	2348300.3	2584751.0

Source: Department of Statistics, Hashemite Kingdom of Jordan

JORDAN **Share of Agribusiness in Economic Activities, according to the International Standard Industrial Classification**
(percent)

Division	Major Group	Category	Description	1987	1988	1989	1990	1991
01			**AGRICULTURE, HUNTING, FORESTRY AND FISHING**					
11			Agriculture, hunting, forestry and fishing	100.00%	100.00%	100.00%	100.00%	100.00%
12			Forestry and logging	100.00%	100.00%	100.00%	100.00%	100.00%
13			Fishing	100.00%	100.00%	100.00%	100.00%	100.00%
			TOTAL	100.00%	100.00%	100.00%	100.00%	100.00%
02			**MINING AND QUARRYING**					
	210		Coal Mining	0.00%	0.00%	0.00%	0.00%	0.00%
	290		Other mining					
		2901	Stone quarrying, clay and sand pits	0.00%	0.00%	0.00%	0.00%	0.00%
		2902	Mining of chemical and fertilizer materials	100.00%	100.00%	100.00%	100.00%	100.00%
		2903	Extraction of salt	0.00%	0.00%	0.00%	0.00%	0.00%
		2909	Mining and quarrying n.e.c.	0.00%	0.00%	0.00%	0.00%	0.00%
			TOTAL	0.00%	0.00%	0.00%	0.00%	0.00%
03			**MANUFACTURING**					
31			Manufacture of food, beverages and tobacco	100.00%	100.00%	100.00%	100.00%	100.00%
	311-2		Food manufacturing	100.00%	100.00%	100.00%	100.00%	100.00%
		3111	Slaughtering, preparing and preserving meat	100.00%	100.00%	100.00%	100.00%	100.00%
		3112	Manufacture of dairy products	100.00%	100.00%	100.00%	100.00%	100.00%
		3113	Canning and preserving of fruits and vegetables	100.00%	100.00%	100.00%	100.00%	100.00%
		3114	Canning, preserving and processing of fish, crustacea and similar foods	100.00%	100.00%	100.00%	100.00%	100.00%
		3115	Manufacture of vegetable and animal oils and fats	100.00%	100.00%	100.00%	100.00%	100.00%
		3116	Grain mill products	100.00%	100.00%	100.00%	100.00%	100.00%
		3117	Manufacture of bakery products	100.00%	100.00%	100.00%	100.00%	100.00%
		3118	Sugar factories and refineries	100.00%	100.00%	100.00%	100.00%	100.00%
		3119	Manufacture of cocoa, chocolate and sugar	100.00%	100.00%	100.00%	100.00%	100.00%
		3121	Manufacture of food products n.e.c.	100.00%	100.00%	100.00%	100.00%	100.00%
		3122	Manufacture of prepared animal feeds	100.00%	100.00%	100.00%	100.00%	100.00%
	313		Beverage industries	100.00%	100.00%	100.00%	100.00%	100.00%
		3131	Distilling, rectifying & blending of spirits; ethyl alcohol production from fermented material	100.00%	100.00%	100.00%	100.00%	100.00%
		3132	Manufacture of wines	100.00%	100.00%	100.00%	100.00%	100.00%
		3133	Manufacture of malt liquors and malt	100.00%	100.00%	100.00%	100.00%	100.00%
		3134	Manufacture of soft drinks; production of mineral waters	100.00%	100.00%	100.00%	100.00%	100.00%
	314		Manufacture of tobacco products	100.00%	100.00%	100.00%	100.00%	100.00%
32			Textiles					
	321		Manufacture of textiles					
		3211	Spinning, weaving and finishing textiles	42.25%	39.72%	44.08%	51.05%	29.23%
		3212	Manufacture of made-up textile goods except wearing apparel	(in 3211)	20.00%	20.00%	20.00%	20.00%
		3213	Manufacture of knitted and crocheted fabrics and articles	20.00%	20.00%	20.00%	20.00%	20.00%
		3214	Manufacture of carpets and rugs	10.70%	10.70%	10.70%	10.70%	10.70%
		3215	Manufacture of cordage, rope, twine and netting	20.00%	20.00%	20.00%	20.00%	20.00%
		3219	Manufacture of textiles n.e.c.	20.00%	20.00%	20.00%	20.00%	20.00%
	322		Man. of wearing apparel, except footwear	20.00%	20.00%	20.00%	20.00%	20.00%
	323		Man. of leather and products of leather, leather substitutes and fur, except footwear and wearing appare	100.00%	100.00%	100.00%	100.00%	100.00%
		3231	Tanning and dressing of leather	100.00%	100.00%	100.00%	100.00%	100.00%
		3232	Fur dressing and dyeing industries	100.00%	100.00%	100.00%	100.00%	100.00%
		3233	Manufacture of luggage, handbags and the like, saddlery and harness	100.00%	100.00%	100.00%	100.00%	100.00%
	324		Manufacture of footwear, except vulcanized, moulded rubber or plastic footwear	100.00%	100.00%	100.00%	100.00%	100.00%

