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## Export Trade of the State of Missouri

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Export Trade of the State of Missouri

Emilio Pagoulatos

Robert Sorensen

EXPORT TRADE OF THE STATE  
OF MISSOURI

BY

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University of Missouri-St. Louis

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## PREFACE

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## Chapter I: Introduction

This study analyzes the volume and impact of exporting activity on the Missouri economy. Until recently foreign trade had not been a major factor in the economic thinking of most Americans. When discussions do turn to international trade matters, they almost always focus upon the impact and potential threat of import competition faced by American firms, to the exclusion of considerations of the export side of the ledger. This kind of thinking is understandable, since the existence of a large and diversified domestic economy has meant that most American producers have not needed to extensively seek out markets for their products outside this country. Nonetheless, this kind of thinking tends to obscure a long history of the importance of U.S. and Missouri produced products in world export markets, and likewise the importance of these exports on the economic health of the U.S. and Missouri economies.

Fortunately, the situation appears to be changing. The increasing reliance of the U.S. upon imported oil, along with the recent declines in the international value of the dollar have helped to re-focus attention on the importance of foreign trade in general, and the necessity of the U.S. maintaining a strong export position. Indeed, recent announcements from Washington indicate the likelyhood of a thorough restructuring of American foreign trade policy, and a renewed emphasis upon the promotion of U.S. exports.

Policies aimed at promoting exports will have effects virtually everywhere in the U.S. economy, but it is important to remember that impacts of policy change, will differ among geographical areas and communities depending upon an area's or community's production mix and dependence upon exporting activity.

If local policy makers are to be prepared to evaluate and respond to the possible consequences of changes in U.S. export policy on their community's economic vitality, it is necessary for them to achieve a better understanding of the impact of export activity on their local economies. It is the aim of this study to provide such information for the Missouri economy.

Exporting activity affects a local economy in a variety of ways. If goods directly exported to foreign countries were the only factor affecting an area's reliance upon foreign trade, the measurement and evaluation of the export activity would be a relatively simple task. The overall impact of exporting, however, extends far beyond the clearly observable effects of direct exports. Because of this, communities often tend to underestimate the importance of foreign sales in generating local business activity, income and employment.

The relatively invisible relationships between the local economy and export activity take at least two additional forms. First, many local firms may produce and sell goods to other U.S. firms which are used as inputs for the production of a final product. To the extent these final products enter export markets Missouri firms end up "indirectly" exporting a share of their production. Second, export sales from the local economy, through complex inter-relationships within the economy, will generate business activity and income in excess of the initial export sale through so called "multiplier effects".<sup>1</sup>

In what follows in this study, we examine the stake of the Missouri economy on exporting activity. Chapter II of the study details the composition, magnitude, and changes of output directly exported from the Missouri economy.

1. A local economy is actually influenced by exports in a third way. Exports from the U.S., wherever they originate, will lead to increases in national income. These increases in national income ultimately result in increased aggregate demand, including the demand for the local economy's output.

Chapter III estimates the composition, magnitude, and changes in the amount of output "indirectly" exported from the Missouri economy. Chapter IV investigates the multiplier repercussions brought about by exporting in terms of the impact on total business activity, personal income, employment, and tax revenues within the state. Finally, Chapter V evaluates the overall performance of the Missouri export sector and presents the conclusions of this study.



## Chapter II: Direct Missouri Exports

In this section we present the estimates of the dollar value of products produced in the State of Missouri and directly exported abroad.

In a following section estimates are made of the order of magnitude of those products that are shipped from Missouri to producers in other States who process them further before they are sold in world export markets. These later exports which derive from products produced in Missouri and are subsequently used as inputs in other States' exports constitute "indirect" exports of the State.

The estimates of "direct" Missouri exports presented in this study were obtained from already published data sources. First, exports of the Missouri farm sector as well as agricultural exports of other States have already been estimated by the U.S. Department of Agriculture, and are published every year in Foreign Agricultural Trade of the United States [ 7 ].<sup>1</sup> The estimated export shares of farm products attributable to individual States are derived from U.S.D.A. farm production and sales data and information obtained from commodity specialists, trade associations, transportation agencies, and exporters. Second, data on "direct" exports of manufacturing establishments by State have been estimated by the Bureau of the Census of the U.S. Department of Commerce [10,11,12] and are available for several years. These manufacturing export data are based on surveys conducted by the Bureau of the Census at irregular intervals. Since directly reported exports from the surveyed firms understate the true value of each State's exports, an effort is made by the Bureau to estimate the actual export value by adding to the reported figures those exports made by wholesalers and independent exporters. The adjustments made to

1. Numbers in brackets refer to references listed at the end of this study.

to compensate for the underreporting of exports are based on data compiled by the Foreign Trade Division of the Bureau of the Census.

### Changes in Missouri Direct Exports

In this section we present the estimates of agricultural and manufacturing "direct" Missouri exports over the period 1963-1976. These estimates along with the percentage change from the previous survey year are summarized in Table 1. The total value of Missouri exports has increased more than sixfold from 1963 to 1976 from about 369 million dollars to about 2.3 billion dollars. The fastest growth was experienced by manufacturing exports which grew from about 204 million in 1963 to 1.6 billion dollars in 1976, which amounted to an almost eightfold increase. Agricultural exports have grown over the same period about half as fast, from about 164 million dollars in 1963 to approximately 650 million dollars in 1976. As a result, exports of farm products have become comparatively less important over time and have dropped from about 45% of total Missouri exports in 1963 to about 29% of the total in 1976. This structural transformation is consistent with the general long-run trend of world trade in agricultural products in that agricultural products have become a smaller proportion of total world trade in all commodities. It is commonly held that this relationship between agricultural and nonagricultural trade is associated with a slowly growing demand for agricultural products in the major industrial nations due to relatively low income elasticities for farm goods. Some additional factors that appear to provide an explanation for the decline of the structural importance of farm products in world markets are the tendency toward self-sufficiency in many agricultural commodities in several developed countries, and the great improvements in farm technology that have lead to a rapid growth of domestic agricultural output to the expense of imports.

Table 1: Percent Change in Missouri Exports, 1960-76

Industry	(million dollars and percentage change)									
	1963	63/60 %	1966	66/63 %	1969	69/66 %	1972	72/69 %	1976	76/72 %
Livestock and prods	21.3	n.a.	19.6	-7.9	29.5	50.5	33.3	12.9	78.4	135.4
Other Agriculture	143.0	n.a.	166.7	16.6	170.2	2.1	257.8	51.5	571.3	121.6
Food and Kindred prods	58.5	16.0	54.8	-6.3	53.5	-2.4	73.9	38.1	118.6	60.5
Tobacco Manuf.	.8	14.3	.7	-12.5	.8	14.3	.7	-12.5	1.2	71.4
Textile Mill prods	1.2	2.0	1.1	8.3	1.5	36.4	2.5	66.7	4.8	92.0
Apparel and prods.	2.5	7.0	4.5	80.0	5.1	13.3	4.6	-9.8	11.7	154.3
Lumber and wood	2.5	33.0	4.5	80.0	5.0	11.1	3.2	-36.0	8.0	150.0
Furniture and fixtures	.3	2.0	.7	133.3	.8	14.3	.9	12.5	3.1	244.4
Paper and allied prods	2.6	39.0	3.2	23.1	3.9	21.9	4.3	10.3	9.9	130.2
Printing and publishing	2.5	39.0	6.0	140.0	6.2	3.3	10.5	69.4	9.3	-11.4
Chemicals and prods	28.9	28.0	44.7	54.7	51.5	-5.9	66.7	29.5	151.5	127.1
Petroleum and coal	.5	1.0	1.1	120.0	2.0	81.8	1.8	-10.0	5.3	194.4
Rubber and plastics	1.2	n.a.	2.5	108.3	5.0	100.0	9.6	92.0	39.2	308.3
Leather and prods	3.9	-2.0	3.6	-7.7	3.0	-16.7	3.7	23.3	10.0	170.3
Stone, clay, glass	12.7	40.0	16.0	26.0	15.5	-40.4	16.4	5.8	30.4	85.4
Primary metal	2.6	-61.2	6.0	130.8	11.3	88.3	17.5	54.9	10.1	-42.3
Fabricated metal prods	7.4	46.0	13.8	86.5	27.6	100.0	9.8	64.5	52.3	433.7
Non-electr. machin.	26.8	2.0	60.6	126.1	65.9	8.7	72.1	9.4	195.7	171.4
Electrical machin.	10.5	26.0	16.9	61.0	26.0	53.8	34.7	33.5	154.8	346.1
Transportation equip	13.0	31.0	101.3	679.2	314.0	209.9	267.9	-14.7	769.2	187.1
Instruments and prods	4.9	75.0	4.2	-14.3	5.9	40.5	12.2	106.8	30.8	152.4
Miscell manuf.	21.3	15.0	22.4	5.8	26.9	20.1	17.7	34.2	5.4	-69.5
<b>Total Agriculture</b>	<b>164.3</b>	<b>n.a.</b>	<b>186.3</b>	<b>13.4</b>	<b>199.7</b>	<b>7.2</b>	<b>291.1</b>	<b>45.8</b>	<b>649.7</b>	<b>123.2</b>
<b>Total Manufacturing</b>	<b>204.6</b>	<b>17.0</b>	<b>369.4</b>	<b>80.6</b>	<b>633.5</b>	<b>71.5</b>	<b>643.3</b>	<b>1.5</b>	<b>1622.0</b>	<b>152.1</b>
<b>Total Exports</b>	<b>368.9</b>	<b>n.a.</b>	<b>555.7</b>	<b>50.6</b>	<b>833.2</b>	<b>49.9</b>	<b>934.4</b>	<b>12.1</b>	<b>2271.7</b>	<b>143.1</b>

As it can be seen from Table 1, a comparison of rates of change across broad two-digit S.I.C. industry categories reveals that the fastest growing commodity groups over the 1963-76 period were Transportation Equipment, Rubber and Plastics, and Electrical Machinery. These commodity groups grew from 13, 1.2, and 10.5 million dollars in 1963 to about 769, 39, and 155 million dollars in 1976 respectively. On the other hand, the Missouri industries experiencing the slowest export growth were Tobacco Manufactures, Food and Kindred Products, Stone, Clay and Glass and Leather and Leather Products. These four slow-growing product groups saw their share in total Missouri exports drop from about 21% in 1963 to only about 7% in 1976. It comes as no surprise, since it conforms with national and international trends, that the group of rapidly growing exporting industries in Missouri consist of those producing high-technology products. In contrast, the slower growing exporters in the State of Missouri include low-technology type of industries. Overall, however, direct exports of manufactured products have become increasingly important to the Missouri economy. Whereas direct exports of manufactures amounted to only 2% of total manufacturing shipments in 1963, this figure increased to 3.3% by 1972 and to 5.9% by 1976.

#### The Position of Missouri in Total U.S. Exports

In this section we investigate the position of Missouri "direct" exports in the framework of total United States exports. Table 2 presents Missouri and U.S. Exports over the 1963 to 1976 period along with the percentage of Missouri exports relative to the corresponding U.S. figure. The overall results show that both agricultural and manufacturing exports originating in the State of Missouri have grown about as rapidly as total United States exports. In terms of the individual two-digit S.I.C. industry categories,

Table 2: Missouri and United States Exports, 1963-1976

Industry and S.I.C. Code	(million dollars)						(estimated values in parenthesis)								
	1963			1966			1969			1972			1976		
	U.S.	MO	MO% of US	U.S.	MO	MO% of US	U.S.	MO	MO% of US	U.S.	MO	MO% of US	U.S.	MO	MO% of US
Livestock and Prods (013)	671.3	21.3	3.2	683.2	19.6	2.9	704.4	29.5	4.2	927.1	33.3	3.6	1805.7	78.4	4.3
Other Agriculture (p. 01, et al)	4456.9	143.0	3.2	4955.9	166.7	3.4	5290.1	170.2	3.2	6251.0	257.8	4.1	18322.2	571.3	3.1
Food and Kindred prods (20)	700.6	(58.5)	8.3	1908.1	(54.8)	2.9	2160.0	(53.5)	2.5	3046.2	(73.9)	2.4	5823.0	(118.6)	2.0
Tobacco Manuf (21)	308.1	(0.8)	.3	578.3	(.7)	.1	666.8	(.8)	.1	608.4	(.7)	.1	1019.9	(1.2)	.1
Textile Mill prods (22)	32.1	(1.2)	3.7	355.3	(1.1)	.3	428.9	(1.5)	.3	654.9	(2.5)	.4	1224.5	(4.8)	.4
Apparel and prods (23)	119.5	(2.5)	2.1	198.9	(4.5)	2.3	226.2	(5.1)	2.3	291.7	(4.6)	1.6	728.5	(11.7)	1.6
Lumber and wood (24)	192.9	(2.5)	1.3	284.3	(4.5)	1.6	512.2	(5.0)	1.0	766.1	(3.2)	.4	1892.0	(8.0)	.4
Furniture and fixtures, (25)	26.4	(0.3)	1.1	36.1	(.7)	1.9	43.8	(.8)	1.8	51.7	(.9)	1.7	134.5	(3.1)	1.7
Paper and allied prods (26)	318.1	(2.6)	.8	599.7	(3.2)	.5	790.0	(3.9)	.5	988.4	(4.3)	.4	2250.7	(9.9)	.4
Printing and publishing (27)	94.5	(2.5)	2.6	258.9	(6.0)	2.3	298.9	(6.2)	2.1	347.7	(10.5)	3.0	573.9	(9.3)	1.6
Chemicals and prods (28)	1354.4	(28.9)	2.1	2438.6	(44.7)	1.8	3049.0	(51.5)	1.7	3756.8	(66.7)	1.8	9271.2	(151.5)	1.6
Petroleum and coal (29)	428.5	(.5)	.1	400.9	(1.1)	.3	434.3	(2.0)	.5	401.0	(1.8)	.4	1151.6	(5.3)	.5
Rubber and plastics (30)	164.8	(1.2)	.7	337.2	(2.5)	.7	387.8	(5.0)	1.3	519.3	(9.6)	1.8	1270.4	(39.2)	3.1
Leather and prods (31)	17.9	(3.9)	21.8	60.4	(3.6)	6.0	69.0	(3.0)	4.3	103.9	(3.7)	3.6	279.7	(10.0)	3.6
Stone, Clay, Glass (32)	153.1	(12.7)	8.3	283.3	(16.0)	5.6	341.6	(15.5)	4.5	488.7	(16.4)	4.0	901.7	(30.4)	3.4
Primary metal ind. (33)	700.0	(2.6)	.4	1080.7	(6.0)	.6	1782.0	(11.3)	.6	1490.2	(17.5)	1.2	2935.7	(10.1)	.3
Fabricated metal prods (34)	389.7	(7.4)	1.9	948.0	(13.8)	1.5	1180.6	(27.6)	2.3	1429.3	(9.8)	.7	3702.5	(52.3)	1.4
Non-electr. Machinery (35)	2547.6	(26.8)	1.0	4722.3	(60.6)	1.3	6021.1	(65.9)	1.1	7823.6	(72.1)	.9	19036.5	(195.7)	1.0
Electrical machin (36)	990.8	(10.5)	1.1	1605.4	(16.9)	1.1	2480.0	(26.0)	1.0	3295.8	(34.7)	1.1	9169.5	(154.6)	1.7
Transportation equip (37)	2097.1	(13.0)	.6	3452.4	(101.3)	2.9	6174.4	(314.0)	5.1	7841.7	(267.9)	-3.4	16519.1	(769.2)	4.7
Instruments and prods (38)	416.3	(4.9)	1.2	791.9	(4.2)	.5	1086.8	(5.9)	.5	1530.9	(12.2)	.8	3758.3	(30.8)	.8
Miscell. manufact. (39)	174.0	(21.3)	12.2	978.5	(22.4)	2.3	1076.4	(26.9)	2.5	1251.7	(17.7)	1.4	1335.8	(5.4)	.4
Total Agriculture (01)	5128.2	164.3	3.2	5639.1	186.3	3.3	5994.5	199.7	3.3	7178.1	291.1	4.0	20127.9	649.7	3.2
Total Manufacturing (2,3)	11003.7	(204.6)	1.9	21299.2	(369.4)	1.7	29210	(633.5)	2.2	36603	(643.3)	1.8	83098	(1522.0)	2.0
Total Exports	16131.9	(368.9)	2.3	26938.3	(555.7)	2.1	35204.5	(833.2)	2.4	43786.1	(934.4)	2.1	103225.9	(2271.7)	2.2

