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9. ABSTRACT

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This profile provides the entrepreneur with a framework of basic information for the production of simple desks and chairs. From this a detailed feasibility study can be developed for a proposed operation in a specific location and market. The market for wood desks and chairs is directly related to population growth, creation of new households, business and commercial activity, and institutional expansion. There is also a substantial replacement market. The profile is arranged in three general sections: marketing, technical, and financial information. Included are: a description of the procedures and plant operation, a general process chart, plant layout, marketing information, tabular data on production requirements, personnel requirements, capital requirements, annual costs and sales revenue, and cash flow projection. This data applies to prevailing conditions in Georgia, U.S.A. and cannot be directly applied to most of the L.D.C.'s without significant revisions. Assuming the same volume of production, an L.D.C. enterprise would have a lower proportion of fixed capital requirements and a higher percentage of working capital requirements. This profile should be considered only as a guide to the items to be considered and to the basic principles involved.

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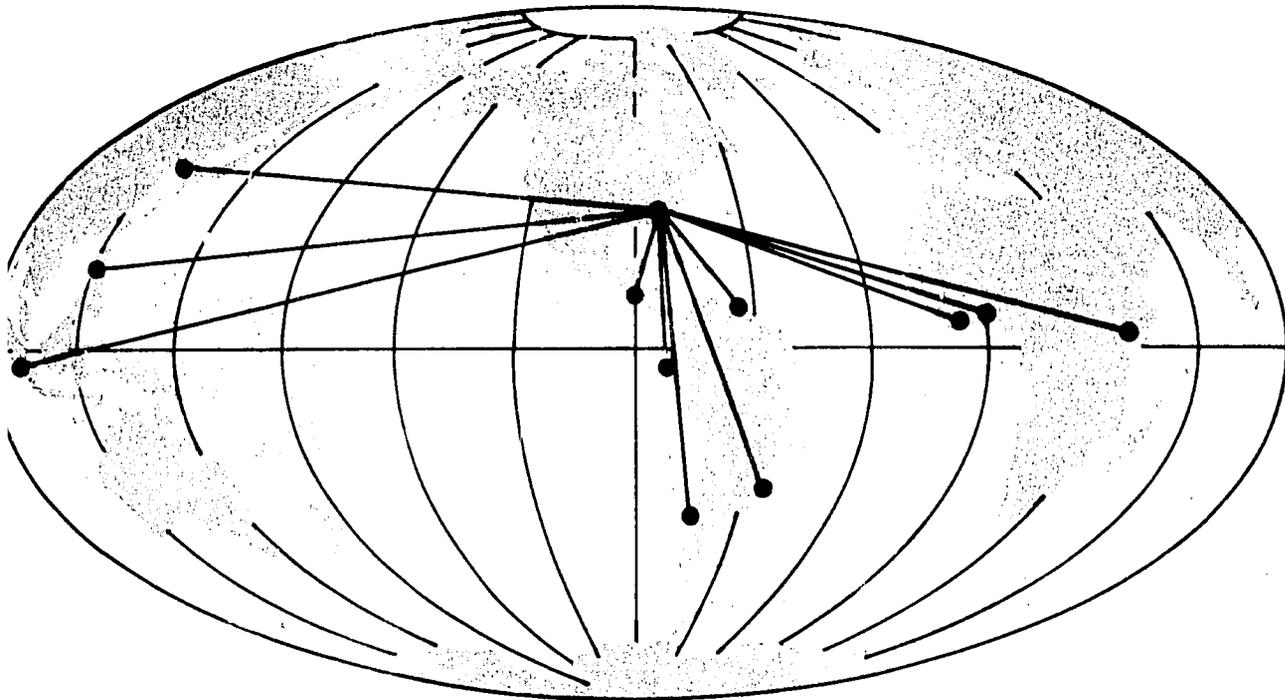
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EMPLOYMENT GENERATION THROUGH STIMULATION OF SMALL INDUSTRIES



INDUSTRY PROFILE NO. 1 WOOD DESKS AND CHAIRS

INDUSTRY PROFILE #1: WOOD DESKS AND CHAIRS
Socorro Quintero and International Programs
Division Staff
February 1977. 15p.

INDUSTRY PROFILE #2: WOOD CHAIRS
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Georgia Institute of Technology
Engineering Experiment Station
Economic Development Laboratory
Atlanta, Georgia 30332

The first three in a series of small-industry profiles aimed at providing entrepreneurs with a framework of basic information from which detailed, location-specific manufacturing feasibility studies can be developed. Included are a description of the products and plant operation, a general process chart, plant layout, marketing information, and tabular data on production requirements (equipment, direct materials, utilities and supplies), personnel requirements, capital requirements, annual costs and sales revenue, and cash flow projections. A list of suggested references also is provided.