JORDAN **Share of Agribusiness in Economic Activities, according to the International Standard Industrial Classification**
(percent)

Division	Major Group	Category	Description	1987	1988	1989	1990	1991
33			Manufacture of wood and wood products, including furniture					
		3311	Sawmills, planing and other wood mills	100.00%	100.00%	100.00%	100.00%	100.00%
		3312	Manufacture of wooden and cane containers and small cane ware	100.00%	100.00%	100.00%	100.00%	100.00%
		3319	Manufacture of wood and cork products n.e.c.	100.00%	100.00%	100.00%	100.00%	100.00%
		3321	Manufacture of furniture and fixtures, except primarily of metal	90.00%	90.00%	90.00%	90.00%	90.00%
		3322	Upholstery	80.00%	80.00%	80.00%	80.00%	80.00%
34			Manufacture of paper and paper products, printing and publishing					
	341		Manufacture of paper and paper products	100.00%	100.00%	100.00%	100.00%	100.00%
		3411	Manufacture of pulp, paper and paperboard	100.00%	100.00%	100.00%	100.00%	100.00%
		3412	Manufacture of containers and boxes of paper and paperboard	100.00%	100.00%	100.00%	100.00%	100.00%
		3419	Manufacture of pulp, paper, and paperboard articles n.e.c.	100.00%	100.00%	100.00%	100.00%	100.00%
	342		Printing, publishing and allied industries	0.00%	0.00%	0.00%	0.00%	0.00%
35			Manufacture of chemicals and chemical, petroleum, coal, rubber and plastic products	0.00%	0.00%	0.00%	0.00%	0.00%
	351		Manufacture of industrial chemicals					
		3511	Manufacture of basic industrial chemicals except fertilizers	0.00%	0.00%	0.00%	0.00%	0.00%
		3512	Manufacture of fertilizers and pesticides	100.00%	100.00%	100.00%	100.00%	100.00%
		3513	Manufacture of synthetic resins, plastics materials and man-made fibres except glass	(in 356)	(in 356)	(in 356)	(in 356)	(in 356)
	352		Man. of other chemical products					
		3521	Man. of paints, varnishes and lacquers	0.00%	0.00%	0.00%	0.00%	0.00%
		3522	Man. of drugs and medicines	5.00%	5.00%	5.00%	5.00%	5.00%
		3523	Man. of soap and cleaning preparations, perfumes, cosmetics and other toilet preparations	4.01%	5.91%	3.18%	2.08%	11.58%
		3529	Man. of chemical products n.e.c.	0.00%	0.00%	0.00%	0.00%	0.00%
	353		Petroleum refineries	7.75%	8.17%	1.97%	3.11%	4.18%
	354		Man. of miscellaneous products of petroleum and coal	0.00%	0.00%	0.00%	0.00%	0.00%