Missouri exports have grown faster than U.S. exports in eight out of twenty product groups. The industries that have grown notably faster than the U.S. total over the 1963-76 period were Livestock and Livestock products, Furniture and Fixtures, Rubber and Plastics and Transportation Equipment. The least successful Missouri industries as compared to total U.S. exports were Food and Kindred Products, Textile Mill Products, Leather and Leather Products, and Stone, Clay and Glass. This latter group of products has grown in average about four times less rapidly than exports for the whole U.S. for the same commodities.

Missouri's export performance also compares favorably to that of other states. Table 3 presents a ranking of the twenty leading States in the export of agricultural and manufacturing commodities. As it can be observed from Table 3, Illinois retained its position over the 1963-1976 period as the largest exporter of farm products. While Texas was the second largest agricultural exporter up to 1969, this position has been captured for 1972 and 1976 by the State of Iowa. Missouri has fared fairly well as an exporter of farm commodities and has experienced a relative improvement in its position over time. Missouri ranked thirteenth as an agricultural exporter in the nation in 1963, but gradually improved to twelveth for the years 1966 and 1969, was ranked tenth in the nation in 1972, and finally was the eleventh farm exporter in the U.S. in 1976.

Turning now to the ranking of the leading States in the export of manufacturing products, we observe from Table 3 that California, Michigan and Illinois have consistently been the national leaders in manufacturing exports. Missouri, however has seen its relative ranking improve over the 1963 to 1976 period. The State of Missouri was ranked twentieth in 1963

Table 3: Leading States in Export of Agricultural and Manufacturing Products

(millions of dollars in parentheses)

rank	1963		1966		1969		1972		1976	
	Agric.	Manuf.	Agric.	Manuf.	Agric.	Manuf.	Agric.	Manuf.	Agric.	Manuf.
1.	Illin (504)	Calif (1494)	Illin (666)	Illin (1869)	Illin (585)	Calif (2721)	Illin (758)	Mich (3243)	Illin (2405)	Calif (8072)
2.	Texas (484)	N.Y. (1447)	Texas (495)	N.Y. (1838)	Texas (551)	Mich (2613)	Iowa (620)	Ohio (2927)	Iowa (1752)	Mich (6888)
3.	Calif (421)	Illin (1441)	Calif (494)	Calif (1786)	Calif (413)	Illin (2343)	Calif (592)	N.Y. (2864)	Texas (1541)	Illin (6660)
4.	Kansas (337)	Ohio (1420)	Iowa (426)	Ohio (1670)	Iowa (392)	Ohio (2338)	Texas (456)	Calif (2818)	Calif (1466)	Ohio (5794)
5.	Iowa (331)	Penn (1238)	Kansas (392)	Mich (1568)	N.Carol (366)	N.Y. (2296)	N.Carol (420)	Illin (2797)	Kansas (1312)	N.Y. (5320)
6.	N. Carol (321)	Texas (899)	Ind (317)	Penn (1542)	Kansas (296)	Penn (1902)	Ind (384)	Penn (2346)	Nebr (1139)	Texas (5201)
7.	Ind (251)	N.Jers (842)	N.Carol (306)	Texas (1100)	Ark (255)	Texas (1468)	Kansas (365)	Texas (1836)	Ind (1135)	Penn (4706)
8.	Minn (222)	Mass (526)	Minn (241)	N.Jers (980)	Ind (252)	N.Jers (1114)	Ark (352)	Wash (1494)	Minn (915)	Wash (3235)
9.	Ark (207)	Wisc (500)	Nebr (232)	Ind (661)	Nebr (230)	Ind (999)	Minn (347)	N.Jers (1368)	Ohio (813)	Ind (2830)
10.	Nebr (205)	N. Car (483)	Ohio (219)	Wisc (620)	Minn (226)	Wash (955)	Mo (317)	Ind (1349)	N.Car (786)	N.Jers (2660)
11.	Ohio (201)	Ind (472)	N. Dak (205)	Wash (602)	Ohio (194)	Mass (818)	Nebr (283)	Mass (983)	Mo (700)	Mass (2502)
12.	N. Dak (194)	Conn (390)	Mo (204)	Mass (600)	Mo (174)	Wisc (785)	Ohio (262)	Wisc (955)	Ark (676)	Wisc (2209)
13.	Mo (193)	VA (368)	Ark (201)	N. Car (560)	N. Dak (166)	N. Car (739)	N. Dak (250)	N. Car (917)	N. Dak (616)	N. Car (2202)
14.	Miss (157)	Wash (301)	Okla (182)	VA (499)	Miss (164)	Conn (659)	Miss (230)	Conn (869)	Ckla (552)	Conn (1958)
15.	Wash (147)	La (283)	Wash (155)	Conn (489)	La (155)	Mo (634)	La (191)	Va (756)	Wash (546)	Mo (1622)
16.	Ckla (133)	Iowa (240)	Miss (127)	Mo (369)	Oregon (152)	Va (501)	Ga (173)	Tenn (716)	Mont (413)	Minn (1567)
17.	Mont (128)	Fla (226)	Mont (127)	Ga (355)	Ga (132)	Minn (492)	Wash (163)	Ga (551)	Miss (399)	Va (1545)
18.	Mich (116)	Mar (225)	Tenn (112)	Tenn (340)	Okla (115)	Tenn (472)	Fla (148)	Mo (643)	Ga (394)	Iowa (1500)
19.	Ga (114)	Ga (208)	Mich (110)	Iowa (337)	S.Car. (107)	Ga (428)	Tenn (143)	Minn (638)	Mich (388)	La (1383)
20.	Tenn (102)	Mo (205)	Ga (109)	Minn (327)	Mont (107)	Fla. (426)	S.Car (135)	Fla (570)	Ky (351)	Ga (1365)

in the export of manufactured products, while by 1976 had risen to the relative position of fifteenth as compared to other states.

Table 4 presents the leading exporting States by rank for selected industries in 1976. As it can be seen, Missouri was the largest exporter of Hats, Caps and Millinery, and Structural Clay products. The State of Missouri ranked third in the Nation in the export of Periodicals, and Non-ferrous Foundry Products. In the case of food and farm products, Missouri was the fourth largest exporter of Meats and Meat Products (except poultry), Soybeans, Soybean Oil, Protein Meal and Grain Mill Products. Finally, the State of Missouri ranked fifth in the export of Commercial Printing Products, and in Agricultural Chemicals. We can thus conclude that the State of Missouri has not only ranked favorably when compared with other States' export performance in farm and manufactured products, but has also improved its relative ranking as an exporting State in the Nation and has achieved high relative rankings for a broad spectrum of commodities.

#### The Commodity Composition of Missouri Exports

Tables 5, 6, 7, 8, and 9 present the commodity composition of exports from the State of Missouri for the years 1976, 1972, 1969, 1966, and 1963 respectively. As can be observed from these tables, farm exports have declined in relative importance in total Missouri exports over time. Livestock and other agricultural products accounted for about 44.5 percent of total Missouri exports in 1963, but have gradually decreased their share of the total to about 33.5 percent in 1966, 24 percent in 1969, 31.2 percent (a slight upturn) in 1972, and finally to about 28.6 percent of the total in 1976. The share of farm products in the commodity composition of total U.S. exports has also declined, but at a faster rate. Agricultural exports



Table 4: Leading Exporting States for Selected Industries, 1976

(million dollars)

Industry Category	Leading 10 States by Rank									
	1	2	3	4	5	6	7	8	9	10
Meats & Products (exc. poultry)	Iowa 98.4	Illin 53.8	Neb. 37.6	<u>Mo.</u> 33.7	Texas 32.7	Ind. 32.2	Minn. 30.5	Kansas 22.9	S. Dac 19.0	Ohio 17.7
Lard & tallow	Texas 38.7	Iowa 33.4	Neb. 25.8	Colo. 18.7	Kansas 18.6	<u>Mo</u> 18.4	Calif 16.7	Okla 15.3	Illin 14.7	Minn 13.9
Soybeans	Illin 591.9	Iowa 482.3	Ind. 242.5	<u>Mo</u> 230.7	Ark 226.0	Ohio 203.9	Minn 186.8	Miss 139.0	Tenn 91.7	La 89.5
Soybean Oil	Illin 33.6	Iowa 27.4	Ind 13.8	<u>Mo</u> 13.1	Ark 12.8	Ohio 11.6	Minn 10.6	Miss 7.9	Texas 5.2	La 5.1
Cottonseed Oil	Texas 42.6	Calif 36.4	Miss 18.3	Ark 12.6	Ariz 11.9	La 6.2	Ala 5.7	Tenn 4.0	<u>Mo</u> 3.8	Okla 3.4
Rice	Ark 169.7	Calif 127.5	La 106.2	Texas 105.9	Miss 28.3	<u>Mo</u> 3.2	-	-	-	-
Protein Meal	Illin 142.2	Iowa 115.9	Ind 58.3	<u>Mo</u> 55.5	Ark 54.5	Ohio 49.0	Minn 48.1	Miss 33.7	Tenn 22.1	La 21.6
Feed Grains (barley, corn, oats, & sorghum)	Illin 1181.6	Iowa 793.7	Neb 610.5	Ind 509.9	Texas 497.3	Minn 298.2	Ohio 263.7	Kans 244.4	Mich 142.0	<u>Mo</u> 123.3
Cotton, including linters	Texas 255.5	Calif 205.5	Miss 111.2	Ark 74.1	Ariz 63.3	La 37.1	Ala 33.3	Tenn 23.3	<u>Mo</u> 20.7	Okla 19.5
Grain Mill Products	Texas 284.5	Ark 163.6	Calif 141.8	<u>Mo</u> 90.4	Neb 64.8	Kans 44.1	Iowa 40.1	Tenn 27.6	Ind 25.3	Wisc. 23.7
Men's & Boy's Furnishings	Tenn. 26.7	Texas 20.6	S. Car 15.6	Ala 14.2	Ga 13.2	Okla 13.1	Miss 11.5	N. Car 9.7	Ky 9.0	<u>Mo</u> 5.9
Hats, Caps and millinery	<u>Mo</u> 3.6	-	-	-	-	-	-	-	-	-
Periodicals	NY 65.2	Illin 23.3	<u>Mo</u> 4.7	Ohio 3.1	Tenn 2.5	-	-	-	-	-

(continued)

Table 4: Continued

(million dollars)

Industry Category	Leading 10 States by Rank									
	1	2	3	4	5	6	7	8	9	10
Commercial Printing	Illin 38.5	Conn 12.9	Ohio 12.1	Calif 10.7	Mo <u>4.6</u>	Penn 4.5	Fla 4.2	Colo 3.7	Texas 3.7	Mass 1.7
Drugs	N.Jers 186.1	Illin 154.8	N.Y. 143.5	Ind. 137.9	Mich 119.0	Penn 85.6	Calif 57.4	Conn 47.5	Mo <u>27.4</u>	-
Soap, Cleaners & toilet goods	N.Jers 325.5	Mass 199.2	Calif 148.9	NY 124.2	Illin 116.7	Ohio 71.6	Mo <u>48.7</u>	Penn 42.4	Maryl 38.3	Conn 32.5
Agricultural Chemicals	Fla 241.2	La 172.9	Texas 88.9	Calif 61.4	Mo <u>12.6</u>	Ohio 8.8	-	-	-	-
Miscell. Plastics products	Ohio 89.3	Illin 60.4	Penn 53.5	Texas 52.0	N.Y. 38.7	Ind 38.2	Calif 36.6	Mo <u>34.0</u>	Iowa 31.4	Mich 29.4
Structural clay prods.	Mo <u>22.0</u>	Ohio 17.4	Ga 5.5	Texas 0.4	-	-	-	-	-	-
Nonferrous foundries	Mich 7.9	Ala 3.4	Mo <u>0.5</u>	Wisc 0.1	-	-	-	-	-	-
Electric lighting & wiring equip.	Ohio 67.6	Illin 49.3	Penn 38.1	Ind 36.9	Conn 33.6	Mo <u>27.0</u>	N.Jers. 22.6	N.Y. 22.3	N.Car 12.7	Mass 10.0
Transportation Equipment	Mich 3586.3	Calif 2061.7	Wash 1805.1	Ohio 1647.4	Conn 930.9	Ind 919.3	Mo <u>769.2</u>	Texas 669.0	Penn 650.6	Ga 466.6

accounted for 31.8 percent of total U.S. exports in 1963, but only 19.5 percent by 1976. This implies that Missouri remains considerably more dependent upon agricultural exports than does the U.S. as a whole.

