

**DETERMINING THE FINANCIAL FEASIBILITY OF A WOOD PRODUCTS INDUSTRIAL
PARK**

by

James T. Walters

Thesis submitted to the Faculty of the
Virginia Polytechnic University and State University
in partial fulfillment of the requirements for the degree of

MASTER OF SCIENCE
in
FORESTRY

Dr. Harold W. Wisdom, Chairman
Dr. Jay Sullivan
Dr. Fred M. Lamb

May, 1998
Blacksburg, VA

Keywords: Wood Products, Industrial Parks, Finance, Feasibility Study

Copyright 1998, James T. Walters

**DETERMINING THE FINANCIAL FEASIBILITY OF A WOOD PRODUCTS INDUSTRIAL
PARK**

by

James T. Walters

Dr. Harold W. Wisdom, Chairman

Forestry

(Abstract)

A methodology was developed for determining the economic feasibility of a wood products industrial park. The methodology consists of twelve steps that address the goals of park owners, the feasibility of secondary manufacturing alternatives, the feasibility of the development corporation, and the financial areas needing management attention. Prerequisites to the financial analysis include market and technical analyses. Community impact analysis was also acknowledged as an important component of an overall feasibility analysis.

A case study was performed that consisted of an economic feasibility analysis for a wood products industrial park in Southwest Virginia. The case study assumed private ownership and found that the best mix of park tenants included: an edge-glued dimension panel manufacturer, a solid dimension lumber manufacturer, a custom millwork manufacturer, and a pallet manufacturer. Primary manufacturing and marketing services were included in the preferred park formation as subsidiaries of the park development corporation. The park was predicted to have a strong positive impact on the regional economy.

ACKNOWLEDGEMENTS

Immense appreciation and thanks go to my wife Amy, whose patience and understanding has given me the opportunity to complete this work. Her support is not always acknowledged, but is never unnoticed.

I would like to thank my committee for their professional advice and assistance. Dr. Harold Wisdom served as a mentor and directed me along the easily-traveled path. Dr. Fred Lamb surrendered many valuable hours in helping to construct the many financial statements found in the appendices. Dr. Jay Sullivan's greatest contribution was one that he performs well, being a good friend.

My friends deserve credit for turning monotonous work into a great deal of fun. They always seemed to know when to bring up racing, hunting, or something interesting. Particular thanks go to: Jason, Bronson, Mike, Scott, Clay, James, Paul, and Chrissy. My brother and sister were great friends before I started graduate work and will always be the same.

Finally, I dedicate this work to my mother and father, who have always given me the inspiration and enthusiasm to accomplish everything I desired. They never pushed me in any one direction, but seemed to wisely guide me down the right road. Thanks Mom and Dad!

TABLE OF CONTENTS

ACKNOWLEDGEMENTS	iii
TABLE OF CONTENTS	iv
LIST OF TABLES.....	v
LIST OF FIGURES.....	viii
CHAPTER 1: INTRODUCTION.....	1
1.1 Justification.....	1
1.2 Objective.....	3
1.3 Literature Review.....	5
CHAPTER 2: METHODS AND PROCEDURES	31
2.1 Market Analysis	32
2.2 Technical Analysis.....	37
2.3 Financial	42
2.4 Community Impact Assessment.....	70
CHAPTER 3: DEMONSTRATION OF METHODS.....	71
3.1 Background for Case Study.....	72
3.2 Financial Feasibility Analysis.....	91
CHAPTER 4: SUMMARY	131
LITERATURE CITED	135
APPENDICES	140
A: Pro-forma Financial Statements for Edge-Glued Panel Manufacturer	140
B: Pro-forma Financial Statements for Solid Dimension Manufacturer	144
C: Pro-forma Financial Statements for Pallet Manufacturer.....	148
D: Pro-forma Financial Statements for Millwork Manufacturer.....	152
E: Pro-forma Financial Statements for Custom Furniture Manufacturer	156
F: Pro-forma Financial Statements for Custom Cabinet Manufacturer	160
G: Pro-forma Financial Statements for Formation Alternative 1	164
H: Pro-forma Financial Statements for Formation Alternative 2	174
I: Pro-forma Financial Statements for Formation Alternative 3	184

LIST OF TABLES

Table 1. Relative importance of community factors, classified by degree of community control over each factor, in choosing a manufacturing site	23
Table 2. Categorization of industries by locational orientation	25
Table 3. Hypothetical production, in-park sales, and external sales for a wood products industrial park	56
Table 4. Hypothetical production, in-park sales, and external sales for a wood products industrial park	57
Table 5. Area of timberland in acres, by county and ownership, for Southern Mountains of Virginia.....	72
Table 6. Volume of Sawtimber (MBF) on timberlands, by species and diameter class, in Southern Mountains of Virginia.....	73
Table 7. Number of wood products related industries, by county and product, in Southern Mountains of	79
Table 8. Historical U.S. consumption, imports, exports, and production (MMBF) for hardwood lumber and projections for these categories through 2040	81
Table 9. Length distribution of dimension panels for edge-glued panel manufacturer	86
Table 10. Dimension distribution of solid wood pieces for dimension lumber manufacturer	87
Table 11. Startup costs for manufacturing alternatives for wood products industrial park in Southwest Virginia	92
Table 12. Summary of financing requirements for manufacturing alternatives for a wood products industrial park in Southwest Virginia	94
Table 13. Summary of important data from pro-forma financial statements of feasibility study of manufacturing alternatives for a wood products industrial park in Southwest Va.....	95

Table 14. Edge-glued panel prices (\$/bd.ft.) in Southwest Virginia for various lengths and species.....	99
Table 15. Solid dimension prices (\$/bd.ft.) in Southwest Virginia for various dimensions and species.....	100
Table 16. Percentage of total cost in each cost category for manufacturing alternatives for wood products industrial park in Southwest Virginia	101
Table 17. Summary of feasibility analysis for manufacturing alternatives for wood products industrial park in Southwest Virginia.....	103
Table 18. Raw material requirements for manufacturing alternatives for a wood products industrial park in Southwest Virginia	104
Table 19. Production of manufacturing alternatives for a wood products park in Southwest Virginia	105
Table 20. Park production and in-park and external sales (assuming unlimited lumber production) for Formation Alternative 1 of a wood products industrial park in Southwest Virginia	110
Table 21. Park production and in-park and external sales (assuming unlimited lumber production) for Formation Alternative 2 of a wood products industrial park in Southwest Virginia.....	111
Table 22. Park production and in-park and external sales (assuming unlimited lumber production) for Formation Alternative 3 of a wood products industrial park in Southwest Virginia	112
Table 23. Lumber production (MBF) and in-park and external lumber sales (MBF) for three park formation alternatives for wood products industrial park in Southwest Virginia.....	113
Table 24. Summary of pro-forma financial statements for development corporation and its subsidiaries in a wood products industrial park in Southwest Virginia	117
Table 25. Financial evaluation criterion for formation alternatives for a wood products industrial park in Southwest Virginia	119
Table 26. Re-evaluation of the financial feasibility of secondary and tertiary manufacturing alternatives for a wood products industrial park in Southwest Virginia	122

Table 27. Internal rates of return for development corporation after changing a financial category while holding other categories static..... 124

Table 28. Internal rates of return for marketing corporation after changing a financial category while holding other categories static 124

Table 29. Internal rates of return for primary manufacturing corporation after changing a financial category while holding other categories static..... 124

Table 30. Important financial ratios for the development, primary manufacturing, and marketing corporations for the preferred park formation for a wood products industrial park in Southwest Virginia 127

LIST OF FIGURES

Figure 1. Management structure for development stage of an industrial park in San Francisco	12
Figure 2. Pro-Forma balance sheet for hypothetical furniture manufacturer Appalachian Furniture Manufacturing.....	47
Figure 3. Pro-Forma cash flow statement for hypothetical furniture manufacturer Appalachian Furniture Manufacturing, Inc.	49
Figure 4. Pro-forma yearly income statement for hypothetical furniture manufacturer Appalachian Furniture Manufacturing, Inc	51
Figure 5. Sample sensitivity analysis for unit sales	62
Figure 6. Sample sensitivity analysis of net present value for unit sales and operating costs	63
Figure 7. Mathematical formulas for important financial	65
Figure 8. Diagram of Formation Alternative 1 for a wood products industrial park in Southwest Virginia	107
Figure 9. Diagram of Formation Alternative 2 for a wood products industrial park in Southwest Virginia	108
Figure 10. Diagram of Formation Alternative 3 for a wood products industrial park in Southwest Virginia	109
Figure 11. Sensitivity analysis for development corporation for preferred park formation for wood products industrial park in Southwest Virginia.....	123
Figure 12. Sensitivity analysis for primary manufacturing corporation for preferred park formation for wood products industrial park in Southwest Virginia.....	125
Figure 13. Sensitivity analysis marketing corporation for preferred park formation for wood products industrial park in Southwest Virginia.....	126

Figure A1.	Pro-Forma Balance Sheet for Edge-Glued Panel Manufacturer	141
Figure A2.	Pro-Forma Income Statement for Edge-Glued Panel Manufacturer.....	142
Figure A3.	Pro-Forma Cash Flow Statement for Edge-Glued Panel Manufacturer	143
Figure B1.	Pro-Forma Balance Sheet for Solid Dimension Manufacturer.....	145
Figure B2.	Pro-Forma Income Statement for Solid Dimension Manufacturer.....	146
Figure B3.	Pro-Forma Cash Flow Statement for Solid Dimension Manufacturer.....	147
Figure C1.	Pro-Forma Balance Sheet for Pallet Manufacturer	149
Figure C2.	Pro-Forma Income Statement for Pallet Manufacturer	150
Figure C3.	Pro-Forma Cash Flow Statement for Pallet Manufacturer	151
Figure D1.	Pro-Forma Balance Sheet for Millwork Operation	153
Figure D2.	Pro-Forma Income Statement for Millwork Operation	154
Figure D3.	Pro-Forma Cash Flow Statement for Millwork Operation	155
Figure E1.	Pro-Forma Balance Sheet for Custom Furniture Manufacturer	157
Figure E2.	Pro-Forma Income Statement for Custom Furniture Manufacturer.....	158
Figure E3.	Pro-Forma Cash Flow Statement for Custom Furniture Manufacturer.....	159
Figure F1.	Pro-Forma Balance Sheet for Custom Cabinet Manufacturer.....	161
Figure F2.	Pro-Forma Income Statement for Custom Cabinet Manufacturer	162
Figure F3.	Pro-Forma Cash Flow Statement for Custom Cabinet Manufacturer.....	163
Figure G1.	Pro-forma Balance Sheet for Dev. Corp., Park Formation Alt. 1.....	165
Figure G2.	Pro-forma Income Statement for Dev. Corp., Park Formation Alt. 1	166
Figure G3.	Pro-forma Cash Flow Statement for Dev. Corp., Park Formation Alt. 1	167
Figure G4.	Pro-forma Balance Sheet for Primary Man. Corp., Park Formation Alt. 1 ..	168
Figure G5.	Pro-forma Income Statement for Primary Man. Corp., Park Formation Alt. 1.....	169
Figure G6.	Pro-forma Cash Flow Statement for Primary Man. Corp., Park Formation Alt.1.....	170
Figure G7.	Pro-forma Balance Sheet for Marketing Corp., Park Formation Alt. 1	171
Figure G8.	Pro-forma Income Statement for Marketing Corp., Park Formation Alt. 1.	172
Figure G9.	Pro-forma Cash Flow Statement for Marketing Corp., Park Formation Alt. 1.....	173
Figure H1.	Pro-forma Balance Sheet for Dev. Corp., Park Formation Alt. 2.....	175
Figure H2.	Pro-forma Income Statement for Dev. Corp., Park Formation Alt. 2	176
Figure H3.	Pro-forma Cash Flow Statement for Dev. Corp., Park Formation Alt. 2	177
Figure H4.	Pro-forma Balance Sheet for Primary Man. Corp., Park Formation Alt. 2..	178
Figure H5.	Pro-forma Income Statement for Primary Man. Corp., Park Formation Alt. 2.....	179
Figure H6.	Pro-forma Cash Flow Statement for Primary Man. Corp., Park Formation Alt. 2.....	180
Figure H7.	Pro-forma Balance Sheet for Marketing Corp., Park Formation Alt. 2.....	181
Figure H8.	Pro-forma Income Statement for Marketing Corp., Park Formation Alt. 2.	182
Figure H9.	Pro-forma Cash Flow Statement for Marketing Corp., Park Formation Alt. 2.....	183
Figure I1.	Pro-forma Balance Sheet for Dev. Corp., Park Formation Alt. 3	185
Figure I2.	Pro-forma Income Statement for Dev. Corp., Park Formation Alt. 3.....	186
Figure I3.	Pro-forma Cash Flow Statement for Dev. Corp., Park Formation Alt. 3	187

Figure I4. Pro-forma Balance Sheet for Primary Man. Corp., Park Formation Alt. 3 ...	188
Figure I5. Pro-forma Income Statement for Primary Man. Corp., Park Formation Alt. 3.....	189
Figure I6. Pro-forma Cash Flow Statement for Primary Man. Corp., Park Formation Alt. 3.....	190
Figure I7. Pro-forma Balance Sheet for Marketing Corp., Park Formation Alt. 3.....	191
Figure I8. Pro-forma Income Statement for Marketing Corp., Park Formation Alt. 3 ..	192
Figure I9. Pro-forma Cash Flow Statement for Marketing Corp., Park Formation Alt. 3.....	193

CHAPTER 1: INTRODUCTION

1.1 JUSTIFICATION

The forests and the forest products industry are very important components in Virginia's economy, contributing \$11.5 annually. The forest industry, when compared to other industries in the state, ranks first in employment, second in wages and salaries, and fourth in value added (Virginia Department of Forestry, 1994). The industry is particularly important in Southwest Virginia, where the output of industrial roundwood products is increasing at a rate of 14% (Johnson et.al., 1995). There is increasing recognition in this region of the opportunities for value-adding industries, taking full advantage of the high quality hardwood resource.

There are several obstacles for creating manufacturing facilities that can take advantage of these opportunities. The most important barrier is that individual investors in Southwest Virginia are not able to fund the type of operation that would be successful: a large facility that can take advantage of economies of scale. Smaller facilities are generally not able to compete with larger companies in surrounding states. The most recent proposed solution to the problem is creating a wood products industrial park (WPIP) composed of smaller, locally owned businesses. A WPIP would allow local investors to pool resources and give each investor more control over a particular operation. The idea of creating a WPIP presents a problem: how can the feasibility of such a venture be determined.

There have been many publications on performing economic feasibility studies for most types of business investments, but the industrial park concept presents several problems that have not been addressed. There are many parties involved in the operation of a WPIP, including the developer, investors, tenant businesses, and the local community. The first problem is to determine which interests to include in the feasibility study. The

second, and the most difficult, problem in assessing a WPIP is that there are many ways that an industrial park can be structured. Determining the feasibility of each possible combination of park members is unrealistic except for the most basic industrial parks. Hence, a more practical technique is needed to assess the economic feasibility of a park. This technique must consider both quantitative and qualitative factors, because economic return is not the primary concern for an industrial park complex. This thesis will develop a technique that will allow developers to assess the financial feasibility of wood products industrial park ventures.

1.2 OBJECTIVE

The objective of this study is to develop a manual that presents a step-by-step process for determining the economic feasibility of a wood products industrial park that could take on a variety of forms. Although the techniques that will be used in the methodology are common financial analysis tools, they have not been applied in this manner. The methodology introduced in the manual will consider the feasibility of both park tenants and investors in the park. Furthermore, this methodology will consider both quantitative and qualitative satisfaction of the goals of the park complex.

All serious feasibility studies should address four components: market feasibility, technical feasibility, financial feasibility, and community impact. The completion of all four components is important because assumptions made during the market and technical analysis affect the projections made during the financial analysis and results of the community impact assessment. All four of these components will be acknowledged in this study, but because the focus of this project is financial feasibility, the majority of discussion will focus on this topic. Discussion of the market analysis and technical analysis, therefore, will primarily consist of an overview of the factors that should be addressed in each study, particularly those factors that will serve as the base for assumptions made during the financial feasibility study. The community impact assessment will simply be recognized as an important segment of the overall feasibility study.

A case study of establishing a wood products industrial park in Southwest Virginia will be used to demonstrate the application of the methodology for determining financial feasibility. This case study is not intended to be an endorsement of a particular industrial park, but rather will serve as an example of how such a park can be analyzed using the methods presented in the manual. The case study will use previously published technical reports of individual secondary manufacturers as market and technical analyses and will focus on the steps of the financial feasibility study.

In summary, the primary objective of this study is to develop a methodology that can be used to determine the financial feasibility of a wood products industrial park. A simple case study will demonstrate the use of these methods.

1.3 LITERATURE REVIEW

HISTORY OF THE INDUSTRIAL PARK CONCEPT

Background

The first industrial park created in the United States, the Central Manufacturing District of Chicago, was established in 1903, but initial development was very slow. A large factor in this slow development was the Great Depression of the 1930's, which had a great impact on all business in the country. The conclusion of World War II marked the beginning of strong growth in the economy and increasing interest in industrial development. Companies had a new outlook toward geography and marketing because of improvements in the mobility of the American people after the war. New industries were demanding more from sites than ever before. The particular requirements of new industrial sites, such as protected space, access to transportation routes, utility availability, and drainage, were well satisfied by the new breed of industrial parks. These parks were designed to increase business efficiency, thereby reducing costs. (Conway and Liston, 1981)

The popularity of the industrial park concept grew slowly until the 1950's, when development exploded. The primary impetus behind this explosion was the development of railroad companies that provided the option of transporting products in large quantities. Railroad companies often owned large parcels of land adjacent to the rail and developed these areas so that they could be marketed as industrial sites. Companies could now expand markets to a national level if they had access to the railroads. Increasing interest in industrial parks created a large amount misinformation for industrial developers as people looked to increase the real estate value of property. A number of parks established during this time period were unsuccessful because the site did not meet the needs of the particular industries. (Conway and Liston, 1981)

The period of greatest growth in the number of industrial parks was the 1960's, when the interstate highway system was created by the Federal Highway Act. The

interstate system drastically improved transportation in the country, particularly in areas not previously serviced by waterways or railroads. The slow initial growth of the interstate system was paralleled by slow industrial development in areas accessed by the interstates. The increase in the number of commercial airlines and airports also accelerated industrial development during this period. As railroads became less competitive, the geographic concentration of industrial parks also changed. Parks development moved into more rural areas that offered incentives such as lower material costs and cheaper labor. (Conway and Liston, 1981)

When industrial parks became more abundant, the government began to regulate and monitor their creation and operation. Zoning became a more important factor in site selection and gave communities an opportunity to control development. Environmental concerns in the 1970's led to many new regulations, such as the Clean Air Act and water quality programs, that affected not only industrial parks, but manufacturing industries as a whole. These new government regulations, in addition to increasing competition, caused industrial parks to become more specialized and to move into new geographical regions. (Conway and Liston, 1981)

Today's parks have evolved into efficient operations, and the focus has broadened to include research, appearance, and amenities as well as traditional concerns such as production and cost minimization. These changes are in response to a general shift in the economy from one based on heavy manufacturing to one based on service, information, finance, and technology. Today's parks are more demanding in terms of architectural quality, flexibility, site and landscape design, land use variety and controls, and amenities. The modern park often contains facilities devoted to light manufacturing, offices, warehouses, showrooms, and research. Although many modern parks are young ventures, some of the older parks have been able to adjust to new demands by developers. Older parks that were not designed with attention to flexibility have consequently deteriorated into "industrial slums". (Conway and Liston, 1981)

Definition and Categorization of Industrial Parks

The National Industrial Zoning Committee (NIZC), a group created to pursue industrial planning objectives, defines an industrial park as follows:

An industrial park is a tract of land, the control and administration of which are vested in a single body, suitable for industrial use because of location, topography, proper zoning, availability of utilities, and accessibility to transportation.