	355		Man. of rubber products	100.00%	100.00%	100.00%	100.00%	100.00%
		3551	Tyre and tube industries	100.00%	100.00%	100.00%	100.00%	100.00%
		3559	Manufacture of rubber products n.e.c.	100.00%	100.00%	100.00%	100.00%	100.00%
	356		Man. of plastics products n.e.c.	67.28%	48.51%	38.00%	31.24%	23.23%
36			Manufacture of non-metallic mineral products, except products of petroleum and coal	0.00%	0.00%	0.00%	0.00%	0.00%
	361		Manufacture of non-structural non-refractory ceramic ware (pottery, china and earthenware)	0.00%	0.00%	0.00%	0.00%	0.00%
	362		Manufacture of glass and glass products	0.00%	0.00%	0.00%	0.00%	0.00%
	369		Man. of other non-metallic mineral products	0.00%	0.00%	0.00%	0.00%	0.00%
37			Basic metal industries	0.00%	0.00%	0.00%	0.00%	0.00%
	371		Iron and steel basic industries	0.00%	0.00%	0.00%	0.00%	0.00%
	372		Non-ferrous metal basic industries	0.00%	0.00%	0.00%	0.00%	0.00%
38			Man. of fabricated metal products, machinery and equipment					
	381		Man. of fabricated metal products, except machinery and equipment	0.00%	0.00%	0.00%	0.00%	0.00%
	382		Man. of machinery except electrical	11.65%	11.65%	11.65%	11.65%	11.65%
		3821	Manufacture of engines and turbines	0.00%	0.00%	0.00%	0.00%	0.00%
		3822	Manufacture of agricultural and forestry machinery	11.65%	11.65%	11.65%	11.65%	11.65%
		3823	Manufacture of metal and woodworking machinery	0.00%	0.00%	0.00%	0.00%	0.00%
		3824	Man. of special industrial machinery & equipment except metal & woodworking machinery	0.00%	0.00%	0.00%	0.00%	0.00%
		3825	Manufacture of office, computing and accounting machinery	0.00%	0.00%	0.00%	0.00%	0.00%
		3829	Machinery and equipment except electrical n.e.c.	11.65%	11.65%	11.65%	11.65%	11.65%
	383		Man. of electrical machinery appartus, appliances and supplies	0.00%	0.00%	0.00%	0.00%	0.00%
	384		Man. of transport equipment	0.00%	0.00%	0.00%	0.00%	0.00%
	385		Man. of prof. and scientific, measuring & controlling equip. n.e.c., and of photographic & optical goods	0.00%	0.00%	0.00%	0.00%	0.00%
39			Other manufacturing industries	0.00%	0.00%	0.00%	0.00%	0.00%
951			Repair of machinery and equipment	23.31%	26.09%	39.96%	33.53%	30.15%
			TOTAL	0.00%	0.00%	0.00%	0.00%	0.00%