In terms of the individual farm product groups, the largest Missouri exports over the 1963-76 period have been in Wheat and Wheat Flour, Other Feed Grains (which include corn, grain sorghums, barley, and oats), Soybeans, and Protein Meal. Soybeans was the largest farm export commodity group accounting for about 10.1 percent of total Missouri exports in 1976, followed by Other Feed Grains and by Wheat and Wheat Flour with shares of about 5 percent each in 1976.

Turning now to the products exported by the Missouri manufacturing sector, we observe that these products have increased their share in total exports of the State for the time period under consideration. Tables 5 through 9 reveal that Missouri exports of manufactures have increased as a proportion of total exports from 55.5 percent in 1963 to 66.5 percent in 1966, and to 76.0 percent in 1969. There was a decline in their share to about 68.8 percent in 1972, but 1976 registered a further increase reaching a share of about 71.4 percent.

In terms of two-digit S.I.C. industry categories some notable changes have taken place. First, the largest manufacturing exporters of the State of Missouri in 1963 were Food and Kindred Products (with 15.9% of the total), followed by Chemicals (7.8%), Non-electrical Machinery (7.3%), Transportation Equipment (3.4), and Stone, Clay and Glass (3.4%). Two of the above industries experienced substantial decreases in their share of total State exports. Specifically, the shares of Food and Kindred Products and Stone, Clay and Glass sharply dropped to 5.2 percent and 1.3 percent respectively in 1976,

Table 5: Industry Composition of U.S. and Missouri Exports, 1976

(million dollars)			
Industry Category (S.I.C. code)	U.S.	Missouri	% of Total Exports
<b>A. Livestock and Livestock Prod</b>	1805.7	78.4	3.451
Dairy Products (0132)	118.9	1.1	.048
Poultry and Eggs (0133,0134)	197.7	4.9	.216
Meats and Products (0135,0136,0139)	572.7	33.7	1.481
Hides and Skins (pt. 2011,pt. 3111)	560.7	19.3	.851
Lard and Tallow (pt. 2011,pt. 2013)	355.7	18.4	.810
<b>B. Other Agriculture</b>	18322.2	571.3	25.149
Wheat and Flour (pt.0113,pt.204)	4934.5	118.2	5.200
Rice (pt.0113)	540.8	3.2	.141
Other Feed Grains (pt.0113)	5597.7	123.3	5.428
Cotton, including linters (0112)	881.9	20.7	.911
Soybeans (0113)	3078.1	230.7	10.155
Soybean Oil (2092)	174.9	13.1	.577
Cottonseed Oil (2091,2096)	151.0	3.8	.168
Protein Meal (pt.2094)	759.6	55.5	2.443
Tobacco, unmanufactured (0114)	917.3	1.4	.060
Fruits and pre- parations (pt.0122)	729.8	1.2	.051
Vegetables and preparations (0123)	556.6	.2	.009
<b>C. Manufacturing</b>			
Food and Kindred products (20)	5883.0	118.6	5.221
Meat products (201)	1293.9	7.5	.320
Grain mill products (204)	1228.0	90.4	3.979
Miscellaneous foods (209)	426.9	6.1	.268
Apparel, other Textile prods. (23)	728.5	11.7	.515
Men's & Boy's furnishings (232)	196.1	5.9	.259
Hats, Caps, and millinery (235)	17.7	3.6	.158
Lumber and Wood prods. (24)	1892.0	8.0	.352
Sawmills and planingmills (242)	590.1	5.8	.255

Table 5: Continued

(million dollars)			
Industry Category (S.I.C. code)	U.S.	Missouri	% of Total Exports
Furniture and Fixtures (25)	184.5	3.1	.136
Household			
Furniture (251)	113.2	2.6	.114
Paper and Allied prod. (26)	2260.7	9.9	.436
Misc. converted			
paper prods. (264)	509.7	8.7	.383
Paperboard contain			
& boxes (265)	80.2	1.3	.056
Printing and Publishing (27)	573.9	9.3	.409
Periodicals (272)	136.0	4.7	.207
Commerical Printing (275)	116.2	4.6	.202
Chemicals, Allied prods. (28)	9271.2	151.5	6.669
Drugs (283)	1147.4	27.4	1.206
Soaps, cleaners,			
toilet goods (284)	1453.4	48.7	2.144
Agricultural chemicals (287)	873.4	12.6	.555
Miscellaneous chemicals (289)	842.6	27.3	1.202
Rubber, Misc. Plastics prods. (30)	1270.4	39.2	1.726
Misc. Plastics prods (307)	774.3	34.0	1.497
Stone, Clay, Glass prods. (32)	901.7	30.4	1.338
Structural Clay prods (325)	63.7	22.0	.968
Concrete, Gypsum,			
Plaster prods. (327)	33.6	0.4	.018
Primary Metal Industries (33)	2935.7	10.1	.445
Nonferrous			
foundries (336)	25.1	0.5	.022
Fabricated Metal prods. (34)	3702.5	52.3	2.302
Fabricated Struc.			
metal prods. (344)	924.7	34.8	1.532
Misc. Fabricated			
metal prods. (349)	910.9	9.7	.427
Machinery, Except Electric (35)	19036.5	195.7	8.615
Construction, related machin. (353)	5980.5	25.3	1.114
Metalworking, mach. (354)	1281.0	12.2	.537
General industrial mach. (356)	1940.6	19.0	.836
Refrigeration and			
Service Mach. (358)	1050.2	35.5	1.563

Table 5: Continued

(million dollars)			
Industry Category (S.I.C. code)	U.S.	Missouri	% of Total Exports
<u>Electric, Electronic Equip. (36)</u>	9169.5	154.8	6.814
<u>Electrical indust.</u>			
apparatus (362)	2057.6	28.5	1.255
Household appliances (363)	525.5	3.5	.154
Elec. lighting, wiring equip. (364)	391.6	27.0	1.189
Elec. components, access. (367)	2901.2	30.2	1.329
<u>Transportation Equipment (37)</u>	16518.1	769.2	33.860
<u>Misc. Manufacturing indus. (39)</u>	1335.8	5.4	.238
<u>Toys and Sporting goods (394)</u>	267.8	3.0	.132
Total Agriculture	22146.9	649.7	28.607
Total Manufacturing	83098.0	1622.1	71.393
Total Exports	105244.9	2271.7	100.000

Table 6: Industry Composition of U.S. and Missouri Exports, 1972

(million dollars)

Industry Category (S.I.C. CODE)	U.S.	Missouri	% of Total Exports
<b>A. Livestock and Livestock Prod.</b>			
Dairy Prod. (0132)	195.1	2.4	.257
Poultry and Eggs (0133,0134)	77.8	1.8	.193
Meats and Prod (0135,0136,0139)	188.2	10.7	1.145
Hides and Skins (pt.2011,pt.3111)	236.6	7.4	.792
Lard and Tallow (pt.2011,pt.2013)	229.4	11.0	1.177
<b>B. Other Agriculture</b>			
Wheat and Flour (0113, 204)	1046.6	22.2	2.376
Rice (pt. 0113)	305.4	.9	.096
Other Feedgrains (0113)	1118.1	43.2	4.623
Cotton, incl. linters (0112)	534.3	20.5	2.194
Tobacco, unmanuf. (0114)	569.9	.7	.075
Soybeans (pt. 0113)	1391.3	115.8	12.393
Soybean Oil (2092)	224.3	18.7	2.001
Cottonseed Oil (2901, 2096)	68.4	2.7	.289
Protein Meal (2094)	397.7	32.4	3.467
Fruits and Preparations (0122)	384.7	.6	.064
Vegetables and Preparations (0123)	210.3	.1	.011
<b>C. Manufacturing Food and Kindred Prod.</b>			
Meat Prod (201)	3046.2	73.9	7.909
Dairy Prod. (202)	268.8	11.1	1.188
Canned, Cured & Frozen Foods (203)	22.5	1.2	.128
Grain Mill Prod. (204)	186.0	2.5	.268
Beverages (208)	388.8	34.4	3.682
Miscellaneous Foods (209)	18.0	2.0	.214
Tobacco Manuf. (21)	610.3	22.7	2.429
Textile Mill Prod (22)	608.7	.7	.075
Apparel & Other Textile (23)	654.9	2.5	.268
Lumber & Wood Prod (24)	291.7	4.6	.492
Furniture & Fixtures (25)	766.1	3.2	.342
Paper and Allied Prod (26)	51.7	.9	.096
Misc. converted paper (264)	988.4	4.3	.460
Paperboard containers (265)	114.5	3.8	.407
Printing and Publishing (27)	10.2	.5	.053
Periodicals (272)	347.7	10.5	1.124
	59.1	8.9	.952

Table 6: Continued

(million dollars)

Industry Category (S.I.C. Code)	U.S.	Missouri	% of Total Exports
<u>Chemicals and Allied Prod (28)</u>	3756.8	66.7	7.138
Industrial Chemicals (281)	1350.3	35.6	3.809
Drugs (283)	387.8	9.7	1.038
Soap, cleaners & Toilet goods (284)	119.1	8.3	.888
Paints & Allied Prod. (285)	29.3	1.2	.128
Agricultural Chemicals (287)	130.2	1.9	.203
Misc. chemical prod. (289)	94.9	10.0	1.070
<u>Petroleum &amp; Coal Prod (29)</u>	401.0	1.8	.193
<u>Rubber &amp; Plastics Prod (30)</u>	519.3	9.6	1.027
Tires & inner tubes (301)	97	1.0	.107
Misc. Plastics Prod. (307)	101.5	3.8	.407
<u>Leather &amp; Leather Prod (31)</u>	103.9	3.7	.396
<u>Stone, Clay &amp; Glass Prod (32)</u>	408.7	16.4	1.755
Structural Clay Prod (325)	33.0	13.9	1.488
<u>Primary Metal Ind. (33)</u>	1490.2	17.5	1.873
Blast furnace & basic steel (331)	552.0	4.3	.460
Iron & steel Foundries (332)	205.6	1.0	.107
<u>Fabricated Metal Prod (34)</u>	1429.3	9.8	1.049
Misc. Fabricated metal prod (349)	196.2	5.5	.589
<u>Machinery, except electric (35)</u>	7823.6	72.1	7.716
Metal-working Mach. (354)	355.5	14.5	1.551
Service Ind. Mach. (358)	429.3	20.6	2.205
Misc. Mach. exc. elect. (359)	92.6	17.0	1.819
<u>Electrical Equipment and Supplies (36)</u>	3295.8	34.7	3.714
Elect. Testing & distrib. equip (361)	271.4	9.8	1.049
Elect. Ind. Apparatus (362)	297.4	3.6	.385
Household appliances (363)	172.8	4.8	.514
Elect. lighting & wiring eq. (364)	151.8	12.1	1.295
<u>Transportation Equipment (37)</u>	7841.7	267.9	28.671
Motor Vehicles & equip (371)	3213.4	81.8	8.754
Aircraft & Parts (372)	2693.6	165.5	17.712
<u>Instruments &amp; related prod. (38)</u>	1530.9	12.2	1.306
<u>Misc. Manufacturing Ind. (39)</u>	1251.7	17.7	1.894
<u>Total Agriculture</u>	<u>7178.1</u>	<u>291.1</u>	<u>31.154</u>
<u>Total Manufacturing</u>	<u>36608.0</u>	<u>643.3</u>	<u>68.846</u>
<u>Total Exports</u>	<u>43786.1</u>	<u>934.4</u>	<u>100.000</u>



Table 7: Industry Composition of U.S. and Missouri Exports, 1969

(million dollars)

Industry Category (S.I.C. code)	U.S.	Missouri	% of Total Exports
<b>A. Livestock and Livestock Prod.</b>			
Dairy Prod. (0132)	109.1	1.2	.144
Poultry & Eggs (0133, 0134)	76.0	1.8	.216
Meats & Prod (0135, 0136, 0139)	152.8	9.1	1.092
Hides & Skins (pt. 2011, pt. 3111)	158.4	6.7	.804
Lard & Tallow (pt. 2011, pt. 2013)	208.1	10.7	1.284
<b>B. Other Agricultural</b>			
Wheat & Flour (pt. 0113, pt. 204)	941.6	19.9	2.388
Rice (pt. 0113)	322.3	.9	.108
Other Feed grains (pt. 0113)	987.3	24.0	2.880
Cotton Including Linters (0112)	352.4	11.5	1.380
Tobacco, unmanuf. (0114)	561.9	.6	.072
Soybeans (0113)	1069.0	77.7	9.325
Soybean Oil (2092)	138.7	10.1	1.212
Cottonseed Oil (2091, 2096)	54.3	1.8	.216
Protein Meal (pt. 2094)	322.6	23.0	2.760
Fruits & Preparations (pt. 0122)	343.2	.6	.072
Vegetables & Preparations (0123)	196.8	.1	.012
<b>C. Manufacturing</b>			
Food & Kindred products (20)	2160.0	53.5	6.421
Meat Products (201)	132.4	10.6	1.272
Dairy Products (202)	17.2	.2	.024
Canned, cured & Frozen Foods (203)	148.7	1.3	.156
Grain Mill Products (204)	401.6	23.7	2.844
Beverages (208)	28.2	1.1	.132
Miscellaneous Foods (209)	374.0	14.9	1.788
Tobacco Manuf. (21)	666.8	.9	.108
Textile Mill Prod. (22)	428.9	1.5	.180
Apparel & Other Textile (23)	226.2	5.1	.612
Lumber & Wood Prod. (24)	512.2	5.0	.600
Furniture and Fixtures (25)	43.8	.8	.096
Paper & Allied Prods (26)	790.0	3.9	.468
Misc. converted Paper prods. (264)	69.7	1.0	.120
Paper board containers & boxes (265)	9.5	2.9	.348
Printing and Publishing (27)	298.9	6.2	.744
Periodicals (272)	49.0	2.5	.300
Books (273)	100.2	3.7	.444