The uses permitted are regulated by protective minimum restrictions, including size of site, parking and loading regulations, and building setback lines from front, side, and rear yards.

The front yards, and side yards adjacent to streets, are to be landscaped in conformance to planning standards set for the park.

All requirements are to be compatible with the community and surrounding land uses in accordance with a comprehensive plan to enable a group of industries to operate within it effectively.

Industrial parks have become specialized to a degree that they can be categorized, as by Kinnard et.al. (1979). The most common type of park is the general or mixed use park, where non-industrial activities, such as support services, are permitted. Examples of the services that might be offered in a general use industrial park are medical services, restaurants, hotels, and gas stations. These types of parks usually demand large acreages of land because of the additional space required by non-industrial activities.

The second type, an exclusively industrial park, is most commonly found type in the United States (Kinnard et.al., 1979). This type of park is easiest to market to potential members because it is flexible and does not have the costs associated with interaction between industrial and non-industrial members. In addition, exclusively industrial parks provide the greatest potential expansion per dollar invested by the local economy and therefore have a particular appeal to the community.

Single-use parks are successful under certain conditions, but are generally considered risky ventures (Kinnard et.al., 1979). This type of park offers the greatest profit potential because of the improved efficiency associated with specialization. Specialization in the park is risky because the park is then subject to changes in taste and industry standard that could leave the park outdated. The long-term implications of an

investment in an industrial park indicate that developers should be risk-adverse and should carefully consider the hazards of this investment.

The fourth type of park listed by Kinnard et.al. (1979), research and technology based ventures, market to non-production, science-oriented firms. These parks are often located in close proximity to universities or other information centers. Research parks also have technology-related site requirements that are difficult to provide in some locations. These types of parks often begin as a purely research oriented enterprise, but evolve into multiple use parks with limited production and complimentary firms. It is important for developers of research and technology parks to create flexibility to meet the changing needs of member firms.

Office parks are becoming common in regional centers across the country (Kinnard et.al., 1979). Firms are realizing the advantages of sharing fixed costs with other companies and the opportunities to improve the work environment for employees. Location and convenience are important factors in development of office parks and less emphasis is placed on traditional site selection criterion such as utility availability. The members of these parks generally have other operations, such as production and warehousing, in a relatively close proximity to the park.

The final types of industrial park that can be found in the United States today are transportation site developments. The three most common types of transportation parks are rail, airport, and port parks. Rail parks are generally marketed to firms with large domestic shipping needs. The airport transportation park is ideal for firms that require fast delivery of light, high value-added products. Water transportation parks are used by companies that produce large quantities and ship in bulk, particularly for firms involved in international trade. (Kinnard et.al. 1979)

GENERAL STRUCTURE OF INDUSTRIAL PARKS

Ownership Structure

The ownership structure of any business depends on the stakeholders and objectives of the business (Wyatt and Wyatt, 1972). The ownership structure of an industrial park is particularly important because it must be compatible with the park's operations and must satisfy community interest in the park. The first ownership distinction is between public and private parks. The choice of public or private ownership depends on the availability of land, capability of local businesses to issue debt, availability of developers, and availability of economic development agencies (Olmi, 1992). Public parks are better suited for areas where there are no large blocks of private property, poorer economic conditions, and where an economic development agency exists. Private parks are better suited for areas where there are larger private parcels, better local economic conditions, and experienced developers. A development agency is usually assumes the ownership role in a public park. As discussed by Urban Land Institute (1989), private parks can be composed of a variety of ownership entities.

The first entity to be considered, individual ownership, is not very common in industrial parks because of the capital requirements and wide range of knowledge necessary for development. Most examples of individual ownership in industrial parks are very small and simple ventures. An advantage of individual ownership is that "double-taxation" is avoided. "Double-taxation" occurs when corporations pay tax on net income and investors also pay income tax on dividends. An individually owned business pays no taxes, but the owner pays income tax on return. In addition to the large financial and technical resources required, a major disadvantage of individual ownership is that the owner assumes full liability in lawsuits against the business. This liability reinforces the need for individually owned ventures to be small and simple. (Olmi, 1992)

Another type of ownership that offers the advantages of individual ownership is the simple partnership. This type of ownership is well suited to small and short-term ventures. Limited partnerships are common because they allow the general partner to have full management control. The advantage this type of partnership over individual

ownership is that the partners can each add financial and technical resources. A partnership also has the advantage of paying no business taxes, avoiding “double-taxation”. Partners report earnings as regular income on their annual income tax return. The primary disadvantage of a partnership is that the partners have full liability for the business. Another problem often associated with a partnership is that it is difficult for the partners to transfer ownership. Careful planning at the beginning of the venture can minimize problems associated with ownership transferal. (Olmi, 1992)

Industrial parks are commonly organized as joint ventures between two people, partnerships, or corporations. A joint venture is advantageous because it provides access to financing for undercapitalized firms. A joint venture is more suitable for long-term projects because it spreads risk among more investors. A joint venture also allows inexperienced investors to become involved in industrial park development, particularly in large projects where substantial amounts of capital investment are required. The primary disadvantage of a joint venture is that the developer can lose control to the other partner. The investing partner often has little technical knowledge about industrial park development, but expects to make business decisions. Negotiations and delays can be expected in joint ventures because of conflicts between partners. Another problem for the developer is that the money-supplying partners generally demand initial profits from the venture. The developer can be presented with cash flow problems in large projects because the discounted returns are less than the present value of time and money invested. (Urban Land Institute, 1989)

The final type of ownership that is common in industrial parks is the corporation. The corporation has three primary advantages: limited liability, perpetual existence, and transferability of ownership interest. The owners of corporate stock are liable for only the amount they have invested in the corporation. The ease of transferring ownership allows more investors to become involved and allows ownership to transfer between generations. Corporate structure also allows developers with extensive knowledge and experience to maintain control of management decisions. These advantages make the corporation more suitable for long-term industrial park projects. The disadvantages of corporate ownership make it unsuitable for most short-term projects. Large legal expenses make corporations

expensive to create. In addition, corporations are subject to taxation of both corporate earnings and dividend payments. (Olmi, 1992)

The choice of ownership structure is a complex legal decision. There are many factors, such as available capital, knowledge, and experience, which are important in the decision. In addition, the size and term of the park must be considered. Short-term and small projects are more suited to partnerships or joint ventures, while long-term and capital intensive projects are better served by corporate structure. Legal advice is an important input of the development stage of an industrial park. (Urban Land Institute, 1989)

Management Structure

The management structure of an industrial park is best considered in two separate stages. The first segment, the development stage, is when infrastructure is designed, tenants are selected, a public relations program is implemented, and financing is arranged. (Martin et.al., 1996) The second stage of management is the daily, on-going management of the industrial park. There are various ways that these two management activities can be structured. (Urban Land Institute, 1989)

The development stage of industrial park management is very important in determining the future success of a venture. Many of the tasks that must be accomplished during this period require special knowledge or experience. Therefore, it is important that a proper team of advisors be created before any important management decisions are completed. Some of these experts will be members of park management and some will be consultants. A development team for a large industrial park might include

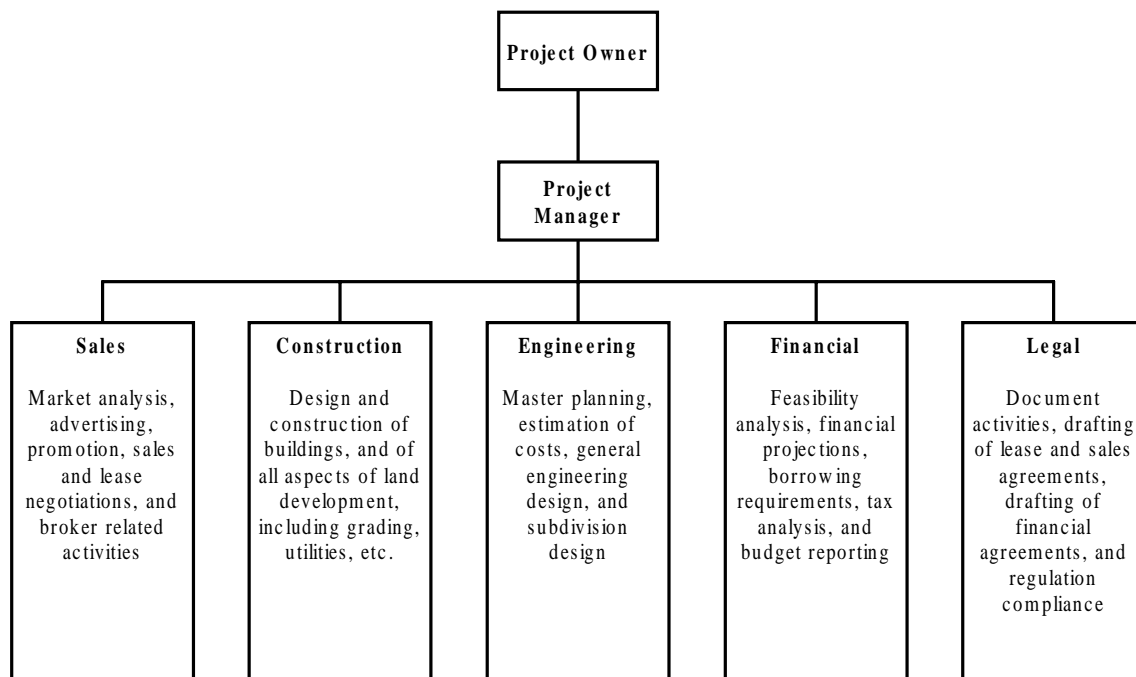


Figure 1. Structure of development management team for an industrial park in San Francisco, CA.

the ownership group, a financial advisor, an engineer, and a marketing specialist. Other functions might be contracted through real estate agents, public relation specialists, independent brokers, attorneys, accountants, tax specialists, surveyors, structural engineers, architects, soil specialists, traffic engineers, and landscape architects. The specific structure of an individual project is a function of the size of the project, the experience of the developer, and how the park is financed. Figure 1 shows an example of the structure for an industrial park in San Francisco. (Urban Land Institute, 1989)

The operational management of an industrial park takes on of several forms, based on the type of park being developed. The management structure will be different for a lease park than for a park where members own their respective park space. The duties of management, however, are the same, regardless of the management structure. (Martin et.al., 1996) The management of the park must serve as a gatekeeper, interacting between park members and the community. Additionally, an environment should be provided that will facilitate communication between park members. It is the responsibility of the park management to maintain a full park with member businesses that can interact. Finally, public goods and services such as infrastructure must be provided to all park members. (Martin et.al., 1996)

In an industrial park where members lease buildings and land from the park owner, the management is structured into two bodies, each with different responsibilities. Martin et.al. (1996) titles the first managing body the “Park Management Company” (PMC), a designee of the developer. The PMC is responsible for maintaining the stability of tenancy with in the park. Duties of the PMC include filling vacancies as soon as possible, maintaining the functionality and attractiveness of the park, negotiating and collecting income from leases, and interacting with the public. Martin et.al. (1996) calls the second managing body the “Community Self-Management System” (CSMS), or the tenants’ association. The CSMS is composed of representatives from each member of the park, the owner, and other various parties. Membership in the CSMS is generally required in the lease or deed of each park member. The primary responsibilities of the CSMS are to resolve conflicts among members and to enforce the Covenants, Conditions, and Restrictions (CC&R) of the park.

The Covenants, Conditions, and Restrictions are the basis for many management decisions of an industrial park. The CC&R are created by the developer and are signed by all park members, whether leaseholders or owners. The CC&R outlines what members can expect from the park and provides conditions of membership. The CC&R ensure the maintenance of a safe, aesthetic, and neighborly environment. It is important to prepare the CC&R during the initial planning stages, because a well-written CC&R indicates to investors that the park has a lower level of risk than less organized ventures. Specific conditions within CC&R apply to site coverage, architectural design, building materials, storage requirements, building usage, parking requirements, signs, and landscaping (Urban Land Institute, 1989). An example layout of a CC&R from Urban Land Institute (1989) is as follows:

1. Declaration of Intent
2. Legal Description of Property
3. Management Associations
4. Maintenance Assessments
5. Permitted/Prohibited Land Uses
6. Nuisance Restrictions
7. Design Guidelines
8. Design or Architectural Review Procedures
9. General Legal Provisions.

A CC&R can sometimes be used in place of zoning regulations if they meet the approval of the local zoning commission. Using the CC&R in place of zoning regulations allows the park management to make quick action during changes in the park. The developer will also have site-specific control instead of having to adhere to county-wide or city-wide regulations. The developer should include provisions to make changes to the CC&R in order to comply with future amendments to zoning regulations. (Urban Land Institute, 1989)

The second form of operational park management occurs when the members own their respective land and buildings. An owners' association is the primary governing body and manages according to CC&R's drafted by the developer. The owners' association is similar to the Community Self-Management System discussed by Martin et.al. (1996), but has additional responsibilities of maintaining the public areas of the park and attracting new businesses. Furthermore, the owners' association must be responsible for all public relation activities for the entire park. Management companies are commonly contracted to perform the physical tasks such as landscaping, maintenance of public buildings, and upkeep of roads and parking facilities. (Urban Land Institute, 1989)

Financial Structure

The previous section outlined the two different forms of industrial parks: lease and purchase. Just as these two types of park are managed differently, the financial structure for each is different. The developer usually retains ownership of a lease-type industrial park as a long-term investment (Urban Land Institute, 1989). The members of the park usually pay a lease for the use of a lot and improvements such as buildings and machinery. The leaseholders also pay a management fee in exchange for benefits, such as maintenance of infrastructure, that are outlined in the CC&R's. There are cases where the park owner offers extensive benefits to the park members. For example, a park owner may own a steel mill at a particular park and will guarantee to park members a certain amount of processed steel at a given price.

Developers generally sell all ownership in a purchase park (Urban Land Institute, 1989). The exception might be where a developer would retain ownership of a core business, such as the steel mill in the previous example. Tenants own their respective portion of the park and are usually responsible for the upkeep of that area according to standards outlined in the CC&R's. Members of a park can contract public work such as landscaping and pay for those services according to procedures in the CC&R's. It is particularly important for the developer of purchase parks to create Covenants, Conditions, and Restrictions that will allow the members of the park to resolve all problems associated with managing the public areas of the park. Although the members of a purchase-type industrial park are generally independent, there are cases where it is best that a joint venture of some or all members own a particular part of the park. An example would be a park composed of members that consumed large quantities of electricity. The members might build an electricity producing facility that would be owned by all members within the park.

Proposed Management Structure for a Wood Products Industrial Park

One of the most complete studies on wood products industrial parks is that of Jones et.al. (1988). This study addresses in great detail the design and formation issues associated with a WPIP. In particular, Jones et.al. (1988) is acknowledged for a discussion of a management organization that will be reviewed in this section and will be used as the groundwork for a feasibility analysis.

The chief management entity for a WPIP is the development corporation, which is responsible for planning, financing, construction, startup of primary manufacturing operations, and recruiting secondary manufacturers to the park. The development corporation provides improved manufacturing sites to independent secondary manufacturers through long-term leases. Furthermore, the development corporation is responsible for operational management and administration of the complex, including maintenance and upkeep of facilities and infrastructure, providing space for future growth, and providing services such as security and fire protection. Finally, the development corporation would be the sole or majority owner of two subsidiaries: the primary manufacturing corporation and the marketing corporation.

The development corporation is fully owned by investors, both private and public, with a local interest. Investors might include individuals, financial institutions, and public entities. The board of directors would include the presidents of the development, primary manufacturing, and marketing corporations, an elected representative from each secondary manufacturer, and representatives of the investors.

The primary manufacturing corporation, which is 100% owned by the development corporation, would be responsible for primary production operations. The components of this corporation would include the sawmill and dry kiln facilities. The principle functions of the primary manufacturing corporation would include procurement of raw materials, primary breakdown into green lumber, and lumber drying. Manufacturing would be directed by the president of the corporation, whose responsibilities would include managing overall operations and directing the supervisors of the sawmill and dry kiln.

The marketing corporation could be owned primarily by the development corporation, with secondary manufacturers having small interest. A primary function of the manufacturing corporation is to sell the products manufactured within the park, either to other park members or to markets outside of the park. The manufacturing corporation would serve as a manufacturer's representative to secondary manufacturers, operating from a sales commission. Other duties of the marketing corporation could include advertising and promotion of park products, customer service, product development, quality control, operation of a finished goods warehouse, and distribution within the park. The president of the manufacturing corporation would act as sales manager, directing salespeople, field representatives, and warehouse personnel.

The secondary manufacturers within the park would be independently owned entities that would lease space from the development corporation. The secondary manufacturers would use raw materials provided by the primary manufacturing corporation and could sell products through the marketing corporation. Contractual agreements between secondary manufacturers and the development corporation would be vital in maintaining a close working relationship between member industries, thereby taking advantage of the economies of scale associated with an industrial park. Contracts could include purchase agreements with the primary manufacturing corporation, sales agreements with the marketing corporation, and membership agreements in the Covenants, Conditions, and Restrictions.

The park structure proposed by Jones et.al.(1988) is flexible enough to be applied to specific park enterprises. Individual units of the structure, such as the marketing corporation, can be excluded in a particular park, leaving those responsibilities to individual producers. There is a advantage in making these important park components publicly owned by all park members, however, because those services are then guaranteed to park members for a long period of time.

CONSIDERATIONS IN PLANNING AN INDUSTRIAL PARK

Selecting a Site for a Park

This section is composed of two parts: a discussion of the major factors of industrial location and an outline of two major schools of thought on industrial location theory. The theory of industrial location will not be addressed in depth, as entire volumes have been devoted to this topic. A more complete discussion of this topic can be found in the works cited, particularly Moriarty (1980), Smith (1981), and Schmenner (1982). These works are very comprehensive, but are somewhat dated, and must therefore be interpreted cautiously.

Factors Influencing Industrial Location

The factors that influence the location decision can vary among different industries, but some factors are common among all industries. Common factors include transportation, labor, land, utility availability, raw material supply, accessibility to markets, agglomeration with other industries, and public policy. The relative importance of each of these factors generally depends on the production process of the industry and the nature of markets.