Profile No. 1

Project B-414

INDUSTRY PROFILE SERIES

WOOD DESKS AND CHAIRS

by

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Economic Development Laboratory
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GEORGIA INSTITUTE OF TECHNOLOGY
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INTRODUCTION

The objective of this Profile is to provide entrepreneurs with a framework of basic information from which detailed feasibility studies can be developed for a proposed operation based upon costs and conditions for a specific location and market.

Most of the research work was performed by graduate students enrolled in the Master's Program with Emphasis on Industrialization of the School of Industrial and Systems Engineering at the Georgia Institute of Technology. This program is sponsored by the U. S. Agency for International Development as part of its 211(d) institutional grant to Georgia Tech. Compilation of the Profile was supervised by the staff of the International Programs Division (IPD).

Industry Profile No. 1 concerns the small-scale manufacture of wooden chair and desk sets. The furniture is of a basic design with no decoration. The finished product will be spray painted and fully assembled.

Some final assumptions are that the plant will operate one eight-hour shift per day for 256 working days each year; its maximum capacity is 10,000 board feet per day or 2,560,000 board feet per year; and it will produce 25,098 chair/desk sets annually.

The Profile is arranged in three general sections: marketing information; technical information; financial information. A plant layout for this operation and illustrations of the chair and desk set are included.

Cost information varies according to location, and persons using the figures in this Profile are cautioned to acquire cost figures for their specific location and operation. Cost figures in this Profile for raw materials, equipment, and personnel were generally based on prices prevailing in Atlanta, Georgia, U.S.A., in mid-1976. Hourly wages of laborers were based on information from the Survey of Manufacturing Wage Rates, Georgia 1971.

Since the data inputs for this Industry Profile apply to prevailing conditions in the United States, and Georgia in particular, the Profile cannot be directly applied to most of the less-developed countries (LDC) without significant revisions. Unlike the U. S., the LDCs depend on labor-intensive technology; therefore, assuming the same volume of production, an LDC enterprise would have a lower proportion of fixed capital requirements and a higher

percentage of working capital requirements. Under the appropriate technology philosophy, one would substitute labor for machines whenever feasible. This would eliminate part or all of the material-handling equipment and perhaps result in the use of less expensive machinery. This reduction in total capital requirements could significantly alter the cash flow and payback figures.

Not only will the technical and financial analysis be different, the marketing strategy and analysis also will have to be revised. Because the environment, conditions, and circumstances under which an industry is set up in an LDC differ from the U. S., users of this Industry Profile in LDCs should consider it only as a guide to the items to be considered and to the basic principles involved.

MARKET POTENTIALS

The market for wood tables and chairs is related directly to population growth, creation of new households, increase of business and commercial activity, and institutional expansion. A sizable replacement market exists as well.

PRIMARY USERS

Residences, offices, commercial establishments, institutions.

PRIMARY SALES CHANNELS

Residential: Retail furniture outlets.

Office-Commercial: Direct factory sales by sales force or agents.

Institutional: Direct factory sales by sales force.

GEOGRAPHICAL MARKET AREA

Domestic: The bulk and weight of these products result in high transportation costs and limited market area. While this characteristic restricts many producers to selling in local and regional markets, it makes them competitive with other producers located outside the market area.

Export: To compete effectively in world markets, high-quality and hence higher-cost furniture is needed. Various trade barriers and export problems should be thoroughly explored before entering this arena. In some instances export of component parts for later assembly in the market locations may be preferable to shipment of assembled units.

COMPETITIVE SITUATION

Wood tables and chairs are suitable for small manufacturing enterprises. Consequently, there may be considerable competition from a number of producers in an area. Competition may also come from products made of other materials (metal and synthetic materials, for example). Key factors in meeting competition are a producer's styling, pricing, cost control, quality, and service. Relatively high freight costs on these products provide substantial protection against imports. Competition from small furniture makers is likely with low-priced wooden furniture of this type.

MARKET NEEDED FOR PLANT DESCRIBED

Taking into account competition from furniture made of other materials and from other small makers, a developing urban area within easy delivery range and with a population of at least a million probably would be necessary to

assure a market outlet for this plant. Demand will generally depend on the income level, living habits, and the technological and economic levels of the area. There is a direct correlation between demand for furniture and the volume of new construction activities in a particular area. It must be noted that the construction industry is very cyclical and the stage of the construction industry cycle in which a furniture industry is started may have considerable impact on its initial success.