Table 7: Continued

(million dollars)

Industry Category (S.I.C. code)	U.S.	Missouri	% of Total Exports
Chemicals, Allied Prods. (28)	3049.0	51.5	6.181
Industrial Chemicals (281)	1080.2	33.9	4.069
Drugs (283)	340.9	9.2	1.104
Soaps, cleaners, toilet goods (284)	96.6	1.4	.168
Paints, Allied prods. (285)	26.4	1.2	.144
Misc. chemicals (289)	115.1	6.7	.804
Petroleum & Coal Prod. (29)	434.3	2.0	.240
Petroleum Refining (291)	401.1	2.0	.240
Rubber & Plastic Prod. (30)	387.8	5.0	.600
Tires & inner tubes (301)	84.5	.7	.084
Fabricated Rubber prods. n.e.c. (306)	85.4	1.6	.192
Misc. Plastic prods. (307)	123.8	1.5	.180
Leather & Leather Prod. (31)	69.0	3.0	.360
Stone, Clay, Glass Prod. (32)	341.6	15.5	1.860
Flat Glass (321)	27.3	4.5	.540
Structural Clay Prod (325)	20.3	10.4	1.248
Misc. Nonmetallic Mineral Prod. (329)	100.7	.9	.108
Primary Metal Industries (33)	1782.0	11.3	1.356
Blast Furnace & Basic Steel Prod. (331)	690.5	7.8	.936
Nonferrous Rolling & Drawing (335)	182.0	3.5	.420
Fabricated Metal Prods. (34)	1180.6	27.6	3.313
Metal Cans (341)	18.7	.9	.108
Cutlery, handtools & hardware (342)	143.8	1.1	.132
Plumbing & heating except electric (343)	47.8	.5	.060
Fabricated Structural Metal Prod. (344)	161.1	10.9	1.308
Metal stampings (346)	318.4	.9	.108
Misc. Fabricated wire prod. (348)	17.3	.2	.024
Misc. Fabricated metal prod. (349)	179.3	6.3	.756
Machinery, Except Electric (35)	6021.1	65.9	7.909
Engines & Turbines (351)	437.0	.8	.096
Farm Machinery (352)	250.7	7.5	.900
Construction, Related Mach. (353)	1387.3	15.9	1.908
Metal Working Machinery (354)	356.3	3.9	.468
Special Industry Mach. (355)	485.9	3.3	.396
General Industrial Mach. (356)	441.8	1.2	.144
Office & Computing Mach. (357)	885.9	.6	.072
Service Industry Mach. (358)	296.1	18.2	2.184
Misc. Machines, except electrical	61.2	10.7	1.284

Table 7: Continued

(million dollars)

Industry Category (S.I.C. code)	U.S.	Missouri	% of Total Exports
Electrical Equipment & Supplies (36)	2480.0	26.0	3.120
Electrical test & Distributing Eq (361)	236.1	5.7	.684
Electrical Industrial Apparatus (362)	233.8	1.0	.120
Household Appliances (363)	161.8	1.3	.156
Elect. Lighting, Wiring equip. (364)	114.9	8.1	.972
Communications Equipment (366)	502.2	9.1	1.092
Transportation Equipment (37)	6174.4	314.0	37.686
Motor Vehicles & Equipment (371)	2551.9	68.9	8.269
Aircraft & parts (372)	1846.9	243.5	29.225
Railroad Equipment (374)	90.5	1.3	.156
Misc. Transportation Equip (379)	13.9	.3	.036
Instruments & Related Products (38)	1086.8	5.9	.708
Medical Instruments & Supplies (384)	81.8	5.9	.708
Misc. Manufacturing Industries (39)	1076.4	26.9	3.229
Toys & Sporting goods (394)	40.1	1.3	.156
Pens, Pencils, Office & Art Supplies (395)	36.5	1.3	.156
Misc. Manufactures (399)	183.0	24.3	2.916
Ordinance & Accessories (19)			
<b>Total Agriculture</b>	<b>5994.5</b>	<b>199.7</b>	<b>23.968</b>
<b>Total Manufacturing</b>	<b>29210.0</b>	<b>633.5</b>	<b>76.032</b>
<b>Total Exports</b>	<b>35204.5</b>	<b>833.2</b>	<b>100.000</b>

Table 8: Industry Composition of U.S. and Missouri Exports (million dollars), 1966

Industry Category (S.I.C. Code)	U.S.	Missouri	% of Total Exports
<b>A. Livestock and Livestock Prod.</b>			
Dairy Products (0132)	174.1	2.4	.432
Poultry and Eggs (0133,0134)	72.4	1.7	.306
Meats and Products (0135,0136,0139)	115.2	4.3	.734
Hides and Skins (pt.2011,pt.3111)	139.3	4.3	.734
Lard and Tallow (pt.2011,pt.2013)	182.2	6.9	1.242
<b>B. Other Agriculture</b>			
Wheat and Flour (pt.0113,pt.204)	1403.1	44.9	8.080
Rice (pt.0113)	220.1	.7	.126
Other Feed Grains (pt.0113)	1351.2	37.8	6.802
Cotton, Including Linters (0112)	385.8	10.0	1.799
Tobacco, unmanuf. (0114)	394.7	0.3	.054
Soybeans (2092)	734.4	70.5	12.687
Fruits and preparations (0122)	326.6	1.3	.234
Vegetables and preparations (0123)	169.7	0.3	.054
Soybean Oil (2092)	140.0	.9	.162
<b>C. Manufacturing</b>			
<b>Food and Kindred Products (20)</b>	<b>1908.1</b>	<b>54.8</b>	<b>9.861</b>
Meat Products (201)	65.0	5.4	.972
Dairy Products (202)	42.4	.6	.108
Canned, Cured, & Frozen Foods (203)	63.5	.2	.036
Grain Mill Products (204)	341.6	20.8	3.743
Beverages (208)	27.6	1.0	.180
Miscellaneous Foods (209)	357.0	13.3	2.393
Tobacco Manuf. (21)	578.3	.8	.144
Textile Mill Products (22)	335.3	1.1	.198
Apparel, other textile (23)	198.9	4.5	.810
Lumber and Wood Products (24)	284.3	4.5	.810
Furniture & Fixtures (25)	36.1	.7	.126
Paper and Allied Prods. (26)	599.7	3.2	.576
Misc. converted Paper Prods. (264)	25.5	2.6	.468
Paperboard containers & boxes (265)	3.0	.6	.108
Printing and Publishing (27)	258.9	6.0	1.080
Periodicals (272)	38.9	1.8	.324
Books (273)	75.3	3.1	.558
<b>Chemicals, Allied Prods. (28)</b>	<b>2438.6</b>	<b>44.7</b>	<b>8.044</b>
Industrial Chemicals (281)	776.9	23.8	4.283
Drugs (283)	238.5	4.8	.864
Soaps,Cleaners, Toilet Goods (284)	80.9	1.7	.306
Paints, Allied Products (285)	28.6	1.4	.252
Miscellaneous Chemicals (289)	107.4	6.1	1.098
<b>Petroleum &amp; Coal Products (29)</b>	<b>400.9</b>	<b>1.1</b>	<b>.198</b>
Petroleum Refining (291)	372.0	1.1	.198
<b>Rubber &amp; Plastic Products (30)</b>	<b>337.2</b>	<b>2.5</b>	<b>.450</b>
Tires & inner tubes (301)	83.0	.6	.108
Fabricated rubber prods. n.e.c. (306)	75.4	.9	.162
Misc. Plastic prods. (307)	57.6	.9	.162
<b>Leather &amp; Leather products (31)</b>	<b>60.4</b>	<b>3.6</b>	<b>.648</b>

(Table 8 Continued)

Industry Category (S.I.C. Code)	U.S.	Missouri	% of Total Exports
<u>Stone, Clay, Glass Products (32).</u>	283.3	16.0	2.879
Flat Glass (321)	23.2	8.9	1.602
Structural Clay prods. (325)	9.5	6.4	1.152
Misc. Nonmetallic Mineral prod. (329)	88.6	1.1	.198
<u>Primary Metal Industries (33)</u>	1080.7	6.0	1.080
Blast Furnace & Basic Steel prods(331)	342.2	6.0	1.080
<u>Fabricated Metal Prods. (34)</u>	948.0	13.8	2.483
Metal cans (341)	37.8	.8	.144
Cutlery, handtools, & hardware (342)	117.9	2.2	.396
Plumb. & heat., except electric (343)	35.0	.5	.090
Fabricated struct. metal prod. (344)	110.8	10.5	1.890
Metal Stampings (346)	75.5	.8	.144
Misc. Fabr. Wire prod. (348)	9.6	.3	.054
Misc. Fabr. Metal prod. (349)	128.6	2.2	.396
<u>Machinery, Except Electric (35)</u>	4722.3	60.6	10.905
Engines and Turbines (351)	354.7	1.4	.252
Farm Machinery (352)	302.7	6.8	1.224
Construction, Related Machinery (353)	1098.0	14.1	2.537
Metal Working Machinery (354)	323.4	5.1	.918
Special Industry Machinery (355)	357.9	4.5	.810
General Industrial Machinery (356)	442.2	7.0	1.260
Office & Computing Machines (357)	564.8	.4	.072
Service Industry Machines (358)	198.4	14.7	2.645
Misc. Machines, except electrical (359)	44.1	6.5	1.170
<u>Electrical Equipment &amp; Supplies (36)</u>	1605.4	16.9	3.041
Electrical Test & Distributing (361)	168.2	3.8	.684
Electrical Industrial Apparatus (362)	172.6	.8	.144
Household Appliances (363)	176.8	3.6	.648
Elec., Lighting, Wiring Equip. (364)	80.1	5.2	.936
Communications Equip. (366)	311.6	3.2	.576
<u>Transportation Equipment (37)</u>	3452.4	101.3	18.229
Motor Vehicles & Equip. (371)	1671.6	29.4	5.291
Aircraft & parts (372)	1179.3	70.4	12.669
Railroad Equipment (374)	142.6	1.3	.234
Misc. Transportation Eq. (379)	5.5	.1	.018
<u>Instruments &amp; Related Prods. (38)</u>	791.9	4.2	.756
Medical Instruments & Supplies (384)	58.2	3.1	.558
<u>Misc. Manufacturing Industries (39)</u>	978.5	22.4	4.031
Toys & Sporting Goods (394)	33.3	2.2	.396
Pens, Pencils, Office & Art Supplies (395)	33.4	2.2	.396
Misc. Manufactures (399)	143.6	18.0	3.239
Ordinance & accessories (19)			
<b>Total Agriculture</b>	<b>5639.1</b>	<b>186.3</b>	<b>33.525</b>
<b>Total Manufacturing</b>	<b>21299.2</b>	<b>369.4</b>	<b>66.475</b>
<b>Total Exports</b>	<b>26938.3</b>	<b>555.7</b>	<b>100.000</b>

Table 9: Industry Composition of U.S. and Missouri Exports (millions dollars), 1963

Industry Category (S.I.C. Code)	U.S.	Missouri	% of Total Exports
<b>A. Livestock and Livestock Prod.</b>			
Dairy Products (0132)	203.0	2.6	.705
Poultry and Eggs (0133,0134)	77.8	1.9	.515
Meats and Products (0135,0136,0139)	118.1	5.2	1.410
Hides and Skins (pt.2011,pt.3111)	81.9	2.9	.786
Lard and Tallow (pt.2011,pt.2013)	193.2	8.7	2.358
<b>B. Other Agriculture</b>			
Wheat and Flour (pt.0113,pt.204)	1354.5	45.7	12.388
Rice (pt.0113)	217.1	.7	.189
Other Feed Grains (pt.0113)	816.1	27.3	7.400
Cotton, including linters (0112)	670.1	19.4	5.259
Tobacco, unmanf. (0114)	420.7	.3	.081
Soybeans (0113)	515.7	48.5	13.147
Fruits and preparations (pt.0122)	298.9	.8	.217
Vegetables and preparations (pt.0123)	163.8	.3	.081
<b>C. Manufacturing</b>			
<u>Food and Kindred products (20)</u>	700.6	58.5	15.858
Meat Products (201)	41.7	3.7	1.003
Dairy Products (202)	57.6	3.7	1.003
Canned, Cured, & Frozen Foods (203)	49.1	.5	.136
Grain Mill Products (204)	338.8	35.0	9.488
Beverages (208)	22.1	2.9	.786
Miscellaneous foods (209)	173.6	10.7	2.901
Tobacco Manf. (21)	308.1	.8	.217
<u>Textile Mill Products (22)</u>	32.1	1.2	.325
<u>Apparel, other textile (23)</u>	119.5	2.5	.678
<u>Lumber and Wood Products (24)</u>	192.9	2.5	.678
<u>Furniture and Fixtures (25)</u>	26.4	.3	.081
<u>Paper and Allied Prods. (26)</u>	318.1	2.6	.705
Misc. converted paper prods. (264)	16.3	2.1	.569
Paperboard containers & boxes (265)	2.5	.5	.136
<u>Printing and Publishing (27)</u>	94.5	2.5	.678
Periodicals (272)	23.4	.4	.108
Books (273)	66.9	1.1	.298
<u>Chemicals, Allied prods. (28)</u>	1354.4	28.9	7.834
Industrial Chemicals (281)	513.4	15.7	4.256
Drugs (283)	177.9	5.0	1.355
Soaps, Cleaners, Toilet goods (284)	53.4	1.2	.325
Paints, Allied prods. (285)	16.0	.9	.244
Agricultural chemicals (287)	59.2	1.2	.325
Miscellaneous chemicals (289)	88.9	3.8	1.030
<u>Petroleum &amp; Coal Products (29)</u>	428.5	.5	.136
Petroleum Refining (291)	400.2	.5	.136
<u>Rubber &amp; Plastic prods. (30)</u>	164.8	1.2	.325
Fabricated rubber prods. n.e.c. (306)	59.9	.5	.136
Misc. Plastic prods. (307)	28.1	.7	.189
<u>Leather &amp; Leather prods. (31)</u>	17.9	3.9	1.057