Transportation is a factor that has declined in importance, but is still considered vital in most decisions (Smith, 1981). Transportation costs are particularly influential in industries that utilize or produce large, heavy, and bulky items. Other industries that are largely affected by these costs are those that require refrigeration or other special care (Smith, 1981). Moriarty (1980) points out that transportation is most commonly evaluated by freight and availability. Freight cost has been the focus of many studies because it is such a large factor in transportation cost. Moriarty (1980) describes how freight can be divided into two components: terminal costs and line-haul costs. Terminal costs are associated with loading, unloading, storage, etc., and are usually considered fixed costs. Line haul costs, which are generally variable costs, include labor, maintenance of transportation line, etc. The various alternatives of transportation have freight costs

that are distributed differently among these categories. Therefore, some forms of transportation are better suited to certain industries. For example, trucks have low terminal costs and high line-haul costs and are better suited for an industry that requires frequent delivery with many stops, such as vegetable production. Water transportation on barges, which has high terminal costs and low line-haul costs, is more suitable for mass transit of products such as petroleum and grain. Other forms of transportation generally have cost structures between trucks and water transportation (Moriarty, 1980).

"It may not be far-fetched to state that labor is the most important single factor influencing plant location decisions." (Moriarty, 1980) There are many characteristics of a labor force that must be considered in a location decision: wages, productivity, reliability, loyalty, stability, quality of skills, and unionization (Smith, 1981; Moriarty, 1980). It is common practice for industrial managers to replace unsuitable labor with capital investments, such as automated machinery. The availability of management and skilled labor are often more influential in a location decision than the availability of unskilled labor. The need for skilled labor has traditionally tended to encourage industries to locate near urban areas in order to provide a living environment suitable for these workers, because skilled labor often has a higher standard of living than does unskilled labor. Locating in an unsuitable area would increase the wages demanded by employees and would lead to lower quality work (Smith, 1981). Improvements in the educational system, however, have reduced the importance of availability of skilled labor in location decisions. There are many community colleges and technical schools that offer special programs based on the labor needs of local industries.

Land is a requirement for industrial developments that must be considered as a locational decision factor. Smith (1981) discusses the many different ways that an industry can use land. The primary and most apparent use is as space to build a factory or other structures. Materials and finished products that are not affected by weather can be stored outdoors. Additional uses of land include parking of cars and trucks, internal circulation, and room for future expansion. Urban Land Institute (1989) outlines the most important land features that influence location decisions. The location of a parcel is often

as important as other factors such as topography, soil type, viewshed, pollution resistance, etc.

The fourth major consideration of most companies when evaluating industrial locations, availability of necessary utilities, is discussed in detail by Moriarty (1980). Water is a primary utility required by all industries on some scale. Some industries use water in the production process, while others use water for support services such as sanitary facilities, fire protection, cooling and air conditioning, and to feed the boiler. Some companies are interested in the quality of water, both as a cleaner and as an ingredient in the production process. Another primary concern of industries is the availability of facilities to dispose of waste-water. The federal government has created standards for treated water and there are stiff penalties for companies not meeting these standards. Solid-waste disposal is required by most companies, even those not implementing a production process where there is a large amount of waste. Most companies are interested in communications services such as telephone, mail, internet, etc. The degree of concern over these amenities is often related to the amount of customer service offered by the company. Service-oriented firms generally have extensive communication needs. Finally, most industries generally require a reliable supply of power and energy, such as electricity or fossil fuels.

Production-based industries generally locate in areas where there is a sufficient supply of raw materials (Smith, 1981). An unreasonably priced raw material supply would make ventures unprofitable in some locations. Companies place quality requirements on the raw material supply in order to maintain a desired quality in products (Moriarty, 1980). For example, a company that produces high quality laminated wood products, such as high-grade plywood, needs a supply of large, straight logs. Long-term manufacturing investments, such as forest products firms, require a stable supply of raw materials (Smith, 1981). Therefore, it is important that a company project the long-term supply and affirm that it will meet future needs.

All businesses must consider accessibility to markets before making a business location decision. Volumes of sales, prices, and elasticities of demand are generally different for potential sites and often depend on the accessibility of markets (Smith, 1981).

The relative importance of this factor, however, generally depends on the nature of the market in which the product competes. Fassl (1989) points out that just-in-time and service industries must be located close to markets in order to provide a quality product. Lopez and Henderson (1989) discuss the classic example of food markets producers that must deliver perishable food products in a timely manner. Accessibility to markets must be considered by an industrial park developer in the context of the mix of members that it hopes to attract. Developers must think in a larger scale than that of an individual company because market accessibility can be a major advantage of an industrial park.

Proximity to other industries is often a factor that can affect a location decision between two similar sites. The most obvious advantage in locating near other industries is a closer relationship with that industry, particularly if that industry produces raw materials or buys products manufactured by a company. Agglomeration can result in both vertical and horizontal integration. Doeringer and Terkla (1990) mention that "agglomeration can offer flexibility to change design and manufacturing process as a result of physical proximity and close working relationship". Agglomeration also offers the opportunity for group projects such as a research institute, marketing organization, etc. (Smith, 1981). An advantage of agglomeration that is sometimes overlooked is the reduced infrastructure costs. Groups of industries enjoy better highways and rail systems, airports, better utility service, commercial facilities, educational facilities, research organization, and increased security (Smith, 1981). These advantages are another selling point for industrial parks.

The final locational factor to be discussed is public policy. Smith (1981), Urban Land Institute (1989), and Kinnard et.al. (1979) discuss the importance of local zoning and land-use regulations. These regulations can influence the manufacturing process of a company, thereby influencing the location decision. Smith (1981) discusses the importance of financial incentives and analyzes the importance they may have on a locational decision. Another aspect of public policy often discussed is taxation; but Moriarty (1980) argues that this area is not as important as once thought. Smith (1981)

Table 1. Relative importance of community factors, classified by degree of community control over each factor, in choosing a manufacturing site.

Community Characteristic and Degree of Community Control	Critical Factor	Critical or Significant
Factors not controlled by community		
- Natural gas service	32	83
- Pool of unskilled workers	17	80
- Raw industrial water supply	16	60
- Soil bearing capacity	14	72
- Water transportation	3	17
Factors influenced by community		
- Major highway within 30 minutes	37	94
- Scheduled rail service	23	62
- Pool of trained workers	17	86
- Scheduled air freight service	12	68
- Scheduled air passenger service	12	63
- Vocational training facilities	2	65
- Higher educational facilities	2	57
Factors controlled by community		
- Fire protection	43	93
- Contract trucking	30	79
- Police protection	18	91
- Processed industrial water supply	23	74
- Industrial sewage processing	20	78
- Solid waste disposal	17	77
- Tax incentives or holidays	8	78
- Lenient industrial zoning	5	77
- Local industrial developer	3	60
- Local industrial bonds	3	40
- Public warehousing	1	24

Source: Deaton (1979)

points out that the influence of taxation on locational decisions is sometimes based on personal bias and is not really a quantitative factor.

There have been many attempts to quantify the effects of the various industrial location factors. Blair and Premus (1987) point out that these attempts have been divided into two different groups, econometric studies and survey studies. Examples of these studies can be found in Raitz (1988), Lopez and Henderson (1989), Bowlby (1988), Galbraith and DeNoble (1988), Doeringer and Terkla (1989), Fassl (1990), Oksansen and Williams (1984), Hastings and Goode (1982), Wheat (1986), Schmenner (1982), Bodenman (1991), and Deaton (1979). Deaton (1979) outlines a survey study by the U.S. Department of Commerce, showing that some important factors are utility service, proximity to highways, and fire protection (Table 1).

Industrial Location Theory

Most texts on locational theory recognize the early work of Alfred Webber as the beginning of the field of industrial location. Webber's minimum cost method of choosing an industrial site is the basis of much work in this area.

The basic principle of the minimum cost method is that the best location is that which minimizes the firm's labor, transportation, and resource costs. When utilizing this method, a firm which is highly dependent on labor costs will locate closer to a cheap labor supply. Likewise, firms dependent on resource costs will locate close to a cheap resource base. Firms sensitive to transportation costs will locate close to a heavy shipping alley. The optimal location will depend on the cost structure and production process of the firm. Table 2, adapted from Kinnard et.al.(1979), illustrates the various effects of different cost structures, based on the minimum cost method as a locational criterion.

Webber also recognized the importance of conglomeration and agglomeration. Conglomeration, locating close to another producer, will create more competition. The

Table 2. Categorization of Industries by Locational Orientation.

<u>Industry Orientation</u>	<u>Industry Characteristic</u>	<u>Example</u>
Market	<ul style="list-style-type: none">- product with short life- manufacturing adds weight- Services requiring personal contact	Vegetables, soda, and automobile sales
Resource	<ul style="list-style-type: none">- Manufacturing requires excessive fuel- Manufacturing reduces weight or volume	Paper, steel, and electricity
Transportation	<ul style="list-style-type: none">- Quick delivery required- Large, heavy products	Gravel, pizza delivery
Labor	<ul style="list-style-type: none">- Labor-intensive production- Technically demanding production	Apparel, electronics, consulting firms
Non-oriented	<ul style="list-style-type: none">- None of the above	Precision Tools

Source: Kinnard et.al. (1979)

economic result of conglomeration is an external diseconomy of scale that reduces the profitability of a firm. Agglomeration occurs when a firm locates close to a complimentary producer and can improve the relationship between the firm and the market. Agglomeration results in an economy of scale.

Melvin Greenhut (1956) improved on Webber's work by addressing the emerging emphasis on demand factors as an in industrial location decisions. Greenhut argued that a locational decision must be based on demand factors, cost factors, and personal management factors. The site selection criteria developed by Greenhut maximized profit

instead of minimizing costs, as under Webber's method, thereby recognizing the importance of the market's influence on the profitability of the firm. Locating in the maximum profit center, argued Greenhut, is particularly important in highly competitive industries, where the demand factors are likely to be of great importance.

Financing an Industrial Park

As with many business projects, financing an industrial park can be the most difficult task of developing a venture. The Urban Land Institute (1989) recommends that a developer answer three questions before attempting to obtain financing. First, determine what type of financing is sought, as different phases of a project require different types of financing. Financing for land acquisition and development costs, building construction, permanent building financing, and equity or joint ventures comes different sources. Second, decide where to obtain each type of financing, matching the financial sources with the type of financing required. Finally, determine the best method for obtaining each type of financing from the various choices. It is important that a well-written business plan is available for presentation to prospective financiers and that the developer be familiar with the application process of each loan source.

In addition to determining proper sources of financing, it is important that a developer attempt to minimize the risk associated with a project (Martin et.al., 1996). Low-risk projects are more likely to obtain financing and will generally receive a lower interest rate than a higher-risk project. Martin et.al. (1996) discusses several ways to reduce the risk of a project. Investment of public land generally reduces risk because there is reduced risk of equity or debt capital. Furthermore, the land provides collateral for securing future investments. Municipal bond financing increases the certainty of obtaining sufficient financing because lenders are not required to take such a large position in the venture. Investors are also more apt to finance a project that has secured an anchor tenant. An anchor tenant demonstrates that a park is marketable and suggests suppliers and secondary producers to target, demonstrating the efficiency of vertical integration. Finally, commitments by local utility companies, particularly contributions of company

land, planning consultation, and discounts, demonstrate to investors that there is community support for a project.

The first source of financing that should be considered by an industrial park developer is the municipal bond. This type of loan is best suited for the purchase of property, construction of infrastructure, and development of manufacturing facilities (Martin et.al., 1996). The two particular types of municipal bonds are general obligation bonds and industrial development bonds (Martin et.al., 1996). General obligation bonds usually require voter approval and are subject to a maximum amount governed by the municipal codes. This type of bond has advantages of relatively low interest and the least risk to the investor. Industrial development bonds are different from general obligation bonds in that they do not require voter approval, but are instead issued by the municipal corporation. Industrial development bonds, as the name suggests, are usually used to finance manufacturing facilities. These bonds are secured through letters of credit and bond insurance.

A second source of investment that industrial parks can obtain in some situations is that of public land. Cities, economic development agencies, public utilities, port or airport authorities, and even private utilities and railroads sometimes offer incentives to developers through investment of land (Martin et.al., 1996). There are several ways that this type of investment can be structured: direct land donation, below-market price sale, or long-term ground lease. A disadvantage of the investment of public land is that the locality will usually be underdeveloped and may not offer other needs of the developer such as resource and labor availability or proximity to a shipping alley.

Public development agencies were discussed as a source of land investment, but these organizations can offer many other financing opportunities to an industrial park developer (Urban Land Institute, 1989). These opportunities can range from grants and bonds to financial incentives such as tax-breaks. The primary drawback to dealing with public development agencies is that the developer is generally required to meet certain public expectations that influence the profitability of the project. In addition, the application and approval process for public development agency investment is usually long and can cause delays in the progress of the park (Martin et.al., 1996).

Pension funds and insurance companies are private financiers that can be a source of long-term permanent financing. Insurance companies generally enter an industrial park project in an equity position, a mortgage position, or a combination of the two. Pension funds usually specialize in either mortgages or real estate equities, and do not get involved in both positions (Martin et.al., 1996). The primary disadvantage of financing through insurance companies and pension funds is that they will enter a project only after quality tenants are under contract, limiting their application during the development stage of an industrial park (Urban Land Institute, 1989).

A traditional source of financing that can be important to a developer is the commercial bank, which is a good source of short-term debt financing for land or construction (Martin et.al., 1996). These investors can often provide a line of credit on smaller projects. Law prohibits commercial banks, however, from making equity investments. In addition, banks are very cautious investors, and prefer to see corporations with good credit signed up as tenants before they will loan money to a developer. A very important function of banks can be gap financing; that is, covering the period of time between construction and permanent financing (Urban Land Institute, 1989).

The Urban Land Institute (1989) discusses the use of savings and loan institutions in industrial park financing. Traditionally, these institutions have invested in housing and residential property, but regulations are being relaxed, allowing them to provide many of the services of a commercial bank. As a group, however, savings and loan institutions play a negligible or no role in most industrial real estate projects.

A final source of financing for industrial park projects is real estate investment trusts (REIT's). These financiers can become involved in both long-term and short-term financing. The short-term loans (typically shorter than 18 months) can be used for construction and development. REIT's handle long-term mortgages in a manner similar to an insurance company or lending institution, except that they sell securities instead of taking deposits.

Marketing an Industrial Park to Potential Tenants

There are two primary methods by which an industrial park developer can market space in an industrial park to potential tenants. The first method is to market through the services of a real estate broker; the second avenue is to communicate directly with potential clients. Real estate brokers can offer services that are very valuable to a developer, particularly access to more customers and specialized knowledge on real estate marketing. Real estate brokers can advertise space through direct solicitation and broker listings, but also have contacts such as past customers, referrals, and personal contacts.

Industrial park developers generally supply real estate brokers with information about park space through a technical services package. This package is generally in pamphlet form and contains certain vital information, such as statistical figures, descriptive materials, and membership requirements. Pertinent statistical information would include population growth and change, tax information (statutory, real estate, and sales tax), and transportation rates. Descriptive material, which must be complete and concise, should include information about the available space, such as location and size. A description of utilities, fire protection, and electrical capacity should also be included. Finally, a copy of the Covenants, Conditions, and Restrictions should be included to describe building, landscape, and other restrictions on members.

The second method of marketing space in an industrial park is for the developer to directly interact with potential tenants. There are many opportunities for a developer to promote the park, including luncheons and community promotional activities, brochures by direct mail, personal contacts with industrial managers, and speeches to Chambers of Commerce, trade associations, and civic groups. A primary focus of advertisement should be the advantages of industrial park membership, including:

- Low unit site development and unit operating costs
- Availability of both building and prepared sites
- Stability in location
- Protection of investment
- Tax savings
- Compatibility with neighbor industries

- Proximity of industrial and employee services
- Security
- Infrastructure
- Park services.

The sales brochure is an important promotional tool for direct advertisement to potential members. It should be prepared by a public relations or advertising consultant and should convey a professional image. The logo of the project and a description of the ownership group can be included to demonstrate the involvement of that group. Maps showing location, configuration, and proximity to inventories are important because they illustrate spatial advantages of the park. Data from the technical services package should be included to outline technical information about the park. Finally, the sales brochure should highlight the previously discussed advantages of park membership.

The developer can often take advantage of other sources of advertisement of industrial park space. Public development agencies can contribute to a promotional campaign, particularly in areas where there is a strong local push for industrial development. Signs on-site should not be overlooked as promotional tools, particularly in highly visible sites. These signs should appear professional and should project a positive image of the park. Although these signs may not be responsible for the recruitment of new tenants, they can certainly create the atmosphere for the park in the development stages.

Achieving the right "mix" of tenants can be a very difficult task, but is paramount to the success of the project. The park manager should attempt to attract park members that have similar needs and that can be vertically integrated, maximizing the benefits of park membership. Putting together an industrial park of unrelated industries would probably not create a profitable project. Determining the ratio of established businesses to new businesses is also important. Established businesses are often suitable as anchor tenants because they commonly invest more capital and add stability to the park. Smaller local firms are useful to fill niches formed by combining large tenants because they are generally much more flexible. The drawback to including small businesses in the park is that risk is increased and financing is more difficult to obtain.

CHAPTER 2: METHODS AND PROCEDURES

The procedure for performing a feasibility analysis varies depending on the objectives of the analyst, the availability of resources used to perform the analysis, the complexity of the project being analyzed, and availability of previously performed feasibility studies. All serious feasibility studies should address four components: market feasibility, technical feasibility, financial feasibility, and community impact. The completion of all four components is important because assumptions made during the market and technical analysis affect the projections made during the financial analysis and results of the community impact assessment. All four of these components will be discussed in this chapter, but because the focus of this project is financial feasibility, the discussion will focus on this topic. The remaining components are discussed more completely by Clifton and Fyffe (1977), which serves as a foundation for the following methodology.

2.1 MARKET ANALYSIS

The market analysis consists of steps taken to: identify demand for a firm's products, identify the supply of competitors, forecast marketshare that the firm can realistically expect to capture, determine price at which to sell products, and outline promotional strategies. The market analysis is an important prerequisite to the financial analysis because most of the estimates for income and sales costs are based on the market analysis. The steps in a market analysis are:

- Step 1: Identify past and present demand and supply for wood products in the market area,
- Step 2: Estimate selling prices, quality, and marketing practices of competitors,
- Step 3: Identify all producers and consumers of wood products within the market area,
- Step 4: Point out channels of distribution that lead from producers to consumers,
- Step 5: Estimate future demand for products,
- Step 6: Estimate share of market for each product that can be captured, and
- Step 7: Develop a sales plan for the project.