JORDAN **Share of Agribusiness in Economic Activities, according to the International Standard Industrial Classification**
(percent)

Division	Major Group	Category	Description	1987	1988	1989	1990	1991
04			**ELECTRICITY, GAS AND WATER SUPPLY**					
41			Electricity, gas, steam	8.89%	9.35%	7.78%	11.25%	12.41%
42			Water works and supply	15.64%	34.45%	31.69%	39.11%	33.61%
			TOTAL					
05			**CONSTRUCTION**					
50			Construction	1.83%	1.83%	1.83%	1.83%	1.83%
			TOTAL					
06			**WHOLESALE AND RETAIL TRADE AND RESTAURANTS AND HOTELS**					
61			Wholesale trade	0.41%	0.41%	0.41%	0.16%	0.66%
62			Retail trade	42.24%	42.24%	42.24%	50.06%	34.42%
63			Restaurants and hotels					
	631		Restaurants, cafes and other eating and drinking places	100.00%	100.00%	100.00%	100.00%	100.00%
	632		Hotels, rooming houses, camps and other lodging places	25.00%	25.00%	25.00%	25.00%	25.00%
			TOTAL					
07			**TRANSPORT, STORAGE AND COMMUNICATION**					
71			Transport and storage	2.45%	2.57%	2.48%	2.21%	3.36%
72			Communications	1.32%	1.54%	1.60%	1.08%	1.36%
			TOTAL					
08			**FINANCING, INSURANCE, REAL ESTATE AND BUSINESS SERVICES**					
81			Finanacial Institutions	18.80%	19.63%	24.45%	27.24%	17.89%
82			Insurance	1.81%	3.56%	1.93%	4.71%	5.38%
83			Real estate and business services					
	831		Real estate	15.10%	15.49%	21.83%	23.16%	19.92%
	832		Business services except machinery and equipment rental and leasing					
		8321	Legal activities	0.00%	3.98%	6.80%	9.84%	13.74%
		8322	Accounting, bookkeeping and auditing activities; tax consultancy	3.53%	4.01%	6.82%	5.68%	10.53%
		8323	Data processing and tabulating service activities	0.00%	0.00%	0.00%	0.00%	0.00%
		8324	Engineering, architectural and technical service activities	0.00%	0.00%	0.00%	0.00%	0.00%
		8325	Advertising service activities	16.17%	24.83%	18.17%	8.00%	50.09%
		8329	Business service activities, except machinery and equipment rental and leasing n.e.c.	0.00%	0.00%	0.00%	0.00%	0.00%
	833		Machinery and equipment rental and leasing	20.24%	20.26%	26.11%	27.81%	23.41%
			TOTAL					
09			**COMMUNITY, SOCIAL AND PERSONAL SERVICES**					
91			Producers of government services	1.49%	0.82%	1.77%	1.75%	1.64%
92			Sanitary and similar service activities	0.00%	0.00%	0.00%	0.00%	0.00%
93			Social and related community services					
	931		Education service activities	0.00%	0.00%	0.00%	0.00%	0.00%
	932		Research and scientific institutes	0.00%	0.00%	0.00%	0.00%	0.00%
	933		Medical, dental, other health and veterinary services	0.00%	0.00%	0.00%	0.00%	0.00%
		9331	Medical, dental and other health service activities	0.00%	0.00%	0.00%	0.00%	0.00%
		9332	Veterinary activities	0.00%	0.00%	0.00%	0.00%	0.00%
	934		Welfare institutions	0.00%	0.00%	0.00%	0.00%	0.00%
	935		Business, professional and labour associations	8.79%	13.97%	20.06%	20.09%	17.52%
	939		Other social and related community services	0.00%	0.00%	0.00%	0.00%	0.00%
94			Recreational and cultural services	0.00%	0.00%	0.00%	0.00%	0.00%
95			Personal and household services	0.00%	0.00%	0.00%	0.00%	0.00%
96			Extraterritorial organizations and bodies	0.00%	0.00%	0.00%	0.00%	0.00%

Source: Authors' calculations

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JORDAN **Value added from agribusiness, 1987-91**
(thousand dinars, current prices)