(Table 9 Continued)

Industry Category (S.I.C. Code)	U.S.	Missouri	% of Total Exports
<u>Stone, Clay, Glass prods. (32)</u>	153.1	12.7	3.443
Flat Glass (321)	11.8	5.1	1.383
Misc. Nonmetallic Mineral prod. (329)	69.5	.9	.244
<u>Primary Metal Industries (33)</u>	700.0	2.6	.705
Blast Furnace & Basic Steel Prod. (331)	378.4	2.0	.542
Nonferrous Rolling & Drawing (335)	96.0	.5	.136
<u>Fabricated Metal prods. (34)</u>	389.7	7.4	2.006
Cutlery, handtools & hardware (342)	76.5	1.2	.325
Plumbing & heating, except electric (343)	24.9	.3	.081
Fabricated structural metal prod. (344)	118.1	4.0	1.084
Metal Stampings (346)	44.8	.3	.081
Misc. Fabricated wire prod. (348)	7.5	.1	.027
Misc. Fabricated metal prod. (349)	84.7	2.2	.596
<u>Machinery, Except Electric (35)</u>	2647.6	26.8	7.265
Engines & Turbines (351)	291.6	.4	.108
Farm Machinery (352)	205.0	2.7	.732
Construction, Related Machinery (353)	806.0	4.1	1.111
Metal working Machinery (354)	302.9	3.0	.813
Special Industry Machinery (355)	299.6	2.7	.732
General Industrial Machinery (356)	263.8	.8	.217
Office & Computing Machines (357)	309.5	.3	.813
Service Industry Machines (358)	135.3	11.1	3.009
Misc. Machines, except electrical (359)	33.9	4.8	1.301
<u>Electrical Equipment &amp; Supplies (36)</u>	990.8	10.5	2.846
Electrical test & Distributing Eq. (361)	130.0	2.2	.596
Electrical Industrial Apparatus (362)	166.3	.6	.163
Household Appliances (363)	140.1	2.4	.651
Elect., Lighting, Wiring equip. (364)	70.0	2.7	.732
Communications Equipment (366)	240.6	2.3	.623
Misc. Elect. equip. & supplies (369)	53.3	.5	.136
<u>Transportation Equipment (37)</u>	2097.1	13.0	3.524
Motor Vehicles & equipment (371)	1107.8	9.1	2.467
Aircraft & parts (372)	828.1	2.9	.786
Railroad Equipment (374)	150.6	1.0	.271
<u>Instruments &amp; Related Products (38)</u>	416.3	4.9	1.328
Medical Instruments & Supplies (384)	42.1	1.1	.298
<u>Misc. Manufacturing industries (39)</u>	174.0	21.3	5.774
Toys & Sporting Goods (394)	19.4	3.0	.813
Pens, Pencils, Office & Art Supplies (395)	32.1	3.0	.813
Misc. Manufactures (399)	78.1	15.2	4.120
Ordinance & accessories (19)			
<b>Total Agriculture</b>	<b>5128.2</b>	<b>164.3</b>	<b>44.5</b>
<b>Total Manufacturing</b>	<b>11003.7</b>	<b>204.6</b>	<b>55.5</b>
<b>Total Exports</b>	<b>16131.9</b>	<b>368.9</b>	<b>100.0</b>

which constitutes approximately one third of their original shares. In contrast, the share of Transportation Equipment rose dramatically to 33.9% in 1976, to make this industry group the largest Missouri exporter for that year. In addition, Electrical Machinery and Rubber and Plastics also registered sharp increases in their share of the total, reaching 6.8% and 1.7% in 1976 from 2.8% and .3% in 1963 respectively. The shares of most other industries over the period remained relatively constant. So, in addition to the already mentioned Transportation and Electrical Machinery industries, the other major exporting industries in 1976 were Non-Electrical machinery (8.6%) and Chemicals (6.7%). Within these industries, the most significant industry products were aircraft and parts, motor vehicles and parts, industrial chemicals, service industry machinery, and soaps, cleaners and toilet goods.

#### The Relative Performance of World and Missouri Exports

Finally, in this section an assessment is made of the relative performance of Missouri exports in world export markets. For this purpose a comparison of the growth of Missouri exports with total world exports of specific industries was undertaken. Since world trade figures are only available from United Nations and O.E.C.D. data sources, and industry categories are defined according to the U.N. Standard International Trade Classification (S.I.T.C.) system, it was necessary to develop a concordance between the S.I.T.C. and the U.S. Standard Industrial Classification (S.I.C.) systems. The concordance between these two systems of industrial classification is provided in Appendix I at the end of this study. Data for the years 1966, 1969 and 1972 were available for approximately fifty five industry groups.



Table 10 summarizes data on World, U.S. and Missouri exports for the 1966-72 period along with percentage changes from the previous period. Keeping in mind that the sample of industries considered is not exhaustive, it can be observed from this table that, for the products analyzed, Missouri exports grew on average faster than world trade in 1966-1969, but increased somewhat less rapidly than world exports in the 1969-1972 period. This is due not only to a slight decrease in the average rate of growth in Missouri exports in the later period, but also to the marked acceleration in the average percentage growth in world trade during that period. While no information is of yet available on whether this trend has continued in the 1972-1976 period, the limited data at hand indicate that exports originating in the State of Missouri grew at rates that compare favorably in average with the growth of world trade.

Missouri's export performance also compares favorably to world trade when individual industries are considered. In the 1966-69 period, the products which experienced the fastest growth in world export markets were about the same as <sup>the</sup> most rapidly growing export products from Missouri. Among the fastest growing products for both the State and world trade were: Meats and Meat Products; Soybean Oil, Paperboard Containers and Boxes, Drugs, Miscellaneous Plastics Products, Structural Clay Products, Fabricated Metal Products, Electrical Lighting and Wiring, and Transportation Equipment. This implies that over the 1966-69 time period Missouri industries were capable of taking advantage of the increased volume of world trade.

A similar observation can be made for the 1969-72 time period. Industries experiencing rapid export growth in Missouri were similar to those experiencing rapid growth in total world trade. In particular, during this time period

Table 10: Comparative Export Performance of Selected Missouri, and World Industries

S.I.C.		World			Missouri			World			Missouri		
		1966	1969	$\frac{69}{66}$ 100	1966	1969	$\frac{69}{66}$ 100	1969	1972	$\frac{72}{69}$ 100	1969	1972	$\frac{72}{69}$ 100
0132	Dairy Products	1088.9	1360.9	125.0	2.4	1.2	50.0	1360.9	2400.2	176.4	1.2	2.4	200
0133, 0134	Poultry & Eggs	249.2	325.7	130.7	1.7	1.8	105.9	325.7	471.3	144.7	1.8	1.8	100.0
0135, 0136, 0139	Meats & Products	657.1	1026.1	156.2	4.3	9.1	211.6	1026.1	1837.6	179.1	9.1	10.7	117.6
pt.2011,pt.3111	Hides & Skins	437.3	469.2	107.3	4.3	6.7	155.8	469.2	823.4	175.5	6.7	7.4	110.4
pt.2011,pt.2013	Lard & Tallow	35.9	40.6	113.1	6.9	10.7	155.1	40.6	48.3	119.0	10.7	11.0	102.8
pt.0113,pt.204	Wheat & Flour	1462.3	1220.6	83.5	44.9	19.9	44.3	1220.6	1842.3	150.9	19.9	22.2	111.6
pt.0113	Rice	33.9	194.0	572.2	.7	.9	128.6	194.0	124.9	64.4	.9	.9	100.0
pt.0113	Other Feed Grains	505.9	603.4	119.3	37.8	24.0	63.5	603.4	1221.8	202.5	24.0	43.2	180.0
0112	Cotton, incl. Linters	212.4	185.9	87.5	10.0	11.5	115.0	185.9	286.3	154.0	11.5	20.5	178.3
0114	Tobacco, unmanuf.	292.1	277.9	95.1	0.3	0.6	200.	277.9	378.4	136.2	.6	.7	116.7
pt. 0113	Soybeans	10.8	2.7	25.0	70.5	77.7	110.2	2.7	40.8	1511.1	77.7	115.8	149.0
2092	Soybeans Oil	27.2	48.7	179.0	.9	10.1	1122.2	48.7	123.6	253.8	10.1	18.7	185.1
2091, 2096	Cottonseed Oil	.4	.6	150	-	1.8	n.a.	.6	.3	50.0	1.8	2.7	150
pt. 2094	Protein Meal	115.9	124.9	107.8	-	23.0	n.a.	124.9	197.5	158.9	23.0	32.4	140.9
pt. 0122	Fruits & Preparations	918.6	1058.2	115.2	1.3	.6	46.1	1058.2	1687.6	159.5	.6	.6	100.0
0123	Vegetables & Prep.	893.3	1152.9	129.1	0.3	.1	33.3	1152.9	1702.6	147.7	.1	.1	100.0
201	Meat Products	694.2	723.1	104.2	5.4	10.6	196.3	723.1	969.1	134.0	10.6	11.1	104.7
202	Dairy Products	1088.9	1361.0	125.0	.6	.2	33.3	1361.0	2400.2	176.4	.2	1.2	600.0
203	Canned, Cured, Frozen Foods	1401.3	1911.6	136.4	.2	1.3	650.0	1911.6	3251.3	170.1	1.3	2.5	192.3
204	Grain Mill Prod.	426.1	496.7	116.6	20.8	23.7	113.9	496.7	781.5	157.3	23.7	34.4	145.1
208	Beverages	1180.2	1530.5	129.7	1.0	1.1	110.0	1530.5	2716.3	177.5	1.1	2.0	181.8
209	Misc. Foods	310.7	408.8	131.6	13.3	14.9	112.0	408.8	694.5	169.9	14.9	22.7	152.3
264	Misc. Converted Paper Prod.	338.8	557.8	164.6	2.6	1.0	38.5	557.8	871.6	156.3	1.0	3.8	380.0
265	Paperboard Containers & Boxes	103.3	189.5	183.4	.6	2.9	483.3	189.5	276.7	146.0	2.9	.5	17.2
272	Periodicals	183.4	278.2	151.7	1.8	2.5	138.9	278.2	364.6	131.1	2.5	8.9	356.0
273	Books	350.9	481.4	137.2	3.1	3.7	119.4	481.4	791.2	164.4	3.7	n.a.	n.a.
281	Industrial Chem.	3362.6	4947.3	147.1	23.8	33.9	142.4	4947.3	8276.2	167.3	33.9	35.6	105.0
283	Drugs	1149.9	1746.8	151.9	4.8	9.2	191.7	1746.8	2742.5	157.0	9.2	9.7	105.4
284	Soap, Cleaner, Toilet goods	573.7	837.3	145.9	1.7	1.4	82.4	837.3	1242.9	148.4	1.4	8.3	592.8
285	Paints & Allied Prod.	83.9	545.9	650.6	1.4	1.2	85.7	545.9	841.7	154.2	1.2	1.2	100.0
289	Misc. Chemical Prod.	1248.4	2215.5	177.5	6.1	6.7	109.8	2215.5	3352.1	151.3	6.7	10.0	149.3
29	Petroleum & Coal Prod	3056.2	3994.5	130.7	1.1	2.0	181.8	3994.5	6931.8	173.5	2.0	1.8	90.0
301	Tires & Inner tubes	525.8	767.4	145.9	.6	.7	116.7	767.4	1445.6	188.4	.7	1.0	142.9
306	Fabricated Rubber Prod.	143.1	213.1	148.9	.9	1.6	177.8	213.1	331.0	155.3	1.6	n.a.	n.a.
307	Misc. Plastic Prod.	340.5	595.8	175.0	.9	1.5	166.7	595.8	1101.1	184.8	1.5	3.8	253.3
325	Structural Clay Prod	305.4	457.9	149.9	6.4	10.4	162.5	457.9	784.8	171.4	10.4	13.9	133.7