Determining the market area can be a difficult task because the market area is different for each particular wood product. Furthermore, the marketing practices of individual producers of a certain product may be different. A good method for determining market area is to assess the markets of established firms in the region. Additionally, undeveloped markets can be investigated to determine if demand will be sufficient to support a larger supply. Aggressive marketing may require expanding current

markets to include new geographic regions or non-traditional customers. The market area is a function of a company's market strategy and demand trends for a product.

Identifying past production and consumption is a relatively easy task; there are organizations that keep records of such statistics. Government forestry agencies, at both the federal and state levels, collect and publish these statistics at regular intervals and sometimes provide unpublished data upon request. Other government agencies, such as the Department of Commerce and the Bureau of the Census, publish data on production and consumption, but these data is often not locally accurate and, therefore, limited in usefulness. Trade associations can be a valuable source of reliable production and consumption data, but this data can be difficult to access because it is generally unpublished and specific sources can be hard to identify. Industry publications such as *Random Lengths*, *The Hardwood Market Report*, and *Timber-Mart South* can be used to identify past supply and demand trends. All data collected by survey should be used with the understanding that it contains unavoidable bias. Statistical estimates of error, when available, indicate the reliability of data. Perhaps the most accurate source of production and consumption figures, however, is personal experience and records. This data gives true local supply and demand for a specific type of firm with minimal statistical error, but is very difficult to obtain.

Estimating the prices, quality, and marketing practices of competitors is generally an easy task if the analyst has experience in the wood products industry. Prices are published in trade publications such as *Random Lengths*, *The Hardwood Market Report*, and *Timber-Mart South*. Furthermore, the industry has created quality standards for products by instituting grading systems for both appearance and structural integrity. Examples of trade association grading systems are those of the Southern Lumber Manufacturers Association, American Plywood Association, and National Hardwood Lumber Association. The marketing strategies for each product can vary throughout the industry and are best assessed by looking at promotional programs and prices of direct competitors. Examples of marketing strategies commonly used in the wood products industry include cost leadership, differentiation, focusing on a target market, and hybrids of these strategies.

Forestry agencies and trade associations can provide help in completing Step 2, but perhaps the best source of information is contact with other members of the industry. Direct personal contacts can secure most of the information needed, but the appearance of collusion must be avoided, as the legal and professional consequences are severe. A final method of obtaining information is observantly "shopping around".

Step 3 in the market analysis is to identify all producers and consumers of wood products within the market area. Trade directories and buyers guides are published at frequent intervals by trade associations and state forestry agencies. Telephone books can identify industry members not included in trade directories and buyer's guides. The list of consumers of the projected park's products should be complete and should include consumers outside of the market area. Changes in regulations and resource costs can change the market area of a wood product manufacturer and a good working relationship with potential customers increases a firm's ability to enter new markets.

Identification of the channels of distribution from wood products producers to consumers is an important step in the market analysis because these channels indicate areas of potential market penetration. This task involves identifying a variety of businesses, including secondary and tertiary manufacturers and middlemen. It is important to recognize the distinction between two categories of middlemen: agents and merchants. Agents do not take title to goods, but purchase and sell for other parties. Examples of agents in the forest products industry are brokers and manufacturer's representatives. The use of agents is most suitable for small firms that do not have sufficient production to employ a full-time sales program. Merchants, which include wholesalers, cooperatives, jobbers, and retailers, are middlemen who take title to a product. Distribution through merchants is different that of agents because the product is shipped to different locations and shipping costs must be considered in the selection of distribution channel. In parks under the proposed industrial park structure, identification of distribution channels would only involve recognizing the marketing corporation as a manufacturer's representative. Distribution channels beyond the marketing corporation are irrelevant because the marketing corporation will be the only distribution outlet for most park members.

Although it is the most difficult step in a market analysis, estimation of future demand is particularly important in marginally feasible projects. In these cases, errors in demand forecasting can lead to undertaking an unprofitable project. There are several methods commonly used by analysts to estimate the future demand for a product. One technique is to examine trends in the past consumption to show patterns that can be used to predict future demand. This technique has limited application for wood products because there are no apparent trends in demand because many factors other than time which affect consumption. Another method is to observe trends in general economic and business conditions that are correlated with demand for a particular product. An example of this technique would be to use estimates of housing starts to forecast demand for softwood structural lumber. While these two methods are based on the use of econometrics to estimate demand, other methods are based on survey studies. Surveys completed by customers, distributors, salespeople, executives, and industry experts are useful in identifying variables that provide insight into the market. Regardless of the type of survey, most demand forecasts are only reliable enough to indicate the direction of market changes. The reason for this inaccuracy is that in most real-world applications of demand forecasting, financial constraints prevent complex studies. The only studies with sufficient resources to complete in-depth demand forecasting are those completed by government agencies such as the Forest Service. These studies are generally on a large geographic scale, however, and are not reliable for use by a specific project as a base for financial projections.

The sixth step in performing a market analysis is to estimate the share of the market that can be captured by the members of the industrial park. This step involves no specific information or computational procedure, but is instead an "educated guess" based on all available information such as location of competition and pricing. Generally, a business can capture marketshare only if it has a marketing strategy that will allow it to seize part of the market or if there is insufficient supply to meet demand. Sensitivity analyses performed in the financial feasibility study will determine which factors are most important to the firm's success and may give cause to re-examine the estimate of marketshare.

The final step in performing a market analysis is to develop a sales plan upon which financial estimates of revenues and sales costs can be based. There are three elements in a sales plan: the marketing plan, the advertising and promotion plan, and the selling expense plan. The marketing plan contains projections of revenue and of unit sales for each production alternative. The advertising and promotion plan describes the type of promotional programs that will be required to generate the projected sales volume and then estimates the cost of implementing these programs. In the proposed industrial park structure, the advertising and promotion plan will be very simple because the marketing corporation is responsible for these activities. The selling expense plan estimates all sales costs except advertising, such as salespeoples' salaries and commission, distribution costs, and packaging costs. Sales costs for members of the proposed park structure would be the fee charged by the marketing corporation. The sales plan should be well developed and should include realistic estimates costs so that financial computations will be accurate.

2.2 TECHNICAL ANALYSIS

The technical analysis consists of steps to outline the production process for different primary and secondary wood products within the analysis region, to estimate costs for land and improvements, to estimate production costs, and to address other technical issues such as labor requirements, machinery and equipment selection, and disposal of wastes. Just as the market analysis is an important prerequisite to the financial feasibility analysis, the technical analysis is important because it is the base for estimates of production costs. The steps of a complete technical analysis are:

- Step 1: Describe primary and secondary wood products produced in the market area,
- Step 2: Describe preferred process used to produce each wood product,
- Step 3: For each scale of production, project plant size, start-up and normal production schedules, and output volumes for each product,
- Step 4: Select machinery and equipment, outlining specifications, source, and price,
- Step 5: Identify a recommended site, based upon accessibility to raw materials and markets, available labor force, available site improvements, and other site selection criterion,
- Step 6: Estimate costs of buildings and other improvements,
- Step 7: Study the raw materials and utility supply, including quantities required, current and projected volumes and costs, locations of sources, and stability of supply
- Step 8: Project labor requirements, categorized by direct labor, indirect labor, and management,
- Step 9: Discuss by-products and wastes from production process, including disposal procedures and costs and laws pertaining to waste treatment, and
- Step 10: Write operation plan for each process.

The first step can be relatively easy in some regions and a sizable task in others. The analyst should discuss all products within the region, because the competitive advantage of a wood products industrial park is substantially based upon the relationship between the various products produced within the park. Technical specifications, such as size, species, and quality, are important because they segment products by production process. In addition, an estimate of the region's production of each product is important because it points out profitable scales of production.

Step 2, describing the preferred process used to produce each product, is a prerequisite to performing the remainder of the technical analysis. A flowchart and complete discussion should address every step in production, from procurement of materials to physical production to packaging. It is important to recognize that there are generally different production processes for different scales of production. For example, a sawmill with an annual output of 100 MBF will utilize a different production process than a mill with an annual output of 1 MMBF. The production process for each scale of production should be recognized in the technical analysis.

The next step in the technical analysis is to project plant size, start-up and normal production schedules, and output volume for each production alternative. These factors will serve as the base for cost estimates used in the financial analysis. Each production alternative will require a specific amount of space for inventory, production space, and raw material storage. It is important to acknowledge the fact that some space in the park will be shared with other park members and to account for this reduced individual space requirement. The distinction between start-up and normal production schedules is important in obtaining realistic results in the feasibility analysis. In addition to projecting the production schedules, a prediction of how the plant will mature from start-up to normal schedules is important. This transition is usually represented in the form of a temporary period for which the start-up schedule will be followed, after which the normal schedule is followed. The normal production schedule is generally determined from the sales forecast, which can be found in the market analysis. Determining the start-up production schedule is a much more complex task, as it is influenced by sales as well as other factors such as equipment availability and skill of the workforce.

The selection of machinery and equipment necessary for production is a complex matter and is based on the factors previously determined such as product, production scale, and raw material availability and character. The technical analysis should outline the specifications, sources, and cost of each piece of machinery needed to complete the production processes listed in steps 2 and 3. The discussion of machinery should include a comparison of the different machines that can be used for the same task and should make a recommendation as to which machine is best suited for each task. It is often necessary to determine physical characteristics, such as layout, in order to make good estimates of equipment needs for materials handling. The list of sources should include suppliers of both new and used machines. This list can be developed through consultation with industry representatives and trade magazines.

Step 5 in the technical analysis is to recommend a site for the firm to establish the operation. Feasibility analyses for industrial park members will not involve a search for a sample site because the site for the venture is assumed to have been chosen and, therefore, costs will be real costs and not estimates. When a site has not been selected, consideration must be given to site factors such as accessibility to raw materials and markets, available labor force, available site improvements, and other site-selection criterion. The site location will serve as a foundation for estimates of utility cost, land and improvement costs, transportation costs, and other business costs. Complete and comprehensive site selection can be expensive and time-consuming, however, and is not necessary. Finding a site that meets the minimum requirements of the firm will be sufficient in most cases. In some cases, however, the analyst is intimately familiar with the local costs of the production process and it is not necessary to find an actual site.

The costs of buildings and improvements can be estimated when assumptions about the site are completed. The estimates should be based on local construction costs and the size of desired buildings. Construction costs can be determined by talking with local contractors, who will need to know the types of buildings, dimensions, site characteristics, and other information. The size of facilities can be determined by estimating the needs for production space, storage of raw materials and products, and

administrative space. The building cost should be determined for each production alternative discussed in step 3.

The next step in the technical analysis is to study the raw materials and utility supplies, including quantities required, current and projected volumes and costs, locations of sources, and stability of supply. Information about raw material supply can be found in the market analysis, which is based on information from government forestry agencies, trade associations, industry publications, and local sources. Information about the utilities supply can be determined by direct contact with the companies involved, such as electricity, gas, water, and other utilities. Company representatives can give estimates, describe the service, and provide other services such as technical advice about developing the facility and assessing different uses of the utility. It is important for the developer to get information from all sources of the utility. Sometimes companies, particularly those in competitive markets, will offer incentives such as financial assistance and technical support to industrial customers. These incentives should be factored into the feasibility analysis, especially in projects where utilities comprise a large component of production costs.

Step 8 of the technical analysis is to assess the labor needs of each production alternative, categorized by direct labor, indirect labor, and management. It is important to distinguish between the different classes of labor so that a realistic estimate of labor costs can be constructed and so that a sufficient supply of each type of labor can be identified. Unskilled and skilled labor requirements should be projected by following the process description and flowchart, estimating the labor needs at each stage of production. Management labor requirements can be approximated by studying firms with a similar management structure. The labor costs can then be estimated by multiplying the wage rate for each type of labor by the number of hours that will be worked by all employees in that class. Average wage rates can be determined by surveying local firms or from Department of Labor statistics. The availability of each type of labor, within the operating area, should then be assessed. If there is an insufficient skilled labor or management supply, the analyst should estimate the cost of either educating unskilled employees or attracting new employees in these classes to the area.

The next area that must be addressed is by-products and wastes from production alternatives, including disposal procedures and costs and laws pertaining to waste treatment. Following the production flowchart, the flow of outputs should be noted. Some of the outputs will be used in later stages of production and some outputs are treated as by-products or wastes. The quantity of by-products and wastes for the start-up and normal production schedules should be determined and expressed on a per-unit-of-output basis. The analysis should consider whether the wastes and by-products can be used by another park member or if they can be marketed outside of the park. If there is not a market for these products, the standard method of disposing of them in the quantities proposed should be discussed and the unit-cost of disposal should be estimated. The legal implications of waste disposal should also be discussed, including the local statutes and regulations as well as federal and state laws.

The final step in the technical analysis is writing an operation plan for each production alternative that will highlight the results of the analysis. The operations plan should contain four sections that will cover the production process and list specific costs related to production. The first section should consist of a flowchart illustrating the production process. The second section should discuss each step of the production process, addressing the method, machinery and labor used, and the inputs and outputs of the process. The next section should focus on the buildings and improvements needed on the site and include technical specifications of the buildings and sources of construction. The final section is the cost section, where the estimates for machinery, labor, building and improvement, and other costs are listed. It is important that cost estimates for site be based on the base basis, purchase or lease, as the proposed industrial park's structure. This section should also list assumptions made in arriving at cost estimates.

2.3 FINANCIAL ANALYSIS

The financial feasibility analysis is a very important component of an economic feasibility analysis because it indicates the profitability of the venture. Financial analyses are generally considered to be quantitative analyses, but the unique nature of a wood products industrial park requires qualitative consideration of factors such as how well products flow within the park and how well the park will meet the goals of the investors. It is important that the sales and operation plans be completed prior to engaging in the financial analysis, as these reports provide data necessary to complete financial calculations. Twelve steps have been developed to complete a financial feasibility analysis for a WPIP.

STEP 1: DETERMINE THE GOALS OF THE PARK.

The first step in assessing the financial feasibility of a wood products industrial park is to determine the goals of the park, which will depend largely on who owns the park and who may have non-ownership interest in the park. Developers, investors, park members, and public development agencies may all have different expectations from the park.

Developers and investors are generally interested in obtaining a satisfactory return on their investment of time and money in the park. A common goal that represents these interests is to maximize the profitability of the park. This goal is usually accomplished by adding value to the land and by bringing together a mix of companies that will profit from park membership. Another goal that is particularly important to investors is to minimize the risk associated with investment in the park. This risk can be minimized by signing reputable businesses as tenants and by having a good mix of tenants so that risk is spread across several product lines.

Park members will generally have goals that are compatible with the goals of the developer and investors, because having a park with profitable businesses is conducive to a good investment. Park members may have the goal of maximizing the transfer of products within the park, thereby decreasing transportation costs, reducing materials costs, and increasing stability of material supply. The members may also have a goal of increasing the value-added within the park by increasing the number of members in the park. Increasing the size of the park will reduce each member's share of infrastructure and administrative costs and provide more in-park markets for the company's products.

Public economic development agencies may sometimes have goals that do not necessarily correspond with the goals of other interests in the park. Examples of goals of a development agency are to increase employment within the region, add value to the local economy, utilize unused resources within the region, increase business opportunities for local businesspeople, and increase local investment opportunities. The specific goals of the agency usually reflect deficiencies in the local economy.

Regardless of what the specific goals of an industrial park are, it is important that they are identified in the early stages of the analysis. The goals of the park will serve as an evaluation criterion later in the analysis.

STEP 2: ESTIMATE TOTAL STARTUP COST FOR EACH MANUFACTURING ALTERNATIVE.

The estimated total startup cost for each secondary manufacturing alternative will be based upon the expenses projected in the sales and operation plans. Investors will generally need to finance at least a portion of the start up cost because it is usually greater than the equity investment in the project. The three major components of the startup cost are capital investments, working capital, and formation expenses.

Capital investments are the non-current assets of the firm, assets that are not readily converted into cash. Examples of capital investments are land and improvements,

buildings, facilities, machinery and equipment, office equipment, and company vehicles. Capital investments are usually expensive and are financed.

Net working capital is defined as current assets in excess of current liabilities. Current assets are those assets that are easily converted into cash in the near future. Examples of current assets are cash, accounts receivable, prepaid expenses, inventory, and supplies. Current liabilities are those debts that must be paid in the near future. Examples of current assets include materials bills, employee paychecks, taxes payable, loan payments, and loan payments due in the short term. The working capital should be conservatively estimated because there are usually expenses that are not accounted for in the current assets. Some financial managers account for these differences by increasing the net working capital estimate by a certain margin or by using gross working capital. Gross working capital is the sum of current assets and current liabilities.

Formation expenses are those expenditures associated with forming the business and investigating the profitability of the business, but are not really related to production. Examples of formation expenses are legal fees, incorporation costs, expenses of obtaining financing, marketing study expenses, and consultants' fees.

STEP 3: DETERMINE THE FINANCING REQUIREMENTS FOR EACH ALTERNATIVE.

Once startup costs have been estimated, the financing requirements for each manufacturing alternative can be determined. Financing will be needed in all but the most simple projects and should be carefully planned in order to maximize the likelihood of obtaining financing and to minimize the interest rate on debts. The amount of financing that will be required is that portion of the startup costs that is not accounted for by equity investments. Financing options should be reviewed and the possible sources of the various types of financing should be researched.

The two types of financing that are most commonly discussed in business are debt financing and equity financing. Debt financing is generally referred to as a loan, while

equity financing involves a transfer of ownership in the company. Governmental agencies can be a source of debt financing in the form of municipal bonds, grants and loans from economic development agencies, and small business loans. A wood products industrial park is a good candidate for government financing because it has large community impacts. Commercial banks are also a source of debt financing through business loans and lines of credit. A line of credit with a bank can be very helpful in managing irregular cash flow patterns, especially those associated with establishing a new business. Equity financing is generally obtained by either selling shares or by adding a partner through either a joint venture or partnership. Shares are used to transfer ownership in corporations while joint ventures and partnerships are non-corporate forms of ownership.

**STEP 4: PREPARE PRO-FORMA FINANCIAL STATEMENTS FOR EACH
ALTERNATIVE.**

One of the most important steps in performing the financial analysis is constructing the pro-forma balance sheets, cash flow statements, and income statements for each secondary manufacturing alternative. Information from these financial statements will be used to assess the feasibility of each alternative. The figures in the financial statements should be based on membership in the park, reflecting the reduced infrastructure cost and other benefits of membership. Furthermore, these statements should follow the Generally Accepted Accounting Principles (GAAP), an accounting standard used by most businesses and investors. GAAP and financial statement construction are thoroughly discussed in accounting and finance texts such as Ross et.al. (1991).

Balance Sheet

The balance sheet, sometimes referred to as the net worth statement, is a financial statement of "ownership" that takes into consideration the business' assets, liabilities, and owner's equity, at a specific point in time. The fundamental accounting equation that is the foundation for the balance sheet is:

$$\text{ASSETS} = \text{LIABILITIES} + \text{OWNER'S EQUITY}.$$

An example of a balance sheet for a hypothetical furniture manufacturer, Appalachian Furniture Manufacturing, Inc. (AFM) is found in Figure 2.