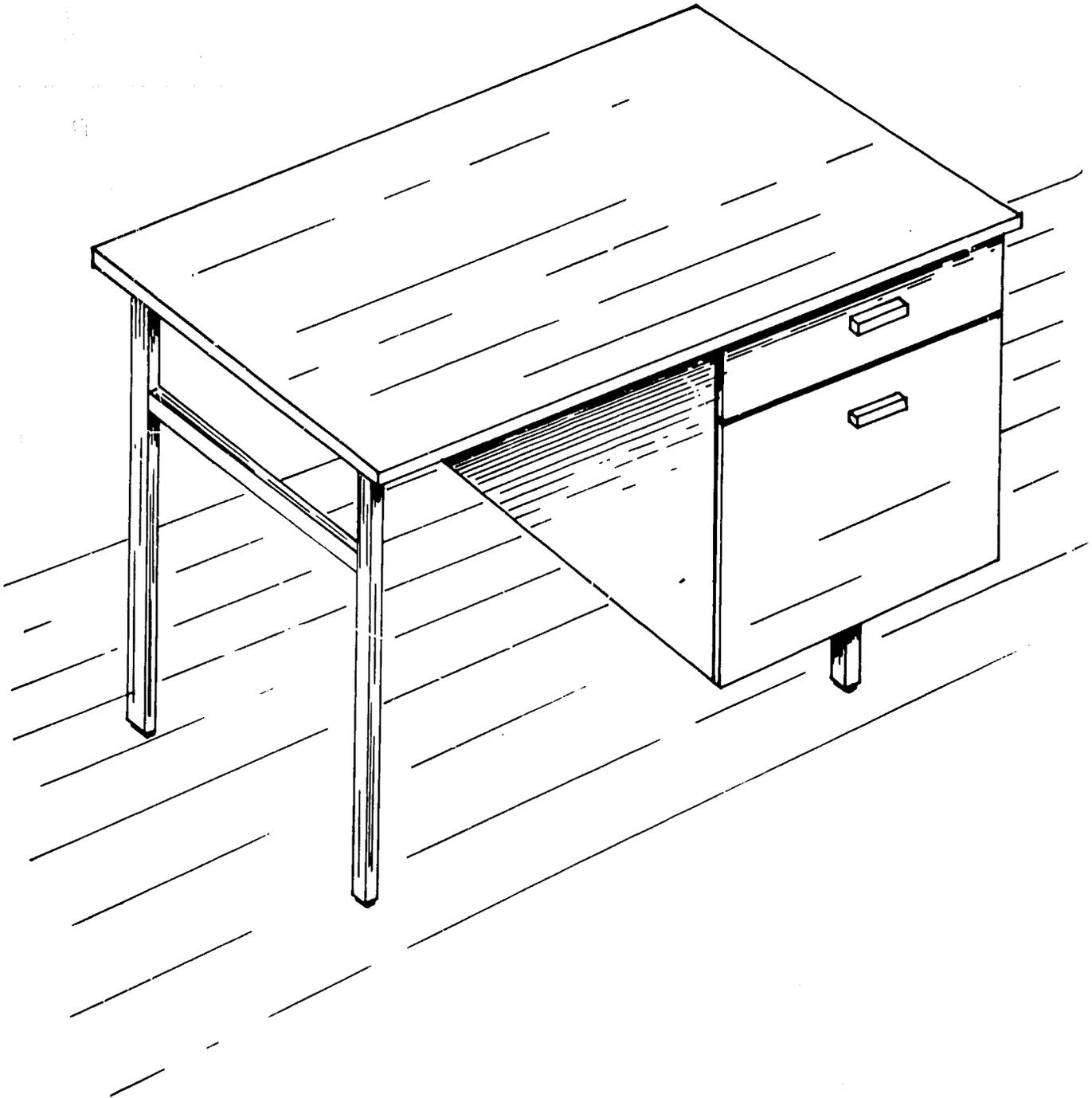
MARKET TRENDS FOR 1975-1985 (U. S. Furniture Industry)