Division	Major Group	Category	Description	1987	1988	1989	1990	1991
01	AGRICULTURE, HUNTING, FORESTRY AND FISHING							
11	Agriculture, hunting, forestry and fishing			123357.70	110664.50	131670.10	179158.00	174300.00
12	Forestry and logging			0.00	0.00	0.00	0.00	0.00
13	Fishing			23.80	57.10	73.40	477.40	0.00
			TOTAL	123381.50	110721.60	131743.50	179635.40	174300.00
02	MINING AND QUARRYING							
	210	Coal Mining		0.00	0.00	0.00	0.00	0.00
	290	Other mining		58864.00	73236.00	188049.90	188638.00	152077.00
		2901	Stone quarrying, clay and sand pits	0.00	0.00	0.00	0.00	0.00
		2902	Mining of chemical and fertilizer materials	58864.00	73236.00	188049.90	188638.00	152077.00
		2903	Extraction of salt	0.00	0.00	0.00	0.00	0.00
		2909	Mining and quarrying n.e.c.	0.00	0.00	0.00	0.00	0.00
			TOTAL	58864.00	73236.00	188049.90	188638.00	152077.00
03	MANUFACTURING							
31	Manufacture of food, beverages and tobacco			72805.00	79242.00	91736.20	107543.00	112347.00
	311-2	Food manufacturing		18678.00	24467.00	36744.00	38609.00	38967.00
		3111	Slaughtering, preparing and preserving meat	0.00	-4.00	864.90	1179.00	1276.00
		3112	Manufacture of dairy products	2560.00	4462.00	5239.70	4477.00	3959.00
		3113	Canning and preserving of fruits and vegetables	641.00	1488.00	5409.10	6730.00	4205.00
		3114	Canning, preserving and processing of fish, crustacea and similar foods	0.00	0.00	0.00	0.00	0.00
		3115	Manufacture of vegetable and animal oils and fats	933.00	1194.00	2196.50	4303.00	5455.00
		3116	Grain mill products	3514.00	3477.00	7145.00	4132.00	4110.00
		3117	Manufacture of bakery products	4907.00	7982.00	10863.90	12548.00	12870.00
		3118	Sugar factories and refineries	0.00	0.00	0.00	0.00	0.00
		3119	Manufacture of cocoa, chocolate and sugar	2759.00	943.00	815.30	2339.00	2949.00
		3121	Manufacture of food products n.e.c.	2266.00	3025.00	2565.60	1242.00	2295.00
		3122	Manufacture of prepared animal feeds	1098.00	1900.00	1644.00	1659.00	1848.00
	313	Beverage industries		14258.00	12846.00	14039.80	18854.00	20194.00
		3131	Distilling, rectifying & blending of spirits; ethyl alcohol production from fermented materials	0.00	0.00	0.00	0.00	0.00
		3132	Manufacture of wines	2685.00	2592.00	3669.40	5747.00	5437.00
		3133	Manufacture of malt liquors and malt	0.00	0.00	0.00	0.00	0.00
		3134	Manufacture of soft drinks; production of mineral waters	11573.00	10254.00	10370.40	13107.00	14757.00
	314	Manufacture of tobacco products		39869.00	41929.00	40952.40	50080.00	53186.00
32	Textiles			5409.02	6770.06	8993.75	10418.53	10088.01
	321	Manufacture of textiles		1605.82	2096.66	3763.80	5757.33	3470.41
		3211	Spinning, weaving and finishing textiles	1427.46	1866.61	3530.66	5315.81	2612.85
		3212	Manufacture of made-up textile goods except wearing apparel	0.00	70.20	36.20	164.00	160.00
		3213	Manufacture of knitted and crocheted fabrics and articles	179.00	133.00	123.18	199.20	444.40
		3214	Manufacture of carpets and rugs	-0.64	26.86	73.77	78.32	253.16
		3215	Manufacture of cordage, rope, twine and netting	0.00	0.00	0.00	0.00	0.00
		3219	Manufacture of textiles n.e.c.	0.00	0.00	0.00	0.00	0.00
	322	Man. of wearing apparel, except footwear		896.20	992.40	1237.96	1714.20	1991.60
	323	Man. of leather and products of leather, leather substitutes and fur, except footwear and wearing apparel		834.00	1364.00	1067.40	747.00	2421.00
		3231	Tanning and dressing of leather	492.00	384.00	859.60	537.00	1786.00
		3232	Fur dressing and dyeing industries	0.00	0.00	0.00	0.00	0.00
		3233	Manufacture of luggage, handbags and the like, saddlery and harness	342.00	980.00	207.80	210.00	635.00
	324	Manufacture of footwear, except vulcanized, moulded rubber or plastic footwear		2073.00	2317.00	2924.60	2200.00	2205.00

JORDAN **Value added from agribusiness, 1987-91**
(thousand dinars, current prices)