Assets are the first major component of the balance sheet and are comprised of the resources and property that are owned by the business. The two major types of assets are current assets and non-current assets. Current assets, or liquid assets, are those assets that are easily converted into cash in the near future. Current assets found in Figure 2 include cash, accounts receivable, prepaid expenses, inventory, and supplies. Non-current assets, or fixed assets, are those assets which are longer-term in nature and not easily converted into cash. Non-current assets are not used by the business to directly produce its product or service. Depreciation is subtracted from the purchase cost to determine the total non-current asset value. Examples of non-current assets found in AFM's balance sheet are land, buildings, and machinery and equipment.

The second major component of the balance sheet is the liabilities section, which represents the debts of the business. Liabilities take two forms on the balance sheet, current liabilities and non-current liabilities. Current liabilities are those debts that must be repaid in the next twelve months. AFM's current liabilities include accounts payable, wages payable, taxes payable, and principle and interest due on land and machinery loans for the next year. Non-current liabilities are those debts and obligations that are not due in the next twelve months. Non-current liabilities on AFM's balance sheet are principle balances on land, building, and machinery loans.

The final major component of the balance sheet is owner's equity, which is the net worth of the company after liabilities have been subtracted from assets. Owner's equity represents capital that owners have contributed to the firm and retained earnings from the

Figure 2. Pro-forma balance sheet for hypothetical furniture manufacturer Appalachian

Furniture Manufacturing.

Assets		
Current Assets		
Cash	524,000	
Accounts Receivable		
Prepaid Expenses	1,200	
Inventory	874,872	
Supplies	6,200	
Total Current Assets		1,406,272
Non-Current Assets		
Land	150,000	
Buildings	1,250,000	
Less: Accumulated Depreciation		
Machinery and Equipment	69,000	
Less: Accumulated Depreciation		
Total Non-Current Assets		1,469,000
TOTAL ASSETS		2,875,272
Liabilities and Owner's Equity		
Current Liabilities		
Accounts Payable		
Wages Payable	324,000	
Taxes Payable		
Principle Due, Land and Building	12,089	
Principle Due, Machinery	3,887	
Interest Payable	97,875	
Total Current Liabilities		437,851
Non-Current Liabilities		
Remaining Principle, Building and Land	1,237,911	
Remaining Principle, Machinery	50,875	
Total Non-Current Liabilities		1,288,786
Owner's Equity		
Contributed Capital	1,148,635	
Retained Earnings		
Total Owner's Equity		1,148,635
TOTAL LIABILITIES AND OWNER'S EQUITY		2,875,272

firm. Retained earnings are transferred at the end of each year to contributed capital. Dividends or other withdrawals by owners would reduce the owner's equity in a business.

The balance sheet can be created at any time to create a firm's financial "snapshot" for that point in time. Most businesses create balance sheets quarterly and include a copy in the annual report. For the purpose of the financial component of a feasibility analysis, it will usually be sufficient to establish pro-forma balance sheets for the present time and for the end of each of the first ten operating years. Multiple balance sheets improve accuracy of the feasibility analysis because they will account for how the firm's financial position will change as the firm matures.

Cash Flow Statement

The cash flow statement shows the flow of cash into and out of the business. This is a very important statement because it demonstrates whether a business will have sufficient cash on hand to pay bills as they come due. Inadequacies of available cash point out the need and timing for short-term financing and indicate to investors that a firm may not be able to repay debt in a timely fashion. A cash flow statement for the hypothetical Appalachian Furniture Manufacturing is found in Figure 3.

The frequency that a firm creates cash flow statements varies with the type of business in which it operates. Businesses with irregular and seasonal cash flow patterns should produce more frequent cash flow statements while a firm with a steady cash flow may only need to produce cash flow statements quarterly or annually. The cash flow statements created for the purpose of a financial feasibility analysis are generally made monthly for the first year, quarterly for the second and third years, and annually for years after that. Cash flow statements of manufacturing alternatives that have irregular cash flow patterns may need to be projected on a more frequent basis. The analysis should contain ten years of cash flow projections.

The cash flow statement consists of three sections: inflows, outflows, and balance information. Cash inflows include all flows of cash into the business, regardless of source, and for most manufacturers will be comprised primarily of cash sales and receipts

Figure 3. Pro-forma cash flow statement for hypothetical furniture manufacturer

Appalachian Furniture Manufacturing, Inc.

	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Total
CASH INFLOW					
Cash Sales					
Credit Sale Receipts	225,260	410,931	456,017	447,791	1,540,000
Other Receipts					
Total Cash Inflows	225,260	410,931	456,017	447,791	1,540,000
CASH OUTFLOWS					
Materials	118,164	215,561	239,211	234,896	807,832
Wages	67,886	67,886	67,886	67,886	271,544
Fringe Benefits	14,253	14,253	14,253	14,254	57,013
Utilities	10,678	19,479	21,616	21,226	73,000
Supplies	5,449	9,940	11,030	10,831	37,250
Office supplies	225	225	225	225	900
Freight	6,758	12,328	13,681	13,434	46,200
Travel Expenses	4,950	4,950	4,950	4,950	19,800
Principal	3,994	3,994	3,994	3,994	15,976
Interest	24,469	24,469	24,469	24,469	97,875
Income Tax	5,059	5,059	5,059	5,059	20,234
Other Expenses	2,625	2,625	2,625	2,625	10,500
Total Cash Outflows	264,509	380,768	408,999	403,849	1,458,124
NET CASH FLOW	(39,248)	30,163	47,019	43,942	81,876
Beginning Cash Balance	524,000	484,752	514,915	561,934	524,000
ENDING CASH BALANCE	484,752	514,915	561,934	605,876	605,876

from credit sales. Other sources of cash inflows are sale of equity, loans, and returns from outside investments. Cash outflows are cash expenditures of the business such as cash purchases, payment of accounts payable, payment of wages and salaries, loan payments, taxes, etc. Cash outflows of AFM, Inc. include expenditures for materials, wages, utilities, supplies, freight, taxes, and goods and services. The cash balance section of the cash flow statement simply consists of the net cash flow for the period in question and an adjustment in the cash balance to account for that cash flow.

Income Statement

The income statement, also referred to as the profit-loss statement, determines the net income or net loss that arises from a firm's activity over a period of time. This statement is valuable because it estimates whether a project will be profitable for the time period in consideration. Furthermore, the income statement shows the margin that will be available to repay debt, invest in expanding the business, and provide return on equity to the owners. The income statement is based on the accounting equation:

$$\begin{aligned} \text{Net Income} &= \text{Gross Revenues} \\ &\quad - \text{Cost of Goods Sold} \\ &\quad - \text{Operating Expenses} \\ &\quad - \text{Interest Expense} \\ &\quad - \text{Income Tax.} \end{aligned}$$

The sample income statement found in Figure 4 shows that the income statement accounts for these different factors.

Gross revenues are calculated by summing cash receipts and receipts of accounts receivable and is simply a measure of the total sales of the business. The cost of goods sold (COGS), which is the total expense of materials used to produce the goods sold, is determined by adjusting the cost of goods manufactured to reflect changes in inventory. In equation format: $\text{COGS} = \text{Beginning Inventory} + \text{Purchases} - \text{Ending Inventory}$. Gross margin is the difference between gross revenues and the cost of goods sold.

Figure 4. Pro-forma yearly income statement for hypothetical furniture manufacturer
Appalachian Furniture Manufacturing, Inc.

Gross Sales/Revenues	1,540,000	
Less: Returns and Allowances	0	
Net Sales	1,540,000	
Less: Cost of Goods Sold	807,832	
Gross Margin		732,168
Operating Expenses		
Wages	253,664	
Fringe Benefits	57,013	
Utilities	73,000	
Supplies	37,250	
Depreciation	63,700	
Office Supplies	900	
Freight	46,200	
Travel	19,800	
Miscellaneous	10,500	
Total Operating Expenses		562,027
Earnings Before Int. and Taxes		170,141
Less: Interest Expense		97,875
Earnings Before Taxes		72,266
Less: Income Taxes		20,234
NET INCOME (LOSS)		52,032

Operating expenses are those expenses that arise directly from carrying out business. Operating expenses for AFM include wages, fringe benefits, utilities, supplies, depreciation, office supplies, freight, travel, and miscellaneous expenses. Other examples of operating expenses would include advertising, vehicle expenses, and real estate taxes.

In the final section of the income statement interest and income taxes are subtracted from earnings before interest and taxes (EBIT). Interest expense, which represents the cost of borrowing money, is the non-principal total of loan payments. Income tax expense includes both federal and state income taxes, and in some cases also includes self-employment, social security, Medicare, and unemployment taxes.

Financial statements projected for each of the first ten years of operation are sufficient for a complete analysis. The balance sheet and income statement can be projected for each year, and the cash flow statement should be projected monthly for year 1, quarterly for years 2 & 3, and yearly for the remainder of the time period. Constructing multiple statements accounts for the transition from start-up to normal production schedules and increasing sales.

STEP 5: ASSESS FEASIBILITY OF EACH MANUFACTURING ALTERNATIVE USING CAPITAL BUDGETING INVESTMENT CRITERION.

This step of the financial analysis is completed by using investment rules that are designed to choose among investments by choosing projects that provide a particular level of return. The investment criterion that is used to evaluate secondary manufacturing alternatives must account for two important factors: time and risk. The most popular investment rules account for these two factors by discounting future cash flows at a particular discount rate, so that all projects are judged on equal footing. Complete discussions of Discounted Cash Flow (DCF) valuation can be found in finance texts such as Ross et.al. (1991). The most popular investment criterion used by managers and investors are net present value, internal rate of return, payback period, and benefit/cost ratio.

Net present value (NPV), the most commonly used criterion, represents how much value is earned today by taking on an investment. NPV is simply the present value of all future cash flows, plus any cash flow occurring at the present time. In equation format:

$$NPV = C_0 + \sum_{t=1}^n \frac{C_t}{(1+r)^n}$$

where C_0 = net cash flow in year 0, C_t = cash flow in year t, and r is the discount rate.

The NPV rule is that all investments where $NPV > 0$ and total investment does not exceed available funds will be accepted. The advantages of the net present value rule are that it considers the time value of money and risk associated with an investment, thereby evaluating each investment on common ground. A disadvantage of the net present value rule is that it assumes that cash flows can be projected for the entire life of the project. Furthermore, this rule requires that investment opportunities be evaluated over the same time period, or at least for the same length of time. To evaluate projects with different lives the net present value can be converted to an equivalent annual annuity (EAA), which is the annuity equivalent of the net present value. The secondary manufacturing alternatives for a WPIP will be evaluated on equal lives, so the EAA should not be needed for this financial analysis. More information on the EAA can be found in Ross et.al.(1991).

The internal rate of return, or IRR, is the discount rate which makes the net present value of an investment equal to 0. For example, an investment that has a net present value of 0 when calculated with a 8% discount rate would have an IRR of 8%.

The IRR rule states that a project will be accepted if its IRR is greater than the minimum acceptable rate (MAR) of return. In most cases, the MAR is the opportunity cost for projects of comparable risk. An advantage of IRR is that it is familiar to many businesspeople and investors, and is therefore readily accepted. The IRR also eliminates the need to determine the discount rate used in net present value calculations.

There are, however, several drawbacks to using the IRR rule. Projects with non-conventional cash flows can have multiple internal rates of return because there can be more than one rate where $NPV=0$. Multiple IRR's usually occur when alternating positive and negative cash flows are found in the calculation. Internal rate of return is most useful

when the cash flow pattern reflects either a borrowing or lending scheme. Furthermore, when comparing mutually exclusive projects, where only one project can be undertaken, the IRR rule can lead to an incorrect investment decision. IRR does not consider the magnitude of an investment's return, but only the rate of return. For example, when only one investment can be made, a \$2000 investment that yields a return of 12% is not better than a \$200,000 investment that yields 10%, but IRR rule would choose the \$2000 investment in this case. For this reason, the IRR rule should be used only to determine whether a project is or is not profitable and should not be used to choose from among profitable projects.

Payback period is defined as the number of years that it takes for expected cash flows to equal the initial investment. **The payback rule states that a project is accepted only if the payback period is less than a specified maximum.** This rule, which is widely used and understood, is commonly used as a primary criteria for small investments, where the possible loss due to an error in project selection does not justify making expensive NPV or IRR calculations. The payback period rule is particularly useful for choosing between investments where cash flow problems are expected because risk is reduced as projects with long payback periods are rejected. The payback rule also reduces risk in investment decisions involving regular cash flows, as distant cash flows are almost always more uncertain than cash flows in the near future. Because the payback period rule is biased toward more liquid projects, it is useful to small businesses who are more vulnerable to cash flow problems.

The payback rule is seldom used as the primary investment selection criteria, however, because of its important disadvantages. The payback rule ignores the time value of money and risk, which are important factors in making a proper investment decision. Furthermore, in not considering cash flows after the cutoff date, the payback rule may be neglecting to see the largest returns from an investment. Finally, the payback rule is biased against long-term projects, which could be the most profitable project among the choices.

The last of the major investment decision criterion, the benefit/cost ratio rule, is very similar to the net present value rule. The benefit/cost ratio, or profitability index, is calculated by dividing the present value of revenues by the present value of costs:

$$\text{Benefit/Cost (B/C) ratio} = \frac{PV_{\text{revenues}}}{PV_{\text{costs}}}$$

The B/C ratio rule states that a project is accepted if the b/c ratio is greater than one. This rule gives the same result as the NPV rule because if the b/c ratio is greater than one, then the net present value will be positive. Likewise, if the b/c ratio is less than one, then the net present value will be negative. The inherent problem with the benefit/cost ratio rule is that the b/c ratio is a relative term and is only useful when considered along with the size of the investment. Because of this problem, the NPV rule will be used in the financial analysis instead of the benefit/cost rule.

The financial analysis for a wood products industrial park will use the net present value rule as the primary criteria for selecting among secondary manufacturing alternatives. This rule is best suited for the analysis because disadvantages of the rule are eliminated by the assumptions made in the market and technical analyses. The financial statements, prepared with costs and revenues estimated in the sales and operating plans, contain all of the cash flows for each alternative during a ten year period. Cash flows after this period will not be required because the analysis will assume that the business is sold at the end of the ten years, representing a cash flow. The value of the business at that time will reflect cash flows that have not yet occurred. The discount rate that should be used in net present value calculations is the rate that the investor could earn by investing money elsewhere. Therefore, the net present value rule can be used with a high level of confidence in the results.

The internal rate of return and payback period should also be calculated for each secondary manufacturing alternative. These figures and the corresponding rules can be used as secondary evaluation criterion to further scrutinize alternatives determined to be marginally feasible or unfeasible by the net present value rule. The primary objective of this step is to determine which alternatives are unfeasible and eliminate them from further consideration. The feasible alternatives will be further analyzed in later stages of the financial analysis.

STEP 6: CREATE PARK FORMATION ALTERNATIVES OF PRIMARY AND SECONDARY MANUFACTURERS

Using feasible secondary manufacturing alternatives, alternative park formations can be created in a three stage process. The first stage is to list material requirements and outputs, by volume, for each secondary manufacturer. These lists will be used to track the flow of materials through the park as each formation alternative is constructed.

The second stage involves creating different formations of manufacturers based on material flows, using only manufacturers that were projected to be feasible. Material flows will be tracked by creating product flow accounts consisting of park production, sales to park members, and sales outside of the park. The products of the primary corporation, such as lumber, slabwood, and wood chips, should be listed as products to begin the process. Next, add secondary manufacturers that use these products as raw materials by adjusting product flow accounts to reflect the input requirements and production of the new manufacturers. An example of this type of transaction can be found in Table 3, where the furniture blank manufacturer uses J_i board feet of lumber to produce J square feet of furniture blanks and J_b board feet of strips and pieces. The pallet

Table 3. Hypothetical production, in-park sales, and external sales for a wood products industrial park. X_i = inputs required to produce product X. X_b = byproduct of producing product X.

Product	Park Production	In Park Sales	External Sales
High Grade Lumber		J_i	
Low Grade Lumber		K_i	
Wood Chips			
Furniture Blanks	J		J
High Grade Strips and Pieces	J_b		J_b
Pallets	K		K
Low Grade Strips and Pieces	K_b		K_b

manufacturer uses K_i board feet of low grade lumber to produce K pallets and K_b board feet of strips and pieces. The supply of primary materials can be assumed to be sufficient to meet the demands of any combination of these manufacturers. The demand for primary products suggests a minimum primary manufacturing capacity and can be used to design primary manufacturing facilities.

When product flow accounts have been adjusted to reflect the addition of secondary manufacturers, other manufacturers that use products scheduled for external sales can be added to the park. Accounts should be adjusted to account for the addition of new manufacturers. Table 4 shows how the external sales of the hypothetical park change with the addition of flooring, short-length dimension lumber, and millwork manufacturers. Note the change in external sales of high and low grade strips and pieces, which are reduced when the new manufacturers are added. Minimizing external sales in this manner will maximize the value added within the park, minimize the outside-park sales of primary and secondary products, and maximize the efficiency of the park.

Table 4. Hypothetical production, in-park sales, and external sales for a wood products industrial park. X_i = inputs required to produce product X. X_b = byproduct of producing product X.

Product	Park Production	In-Park Sales	External Sales
High Grade Lumber		J_i, L_i, M_i	
Low Grade Lumber		K_i	
Wood Chips	L_b, M_b, N_b		$L_b + M_b + N_b$
Furniture Blanks	J		J
High Grade Strips and Pieces	J_b	L_i, M_i, N_i	$J_b - L_i - M_i - N_i$
Pallets	K		K
Low Grade Strips and Pieces	K_b	L_i	$K_b - L_i$
Flooring	L		L
Short-length Dimension Lumber	M		M
Millwork	N		N

The process of creating manufacturing formations can be repeated so that a variety of combinations are constructed. Diversity among the structures will increase the probability that one of the formations will satisfy the goals of the park. If tertiary manufacturing alternatives are available, a similar process is employed to add those alternatives to the park.

The final stage of creating park formations alternatives involves matching primary manufacturing facilities to meet the demand for primary products. The product flow accounts in Table 4 can be used to determine the primary product demand for each combination of secondary manufacturers. For example, the high grade lumber requirements for the hypothetical park is the sum of J_i , L_i , and M_i . The primary manufacturing facilities should have excess production capacity to account for peaks in demand, allow for expansion of secondary manufacturers, and provide for sales of primary products outside of the park. In cases where there is more than one primary production process that will meet demand, multiple park formations can be created. Unless a particular process appears to have promise as a profitable venture, however, it should not be included in a park formation alternative, as only primary production processes that have proven to be profitable should be considered.

STEP 7: DETERMINE FINANCIAL FEASIBILITY OF DEVELOPMENT

CORPORATION FOR EACH PARK FORMATION ALTERNATIVE.