Table 10: Continued

S.I.C.		World			Missouri			World			Missouri		
		1966	1969	$\frac{69}{66}$ 100	1966	1969	$\frac{69}{66}$ 100	1969	1972	$\frac{72}{69}$ 100	1969	1972	$\frac{72}{69}$ 100
329	Misc. Nonmetallic Min.	284.7	431.4	151.5	1.1	.9	81.8	431.4	685.3	158.9	.9	n.a.	n.a.
33	Primary Metal Ind.	10939.8	15550.9	142.1	6.0	11.3	128.3	15550.9	22077.5	142.0	11.3	17.5	154.9
331	Blast Furnace & Basic Steel	6659.5	9848.9	147.9	6.0	7.8	130.0	9848.9	15176.7	154.1	7.8	4.3	55.1
34	Fabricated Metal Prod.	4046.2	5751.9	142.2	13.8	27.6	200.0	5751.9	8658.5	150.5	27.6	9.8	35.5
349	Misc. Fab. Metal Prod.	2389.6	3433.8	143.7	2.2	6.3	286.4	3433.8	4960.5	144.5	6.3	5.5	87.3
35	Machinery, Exc. Electrical	14546.1	20676.9	142.1	60.6	65.9	108.7	20676.9	33881.5	163.9	65.9	72.1	109.4
354	Metal working Mach.	1196.3	1683.2	140.7	5.1	3.9	76.5	1683.2	2585.6	153.6	3.9	14.5	371.8
358	Service Ind. Mach.	1814.3	2483.8	136.9	14.7	18.2	123.8	2483.8	4146.8	167.0	18.2	20.6	113.2
359	Misc. Machinery, Exc. Elect.	5613.2	8028.6	143.0	6.5	10.7	164.6	8028.6	13710.3	170.8	10.7	17.0	158.9
36	Electrical Equip & Supplies	6337.7	10171.8	160.5	16.9	26.0	153.8	10171.8	17181.1	168.9	26.0	34.7	133.5
361	Electric Test & distrib. equip	3666.7	5790.2	157.9	3.8	5.7	150.0	5790.2	9515.3	164.3	5.7	9.8	171.9
362	Electrical indust. apparat	3518.3	5223.6	148.5	.8	1.0	125.0	5223.6	8703.2	166.6	1.0	3.6	360.0
363	Household Appliances	677.0	1081.9	159.8	3.6	1.3	36.1	1081.9	1764.6	163.1	1.3	4.8	369.2
364	Elect. Lighting & Wiring	2160.2	3633.2	168.2	5.2	8.1	155.8	3633.2	5886.9	162.0	8.1	12.1	149.4
37	Transportation Equip	11712.7	19538.4	166.8	101.3	314.0	309.9	19538.4	34594.7	177.1	314.0	267.9	85.3
371	Motor Vehicles & Equip.	8133.1	14285.1	175.6	29.4	68.9	234.4	14285.1	24820.6	173.8	68.9	81.8	118.7
372	Aircraft & Parts	952.5	1349.4	141.7	70.4	243.5	345.9	1349.4	1726.3	127.9	243.5	165.5	68.0
38	Instruments & related	1347.2	2021.0	150.0	4.2	5.9	140.5	2021.0	3425.6	169.5	5.9	12.2	206.8
39	Misc. Manuf. Ind.	1397.3	1979.4	141.7	22.4	26.9	120.1	1979.4	2906.0	146.8	26.9	17.7	65.8
Average Percentage Growth				155.6			171.4			182.6			168.4

rapidly growing industries in both Missouri and world markets consisted of: Other Feed Grains, Cotton, Soybeans, Soybean Oil, Dairy Products, Canned, Cured and Frozen Foods, Beverages, Miscellaneous Converted Paper Products, Miscellaneous Plastics Products, Metalworking Machinery, Electrical Industrial Apparatus, Household Appliances, and Instruments and Related Products. While no definitive conclusions can be drawn from these comparisons, we can at least tentatively conclude that the industries in Missouri which demonstrate rapid export growth parallel those that are growing in world commerce. Since the fastest growing industries in <sup>the</sup> world have changed considerably over the 1966-72 time period, Missouri firms have apparently shown an ability to adjust quickly and take advantages of changes occurring in world export markets.

### Chapter III: Indirect Missouri Exports

Indirect exports represent those goods locally produced, but subsequently sold outside the State to other firms for further processing and ultimately exported. A precise enumeration of the magnitude of these sales is virtually impossible. To calculate such a figure would require that one trace the path of every sale made by Missouri firms outside of the state all the way through to the final sale. While estimates are available of the magnitude of sales made by Missouri firms outside the State, no data exists which details to which firms, consumers, or geographic areas these sales are made. Nonetheless, utilizing information contained in the input-output tables for Missouri [ 1 ], along with those for the U.S. as a whole, a reasonable approximation to the magnitude of these indirect exports can be ascertained.<sup>1</sup>

The first step in the process was to gather data on an industry basis of the total amount of sales made by Missouri firms to other parts of the U.S.. This data was available from the input-output tables for Missouri. Because information is not available concerning the distribution of these sales among various industries, consumers, etc. it was necessary to make assumptions as to how these sales actually were distributed. Since these products are being sold within the U.S., the most logical assumption is that the distribution of this output would follow a pattern consistent with the distribution for the U.S. as a whole. Thus, for example, if one were to find that nationally the output of the Auto and Parts industry were distributed in a fashion such that 50% was allocated to final consumption, 1% to the Lumber and Furniture industry, 5% to the Primary Metals industry, and so forth; our assumption would imply

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1. A more complete description of the analytical technique utilized to determine the volume of indirect exports is provided in Appendix II.

that the sales made by Missouri firms to the rest of the U.S. would follow the same distribution. Given the total amount of sales to the rest of the U.S. made by each Missouri industry, along with the percentage distribution as calculated above, the dollar amount of sales made to each industry by each Missouri industry was determined.<sup>2</sup>

The next step in the process is to determine how much of these intermediate goods sold to other industries ultimately end up as part of an exported product. This is accomplished by multiplying the dollar amount of intermediate sales made to each industry by exports as a percentage of output for that industry. Thus, if Missouri firms in the Auto and Parts industry sold \$10 million worth of intermediate inputs to the Primary Metals industry, and the Primary Metals industry exported 10% of its output, then \$1 million ( $.1 \times 10$ ) of the inputs purchased from Missouri firms were designated for export. Missouri firms in the Auto and Parts industry thus "indirectly" exported \$1 million worth of output through the Primary Metals industry. By summing these amounts for each Missouri industry across all other industries to which it sells, the total amount of indirect exports for each industry is determined.

Tables 11 and 12 provide the estimates of indirect exports by industry for the years 1963 and 1972. These years were chosen for analysis because they are the only years in which complete input-output information for Missouri and the U.S. is available. The industry classification system shown in the tables follows that of the Missouri input-output tables.<sup>3</sup> For comparison purposes, direct exports from each industry are also included in the tables.

2. It may be argued that this procedure does not present an accurate picture of the amount of Missouri products that actually end up as a part of an exported good. While this may be true, the procedure nonetheless is still valid for determining the indirect reliance of Missouri firms on export demand. This is so because, presumably, if export demand were to vanish then overall demand by U.S. firms for intermediate products would decline, including the demand for Missouri produced goods.
3. A description of the Missouri Input-Output Industry Classification System along with a concordance between it and the National Input-Output Classification System and the Standard Industrial Classification System is provided in Appendix III

As can be seen from the tables, indirect exports add considerably to the demand for output from Missouri firms. Nearly \$82 million worth of Missouri output was indirectly exported in 1963, while close to \$235 million was indirectly exported in 1972. Indirectly exported goods thus amounted to around 22% of direct exports in 1963, and about 25% by 1972.

It is interesting to note that in many industries output indirectly exported actually exceeded the amount directly exported. For example, in 1963 three industries (Primary Metals, Metal Products, Auto and Parts) had indirect exports in excess of the amount they directly exported. In 1972 the same was true for five industries (Dairy Products, Paper and Paper Products, Primary Metals, Metal Products, Lead and Zinc Mining).

In a number of other industries indirect exports can be seen to be substantial. In 1963, for instance, five industries (Meat Products, Textile and Apparel, Paper and Paper Products, Leather-Rubber-Plastics, Other Electrical Products, Airplanes and Aerospace) exhibit indirect exports which amount to at least 50% of their direct exports. Another four industries (Lumber and Furniture, Leather-Rubber-Plastics, Other Electrical Products, Auto and Parts) show the same phenomenon for 1972.

It is also interesting to note that the industries which have the highest percentages of indirect to direct exports are those which would be expected to on the basis of economic theory. Virtually all the high indirect export industries are so called "basic" or "intermediate" good industries. The output of these industries is not sold directly for final consumption, but as inputs to other firms to be utilized in the manufacture of a final product. In summary, indirect exports can be seen to have added substantially to the dependence of the Missouri economy on export demand.

Table II: Direct and Indirect Missouri Exports, 1963

(million dollars)

Industry	Direct Exports	Indirect Exports	Total Exports	Indirect % of Direct
Livestock	21.3	2.9	24.2	13.6%
Agriculture	143.0	*	143.0	0
Meat Processing	3.7	1.9	5.6	51.4
Dairy Products	3.7	.5	4.2	13.5
Grain Mill Prod	34.9	.9	35.8	2.6
Other Food Prod.	16.2	1.9	18.1	11.7
Textile & Apparel	3.7	2.0	5.7	54.1
Lumber & Furniture	2.8	.7	3.5	25.0
Paper & Paper Prod.	2.6	2.5	5.1	96.2
Printing & Publishing	2.5	.5	3.0	20.0
Chemicals	28.9	12.7	41.6	43.9
Petroleum Prod.	.5	*	.5	n.a.
Leather, Rubber, Plastics	5.1	3.1	8.2	60.1
Stone, Clay, Glass	12.7	1.7	14.4	13.4
Primary Metals	2.6	8.2	10.8	315.4
Metal Prod.	7.4	7.4	14.8	100.0
Industrial Mach.	26.8	7.8	34.6	29.1
Household Appliances	2.4	.4	2.8	16.7
Other Electrical Prod.	8.1	5.4	13.5	66.7
Auto & Parts	9.1	16.7	25.8	183.5
Airplanes, Aerospace	2.9	1.7	4.6	58.6
Other Transportation	1.0	.1	1.1	10.0
Other Manufacture	27.0	1.9	28.9	7.0
Lead & Zinc Mining	*	.1	.1	n.a.
Oil & Gas Mining	*	*	*	n.a.
Coal Mining	.4	.1	.5	25.0
Other Mining	1.3	.6	1.9	46.2
Totals	370.0	81.7	451.7	22.1

\* indicates a value less than 100,000 dollars.



Table 12: " Direct and Indirect Missouri Exports, 1972

(million dollars)

Industry	Direct Exports	Indirect Exports	Total Exports	Indirect % of Direct
Livestock	33.3	8.3	41.6	24.9%
Agriculture	257.8	.4	258.2	0.0
Meat Processing	12.1	2.0	14.1	16.5
Dairy Products	1.7	1.8	3.5	105.9
Grain Mill Prod.	37.4	1.5	38.9	4.0
Other Food Prod	22.7	5.3	28.0	23.3
Textile & Apparel	7.1	3.3	10.4	46.5
Lumber & Furniture	4.1	3.0	7.1	73.2
Paper & Paper Prod.	4.3	4.5	8.8	104.7
Printing & Publishing	10.5	1.7	12.2	16.2
Chemicals	66.7	32.4	99.1	48.6
Petroleum Prod.	1.8	.3	2.1	16.7
Leather, Rubber, Plastics	13.3	9.8	23.1	73.7
Stone, Clay, Glass	16.4	4.8	21.2	29.3
Primary Metals	17.5	30.7	48.2	175.4
Metal Products	9.8	18.8	28.6	191.8
Industrial Mach.	72.1	22.4	94.5	31.1
Household Appliances	4.8	.1	4.9	2.1
Other Electrical Prod.	29.9	25.0	54.9	83.6
Auto & Parts	81.8	48.5	130.3	59.3
Airplanes, Aerospace	165.5	3.6	169.1	2.2
Other Transportation	20.6	.6	21.2	2.9
Other Manufacture	30.6	3.0	33.6	9.8
Lead & Zinc Mining	.8	2.1	2.9	262.5
Oil & Gas Mining	*	*	*	n.a.
Coal Mining	*	*	*	n.a.
Other Mining	1.4	.6	2.0	42.9
Totals	924.0	234.5	1158.5	25.4

## CHAPTER IV: Effect of Exports on the Missouri Economy

Thus far we have discussed the magnitudes of direct and indirect exports in the Missouri economy. The ultimate effect of exports by Missouri firms, however, extends beyond that simply implied by the dollar values of these exports. Sales made directly or indirectly abroad by Missouri firms represent a source of basic income for the State. It is the introduction and generation of basic income which ultimately makes the Missouri economy work, and determines in large part the size and growth of the economy. The process by which the introduction of basic income leads to the development of the economy is often referred to as the "dollar turnover" effect or the "multiplier" effect. The "multiplier" process is a complex one and depends upon detailed linkages that firms, consumers, and governments in the Missouri economy have with one another.

Suppose, for instance, that the Auto and Parts industry in Missouri were to sell \$1 million worth of automobiles to Germany. As a result of this transaction, \$1 million of new money (basic income) is received by the industry and introduced into the Missouri economy. Some of the receipts of this sale by the Auto and Parts industry will be utilized to pay for inputs from other industries in the State (say the Metal Products industry), some to pay for labor services from residents of the State, some to pay State taxes, and so forth. This transaction has thus generated demand for output from the Metals industry (as well as all others which sell to the Auto and Parts industry) and for additional labor services. The process, however, does not end here. The Metals industry as well as others faced with increased demand for their output find it necessary to buy inputs from other

industries in the state and additional labor services. Thus a second round of spending is initiated. Again, however, the process is not ended. The industries which sell to the Metals products industry (as well as to others which sell to the Auto and Parts industry) now faced increased demand for their output, and will call upon other industries for more material inputs and residents for more labor services. In addition workers who have received income in this process will consume some of this income for locally produced goods and services thus generating further rounds of spending. The net result is that the introduction of the \$1 million of basic income through the Auto and Parts industry leads to further rounds of spending within the State and an expansion of output and income far beyond that of the original \$1 million.

Since industries differ in regard to their linkages with other industries in the State, the ultimate effect of the introduction of a new dollar of basic income will vary depending upon the industry through which the dollar is generated and that industry's linkages with other industries and consumers within the State. Some industries, for example, will exhibit strong linkages because they purchase large amounts of their material inputs from other Missouri firms, and/or rely heavily on labor services from residents of the State. Other industries will exhibit weaker linkages because they import a large percentage of their material requirements from firms located outside Missouri, and/or purchase only small amounts of labor services from the residents of the State.