Division	Major Group	Category	Description	1987	1988	1989	1990	1991
33			Manufacture of wood and wood products, including furniture	7561.40	8645.90	11854.10	10745.90	12189.80
		3311	Sawmills, planing and other wood mills	0.00	2606.00	4586.40	1876.00	2779.00
		3312	Manufacture of wooden and cane containers and small cane ware	1284.00	382.00	282.90	316.00	266.00
		3319	Manufacture of wood and cork products n.e.c.	0.00	612.00	419.00	415.00	286.00
		3321	Manufacture of furniture and fixtures, except primarily of metal	6053.40	4250.70	5603.40	7420.50	7909.20
		3322	Upholstery	224.00	795.20	962.40	718.40	949.60
34			Manufacture of paper and paper products, printing and publishing	6360.00	8277.00	10448.70	13404.00	14958.00
	341		Manufacture of paper and paper products	6360.00	8277.00	10448.70	13404.00	14958.00
		3411	Manufacture of pulp, paper and paperboard	622.00	601.00	4618.00	2812.00	1138.00
		3412	Manufacture of containers and boxes of paper and paperboard	2844.00	3634.00	3463.60	7392.00	6565.00
		3419	Manufacture of pulp, paper, and paperboard articles n.e.c.	2894.00	4042.00	2367.10	3200.00	7255.00
	342		Printing, publishing and allied industries	0.00	0.00	0.00	0.00	0.00
35			Manufacture of chemicals and chemical, petroleum, coal, rubber and plastic products	18037.41	29142.77	42711.04	27355.53	31975.08
	351		Manufacture of industrial chemicals	4750.00	16566.00	36358.90	19795.00	23831.00
		3511	Manufacture of basic industrial chemicals except fertilizers	0.00	0.00	0.00	0.00	0.00
		3512	Manufacture of fertilizers and pesticides	4750.00	16566.00	36358.90	19795.00	23831.00
		3513	Manufacture of synthetic resins, plastics materials and man-made fibres except glass	0.00	0.00	0.00	0.00	0.00
	352		Man. of other chemical products	537.81	860.64	1155.27	1022.08	2437.23
		3521	Man. of paints, varnishes and lacquers	0.00	0.00	0.00	0.00	0.00
		3522	Man. of drugs and medicines	362.05	557.90	926.02	878.10	1050.05
		3523	Man. of soap and cleaning preparations, perfumes, cosmetics and other toilet preparations	175.76	302.74	229.25	143.98	1387.18
		3529	Man. of chemical products n.e.c.	0.00	0.00	0.00	0.00	0.00
	353		Petroleum refineries	8099.39	7289.19	672.54	1126.17	1466.70
	354		Man. of miscellaneous products of petroleum and coal	0.00	0.00	0.00	0.00	0.00
	355		Man. of rubber products	321.00	433.00	738.30	724.00	471.00
		3551	Tyre and tube industries	321.00	433.00	738.30	724.00	471.00
		3559	Manufacture of rubber products n.e.c.	0.00	0.00	0.00	0.00	0.00
	356		Man. of plastics products n.e.c.	4329.21	3993.94	3786.04	4688.29	3769.14
36			Manufacture of non-metallic mineral products, except products of petroleum and coal	0.00	0.00	0.00	0.00	0.00
	361		Manufacture of non-structural non-refractory ceramic ware (pottery, china and earthenware)	0.00	0.00	0.00	0.00	0.00
	362		Manufacture of glass and glass products	0.00	0.00	0.00	0.00	0.00
	369		Man. of other non-metallic mineral products	0.00	0.00	0.00	0.00	0.00
37			Basic metal industries	0.00	0.00	0.00	0.00	0.00
	371		Iron and steel basic industries	0.00	0.00	0.00	0.00	0.00
	372		Non-ferrous metal basic industries	0.00	0.00	0.00	0.00	0.00
38			Man. of fabricated metal products, machinery and equipment	236.82	462.12	458.33	729.11	991.80
	381		Man. of fabricated metal products, except machinery and equipment	0.00	0.00	0.00	0.00	0.00
	382		Man. of machinery except electrical	236.82	462.12	458.33	729.11	991.80
		3821	Manufacture of engines and turbines	0.00	0.00	0.00	0.00	0.00
		3822	Manufacture of agricultural and forestry machinery	54.63	49.86	0.00	68.26	57.31
		3823	Manufacture of metal and woodworking machinery	0.00	0.00	0.00	0.00	0.00
		3824	Man. of special industrial machinery & equipment except metal & woodworking machinery	0.00	0.00	0.00	0.00	0.00
		3825	Manufacture of office, computing and accounting machinery	0.00	0.00	0.00	0.00	0.00
		3829	Machinery and equipment except electrical n.e.c.	182.19	412.26	281.72	660.85	934.48
	383		Man. of electrical machinery appartus, appliances and supplies	0.00	0.00	0.00	0.00	0.00
	384		Man. of transport equipment	0.00	0.00	0.00	0.00	0.00
	385		Man. of prof. and scientific, measuring & controlling equip. n.e.c., and of photographic & optical goods	0.00	0.00	0.00	0.00	0.00
39			Other manufacturing industries	0.00	0.00	0.00	0.00	0.00
951			Repair of machinery and equipment	2499.54	3581.45	7885.57	5523.85	6028.43
			TOTAL	112909.20	136121.29	174087.70	175719.92	188578.11

JORDAN **Value added from agribusiness, 1987–91**
(thousand dinars, current prices)