The process for determining the financial feasibility of the development corporation for each park formation alternative will be the same as that used to assess the feasibility of individual secondary manufacturers. The first step in this process is constructing pro-forma financial statements for the development corporation and its subsidiaries, the primary manufacturing corporation and the marketing corporation. These statements should be constructed for a ten year period and should include the value of the business at the end of the period as a cash income. The balance sheet and income statement should be projected for each year; the cash flow statement should be projected

monthly for year 1, quarterly for years 2 & 3, and yearly for the remainder of the time period. It is necessary to construct multiple statements to account for increasing sales and the transition from start-up to normal production schedules.

The financial projections for the development corporation will be based on the characteristics of each particular park formation, such as number of members and site requirements of members, and on geographic characteristics such as land prices. The complexity of these statements will depend on the management structure of the park and the role that the developer plays after the park is completely functional. Parks that are developed and sold will present relatively simple financial statements. Likewise, financial statements of parks that are developed and leased, with the development corporation playing a role in the operation and management of the park, will be more difficult to develop.

The financial statements of the primary manufacturing corporation can be the most difficult to construct because technical and market data are necessary to project costs. Market data is generally easy to develop because most of the output of the primary corporation will be sold within the park at quantities and prices previously determined. Technical data, however, must come from a operations plan upon which cost estimates can be based. The operations plan will be similar to that constructed for secondary manufacturing alternatives and should highlight the costs associated with the sawmill and dry kiln.

The sales requirements of each park formation's member manufacturers will serve as the foundation for the marketing corporation's financial statements. The marketing fee that secondary manufacturers pay should be based on the costs incurred by the marketing corporation, such as sales staff salaries and benefits, the finished goods warehouse, and delivery within the park. Markup pricing, a cost-based pricing strategy, could be employed, with markup being minimal so that the advantage of the marketing corporation is realized. Prices for the products sold by the marketing corporation were estimated during the market analysis of individual secondary manufacturing alternatives.

When financial statements have been completed, the net present value, internal rate of return, and payback period should be calculated for each park formation alternative.

The net present value rule will serve as the primary decision making criterion. The time period for the analysis will be ten years, just as it was for during the analysis of secondary manufacturers. The interest rate that could be earned in alternative investments of similar risk should be the discount rate. The internal rate of return will serve as a double-check on formations that are found to be marginal by the NPV rule. Finally, the payback period rule will be used to point out projects that should be further examined from a cash flow perspective. Projects with a long payback period and irregular or uncertain cash flows should not be accepted if equally profitable alternatives are available.

STEP 8: CHOOSE A PREFERRED PARK FORMATION

A preferred park formation should be selected on the basis of how well each park formation satisfies the goals of the park. Criterion can be developed for quantitative goals that will evaluate formation alternatives based on information found in the market, technical, and financial analyses. For example, if the goal of the park is to maximize the return on investment in the park's development corporation, then the park formation with the greatest net present value should be selected. Likewise, if the goal of the park is to increase regional employment, then the formation that creates the most new jobs should be selected.

There is no analytical method for choosing a preferred park structure from alternatives when the goals are more qualitatively oriented or when multiple goals are involved. Personal judgment must be used to select a formation in these cases, which constitute the largest proportion of industrial park ventures. The best selection method is to have a group choose the preferred structure based on the qualitative satisfaction of goals. The board of directors of the development corporation can usually serve as the selection committee, as this group includes members representing the various interests in the park. Regardless of the goals of the park, consideration should be given to the profitability of the park and park members in every decision, as selecting a park formation

with a larger net present value decreases the probability that an error in financial projections will lead to choosing an unprofitable formation.

STEP 9: RE-EVALUATE THE FEASIBILITY OF MANUFACTURERS INCLUDED IN THE PREFERRED PARK FORMATION

The manufacturing alternatives included in the preferred park structure should be re-evaluated to ensure that these ventures are still be financially feasible when using costs estimated during the financial analysis of the development corporation. This re-evaluation can be completed by fine tuning the first analysis, adding data from the development corporation analysis. Re-evaluation is very important when there is a difference in the sales cost estimates used in the first analysis and those determined in the analysis of the marketing corporation. The new analysis should reflect the costs determined in the marketing corporation analysis because these estimates are more realistic.

The re-evaluation process involves changing values in the original financial statements and applying the net present value rule to the new statements. This process can be a relatively simple task if a computer program, such as a spreadsheet, were used to perform the original analysis.

STEP 10: USE SENSITIVITY ANALYSIS TO IDENTIFY VARIABLES THAT ARE MOST IMPORTANT TO SUCCESS

Sensitivity analysis is a valuable tool because it identifies variables in the development corporation where forecasting risk is most severe and where further market research or cost analysis may be necessary. Sensitivity analysis is basically a what-if analysis where one input variable is changed and the corresponding changes in net present value are recorded. Large NPV changes relative to small changes in the input variable

suggest that the net present value is sensitive to changes in that input and that forecasting risk is high for that variable.

An example of a sensitivity analysis would be to freeze all variables except for unit sales in order to determine the sensitivity of net present value to sales level. Consider the following hypothetical scenarios:

<u>Unit Sales</u>	<u>Net Present Value</u>	<u>Internal Rate of Return</u>
2000	-\$5,063	5.6 %
2500	12,037	14.7
3000	29,137	23.8

If the original estimate of sales volume were 2500 units, then this data shows the effects of a twenty percent decrease and a twenty percent increase in sales volume. These changes are illustrated in Figure 5.

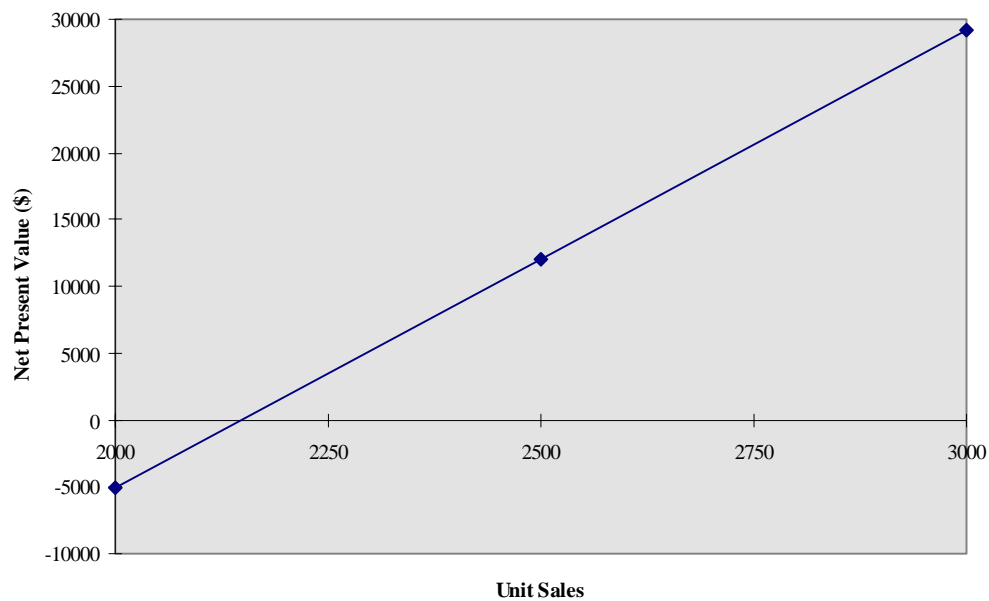


Figure 5. Sample sensitivity analysis for unit sales.

Consider also the following scenarios, which demonstrate the sensitivity of NPV to operating costs:

<u>Operating Costs</u>	<u>Net Present Value</u>	<u>Internal Rate of Return</u>
\$ 80,000	\$1,214	10.7 %
100,000	12,037	14.7
120,000	22,860	18.7

This data shows the changes in net present value corresponding to both a twenty percent decrease and a twenty percent increase in operating costs.

These scenarios demonstrate that, for this example, net present value is more sensitive to changes in unit sales than to changes in operating costs. The relationship between the two sensitivities is illustrated when both are graphed simultaneously, with changes in unit sales and operating costs on the x-axis, represented as percentage change in the originally projected value. Proportional changes in net present value are represented on the y-axis. (Figure 6)

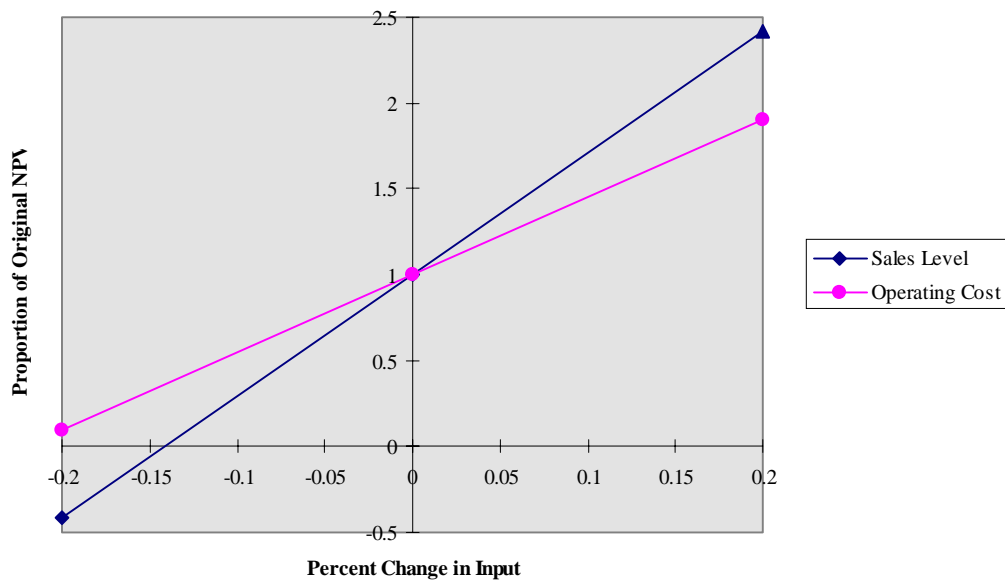


Figure 6. Sample sensitivity analysis of net present value for unit sales and operating costs.

Sensitivity analysis can be performed for all input variables, but this procedure would be very expensive. A more logical approach is to study the impact of changes in broad categories such as gross sales/revenues, materials costs, operating costs, and interest rate. When net present value proves to be sensitive to one of these categories, then further investigation would be warranted to determine which variable within that area has the most impact.

The final component of the sensitivity analysis is a break-even analysis, which determines the sales volume that results in a zero net income for the project. The break-even point is determined by dividing fixed costs by the difference between selling price and variable costs as follows:

$$\text{Break-even sales level} = \frac{\text{Fixed Cost}}{\text{Selling Price} - \text{Variable Cost}}$$

Although it ignores the time value of money, the break-even sales level is a useful figure because it is easy to understand and provides the marketing corporation with the minimum number of sales to be profitable.

STEP 11: CALCULATE FINANCIAL RATIOS AND PERFORM RATIO ANALYSIS

Financial ratios, which are calculated from the data in financial statements, are a valuable tool for determining the strengths and weaknesses of a firm. Because they are relative terms, ratios are also effective when using financial statements to compare a business to other members of the industry. Financial lenders frequently use ratios, in conjunction with other factors, to grade risk associated with all types of financing. Ratio analysis will be useful in evaluating industrial park investment opportunities and will help to market the park to creditors.

The most commonly used financial ratios fall into four categories: liquidity ratios, leverage ratios, financial efficiency ratios, and profitability ratios. The mathematical formulas used to compute these ratios are listed in Figure 7.

Liquidity ratios provide a measure of short term solvency, the ability of a firm to pay bills over the short run without disrupting normal business operations. These ratios

Liquidity Ratios

$$\text{Current Ratio} = \frac{\text{Current Assets}}{\text{Current Liabilities}}$$

$$\text{Quick Ratio} = \frac{\text{Current Assets} - \text{Inventory}}{\text{Current Liabilities}}$$

Leverage Ratios

$$\text{Debt/Equity Ratio} = \frac{\text{Debt}}{\text{Equity}}$$

$$\text{Coverage Ratio} = \frac{\text{EBIT} + \text{Depreciation}}{\text{Interest}}$$

Financial Efficiency Ratios

$$\text{Capital Turnover Ratio} = \frac{\text{Sales}}{\text{Total Assets}}$$

$$\text{Inventory Turnover Ratio} = \frac{\text{COGS}}{\text{Average Inventory}}$$

$$\text{Average Inventory Period} = \frac{365}{\text{Inventory Turnover Ratio}}$$

$$\text{Receivables Turnover Ratio} = \frac{\text{Credit Sales}}{\text{Accounts Receivable}}$$

$$\text{Average Collection Period} = \frac{365}{\text{Receivables Turnover Ratio}}$$

$$\text{Payables Turnover Ratio} = \frac{\text{Purchases}}{\text{Accounts Payable}}$$

$$\text{Average Payment Period} = \frac{365}{\text{Payables Turnover Ratio}}$$

Profitability Ratios

$$\text{Profit Margin} = \frac{\text{Net Income}}{\text{Sales}}$$

$$\text{Return on Assets} = \frac{\text{Net Income}}{\text{Total Assets}}$$

$$\text{Return on Equity} = \frac{\text{Net Income}}{\text{Total Equity}}$$

Figure 7. Mathematical formulas for important financial ratios.

are of particular interest to short-term creditors, who are interested in the short-term financial health of the firm. Financial managers for companies with irregular cash flows should be intimately familiar with these ratios, as these firms generally require more short-term financing. Data from the balance sheet is used to construct liquidity ratios. The current ratio, which is one of the best known and most commonly used financial ratios, is the ratio of current assets to current liabilities (Figure 7). The current ratio should be greater than one in almost all situations, indicating that the firm has a positive net working capital. Creditors generally look for firms with a high current ratio, which indicates that there are currently enough assets to repay short-term debts. A high current ratio suggests, however, that the firm is not using cash and other short term assets efficiently and may need to investigate investment opportunities for these assets.

The quick ratio is a liquidity ratio that considers inventory to be a relatively insolvent asset compared to cash. Inventory may contain damaged or hard to sell products. In the wood products industry, an excessive inventory may indicate that the firm has overestimated sales and has overbought or overproduced as a result. Because this excessive inventory cannot generally be considered a liquid asset, the current ratio would provide an incorrect estimate of the firm's liquidity. The formula for the quick ratio is the same as that for the current ratio, except that inventory is omitted from current assets (Figure 7). Discrepancies between the current ratio and the quick ratio do not necessarily suggest that the firm has a liquidity problem with inventory, but that inventory levels should be further investigated.

The second group of financial ratios, leverage ratios, provide a measure of a firm's long-term solvency. The two most commonly used leverage ratios are the debt/equity ratio and the coverage ratio. As the name suggests, the debt/equity ratio is simply the ratio of total debt to total equity (Figure 7). This ratio provides insight into how a firm uses financing. Firms with a high debt/equity ratio are considered to be highly levered, and are subject to magnified potential gains and losses.

The coverage ratio is more commonly used by creditors as a measure of a firm's ability to repay long-term debt. The formula for the coverage ratio is listed in Figure 7. High current ratios indicate that a firm is better able to handle risk and uncertainty and

should negotiate for variable interest or shorter repayment schedules. Low coverage ratios can be improved by reducing business costs, increasing incomes, reducing equity payments, and restructuring debt at longer terms.

Financial efficiency ratios are a measure of how efficiently a business uses its assets and repays its debts. The capital turnover ratio reflects on the performance of capital and management by measuring how long it takes for earnings to equal assets. Large capital turnover ratios are desirable because they indicate that the firm's assets are being used productively. The financial turnover ratio is calculated by dividing sales by total assets (Figure 7).

The inventory turnover ratio and inventory period are used to gauge how well inventory is managed. The inventory turnover ratio is determined by dividing cost of goods sold by inventory (Figure 7). A high inventory turnover ratio is desirable because it indicates that products are not kept in inventory for extended periods. Firms should be cautious in attempting to increase the inventory turnover ratio, however, because depletion results from turning over inventory too often. The average inventory period is 365 divided by inventory turnover. This ratio is the number of days that the current inventory will last if production were to cease.

The receivables turnover ratio, a measure of how quickly the firm collects on credit sales, is the ratio of sales to accounts payable (Figure 7). Higher receivable turnover ratios are desirable because they indicate that the firm collects on debt quickly. The average collection period is how long, in days, that it takes for the firm to collect on sales. Strategies for reducing the average collection period include improving billing procedures, offering discounts for timely payment, and increasing the interest rate on past due accounts.

The payables turnover ratio, which is determined by dividing cost of goods sold by accounts payable, is a measure of how quickly a firm pays accounts payable. The average payment period is the average amount of time that the firm takes in paying for credit sales. Long payable periods are desirable in theory, but can easily damage the credit rating of a firm. An ideal payment period is approximately the same length as the sum of the average

inventory and collection periods. A payment period of this length lessens the need to reduce the collection period because suppliers are financing the firm's credit sales.

Profitability ratios are the most widely used of all financial ratios and are often used to evaluate the management of a business. These ratios are intended to measure how efficiently a firm uses its assets. The three most common profitability ratios are the profit margin, return on assets, and return on equity. The profit margin provides an estimate of how much profit is earned for each dollar in sales. The return on assets is a measure of profit per dollar of assets. Return on equity, a similar ratio, is the profit earned for each dollar of equity. These ratios are generally used by managers and owners of a company and are less important to creditors than ratios related to solvency.

The use of financial ratios in assessing the feasibility of a wood products industrial park are three-fold. The ratios can be used to identify areas in the development corporation's financial structure that deserve attention. Furthermore, these ratios could be used cautiously to compare the park to similar ventures. The final reason for preparing financial ratios is that the number of financing opportunities will generally be increased if ratios are included in the financial plan.

Because financial ratios highlight the strengths and weaknesses of the business, they can be used by managers of the development corporation to focus attention on areas that need improvement. Problems indicated by financial ratios can generally be solved by looking at how the ratio is formed. For example, if the development corporation's debt/equity ratio is low, then the managers could add more equity to the operation by finding more equity-holders. Reducing liabilities would also improve the debt/equity ratio, but if the corporation has just been formed this is probably not an option.

There are several companies, particularly Robert Morris Associates, that publish average industrial financial ratios based on industry surveys. The financial ratios for a particular firm can be compared to these industry averages to observe the financial standing of that firm relative to others in the industry. This comparison has limited application in the analysis of wood products industrial parks because these parks are in a specific industry that is not represented in this data. The subsidiaries of the development

corporation could be evaluated in this manner, but these results should also be interpreted with caution.

Performing a ratio analysis can increase the chances that the development corporation will be financed by creditors. Most creditors use financial ratios when evaluating an investment and including ratios in the financing proposal will make this evaluation more convenient. Including the ratios in the proposal will also enhance the image of the corporation's management by acknowledging the importance of ratio analysis in making good management decisions. Finally, performing a ratio analysis will point out areas that should be improved to make the project more appealing to investors.

STEP 12: WRITE FINANCIAL PLAN

The financial plan is a report on the financial feasibility of the preferred industrial park formation. This plan should be distributed to all members of the development corporation's board of directors and can be used to solicit potential investors. The contents of the financial plan should include:

1. Pro-forma financial statements of the development corporation,
2. A review the financial evaluation of the venture,
3. Financial ratios for the firm should be listed and explanation of what they mean,
4. A discussion of the results of the sensitivity analysis,
5. A list of assumptions made in arriving at financial conclusions.