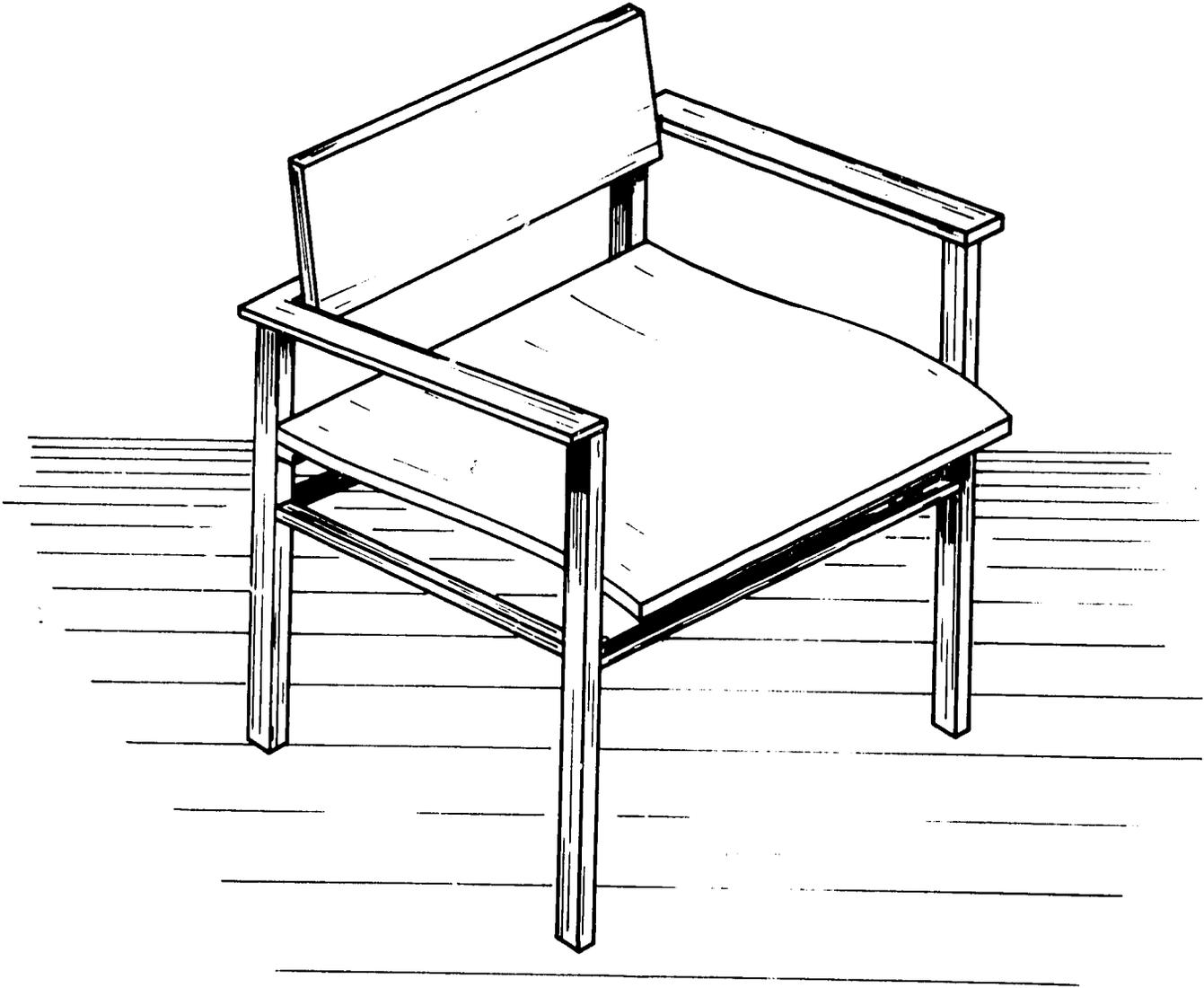
Export Growth Rate: 8.5% annually, with a rate exceeding 8.5% during the rest of the 1970s and slightly below that rate during the early 1980s.

Household Furniture Sales: 1975 -- \$7.7 billion; 1980 -- \$11.6 billion; 1985 -- \$17.4 billion. Price increases will likely account for half of these gains.