In order to evaluate the overall impact of export sales on the Missouri economy, it is necessary, therefore, to have information concerning the linkages of the various Missouri industries and consumers with one another. Fortunately, such information does exist for Missouri in the form of the

input-output studies of the Missouri economy. Indeed, one feature of the input-output model of the Missouri economy is the calculation of various multiplier values which allow us to trace through the impact of a dollar of basic income on such important variables as the generation of business activity, personal income, state tax revenues, and local tax revenues.<sup>1</sup>

The input-output multiplier values along with the estimates of export sales of Missouri firms can thus be utilized to evaluate the overall impact of the export sector on the Missouri economy. The results of such calculations for the years 1963 and 1972 are presented in Tables 13 and 14. The industry classification system again follows that of the input-output tables for Missouri. Column I of the tables indicates for each industry the total amount of business output which was generated (including the initial export sales) within the State after all rounds of subsequent spending have occurred as a result of that industry's direct and indirect exporting activity. The figures in this column, thus, indicate the total amount of business output in the State which is dependent upon exporting activity. Column II of the tables indicates the amount of personal income (wages, salaries, profits, interest, dividends) which is generated within the State as a result of exporting, again after all subsequent spending rounds have occurred. Column III indicates the amount of State tax revenue that arises due to the total business activity created by exporting. Finally column IV shows the amount of local government tax revenue that is generated as a result of the impact of export sales on business activity.

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1. A description of the input-output structure of the Missouri economy, along with an explanation of how the tables are used is provided by Harmstron, et al [1]. Other good references on regional input-output analysis include Richardson [6] and Miernyck [4].

Table 13: Impact of Exports on Missouri Economic Activity, 1963

(million dollars)

Industry	Business Activity	Personal Income	State Taxes	Local Taxes
Livestock	78.0	21.8	1.8	1.1
Agriculture	353.1	152.6	14.4	6.8
Meat Processing	20.2	5.2	.3	.2
Dairy Prod.	13.0	3.4	.2	.2
Grain Mill Prod.	86.3	26.5	1.8	1.1
Other Food Prod.	43.6	12.4	.6	.6
Textile & Apparel	10.5	3.8	.1	.2
Lumber & Furniture	9.1	3.6	.2	.2
Paper & Paper Prod.	10.1	3.6	.1	.2
Printing & Publishing	6.4	2.5	.1	.1
Chemicals	78.0	24.9	.9	1.1
Petroleum Prod.	1.0	.2	*	*
Leather, Rubber, Plastics	18.2	6.6	.2	.3
Stone, Clay, Glass	33.4	12.3	.5	.7
Primary Metals	18.5	4.4	.2	.3
Metal Prod.	31.4	14.0	.5	.6
Industrial Mach.	66.8	24.8	.9	1.1
Household Appliances	5.1	1.9	.1	.1
Other Electrical Prod.	24.7	9.2	.3	.4
Auto & Parts	35.2	6.9	.3	.3
Airplanes, Aerospace	7.3	2.3	.1	.1
Other Transportation	1.7	.6	*	*
Other Manufacture	70.3	21.1	1.0	1.7
Lead & Zinc Mining	.2	.1	*	*
Oil & Gas Mining	*	*	*	*
Coal Mining	1.3	.6	*	*
Other Mining	4.4	1.8	.1	.1
Totals	1027.8	367.1	24.7	17.5

Table 14: Impact of Exports on Missouri Economic Activity, 1972

(million dollars)

Industry	Business Activity	Personal Income	State Taxes	Local Taxes
Livestock	104.4	26.4	2.9	1.5
Agriculture	557.3	230.6	30.3	11.7
Meat Processing	45.5	9.5	.9	.5
Dairy Prod.	8.2	1.6	.1	.1
Grain Mill Prod.	89.8	23.1	2.5	1.2
Other Food Prod.	58.5	15.6	1.3	.8
Textile & Apparel	17.9	6.6	.4	.3
Lumber & Furniture	14.3	4.9	.3	.2
Paper & Paper Prod.	17.3	5.5	.4	.3
Printing & Publishing	23.5	9.2	.5	.5
Chemicals	188.9	54.5	3.7	2.8
Petroleum Prod.	5.1	1.3	.1	.1
Leather, Rubber, Plastics	42.2	14.6	.9	.7
Stone, Clay, Glass	42.5	15.2	1.0	.8
Primary Metals	95.0	28.9	2.0	1.5
Metal Prod.	51.9	19.5	1.2	1.0
Industrial Mach.	169.9	63.9	3.7	3.2
Household Appliances	9.8	3.1	.2	.2
Other Electrical Prod.	113.7	39.4	2.3	2.0
Auto & Parts	264.6	78.9	5.3	4.0
Airplanes, Aerospace	277.4	77.0	5.1	4.0
Other Transportation	47.8	14.0	1.0	.7
Other Manufacture	62.6	22.3	1.4	1.1
Lead and Zinc Mining	6.9	2.2	.2	.1
Oil & Gas Mining	*	*	*	*
Coal Mining	*	*	*	*
Other Mining	3.0	.9	.1	*
Totals	2318.0	768.7	67.8	39.3

Since the tables are rather large, the interpretation and discussion of the overall impact of exports on the Missouri economy will proceed by separately analyzing each major variable as depicted in columns I-IV of the tables.

### Business Activity

This column reflects the effect of exports by industry on the total amount of business output within the state. The gross amount of business output of the State is important in that total employment is closely associated with this variable. It is clear from the tables that the most important exporting industry in terms of generating business activity within the State is Agriculture. The exporting activity of this industry alone accounted for over one half billion dollars of business activity in 1972. Other important sectors include Airplanes and Aerospace, Auto and Parts, Chemicals and Industrial Machinery. Perhaps the most striking observation is the rapidly increasing importance of exports from the Airplane and Aerospace industry on the Missouri economy. This industry's exports generated only \$7.3 million worth of business activity in 1963, but by 1972 this figure had increased to \$277.4 million.

In terms of economy wide totals, export activity generated \$1,027 worth of business output in 1963 and \$2,318 million by 1972. These total figures constitute 4.3% and 4.6% of total Missouri business output respectively. Thus without exports the Missouri economy would have been 4.6% smaller in 1972 than it actually was.

Looking at the total figures for the State leads to a rather interesting finding. Over the 1963-72 time period, basic income from export sales grew by 256%, but total business output generated as a result of these exports grew only by 225%. This implies that, on average, each dollar of export sales

generated less in terms of secondary spending and output within the State in 1972 than in 1963. A demonstration of this point is provided in the table below. Row (1) of the table shows the total business output that is generated by export sales. Row (2) indicates the amount of basic income received from direct and indirect exports. Row (3) displays the incremental output that was generated by multiplier effects within the Missouri economy. This value is simply the difference between the total business output generated and the amount of basic income. Finally, row (4) shows the ratio of incremental business output to basic income.

Basic Income and Incremental Business Output Attributable  
to Exporting Activity

	1963	1972
(1) Total Business Output Attributable to Exports	\$ 1,027.8	\$ 2,318.0
(2) Basic Income Received From Exports	451.7	1,158.5
(3) Incremental Business Output Due to Multiplier Effects. [i.e. (1) - (2) ]	576.1	1,159.5
(4) Ratio of Incremental Business Output to Basic Income. [i.e. (3)/(2)]	1.27	1.0

One can observe from the table that the ratio of incremental output to basic income was 1.27 in 1963, but only 1.0 in 1972. This implies that the



secondary spending effects were smaller in 1972 than in 1963. Indeed, had the same ratio occurred in 1972 that occurred in 1963, total business output generated by export sales would have been 13% higher than it actually was.

Although we can not be sure of the precise reasons for this phenomenon, at least two plausible explanations arise. First, the multiplier values in the 1972 input-output tables are generally lower than those from the 1963 tables. While the authors of the input-output study do not give specific reasons for this occurrence one likely explanation is that the Missouri economy was more "open" in 1972 than 1963. That is, Missouri firms purchased a larger percentage of their inputs from firms located outside the State in 1972 than they did in 1963. This, in effect, weakens the linkage among firms within the Missouri economy and implies that each dollar of basic income generates less secondary spending now than in 1963.

A second possible explanation of this phenomenon is that the industries which grew most rapidly in terms of export sales are those which have weak linkages with the rest of the Missouri economy. For example, as noted earlier, one of the most rapidly growing export industries in the State was Airplanes and Aerospace. This industry, however, is one which has relatively weak linkages with the rest of the State. Thus the growth in Airplane and Aerospace exports did not call forth nearly the same impact on secondary spending as would growth in an industry with stronger linkages to the rest of the Missouri economy.

#### Personal Income.

Column II of the Tables 13 and 14 displays the effects of exporting activity on the generation of personal income for residents of Missouri. The leading industries in terms of personal income generation dependent

upon export sales are similar to those for business activity. Agriculture again heads the list followed by Auto and Parts, Airplanes and Aerospace, Industrial Machinery and Chemicals. The most striking growth again occurred in the Airplane and Aerospace industry which generated only \$2.3 million of personal income in 1963, but \$77 million by 1972.

In terms of the Missouri economy totals, the \$367.1 million of personal income attributable to exports in 1963 constituted 3.4% of the state total, while the \$768.7 million in 1972 represented 3.6% of the total.

#### State Tax Revenues

Column III in the tables displays the amount of tax revenue that the Missouri State Government receives due to income generated by export sales. Far and away the leading industry in terms of its impact on state revenues is Agriculture, which alone accounted for some \$30.3 million in 1972. Other important industries in terms of their effect on State tax revenues include Auto and Parts, Airplanes and Aerospace, Chemicals, and Industrial Machinery.

The total figures for the State indicate that export sales were ultimately responsible for \$24.7 million of State taxes in 1963, or 3.1% of the total; and \$67.8 million in 1972, or 4.1% of the total.

#### Local Tax Revenue

Column IV in tables 13 and 14 indicates the amount of revenues received by local governments in Missouri which are ultimately dependent upon export sales. In terms of the importance of various industries, the same pattern applies for local tax revenue as for State tax revenue. Agriculture once again is the leading industry, with its exports ultimately leading to the generation of \$11.7 million worth of local taxes in 1972. Auto and Parts, Airplanes and Aerospace, Chemicals and Industrial Machinery again display

their importance in terms of the local tax revenues their export sales generate.

The Statewide totals indicate that export activity ultimately generated \$17.5 million in local tax revenues in 1963, or 3.2% of the total, while in 1972 \$39.2 million of local revenues were dependent upon exports, or about 2.4% of the total.

### Employment

A final figure of interest is the total amount of employment in Missouri which is ultimately dependent upon the exporting sector of the economy. A complete analysis of the employment effects of exporting would involve the development of input-output matrices based upon employment relationships rather than dollar output relationships. Unfortunately, no such tables currently exist for the Missouri economy. The cost in terms of time and dollars of developing such tables made it prohibitive to accomplish the task at this time. We can, however, on the basis of the information already developed in this report provide some estimates of the importance of exports on employment in the State.

For example, we know that in 1963 the employed labor force in Missouri amounted to 1.767 million persons. Since the total amount of business output produced in the State that year was \$24.13 billion, it follows that, on average, for each million dollars of business output produced, 73.2 persons were employed. Since exports generated in total \$1,027.8 million worth of business output in 1963, it is reasonable to infer that the total number of jobs generated by export activity amounted to 75,550 [i.e.  $(73.2) \times (1,027)$ ].

In 1972, the employed labor force in Missouri was 1.914 million. Since total business output amounted to \$50,157 billion, it follows that for each

million dollars of business output, 38.2 persons were employed. Since export activity in 1972 generated \$2,318 million worth of business output, the total amount of jobs attributable to export activity amounted to 88,547.

The increase in the employed labor force between 1963-72 was 146,800 persons. The increase in the employed labor force over the same time period which could be attributed to export activity was 13,297. This implies that roughly 9% of the increase in the employed labor force over the time period was related to the ability of Missouri firms to direct and indirectly export their products.

## Chapter V: Summary and Conclusions

This study has investigated the participation of Missouri firms in export trade over the 1963-76 time period. Contrary to what might be expected of a state so centrally located in the U.S., export activity was found to have an important and growing influence on the Missouri economy. Total direct Missouri exports registered a sixfold increase from \$369 million in 1963 to about \$2.3 billion in 1976. Manufacturing exports experienced the fastest growth, increasing their share of total exports from about 55.5% in 1963 to 71.4% in 1976. In spite of the relative decline in the share of agricultural products in the commodity composition of total Missouri exports, farm products still constitute a large export product for Missouri, and the State remains considerably more dependent upon agricultural exports than does the U.S. as a whole.

Missouri's export performance compares favorably to that of the rest of the U.S. over the time period examined. The State ranked eleventh in the Nation in terms of agricultural exports and was the fifteenth largest exporter of manufactured goods in 1976. Moreover, the volume of direct exports from Missouri in both agricultural and manufacturing has been keeping pace with the overall growth rate in U.S. exports. Given that Missouri is located near the geographic center of the U.S., which renders transportation costs more important than at costal locations, the performance of the export sector of Missouri would have to be considered quite good.

The overall impact of the export sector on the Missouri economy, while not massive, was significant, and perhaps more importantly, is growing in significance. After accounting for all multiplier repercussions, the direct and indirect exports of Missouri firms were responsible for generating nearly

5% of total business output and about 4.5% of personal income within the State in 1972. While all the data required to determine the impact of the export sector for later years are not yet available, it is nonetheless apparent from the existing data that exports are playing an even larger role in the Missouri economy today. For example, in 1972 only 3.3% of total manufacturing output produced in the State was directly exported. By 1976 this figure had nearly doubled, amounting to 5.9%. It is safe, therefore, to conclude that the overall impact of exporting activity in generating income and jobs is substantially greater today than in 1972.

In an economy so large and diverse as that of the U.S., one would not expect foreign countries to constitute the major market for domestically produced goods. Nonetheless, foreign sales can make the difference between a stagnant and a growing economy. States which are successful in promoting and expanding their exports will experience rates of growth in income and employment greater than those which are not. On the other hand any precipitous drop in export activity is likely to result in declining growth of income and job opportunities. It is important, therefore, that the State make every effort to protect the existing export base and where possible expand it.

Perhaps the most critical question in terms of State export promotion is how to bring small and medium sized firms into international markets. Most large firms in the economy already have experience with international trade. They possess the financial capability and international expertise to seek out foreign market opportunities and to cope with the variety of problems (e.g. knowledge of tariff regulations, filing of necessary documents, handling of foreign exchange, etc.) associated with selling products abroad. Indeed,

much of Missouri's success in the exporting of manufacturing goods can probably be attributed to the existence of a number of large, knowledgeable, multi-national firms (such as Monsanto, McDonnell-Douglas, Ralston Purina, etc.) within the State. Export promotion efforts by the State are thus likely to have the greatest impact if they are directed towards the small and medium size firms.