In addition to these items, the financial analysis should contain an appendix of pro-forma financial statements and financial evaluations of member manufacturers. This information is pertinent because the financial success of the development corporation is directly related to the success of the park's secondary manufacturers.

2.4 COMMUNITY IMPACT ASSESSMENT

A community impact assessment is an examination of the impact that a business can have on the local economy. The results of this analysis can be valuable to industrial park developers as a marketing tool, particularly in developments that require public investment. Impact analyses are very popular with economic development agencies, which are interested in positive economic influences. Impact analyses are also used by politicians to promote special programs and projects. Therefore, the greatest utility of the community impact assessment to the park developer is to influence external sources of financing and support.

A detailed community impact assessment would involve using impact analysis to derive multipliers which predict the impact of a wood products industrial park on total regional production, personal income, value added, employment, and other financial indicators. A complex analysis of this type is beyond the scope of this project. Community impact analyses are generally contracted to consultants with specialties in this area.

CHAPTER 3: DEMONSTRATION OF METHODS

The previous section discussed the methodology to be used to determine the economic feasibility of a wood products industrial park. A simple case study will demonstrate the application of these methods to a real-world problem. The area that will be considered in the case study is the Southern Mountains of Virginia, which encompasses the counties of Bland, Buchanan, Carroll, Dickenson, Floyd, Giles, Grayson, Lee, Montgomery, Pulaski, Russell, Scott, Smyth, Tazewell, Washington, Wise, and Wythe.

It is important to note that this case study does not endorse any real-world investment opportunities. The best available information on prices and costs was used in the financial analysis, but this data is subject to error because the project did not have the resources to pursue more accurate data. The costs and prices for any specific project would likely be different than those used in this analysis. Therefore, actual investors should develop their own estimates for costs and prices based on each particular situation. The purpose of this case study is to demonstrate the method that would be used to perform a feasibility analysis when real estimates are available.

3.1 Background for Case Study

TIMBER SUPPLY

The Southern Mountains of Virginia are composed of vast acreages of hardwood forests. The majority of these forests are owned by non-industrial private landowners (Table 5). The large proportion of non-industrial, privately owned timberland suggests that this land is not tied up by government or forest industry ownership. Thompson (1992) found that seventy-one percent of this forestland is composed of the Oak-hickory forest type. Other substantial forest types found in the area include Chestnut oak, Oak-pine, White pine-hemlock, Maple-beech-birch, and Virginia pine. The volume of sawtimber found in these forests is found in Table 6. The predominant species of sawtimber include yellow poplar, red and white oak, and white pine. Thompson found that net annual growth exceeds the annual timber harvest by 204,291 MBF.

Table 5. Area of timberland in acres, by county and ownership, for Southern Mountains of Virginia. Adapted from Thompson (1992)

County	Total Forestland	Government	Industry	Non-Industrial Private
Bland	173,503	66,390	4,473	102,640
Buchanan	290,585	250	3,452	286,883
Carroll	182,605	5,854	7,437	169,314
Dickenson	171,650	14,279	408	156,963
Floyd	141,181	116	3,891	137,174
Giles	167,121	53,122	5,545	108,454
Grayson	164,742	23,218	3,932	137,592
Lee	150,024	11,459	1,380	137,185
Montgomery	145,281	22,482	3,766	119,033
Pulaski	118,624	22,858	1,049	94,717
Russell	174,359	5,983	155	168,221
Scott	235,375	32,754	510	202,111
Smyth	172,279	78,210	528	93,541
Tazewell	207,871	8,008	1,661	198,202
Washington	189,398	28,942		160,456
Wise	178,114	47,502	150	130,462
Wythe	140,921	52,632	6,994	81,295
TOTAL	3,003,633	474,059	45,331	2,484,243

Table 6. Volume of Sawtimber (MBF) on timberlands, by species and diameter class, in Southern Mountains of Virginia. Adapted from Thompson (1992)

Species	All Classes	9.0-14.9	15.0-20.9	21.0 +
Softwood				
Eastern White Pine	1435741	524942	691730	219069
Yellow Pine	611654	500936	110718	0
Eastern Hemlock	374748	97027	106988	170733
Spruce and Fir	14254	14254	0	0
Cedars	13173	5500	7673	0
Total Softwoods	2449570	1142659	917109	389802
Hardwood				
Select White Oak	1212233	416845	537607	257781
Select Red Oak	1733974	423356	680316	630302
Chestnut Oak	1978387	692696	769529	516162
Other White Oaks	7137	3082	4055	0
Other Red Oaks	1590677	566522	716611	307544
Hickory	911379	350461	458479	102439
Yellow Birch	49767	6950	20000	22817
Hard Maple	463901	177651	183555	102695
Soft Maple	806209	420757	291859	93593
Beech	498556	140278	223282	134996
Sweetgum	6586	2742	3844	0
Blackgum	102985	39068	40017	23900
Ash	209391	64386	64623	80382
Basswood	394765	120023	186900	87842
Yellow Poplar	3383507	1228127	1521323	634057
Bay and Magnolia	63945	34627	8606	20712
Black Cherry	131695	55066	43227	33402
Black Walnut	95071	36068	45986	13017
Sycamore	36000	12971	9324	13705
Black Locust	174292	81552	85642	7098
Elm	16619	12179	4440	0
Other	580673	217550	269035	94088
Total Hardwoods	14447749	5102957	6168260	3176532
ALL SPECIES	16897319	6245616	7085369	3566334

POTENTIAL WOOD PRODUCTS FOR SOUTHWEST VIRGINIA

There are many different products that can be manufactured from the timber resource found in Southwest Virginia. These products can be broken down into primary, secondary, and tertiary products. The most common primary products are lumber, veneer products, oriented-strand board, and paper. Secondary products produced in the region include dimension lumber, flooring, millwork, pallets, railroad ties, and custom products. The most important tertiary products to the region are furniture and cabinets.

Primary Products

Lumber produced in the region varies widely according to species, level of processing, dimensions, and grade. Virtually all species of lumber found in the region have a market, but there is usually volatile and relatively low demand for unusual species. Hardwood lumber in the region can be produced either rough or dressed, and either green or dry. Common thicknesses range from 3/8" to 6" and lengths range from 4 feet to 16 feet or more. It is important to remember that hardwood lumber is represented as actual size, and not nominal size. Lumber is graded to reflect appearance and size; higher grades require more clear cuttings and longer lengths. Likewise, lower grades are allowed to have more defects and to be shorter.

Hardwood lumber produced in the region is usually used as a raw material for some type of secondary manufacturing. The distribution from sawmills to secondary producers often goes through brokers or wholesalers. Although the average size of sawmills is growing, there are still many small producers in the region. There are many production levels that are proving to be profitable.

The most common types of veneer products are different types of plywood, which are most commonly used as wall panels. Hardwood plywood is also widely used as furniture and cabinet parts and is produced in a variety of thicknesses and species. Other laminated products are also becoming more important as raw material prices rise and large logs are becoming more scarce. These products are often specialty products, such as custom made beams or panels. Veneer can also be applied as the top layer for decorative

furniture or doors. The only current veneer manufacturer in Southwest Virginia produces veneer and exports it to Japan.

Veneer products can be distributed in a variety of ways. Some producers will have a contract with buyers, while others use brokers or distributors. Custom products are often marketed directly to the end buyer. Most veneer manufacturing facilities are large scale ventures that require large capital investments and high production levels.

Oriented-strand board (OSB) is a composite wood product made from small wafers of wood that are oriented in layers at 90° to each other and then compressed and glued together. Hardwood species generally used to make OSB include low grade and small yellow poplar, cucumber tree, and basswood. Structural paneling is the most common use of OSB; thus the grading system is based on strength properties. OSB manufacturing requires expensive and complex machinery and other large capital investments. Therefore, there are relatively few strandboard plants; there is one producer in Southwest Virginia. OSB is usually distributed to wholesalers and large retailers because most producers do not have extensive distribution networks.

The final primary product produced from the timber resource in the region is paper. There are many different types of paper that can be produced, and each type requires different proportions of hardwood and softwood pulp. Pulp and paper mills require very large capital investments, large scale production, and continuous operation. These qualities make paper production an unlikely candidate for industrial park membership. There is a market, however, for wood chips that can be used as a raw material for pulp mills outside of the region. There is a large supply of chips, however, and the demand for wood chips is volatile.

Secondary Products

One of the most important secondary manufacturing activities in the region is the production of dimension lumber. Dimension lumber is partially to fully machined parts for furniture, cabinets, and other goods. Dimension lumber is usually produced in either standard sizes or sizes specified by a particular customer. Dimension pieces of narrow widths are generally solid, but wide pieces are often composed of edge-glued strips. The

lumber used to make dimension parts is low-grade hardwoods of various species. Red and white oak are the most important species used for production in the study region.

Dimension lumber is important because of the location of furniture and cabinet manufacturers in Virginia and North Carolina. Most dimension lumber produced in the region is sold directly to a tertiary manufacturer. Because some furniture manufacturers require large amounts of standard-sized dimension parts, while others require small quantities of different sized parts, there are many different scales of dimension operations.

The most common flooring product produced from hardwoods is oak strip flooring, but no large-scale producers operate in Southwest Virginia. Flooring manufacturing requires large capital investment, high levels of production, and large quantities of raw materials. Hardwood flooring is usually marketed through wholesalers. There is also a small market for custom flooring, but there are few producers for this product in the region. Custom flooring would include products such as wide flooring strips and unusual species. These operations would be small scale and would require marketing directly to the customer.

Millwork manufacturers produce a variety of products ranging from moulding to window and door parts. Because some machines can produce several different products, millwork producers can produce several different products. Milling operations use high grade lumber as a raw material so that they can get long, clear lengths. A variety of species are utilized to produce millwork, but softwoods and soft hardwoods such as yellow poplar are the most common because they are most easily milled. Millwork is used by tertiary manufacturers and in home construction or remodeling and is therefore marketed accordingly. Millwork operations are often small ventures, but larger manufacturers are realizing the advantages of economies of scale.

Since the increase of mechanization of shipping, pallets have become the largest single user of hardwood lumber. Pallets are made in a variety of sizes and are used as a portable platform for storage and transportation of manufactured goods. The primary material used is green lumber of various species, usually hard hardwood species for permanent pallets and softer hardwoods for expendable pallets. Low grade lumber is generally used to make pallets because visual qualities are not important. Pallets are

generally marketed through wholesalers or directly to large customers. Manufacturers are usually small businesses that do not require large capital investments.

Railroad ties and mine props could be considered a primary product, as they are produced directly from logs. Railroad ties are usually 7" by 9" and are eight and a half feet long; mine props are produced in various sizes. The only secondary manufacturing that may occur is preserving railroad ties. Various species are used to produce these products, but they are usually low grade hardwoods. The producers found in Southwest Virginia are small producers who generally market products directly to the customer.

Custom manufacturing includes unique millwork and flooring and others products. These products are generally marketed directly to a customer and are produced on an order basis. These operations are usually small and are versatile in production capabilities. Demand for these products is often not constant and therefore most producers do not make large capital investments.

Tertiary Products

One of the most important hardwood markets is the furniture industry; it is the largest user of high grade lumber. Hardwood furniture is used to furnish new households and offices and to replace worn-out furniture. There are a large variety of products manufactured by the furniture industry. Large manufacturers make large quantities of standard products and smaller producers make custom products, either for niche markets or for pre-arranged sales. The furniture industry uses dried lumber, dimension parts, and millwork, and many large manufacturers have in-house production capabilities for these products. Furniture is distributed through a variety of channels, including wholesale, retail, and other options.

There are many other tertiary products that are produced from hardwoods. Cabinets are a very important product and consume a fairly substantial proportion of hardwood lumber, dimension parts and, to a smaller degree, veneer products. The largest use of cabinets is for kitchens and bathrooms, but other markets also exist. There are a large number of specialty products that are produced from hardwood lumber, including toys, musical instruments, gun stocks, and novelties.

DISTRIBUTION CHANNELS

The distribution channels for hardwood products vary according to product and size of operation (Sinclair, 1992). Large companies that produce primary and secondary products generally market directly to customers. These manufacturers usually employ a marketing staff that sells products in relatively large quantities. In contrast to large manufacturers, smaller producers generally use brokers to market products. These manufacturers make relatively few sales to final customers and often make smaller, more specialized sales. The exception to these patterns would be custom producers who make products on an order basis.

In the proposed industrial park complex, marketing activities will be the responsibility of the marketing corporation. Outside-park sales and in-park transactions will both be made by the marketing unit. The marketing corporation will serve as a distribution yard, handling inventory and transporting materials inside the park. Compensation for marketing activities will be in the form of a marketing fee paid by park members. Distribution channels for in-park transactions will be regulated by contracts between the individual park members and the development corporation. Outside park sales will be conducted as wholesale or retail transactions. Therefore, the manufacturers in the park will not need to employ a sales staff. The result of the formation of the marketing corporation should be a decrease in sales costs and more stable supply for park members.

INDUSTRY OVERVIEW

The hardwood industry in the Southern Mountains region has traditionally been composed of many small producers. The current trend of centralizing of hardwood processing activities in larger, more efficient facilities has resulted in a decreased number of producers. The Virginia Department of Forestry (1992) found that the number of sawmills in the region decreased from eighty to sixty-two over the period from 1988 to 1992. The principle reason for the increasing average producer size is the increased raw material costs and the resulting need to use higher production machinery. The current industry is summarized in Table 7.

Table 7. Number of wood products related industries, by county and product, in Southern Mountains of Virginia. Adapted from Virginia Department of Forestry (1992).

County	Sawmills	Concentration Yards	Dimension	Millwork	Pallets	Cabinets	Furniture	ETC	Total
Lee	3	1						1	5
Wise	2	1							3
Scott	1							2	3
Dickenson	2								2
Buchanan	7								7
Russell	3						1		4
Washington	3	1	1		1			1	7
Tazewell	1							1	2
Smyth	5		1	1		1	3		11
Grayson	4		1					2	7
Bland	4							1	5
Wythe	7	1							8
Carroll	13						3	7	23
Giles	1								1
Pulaski	0						1	1	2
Montgomery	2			1	1		1	2	7
Floyd	4								4
Total	62	4	3	2	2	1	9	18	101

Sawmills account for sixty-one percent of the 101 manufacturers in Southwest Virginia. The relatively small proportion of secondary and tertiary manufacturers is misleading in that these facilities generally have larger scales of production than do the primary producers. There is, however, a fair amount of primary products that leave the region. A major reason that green lumber leaves the region is that there is a shortage of local kilning capacity. There is also a shortage of secondary producers who can provide furniture companies with a sufficient volume of products with consistent quality. Therefore, many furniture companies purchase green lumber and have secondary manufacturing capacity. The shortage of satisfactory secondary manufacturers results in little value added to the timber resource within the region.

TRENDS IN DEMAND FOR HARDWOOD PRODUCTS

There are several methods that can be used to project demand for hardwood products in Southwest Virginia. A survey on product demand could be sent to forest product companies in the region, and results could be used to make projections. Consumption data could be collected from various hardwood market sources and an econometric model could be constructed that may predict future demand. Both of these methods, however, require in-depth study that can be very expensive and is outside the scope of this project. The general trend of demand will be roughly estimated by looking at published demand projections and by examining factors that influence hardwood demand.

One of the most complete forest products demand studies for the United States was completed by the Forest Service in 1990: **An Analysis of the Timber Situation in the United States: 1989-2040**. Table 8 summarizes this study, showing historical consumption, imports, exports, and production for hardwood lumber and also showing projections for these categories through 2040. Note that both production and consumption are projected to increase by approximately thirty percent over the next forty years. This report also states that regional projections of hardwood lumber production

Table 8. Historical U.S. consumption, imports, exports, and production (MMBF) for hardwood lumber and projections for these categories through 2040.

Year	Consumption	Imports	Exports	Production
1960	8.1	0.3	0.2	8.0
1970	7.9	0.3	0.1	7.7
1976	8.0	0.3	0.2	7.9
1986	10.1	0.3	0.5	10.3
2000	9.9	0.3	0.6	10.2
2010	11.3	0.3	0.6	11.6
2020	12.1	0.3	0.6	12.4
2030	12.9	0.3	0.6	13.2
2040	13.2	0.3	0.6	13.5

will shift in response to changing cost conditions, with a concentration in the Appalachian and Northern regions as Southern hardwood inventories decrease.

The Forest Service study must be interpreted cautiously for several reasons. The report offers no indication of the error in the model used to make projections. There are inevitably errors in the estimates, but the magnitudes of these errors are not addressed. The most important reason to interpret this study cautiously is that it presents only long-term demand projections. While it is encouraging to know that demand will increase over the long term, the most important time period to firm managers is the immediate ten-year future. During this time period capital debts must be repaid and the success of the firm will be determined. Therefore, the demand for the park's products must be more closely examined.

The best method of examining the demand for hardwood products over the immediate future is to examine the factors that influence demand. While this examination will not result in a numerical projection of demand, it will identify the demand trends that will be sufficient for the case study. The two steps in identifying demand trends are investigating factors that affect demand on a national level, and projecting changes in regional hardwood production. Both of these subjects have been examined in a series of studies by William Luppold (1989, 1990, and 1991) and Luppold and Dempsey (1989 and 1994). Luppold found that factors influencing hardwood demand include: demand for hardwood pulpwood, use of hardwoods in structural products, changes in international

markets, changes in the pallet industry, changes in the U.S. population, improving computer technology, furniture demand, and environmental and social factors.

The demand for hardwood pulpwood affects the hardwood lumber market because paper companies must pay premiums when pulpwood inventories are low. When the value of pulpwood increases, loggers merchandise small sawlogs as pulpwood and landowners prematurely harvest hardwood stands. This trend is most important in the South, where there is a large paper production capacity. Pulpwood demand is not as important in the Appalachian and Northern regions, where the use of low-grade timber for pulpwood has actually complimented sawtimber production. These regions generally have a smaller paper-making capacity and have more than ample inventories of low-grade lumber to supply pulp mills.

The increased use of hardwood timber in the production of structural products is very common in the Appalachian region, where mills produce both oriented-strand-board and laminated-veneer products. The large inventories of yellow poplar, soft maple, and other soft hardwoods have attracted the attention of several large producers. The effects of increased demand for timber to feed these mills are both positive and negative. The cost of raw materials for manufacturers using yellow poplar has increased drastically and many landowners have harvested stands of yellow poplar before they reached sawtimber size. A positive effect of increased demand for yellow poplar is that stands that were previously not valuable enough to harvest may be regenerated to contain more desirable species such as red and white oak.