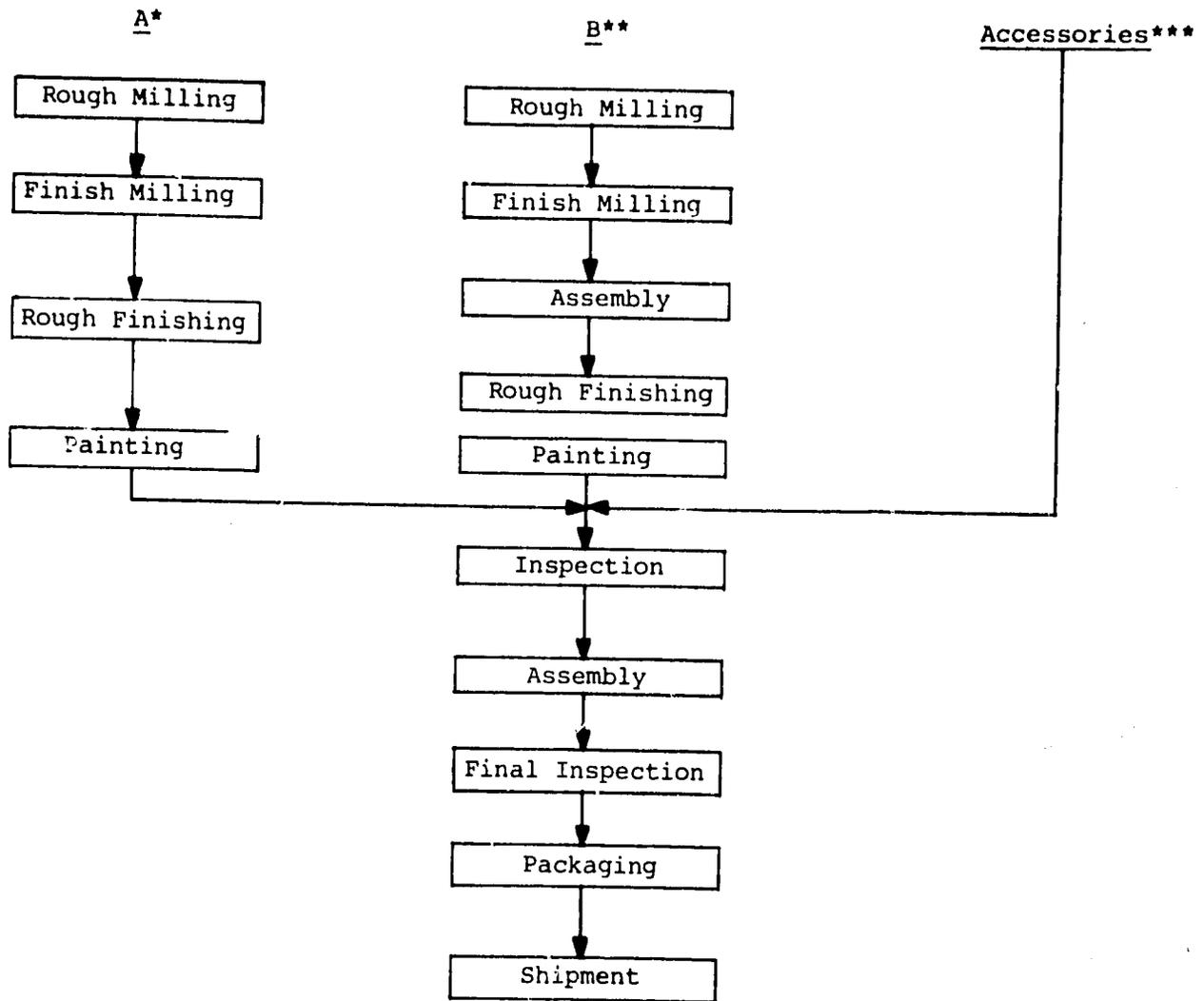
OTHER POSSIBLE CONTRIBUTING FACTORS TO THE POSITIVE TRENDS

- (1) Increasing disposable income
 - (a) Rapid growth of multi-earner families
 - (b) Expected increase in consumer spending for household durables
- (2) Continuing positive trends in the construction industry
- (3) Existing rapid increase in mobile home building
- (4) Expansion of the wood furniture industry to secondary products