Division	Major Group	Category	Description	1987	1988	1989	1990	1991
04			ELECTRICITY, GAS AND WATER SUPPLY					
41			Electricity, gas, steam	3120.27	3280.81	2731.21	3948.22	4355.20
42			Water works and supply	1391.61	2962.77	3359.22	4732.12	3345.43
			TOTAL	4511.88	6243.58	6090.43	8680.34	7700.63
05			CONSTRUCTION					
50			Construction	2308.16	2168.94	1954.61	2044.37	2302.66
			TOTAL	2308.16	2168.94	1954.61	2044.37	2302.66
06			WHOLESALE AND RETAIL TRADE AND RESTAURANTS AND HOTELS					
61			Wholesale trade	110.73	35.88	-296.59	-131.38	-190.34
62			Retail trade	94416.99	91876.96	89351.20	103112.71	80818.78
63			Restaurants and hotels	17083.08	20553.90	24034.52	25808.33	30817.08
	631		Restaurants, cafes and other eating and drinking places	13921.30	16725.00	19222.10	19293.90	24495.70
	632		Hotels, rooming houses, camps and other lodging places	3161.78	3828.90	4812.43	6514.43	6321.38
			TOTAL	111610.80	112466.74	113089.13	128789.65	111445.52
07			TRANSPORT, STORAGE AND COMMUNICATION					
71			Transport and storage	5981.33	6637.19	7751.18	6253.84	9722.94
72			Communications	565.98	729.62	913.60	934.15	1329.08
			TOTAL	6547.31	7366.81	8664.78	7187.99	11052.03
08			FINANCING, INSURANCE, REAL ESTATE AND BUSINESS SERVICES					
81			Finanacial Institutions	13214.67	17490.92	26750.73	17639.79	16458.22
82			Insurance	323.88	540.31	297.83	783.52	1089.06
83			Real estate and business services	32541.11	37283.04	56206.58	68128.23	71374.09
	831		Real estate	32317.46	36341.60	55362.80	67378.35	70353.05
	832		Business services except machinery and equipment rental and leasing	80.05	828.46	791.55	661.50	982.39
		8321	Legal activities	0.00	142.81	236.84	286.58	410.94
		8322	Accounting, bookkeeping and auditing activities; tax consultancy	0.00	140.27	155.04	145.65	155.81
		8323	Data processing and tabulating service activities	0.00	0.00	0.00	0.00	0.00
		8324	Engineering, architectural and technical service activities	0.00	0.00	0.00	0.00	0.00
		8325	Advertising service activities	80.05	545.38	399.68	229.26	415.63
		8329	Business service activities, except machinery and equipment rental and leasing n.e.c.	0.00	0.00	0.00	0.00	0.00
	833		Machinery and equipment rental and leasing	143.59	112.97	52.22	88.39	38.66
			TOTAL	46079.66	55314.27	83255.14	86551.55	88921.37
09			COMMUNITY, SOCIAL AND PERSONAL SERVICES					
91			Producers of government services	5734.29	3281.45	7587.69	7769.28	7742.55
92			Sanitary and similar service activities	0.00	0.00	0.00	0.00	0.00
93			Social and related community services	78.87	4698.66	5669.34	7115.65	8639.03
	931		Education service activities	NA	0.00	0.00	0.00	0.00
	932		Research and scientific institutes	NA	0.00	0.00	0.00	0.00
	933		Medical, dental, other health and veterinary services	0.00	0.00	0.00	0.00	0.00
		9331	Medical, dental and other health service activities	0.00	0.00	0.00	0.00	0.00
		9332	Veterinary activities	0.00	0.00	0.00	0.00	0.00
	934		Welfare institutions	0.00	0.00	0.00	0.00	0.00
	935		Business, professional and labour associations	78.87	128.27	123.02	190.31	181.72
	939		Other social and related community services	0.00	0.00	0.00	0.00	0.00
94			Recreational and cultural services	0.00	0.00	0.00	0.00	0.00
95			Personal and household services	0.00	0.00	0.00	0.00	0.00
96			Extraterritorial organizations and bodies	0.00	0.00	0.00	0.00	0.00
			TOTAL	5813.16	7980.11	13257.02	14884.93	16381.59
GDP at Producers Prices				472025.67	511619.34	720192.22	792132.15	752758.92
Share of Agribusiness in Entire Economy				24.15%	24.77%	31.83%	33.73%	29.12%

Source: Authors' calculations