A number of alternatives arise regarding methods of promoting State exports. Many states (notably Virginia, Pennsylvania, Georgia, Texas, Washington, and Illinois) claim that the establishment of international trade offices abroad has greatly increased the export sales of their state products. Apparently, the greatest value of these offices has been the ability to establish immediate communication between foreign buyers and the potential suppliers located in their states. Missouri has recently opened such an office in Dusseldorf, West Germany. The results of this effort should be monitored closely to determine what benefits are being derived from this program. If the program appears successful, then the State might consider establishing additional offices in other locations.

Furthermore, the State could provide export assistance to smaller firms by disseminating more information to these firms. One of the fundamental problems as small firm faces in attempting to engage in export business is acquiring the knowledge necessary to undertake the activity. Many avenues of assistance (both governmental and private) are available, but many firms are simply not aware of their existence. Knowledge of the availability of export assistance such as that provided by the local offices of the U.S. Department of Commerce, or Export Companies and agents should be invaluable in increasing the participation of Missouri firms in international trade.

Export promotion programs such as the one recently developed by the University Business Development Center (at University of Missouri-St. Louis) in conjunction with the Small Business Administration and the U.S. Department of Commerce should be encouraged by the State. The State might even consider subsidizing these types of programs in order that they reach the widest possible audience.

Besides expanding export sales, the State should take an active interest in protecting its current export base. From the State of Missouri's point of view the primary aim in this regard should be a policy of maintaining free trade in Agricultural products. Exports of farm products generated over half a billion dollars in total business output in 1972, and presumably even more in 1976. Export restrictions on agricultural goods imposed by the Federal Government could have a damaging effect on the Missouri economy. The State should be prepared to argue strongly against such proposals.

Finally, the overall role of exports in the Missouri economy could be enhanced by strengthening the linkages between the major exporting industries and the rest of the State. Businesses which supply the inputs to Missouri exporting firms should be encouraged to locate their facilities within the State. By improving the linkages between exporting firms with the rest of the economy, each dollar of exports would generate greater multiplier effects within the State economy. In a sense, this is a policy which simply utilizes the existing base of exports more effectively.

In summary, the Missouri economy has a significant stake in international trade. It has a healthy export base upon which to expand. Given the decline in the value of the dollar, American products are becoming more competitive in international markets. If the current opportunity is seized by Missouri firms, exports are likely to become an even more important component of the Missouri economy.



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APPENDIX I: Domestic (S.I.C.) and International (S.I.T.C.) Industry Classification

Industry Group	Standard Industrial Classif.	Standard Internat'l Trade Classif.
<b>I. Livestock and Livestock Products</b>		
1. Dairy products	0132	022, 023, 024
2. Poultry and Eggs	0133, 0134	011.4, 025
3. Meats and products	0135, 0136, 0139	011 (exc. 011.4)
4. Hides and Skins	pt. 2011, pt. 3111	211, 212
5. Lard and Tallow	pt. 2011, pt. 2013	091.3
<b>II. Other Agriculture</b>		
1. Wheat and Flour	pt. 0113, pt. 204	041, 046
2. Rice	pt. 0113	042
3. Other Feed Grains	pt. 0113	043, 044, 045
4. Cotton, including linters	0112	263
5. Tobacco, unmanufactured	0114	121
6. Soybeans	pt. 0113	221.4
7. Soybean Oil	2092	421.2
8. Cottonseed Oil	2091, 2096	421.3
9. Protein Meal	pt. 2094	081.4
10. Fruits and preparations	pt. 0122	051 (exc. 051.7), 052, 053
11. Nuts and preparations	pt. 0122	051.7
12. Vegetables and preparations	0123	054, 055
<b>III. Manufacturing</b>		
1. Food and kindred products	20	
1. Meat products	201	012, 013
2. Dairy products	202	022, 023, 024
3. Canned, cured, and frozen foods	203	031, 032, 052, 053, 055
4. Grain Mill products	204	046, 047, 048 (exc. 048.3)
5. Confectionery and related prod.	207	062, 073
6. Beverages	208	111, 112
7. Miscellaneous foods	209	091, 091, 071, 048.3
2. Tobacco Manufactures	21	65 122
3. Textile mill products	22	651, 652, 653, 654, 655, 657, 841
4. Apparel and Other Textile products	23	656, 841, 842
5. Lumber and Wood products	24	631, 633
6. Furniture and Fixtures	25	632, 821
7. Paper and allied products	26	641, 642
1. Papermills, except building paper	262	641 (exc. 641.6)
2. Miscellaneous converted paper prod.	264	642 (exc. 642.1)
3. Paperboard containers and boxes	265	642.1

(continued)

## APPENDIX I continued

Industry Group	Standard Industrial Classif.	Standard Internat'l Trade Classif.
8. Printing and Publishing	27	892, 862
1. Periodicals	272	892.2
2. Books	273	892.1
9. Chemicals and allied products	28	
1. Industrial Chemicals	281	512, 513, 514, 521, 531, 533
2. Plastics materials and Synthetics	282	581
3. Drugs	283	541
4. Soap, cleaners and toilet goods	284	551, 553, 554
5. Paints and allied products	285	533
6. Agricultural Chemicals	287	561
7. Miscellaneous chemical products	289	571, 599
10. Petroleum and Coal products	29	331, 332, 321
1. Petroleum refining	291	332
11. Rubber and Plastics products, n.e.c.	30	621, 629, 581, 851, 893
1. Tires and inner tubes	301	629.1
2. Fabricated rubber products, n.e.c.	306	629.3, 629.4, 629.9
3. Miscellaneous plastics products	307	893
12. Leather and Leather Products	31	611, 612, 831, 841.3, 851
13. Stone, Clay, and Glass products	32	
1. Structural clay products	325	662
2. Concrete, gypsum, and plaster prod.	327	661, 663
3. Miscellaneous nonmetallic mineral prod.	329	664
14. Primary metal industries	33	
1. Blast furnace and Basic steel prod.	331	673, 674, 675, 676, 677, 678
2. Iron and Steel foundries	332	671, 672
3. Nonferrous rolling and drawing	335	682, 684, 685, 686, 687, 693
4. Nonferrous foundries	336	698
15. Fabricated metal products	34	
1. Metal Cans	341	692.2
2. Cutlery, handtools and hardware	342	696, 695
3. Plumbing and heating, except electric	343	812
4. Fabricated structural metal prod.	344	691, 692 (exc. 692.2)
5. Metal stampings	346	694
6. Miscellaneous fabricated metal prod.	349	684, 698, 812 (part)
7. Miscellaneous fabricated wire prod.	348	693
16. Machinery, except electrical	35	

(continued)

## APPENDIX I continued

Industry Group	Standard Industrial Classif.	Standard Internat'l Trade Classif.	
	1. Engines and turbines	351	711 (exc. 711.4)
	2. Farm machinery	352	712
	3. Construction and related machinery	353	718.4
	4. Metalworking machinery	354	715
	5. Special industry machinery	355	717, pt. 718, pt. 719
	6. General industrial machinery	356	pt. 719
	7. Office and computing machines	357	714
	8. Service industry machines	358	719.1, 719.2
	9. Miscellaneous machinery, except electr.	359	pt. 719
17. Electrical equipment and supplies	36		
	1. Electric test and distributing equip.	361	pt. 723, pt. 729
	2. Electrical industrial apparatus	362	pt. 722
	3. Household appliances	363	725
	4. Electric lighting and wiring equipment	364	pt. 723, pt. 729
	5. Radio and TV receiving equipment	365	pt. 724
	6. Communication equipment	366	pt. 724
	7. Electronic components and accessories	367	pt. 724
	8. Miscellaneous electrical equipment	369	726
18. Transportation equipment	37		
	1. Motor vehicles and equipment	371	732
	2. Aircraft and parts	372	734
	3. Railroad equipment	374	731
	4. Miscellaneous transportation equipment	379	733
19. Instruments and related products	38		
	1. Medical instruments and supplies	384	861
20. Miscellaneous Manufacturing industries	39		
	1. Toys and sporting goods	394	894
	2. Pens, pencils, office and art supplies	395	895
	3. Miscellaneous manufactures	399	899
	4. Ordnance and accessories	19	951

## APPENDIX II: Derivation of Indirect Exports

The first step in the process was to make the Missouri and the U.S. Input-Output Tables compatible. The table for Missouri contains 54 industries, while the tables for the U.S. contain 83 industries. It was thus necessary to aggregate the U.S. table into conformity with the Missouri tables. The aggregation of the 1963 and 1972 U.S. tables followed the concordance provided in Appendix III. The net result of the aggregation process was to produce a transactions table for the U.S. as a whole with an industry classification the same as that of Missouri's table.

Once the tables were at the same level of industry aggregation, the procedure to determine indirect exports was as follows.

Let:

$MX_i$  = total sales (less direct exports) made by Missouri firms in industry  $i$  to the rest of the U.S., calculated from the Missouri input-output table.

$a_{ij}$  = the percentage of sales of industry  $i$  allocated to industry  $j$ , calculated on the basis of the aggregated input-output table for the U.S.

$USX_j$  = the percentage of total output of industry  $j$  exported from the U.S., calculated from the aggregated input-output table for the U.S.

The dollar allocations of sales by each Missouri industry  $i$  to each U.S. industry  $j$  is then given by:

$$(1) \quad MS_{ij} = (a_{ij}) (MX_i)$$

Given the total sales to each U.S. industry  $j$  from (1) above, the amount of goods exported by Missouri firms in each industry  $i$  through U.S. industry  $j$  is given by:

$$(2) \quad INX_{ij} = (MS_{ij}) (USX_j)$$

Summing across all  $j$  industries then yields the total amount of indirect exports for each Missouri industry  $i$ .

$$(3) \quad INX_i = \sum_{j=1}^n INX_{ij}$$

APPENDIX II cont.

Finally, total indirect exports from the State of Missouri is given by the sum of indirect exports by each industry  $i$ .

$$(4) \quad \text{INX} = \sum_{i=1}^n \text{INX}_i$$

APPENDIX III: Concordance Between the Missouri Input-Output,  
the National Input-Output and the Standard Industrial  
Classification Systems

Missouri Standard Sectors

Sector No.	Missouri (New)	Missouri (67 Old) Sector No.	National (83 Sector)	SIC Nos.
1	Livestock	1	1,4	02,09
2	Other Agriculture	1	2,3	01,08
3	Meat Processing	2	14.01	201
4	Dairy Products	3	14.02-14.06	202
5	Grain Mill Products	4	14.14-14.18	204
6	Other Food	5	Rest of 14	203,205,206,207, 208,209
7	Textile & Apparel	6,7	16,17,18,19	22,23
8	Lumber & Furniture	8,9	20,21,22,23	24,25
9	Paper & Paper Products	10	24,25	26
10	Printing & Publishing	11,12	26	27
11	Chemicals	13	27,28,29,30	28
12	Petroleum Products	14	31	29
13	Leather, Rubber, Plastics	15,16	32,33,34	30,31
14	Stone, Clay, Glass	17,18	35,36	32
15	Primary Metals	19	37,38	33
16	Metal Products	20,21	39,40,41,42	34
17	Industrial Machinery	22	43-52	35
18	Household Appliances	23	54	363
19	Other Electrical Products	24	53,55,58	361,362,364,365, 366,367,369
20	Auto & Parts	25	59	371
21	Airplanes, Aerospace	26	60	372
22	Other Transportation	27	61	373,374,375,376,379
23	Other Manufacture	28	13,15,62,63,64	21,38,39
24	Lead & Zinc Mining	29(partly)	6.02 (Pb, zn only)	103
25	Oil & Gas Mining	31(partly)	8	1311, 1321
26	Coal Mining	30	7	11, 12
27	Other Mining	29, 31(both partly)	5, 6 (except 9,10 Pb, zn)	101, 102, 104, 105, 106, 109, 14
28	Electrical Utilities	32	68.01	491, 493
29	Gas Utilities	33	68.02	492
30	Water & Sanitation Services	34	68.03	494,495,496,497
31	Communications	35	66,67	48,43
32	Trucking & Warehousing	36	65.03	421,422,423
33	Railroads	37	65.01,65.02	40
34	Other Transportation	38	Rest of 65	41,44,45,46
35	Petroleum Wholesalers	39	69.01(partly)	517
36	Other Wholesalers	40	69.01(partly)	50,511,512,513,514, 516,518,519
37	Farm Products Wholesalers	41	69.01(partly)	515
38	Gasoline Filling Stations	42	69.02(partly)	554
39	Auto & Accessories Dealers	43,44	69.02(partly)	551,552,553,556,557,559
40	Eating & Drinking Places	46	69.02(partly)	58

(continued)



APPENDIX III (continued)

Missouri Standard Sectors

Sector No.	Missouri (New)	Missouri (67 Old) Sector No.	National (83 Sector)	SIC Nos.
41	Other Retail	45,47,48, 49,50	69.02(partly)	52,53,54,555,56, 57,59
42	Banking & Other Finance	51,52(partly)	70.01,70.02, 70.03	60,61,62,67
43	Insurance	52(partly)	70.04,70.05	63,64
44	Lodging Places	53	72.01	70
45	Medical & Health Serv.	60(partly)	77.01,77.02, 77.03	80
46	Educational Services	55	77.04	82
47	Other Services	54,56,57 58,59,60 (partly),61	72.02,72.03,73, 74,75,76,81	72,73,75,76,78,79 81,83,84,86,88,89 07,108,138,47
48	Gen. Building Contractors	62	11.01,11.02	15
49	Heavy Construction Contrac.	63	11.03,11.04 11.05	16
50	Special Trade Contractors	64	12	17,6552(partly)
51	Real Estate & Rentals	65	71	65,6552(partly),66
52	Households	66	VA	
53	Local Government	67(partly)		91,92,93,94,95,96,97
54	State Government	67(partly)		91,92,93,94,95,96,97