GENERAL PROCESS CHART

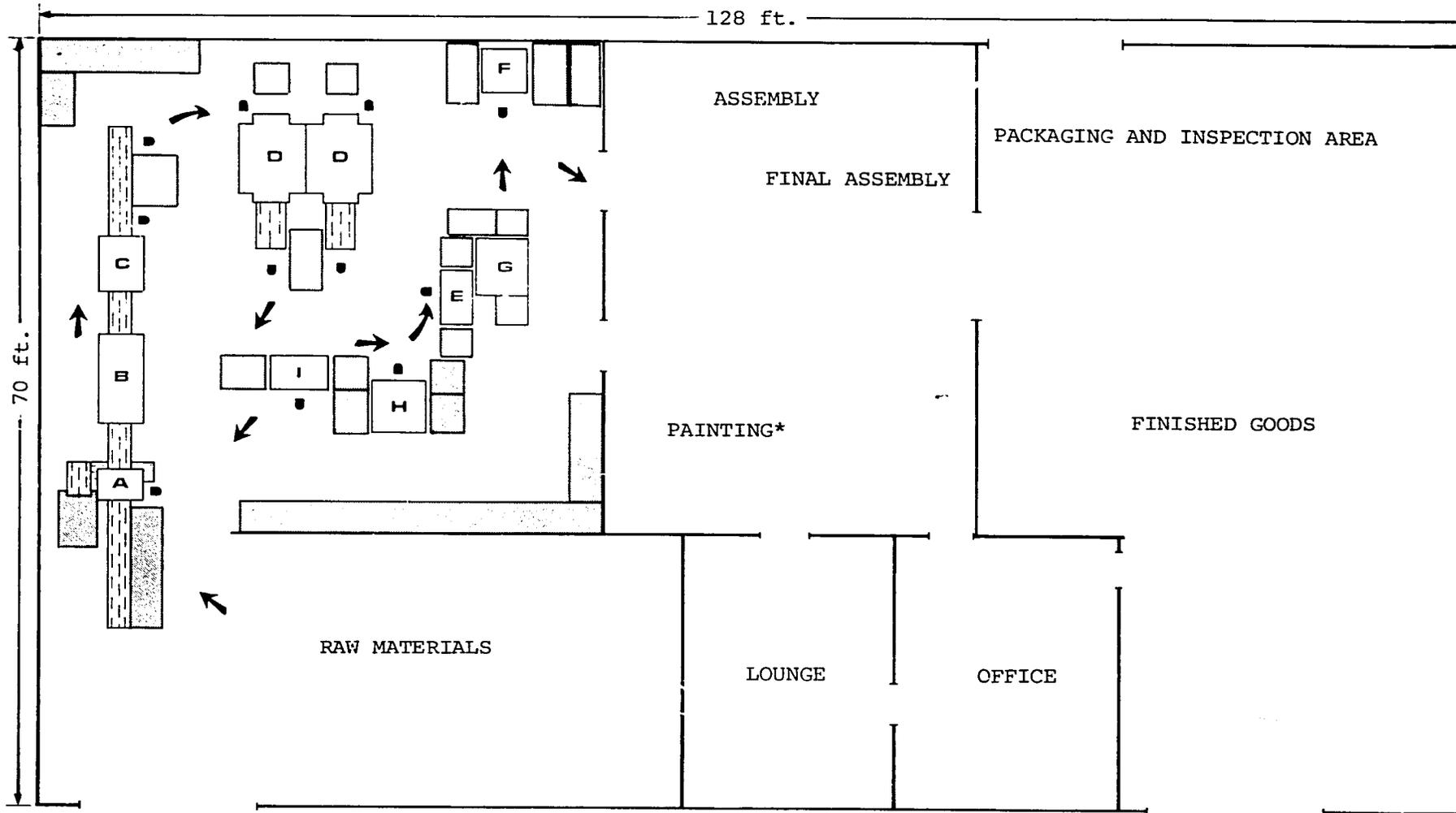


*A refers to the wide components of the furniture, such as desk tops, chair seats, and drawer sidings.

**B refers to the narrow, almost rodlike components, such as desk legs and arm rests, which have been assembled to constitute the framework of the chair or desk.

*** Accessories refer to the hardware items, such as drawer pulls, drawer slides, stops, and glides.

PLANT LAYOUT FOR WOOD DESKS AND CHAIRS

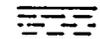


LEGEND:

- A - HYDRACUT SAW
- B - FACING PLANER
- C - SURFACE PLANER
- D - RIPSAW

- E - MULTIPLE SPINDLE BORER
- F - BELT SANDER
- G - END TENONER
- H - MORTISER CHISEL
- I - PRESS

 IN-PROCESS INVENTORY

 CONVEYOR

 - MACHINE OPERATOR

*Drying in-process inventory is stored in open shelves hung on monorail conveyors.

PRODUCTION REQUIREMENTS
(Cost figures in U. S. dollars)

1. EQUIPMENT

<u>Manufacturing</u>	<u>Dimensions</u> (feet)	<u>Area</u> (sq. ft.)	<u>Quantity</u>	<u>Unit</u> <u>Cost</u>	<u>Total</u> <u>Cost</u>
Hydracut Saw	4 x 18	72	1	\$ 4,500	\$ 4,500
Facing Planer	4 x 8	32	1	15,000	15,000
Surface Planer	4 x 5	20	1	20,000	20,000
Straight Line Ripsaws	6 x 8	48	2	10,000	20,000
Multiple Spindle Borer	3 x 5	15	1	18,000	18,000
Belt Sander	4 x 4	16	1	15,000	15,000
Single End Tenoner	5 x 5	25	1	5,000	5,000
Mortiser-Chisel	5 x 5	25	1	2,000	2,000
Glue Press	3 x 5	15	1	10,000	10,000
Band Saw	2 x 2	4	1	500	500
Painting Equipment	5 x 6	30	2	2,500	5,000
Assembly Presses	3 x 5	15	2	10,000	20,000
Subtotal					\$135,000

Materials Handling

Conveyors (Overhead)	-	-	160 ft.	\$25/ft.	\$ 4,000
Conveyors (Belt)	2 x 40	80	40 ft.	75/ft.	3,000
Shelves for Drying	(width 41")	-	70	Manufactured in plant	
Forklift	-	-	1	10,000	10,000
Truck (1 to 4-ton capacity)	-	-	2	6,000	12,000
Subtotal					\$ 29,000

Office

Typewriter	-	-	1	\$ 200	\$ 200
Calculator	-	-	1	90	90
Metal Filing Cabinets and Miscellaneous	-	-	-	1,000	1,000

Subtotal \$ 1,290

Total Equipment \$165,290

2. LAND: 1.25 acres @ \$18,000/acre \$ 22,500

3. BUILDING: 8,960 sq. ft. @ \$10/sq. ft. \$ 89,600

4. DIRECT MATERIALS

<u>Raw Material</u>	<u>Annual</u> <u>Cost</u>
Lumber: 42 bd. ft./set x 25,098 sets = 1,054,116 bd. ft. x \$.594/bd. ft.	\$626,145
Glue, Varnish, Finishing Materials	21,133
Hardware	81,568
Total	\$728,846

5. SUPPLIES

Hand Tools, Lubricants	\$ 890
Cutting Tools	900
Sandpaper	1,200
Maintenance and Repair Components	2,500
Working Gloves, Safety and First Aid Supplies	1,500
Total	\$ 6,990

6. ENERGY: 150 KW demand/hour = \$950/month \$ 11,400

7. WATER: \$25/month \$ 300

PERSONNEL REQUIREMENTS*
(Based on 256 working days per year)

DIRECT LABOR

<u>Title</u>	<u>No.</u>	<u>Hourly Wage Rate</u>	<u>Annual Wage Rate</u>	<u>Total Annual Wage</u>
Planer Operator	1	\$2.90	\$5,939.20	\$ 5,939.20
Band Scroll Saw Operator	4	3.46	7,086.10	28,344.40
Drill Press Set Up Operator	1	3.88	7,946.25	7,946.25
Sander (Machine)	1	3.65	7,475.20	7,475.20
Tenoner Operator	2	3.75	7,680.00	15,360.00
Presser (Machine)	2	3.25	6,656.00	13,312.00
Painter	2	3.75	7,680.00	15,360.00
Furniture Assembler	<u>14</u>	4.35	8,908.80	<u>124,723.20</u>
Total	27			\$218,460.25

2. INDIRECT LABOR & ADMINISTRATIVE PERSONNEL

<u>Title</u>	<u>No.</u>	<u>Salary or Wage Rate</u>	<u>Annual Salary or Wage</u>	<u>Total Annual Salary or Wage</u>
General Manager	1	\$1,500/mo.	\$18,000.00	\$ 18,000.00
Plant Supervisor	1	1,200/mo.	14,400.00	14,400.00
Sales Representative	1	1,000/mo.	12,000.00	12,000.00
Office	1	600/mo.	7,200.00	7,200.00
Truck Driver	2	3.91/hr.	8,007.70	16,015.40
Materials Handling	2	3.33/hr.	6,819.85	13,696.70
Maintenance, Mechanic	1	3.75/hr.	7,680.00	7,680.00
Janitor	1	3.33/hr.	6,819.85	6,819.85
Wood Sorter	<u>2</u>	2.90/hr.	5,939.20	<u>11,878.40</u>
Total	12			\$107,633.35

* The hourly wage rates were based on the highest wage rate available for the given job category in a 1971 survey for Georgia alone. The highest wage rates were used to absorb the effects of inflation and to comply with the new state ordinance regarding minimum wages. Some of the average values were below the minimum even after applying a constant adjustment factor equivalent to the rate of inflation.

ANNUAL PRODUCTION

One shift operation, 83.3% machine capacity utilization, 25,098 sets/year.

CAPITAL REQUIREMENTS

1. FIXED CAPITAL

<u>Item</u>	<u>Cost</u>	<u>Percent of Total</u>
Land (1.25 acres at \$18,000/acre)	\$ 22,500	8.11
Building (one story, 70' x 128')	89,600	32.30
Manufacturing Equipment	135,000	48.67
Materials-Handling Equipment	29,000	10.45
Office Equipment	<u>1,290</u>	<u>.47</u>
Total Fixed Capital	\$277,390	100.00

2. WORKING CAPITAL

<u>Item</u>	<u>Time Span*</u>		
Direct Materials			
Lumber (Oak or Hickory)	25 days	\$ 61,147	
Materials Added (Glue, Varnish, Hardware)	2 months	<u>17,117</u>	
Subtotal		\$ 78,264	42.63
Direct Labor	60 days	51,202	27.89
Manufacturing Overhead			
Indirect Labor and Adminis- trative Personnel	60 days**	21,733	
Supplies	2 months	1,170	
Power	2 months	1,900	
Water	2 months	<u>50</u>	
Subtotal		\$ 24,853	13.53
General and Administrative Expense	2 months	2,000	1.09
Sales Cost	2 months	6,480	3.53
Transportation	2 months	1,416	.77
Audit and Legal Expense	2 months	300	.16
Insurance	2 months	1,667	.91
Interest Cost (10% on Fixed Capi- tal except Land)	2 months	4,248	2.31
Contingencies	2 months	<u>13,186</u>	<u>7.18</u>
Total Working Capital		\$183,616	100.00
TOTAL CAPITAL (FIXED + WORKING)		\$461,006	

* The days indicated are working days.

** Two months for administrative and management personnel and 60 working days for hourly wage earners.

ANNUAL COST, SALES, AND PROFIT

<u>Annual Costs</u>	<u>Amount</u>	<u>Percent of Total Cost</u>
Direct Materials	\$ 728,846	57.17
Direct Labor	218,460	17.14
Indirect Labor	107,633	8.44
Supplies	6,990	.55
Sales Expense (Advertising, Commissions, Representation Allowance)	38,880	3.05
General and Administrative Expense	12,000	.94
Insurance (on Fixed Capital and Labor)	10,000	.79
Interest (10% of Fixed Capital except Land)	25,490	2.00
Audit and Legal Expense	1,800	.14
Transportation	8,500	.67
Water	300	.02
Electricity (Power)	11,400	.89
Depreciation (Straight-Line Method)	25,430	1.99
Contingencies (Fringe Benefits, Social Security, Vacation, Unemployment Com- pensation, and Other Liabilities)	<u>79,118</u>	<u>6.21</u>
<u>Total Annual Cost</u>	\$1,274,847	100.00
<u>Annual Sales Revenue</u> (\$67.50/set)	\$1,694,115	
<u>Profit before Tax</u>	\$ 419,268 (24.75% of Sales)	

CASH FLOW

Month	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>	<u>9</u>	<u>10</u>	<u>11</u>	<u>12</u>	<u>13</u>	<u>14</u>
Opening Balance	\$150,000	32,937	36,227	9,097	6,681	7,138	2,845	3,844	5,093	1,592	3,382	422	2,754	336
Collection of Receivables	-	-	6,109	50,823	63,529	63,529	63,529	63,529	63,529	63,529	63,529	63,529	63,529	63,529
Cash Sales	6,788	56,470	70,588	70,588	70,588	70,588	70,588	70,588	70,588	70,588	70,588	70,588	70,588	70,588
Short-Term Borrowing	-	40,000	-	-	-	-	-	-	-	-	-	-	-	-
Long-Term Borrowing	280,000	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Receipts	\$436,788	129,407	112,924	130,508	140,798	141,255	136,962	137,961	139,210	135,709	137,499	134,539	136,671	134,453
Direct Materials	\$ 27,332	48,590	60,737	60,737	60,737	60,737	60,737	60,737	60,737	60,737	60,737	60,737	60,737	60,737
Salaries and Wages	16,364	27,174	27,174	27,174	27,174	27,174	27,174	27,174	27,174	27,174	27,174	27,174	27,174	27,174
Supplies and Utilities	1,558	1,558	1,558	1,558	1,558	1,558	1,558	1,558	1,558	1,558	1,558	1,558	1,558	1,558
General and Administrative Expense	1,500	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
Audit and Legal Expense	1,500	150	150	150	150	150	150	150	150	150	150	150	150	150
Transportation Expense	708	708	708	708	708	708	708	708	708	708	708	708	708	708
Selling Expense	6,480	3,240	3,240	3,240	3,240	3,240	3,240	3,240	3,240	3,240	3,240	3,240	3,240	3,240
Interest Payment	2,333	2,667	2,667	2,667	2,500	2,250	1,958	3,240	3,240	3,240	3,240	3,240	3,240	3,240
Loan Payment (or Provisions)	-	-	-	20,000	30,000	35,000	30,000	1,708	1,458	1,167	917	625	375	83
Insurance	10,000	-	-	-	-	-	-	30,000	35,000	30,000	35,000	30,000	35,000	10,000
Installation and Set-up Expense	65,000	-	-	-	-	-	-	-	-	-	-	-	-	-
Equipment Purchase	165,290	-	-	-	-	-	-	-	-	-	-	-	-	-
Consultants' Fees	3,000	1,500	-	-	-	-	-	-	-	-	-	-	-	-
Building Payment	89,600	-	-	-	-	-	-	-	-	-	-	-	-	-
Cortingencies	13,186	6,593	6,593	6,593	6,593	6,593	6,593	6,593	6,593	6,593	6,593	6,593	6,593	6,593
Income Tax	N. A.	N. A.	N. A.	N. A.	N. A.	N. A.	N. A.	N. A.	N. A.	N. A.	N. A.	N. A.	N. A.	N. A.
Total Disbursements	\$403,851	93,180	103,827	123,827	133,660	138,410	133,118	132,868	137,618	132,327	137,077	131,785	136,535	111,243
End Balance	\$ 32,937	36,227	9,097	6,681	7,138	2,845	3,844	5,093	1,592	3,382	422	2,754	336	23,210

N. A. - Not available.

COMMENTS AND ANALYSIS OF CASH FLOW

Cash Sales: May include the 50% down payment.

Collection of Receivables: A 90-day time interval is given for the payment of the balance. The balance is 45% since 5% accounts for bad debts and discounts.

Borrowings: Issued at the start of the month.

Interest and Loan Payments: Made at the end of the month. Loan payments shown are cash disbursements. Since different organizations have different lending policies, adjustments should be made to conform to specific policies.

Taxable Income: Only at the end of the 14th month is profit realized. Thus, part of the ending balance for the 14th month is profit and part is a portion of the working capital for the next month.

Payback Period at \$67.50/Set: 14 months (on short and long-term loans).

Ratios:

Sales/Working Capital	9.23
Sales/Fixed Capital	6.12
Profit before Tax/Fixed Capital	1.5

The approximate break-even point at \$67.50/set = 23,573 sets. Based on annual production of 25,098 sets plus 90 days for collections on sales, the payback period would be 14 months.

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