One of the most important influences on the demand for hardwood products over the past two decades has been the increasing level of export of hardwood products. International demand has increased due to the declining dollar, reduced supplies of tropical materials, and the ability of U.S. producers to provide a consistent product. Growth in international demand will be slower in the future, however, because of increasing supplies from other countries such as Russia and China, increasing prices due to increased domestic demand, and uncertainty in foreign economies (Luppold, 1993). The most recent example of economic uncertainty is the variation in Asian markets, which continue to be an important foreign market for American hardwood products.

If export markets have been the most important factor influencing the demand for high-grade hardwood products over the past twenty-five years, then the pallet industry has certainly had the greatest influence on demand for low-grade products. The pallet industry has increased substantially, utilizing approximately forty percent of hardwood lumber production. The pallet industry will, however, become a less important market for hardwood lumber over the next decade (Luppold, 1989). The decreasing use of expendable pallets, the substitution of softwood lumber for hardwood lumber, and competition from cardboard and plastic will impact have a tremendous impact on the demand for low-grade hardwood lumber.

Demographic and social characteristics of the U.S. Population should also influence the demand for hardwood products over the next decade. An increased emphasis on family values could increase the demand for hardwood products such as cabinets, flooring, furniture, and millwork. The age structure of the population is also important because the baby boomers have increasing purchasing power. The demand for home improvements should increase to account for this increase in purchasing power (Luppold, 1991). Furthermore, demand for home improvements will also increase as middle class families continue to improve their homes.

The increasing computer technology will be an important factor in the demand for hardwood products because there will be an increasing number of office jobs. Many of these employees will also have an office at home. The increased demand for office furniture will lead to an increased demand for hardwood lumber (Luppold, 1991).

The demand for furniture is influenced by many factors, including demographics of the U.S. population, competition from international furniture manufacturers, and interest rates. The disposable income of domestic customers will increase due to the increased purchasing power of baby boomers, resulting in a larger demand for furniture products, particularly higher-quality pieces (Sinclair). Competition from furniture imports will focus on lower quality furniture such as "disposable" and ready-to-assemble furniture (Luppold, 1991). Interest rates, which are currently very low, can be expected to increase over the next decade and continue to show variation throughout the period. Interest rates affect furniture demand by influencing the number of housing starts and impact the number of

credit sales of furniture (Sinclair). It is difficult to project demand for furniture because of the amount of the variation and uncertainty in the factors that affect that demand. It is reasonable, however, to say that furniture demand will at least remain stable for the next decade.

The impact of the furniture market on demand for hardwood products will be two-fold. Increasing demand for high quality furniture will likely lead to increase in hardwood demand, particularly in preferred species such as red oak and hard maple. The growing use of composite materials in construction of lower-quality furniture should lead to increased demand for hardwood veneers, as these two products are compliments.

Social pressures on environmental issues have been an important factor in western lumber markets, but have not particularly affected demand for hardwood products because the forests where hardwood timber is produced are predominately privately owned. With the exception of water quality issues, environmental issues have not resulted in regulations on these timberlands. It is difficult to predict whether the social pressures in the future will be sufficient to enact legislation which will regulate the property rights of forest landowners, but the current political climate suggests that these changes would probably not take place in the next decade.

Projecting changes in relative regional demand is a somewhat simpler task than estimating overall hardwood demand. The regional timber supply will affect regional lumber supply because each region's forest are composed of different species, volumes, and grades (Luppold and Dempsey, 1993). Furthermore, outlets for low-grade hardwood lumber will influence regional demand because the absence of these markets result in an upward cost pressure on lumber production (Luppold and Dempsey, 1993). The supply of hardwoods in the South should decrease relative to other regions of the country because of the diminishing hardwood inventory, which is being replaced by softwoods. Luppold (1994) suggests that hardwood supply in the Lake States will reduce because that region is harvesting at levels that are not sustainable. Therefore, demand for hardwood products in the Appalachian and Northern regions should increase relative to the Southern and Lake State regions. The increasing demand for select species such as red and white

oak, maple, and cherry will also cause demand to increase in regions where there are large inventories of those species.

In conclusion, it is difficult to estimate the demand for each particular hardwood product because of the many factors involved in determining that demand. It is reasonable, however, to predict that overall hardwood demand will increase over the next decade. Additionally, it is reasonable to project that hardwood product demand in the Appalachian region will increase in relation to the Southern region, thereby increasing marketshare of the Appalachian manufacturers. Therefore, demand for the products that would be produced in a wood products industrial park in Southwest Virginia should be sufficient to allow the park members to gain marketshare for their products. A key to success will be planning the operation so that it is flexible enough to meet changing demands within the industry. The industrial park concept allows for diversity in products, but also would not spread losses on a particular product among other products, as would occur in a large company producing many different products. Park members should be flexible in their own production line or should be producing for a market where demand is projected to remain strong, such as furniture production.

TECHNICAL PLAN

The technical plan could be written to include every industry that could be a possible member of the park, but there is a very large number of producers that use hardwood lumber as a resource. In particular, there are many specialty products, such as toys, that used virtually the same processes to manufacture different products. Therefore, this technical plan will include only industries that are conceivable within the park that provide local investment opportunities and fit the scale of the park. A large producer, such as a plywood mill, would not make a good park member because the entire park would depend on this mill, but the mill would be essentially independent. Furthermore, resources will generally limit the number of industries that are considered for park membership; this study will consider seven alternatives.

Edge-Glued Dimension Panel Plant

The edge-glued dimension panel plant that is being considered is based on a study by Araman and Hansen (1983). This mill will produce dimension panels that are twenty-six inches wide and are 4/4 and 5/4 thick. The lengths of these panels will range from fifteen inches to one hundred inches. The length distribution is listed in Table 9. These dimension panels will be manufactured from kiln dried lumber by clearing for defect, dressing on all four surfaces, matching for color, and edge-gluing into standard length panels. The range of widths of the strips that compose the panels will be from 1.5 inches to 3.5 inches. Four different species will be used to make the panels, including 50% red oak, 25% white oak, 20% poplar, and 5% hard maple.

The annual production for the edge-glued dimension panel manufacturer will be 1,612.8 msf of 4/4 panels and 552.96 msf of 5/4 panels. Production in the first year is projected to be 75% of that of a normal year, or 1209.6 msf of 4/4 panels and 414.72 msf of 5/4 panels. Annual raw material requirements will be 2650 MBF of 4/4 kiln dried lumber and 1170 MBF of 5/4 kiln dried lumber. The species distribution of raw materials will be the same as the species distribution of products. The grade distribution of raw

Table 9. Length distribution of dimension panels for edge-glued panel manufacturer

Length (inches)	Percentage of Production
15	6.3
18	9.7
21	9.8
25	9.8
29	9.7
33	10.4
38	9.9
45	13.3
50	2.7
60	7.2
75	6.5
100	4.7

materials will be 12% FAS, 20% #1C, 40% #2C, and 28% #3C. The higher grade lumber is required to produce the longer length dimension pieces. Personnel requirements for the operation are five administrative and management employees and thirty labor employees, or a total of thirty-five employees. The by-products of production would include 2308 tons of dry chips and sawdust per year.

Solid Dimension Lumber Manufacturer

The solid dimension lumber manufacturer considered for the park is based on a study by Huber et.al.(1980). This manufacturer will produce varying length hardwood dimension pieces from three to five inches in width and 4/4 thick. The length distribution is listed in Table 10. The species distribution of the dimension pieces is the same as for edge-glued dimension panels: 50% red oak, 25% white oak, 20% poplar, and 5% hard maple. The dimension pieces would be produced by clearing 4/4 lumber of defect, chopping to specified lengths, ripping to width, and dressing. This manufacturer will purchase used equipment to reduce the capital investment in the firm.

The annual production of solid dimension lumber will be 1000 MBF, but production for the first year is projected to be 750 MBF. Raw material requirements will be 2000 MBF of random length, random width 4/4 kiln dried lumber per year. The species distribution of raw materials requirements is the same as the production distribution. The grade of raw materials will be #2C on average, but the study assumes

Table 10. Dimension distribution of solid wood pieces for dimension lumber manufacturer.

Dimensions (inches)	Percentage of MBF Production
16 x 5 x 1	31 %
20 x 5 x 1	32
25 x 3 x 1	7
29 x 3 x 1	14
42 x 3 x 1	16

that the grade distribution is 15% #1C, 70% #2C, and 15% #3C. Because the dimension pieces are relatively of short length, short length lumber can be purchased at a reduced price if available. Personnel requirements are nine labor employees and two administrative and management employees. The by-product from the operation will be 1717 tons of dry chips and sawdust per year.

Pallet Manufacturer

The pallet manufacturer considered for membership in the park is based on a study by White et.al. (1980). This manufacturer produces pallets of various sizes, built to meet customer orders. The most common size for pallets is 48" by 40". The process used to build pallets is to chop lumber to size, cut notches in boards if necessary, and assemble pallets with nails.

Annual production for the pallet manufacturer is projected to be 68,750 pallets; production for the first year is assumed to be 51,563 pallets. The raw material requirements for this operation are 1564 MBF of #2B and #3C green lumber per year. When possible, this lumber should be purchased in specified widths so that ripping is not necessary. The species purchased will depend on the type of pallet being purchased; expendable pallets are generally made of soft hardwoods and permanent pallets are usually constructed from hard hardwoods. This is a labor intensive operation, employing seven labor employees and two administrative personnel. By-products from pallet production are 342 tons of green chips and sawdust per year.

Custom Millwork Manufacturer

The millwork operation will be a small-scale operation that will produce both custom flooring and custom moulding. The custom flooring will be produced from kiln-dried lumber that is cleared for defect, ripped to width if necessary, dressed, and run through the moulder to produce tongue and groove edges. Custom moulding will include chair-railing, wainscoting, crown moulding, and other unfinished custom moulding. The operation will produce a regular product line and will also make special products on an order basis. The moulding is produced from kiln dried lumber that is run through the

moulder and chopped to length. Species of both flooring and moulding will vary, including both traditional species, such as red oak, and other species such as hackberry or sassafras.

The annual production of the millwork operation will be approximately 200 MBF of flooring and the equivalent of 100 MBF of moulding products. The operation is assumed to operate at full capacity during the first year because it is a small-scale manufacturer. Raw material requirements will be 600 MBF per year of kiln dried lumber of various species. The grade distribution is assumed to be 10% FAS, 25% #1C, 45% #2C, and 20% #3C. The higher grade materials will be required to produce long lengths of moulding. Labor requirements will be 4 laborers, 1 laborer/manager, and 1 administrative employee. The by-product from the operation will be 515 tons of dry sawdust per year.

Custom Furniture Manufacturer

The custom furniture manufacturer considered for the park is a small scale operation that will produce a high quality line of furniture and will build custom furniture on an order basis. The operation will purchase parts for furniture and lumber to make parts that cannot be purchased. The parts will be assembled and a finish will be applied to the pieces. The operation will purchase used equipment, particularly saws and other equipment that will have a low utilization rate.

The annual production projection for the custom furniture operation is based on an annual sales basis because of the variety of different products will be produced. The projected annual sales level is \$250,000. Raw materials used by the operation include wood parts, lumber, and hardware required for assembly. In addition, the firm will need to purchase finishing supplies. The firm will employ 5 employees: 3 laborers, 1 laborer/manager, and 1 administrative person. By-products from the operation will be minimal and will be mixed with the by-products of other manufacturers.

Custom Cabinet Manufacturer

The custom cabinet manufacturer is an operation that is very similar to the furniture manufacturer, but the product line is composed of cabinets instead of traditional furniture. This operation will purchase dimension pieces, millwork, and lumber and will assemble cabinets from these materials. Some woodworking will occur, but will mostly be minor work completed during assembly. Only a portion of the cabinets will be finished and the finishing will not generally be as elaborate as finishes for furniture. This operation will also purchase simple and used equipment because of the low utilization rate.

The annual sales projection for the cabinet operation is \$250,000. Production is difficult to predict because the operation is market-oriented. Raw materials used in the production process include dimension parts, lumber, and millwork. Hardware and finishing materials will also be required to complete assembly. The operation will employ three laborers, one manager/laborer, and one secretary. By-products will be relatively the same as for the furniture manufacturer and will be mixed in with the sawdust from other producers.

3.2 Financial Feasibility Analysis

GOALS

There are three primary goals for the wood products industrial park. The first is to meet the minimal acceptable rate of return for each investor, including the shareholders in the development corporation and the owners of the member companies. The minimum acceptable rate of return is assumed to be 15%. The second goal is to provide local investment opportunities, particularly among the park's member companies. The preferred investment level would be less than \$1,500,000. The final goal of the park is to provide local employment opportunities. There is an ample supply of local laborers and Southwestern Virginia Community College offers technical programs to train for other positions.

STARTUP COSTS

The startup costs for the manufacturing alternatives range from \$151,210 for the pallet manufacturer to \$1,579,192 for the edge-glued panel operation. The startup costs for each alternative are listed in Table 11. Differences in startup costs are related to the scale of production and level of mechanization of the production processes. For example, the edge-glued panel operation involves a mechanized process that requires large capital expenditures. In contrast, pallet manufacturing is a labor intensive operation that requires only small machinery cost.

The categories for startup costs are machinery cost, equipment cost, office expenses, working capital, and formation expense. Land and buildings are not a startup cost because the park members will lease manufacturing space from the development corporation. Machinery costs account for expenditures on production machinery such as saws, planers, moulders, etc. Equipment costs include handling system expenses such as

Table 11. Startup costs for manufacturing alternatives for wood products industrial park in Southwest Virginia.

Manufacturer	Start-up Cost				TOTAL
	Equipment	Machinery	Office	Working Capital	
Edge-Glued	\$ 92,450	\$ 683,350	\$ 25,000	\$ 778,392	\$ 1,579,192
Solid Dimension	118,900	133,400	7,250	375,497	635,047
Pallets	26,100	14,500	1,450	109,160	151,210
Millwork	10,000	125,000	1,500	130,780	267,280
Cabinets	25,000	115,000	1,500	44,975	186,475
Furniture	25,000	132,500	1,500	45,623	204,623

forklifts and conveyors. Office expenses would include office furniture, computers, and an inventory of office supplies. Working capital is assumed to be the equivalent of three months of expenses for materials and operating costs. Finally, formation expenses would include legal expenditures for starting the business, business license, and other expenses related to initiating the business.

The total startup cost for the edge-glued dimension panel manufacturer is \$1,579,192 and the capital investment is \$800,800. The startup cost for the solid dimension producer is \$635,047 and the capital investment is \$259,550. The difference in capital investment for these two operations is quite substantial. There are three primary reasons for this difference. The first is that the panel producer will have a much larger production capacity than that of the solid dimension manufacturer. Secondly, the panel operation will perform the additional processing steps of sorting and gluing. Finally, the solid dimension operation will purchase used equipment to reduce capital investments.

The pallet manufacturer faces a relatively small startup cost of \$151,210. The capital investment for this producer is \$42,050. This operation has a low capital investment because the production process is labor intensive, replacing capital with labor. This relationship is illustrated by the fact that the working capital for three months is greater than the capital investment. Most pallet manufacturers are small operations with a cost structure similar to this example.

The millwork operation is a relatively small-scale venture, so start-up cost and capital investment are less than for a typical millwork operation. The startup cost for the millwork operation is \$267,280. Capital investments total \$136,500. This operation will operate used machinery because it has a low production capacity, reducing the need for high machine utilization rates.

The startup costs and capital investments for the custom cabinet and furniture manufacturers are very similar because the two operations are very similar. The startup costs for the cabinet and furniture manufacturers are \$186,475 and \$204,623, respectively. The capital investments are \$141,500 and \$159,000, respectively. Both operations are small-scale and use relatively low-capacity machinery. Furthermore, both manufacturing processes are relatively labor intensive. The differences in startup cost for the two operations are attributes to the simpler production process for the cabinet operation, which requires less machining and finishing.

FINANCING REQUIREMENTS

This financial analysis will assume that the owner of each member manufacturer will invest the total of three months of working capital and formation expenses. The investment of capital by the owner will serve as the beginning cash balance for the firm and will increase the of financing opportunities for capital expenditures because the firm has sizable liquid assets.

Other startup costs such as expenses for capital investments such as machinery, equipment, and office expenses must be financed. This study will assume that these expenses are financed at eight percent for a ten-year period and that payments on this debt will be made quarterly. Table 12 summarizes the debt and payment information for each manufacturing alternative.

Table 12. Summary of financing requirements for manufacturing alternatives for a wood products industrial park in Southwest Virginia.

Manufacturer	Total Debt	Interest Rate	Time Period	Quarterly Payment
Edge-Glued Panels	\$ 800,800	8%	10 Years	\$ 29,274
Solid Dimension	292,550	8	10	9,488
Pallets	42,050	8	10	1,537
Millwork	136,500	8	10	4,990
Cabinets	141,500	8	10	5,173
Furniture	159,000	8	10	5,812

There are a variety of sources that park members can solicit for financing of capital debt, including commercial banks, governmental small business loans, the Rural Electric Administration, and economic development agencies. The preferred loan source should be determined after the financial analysis is finalized and a financial plan has been completed.

PRO-FORMA FINANCIAL STATEMENTS

Complete pro-forma financial statements for all seven manufacturing alternatives can be found in Appendices A-G. Important information from these statements is summarized in Table 13. The various categories for revenues and expenditures are discussed so that there is a complete understanding of the accounting system used in creating statements. The pro-forma statements of individual alternatives will then be briefly analyzed. Statements from year 2 will be examined because this is the first year of normal operation; year 1 statements have been adjusted to account for a startup production schedule.

Table 13. Summary of important data from pro-forma financial statements of feasibility study of manufacturing alternatives for a wood products industrial park in Southwest Virginia..

	Glued Panels	Solid Dimension	Pallets	Millwork	Cabinets	Furniture
Balance Statement						
Cash - Year 0	\$ 778,392	\$ 375,497	\$ 109,160	\$ 130,780	\$ 44,975	\$ 45,623
Cash - Year 10	2,380,291	1,322,912	242,020	326,162	179,747	184,104
Owners Equity - Year 0	597,877	285,375	72,944	86,457	6,039	5,326
Owners Equity - Year 10	2,383,028	1,281,966	206,455	308,470	170,820	178,668
Income Statement						
Gross Sales - Year 1	3,445,812	1,755,661	469,434	554,458	189,299	189,325
Net Income - Year 1	194,250	168,071	21,251	14,900	(1,635)	(5,568)
Gross Sales - Year 10	4,641,969	2,370,302	629,276	744,573	256,618	256,764
Net Income - Year 10	358,172	263,846	36,045	33,862	11,923	9,177
Cash Flow Sheet						
Beginning Cash Balance - Year 1	778,392	375,497	109,160	130,780	44,975	45,623
Total Cash Inflows - Year 1	3,275,078	1,668,629	446,181	526,996	179,924	179,950
Total Cash Outflows - Year 1	3,016,764	1,479,794	421,566	25,820	170,239	172,797
Total Cash Inflows - Year 10	4,414,324	2,254,259	598,271	707,958	244,118	244,264
Total Cash Outflows - Year 10	4,260,717	2,167,534	585,896	19,385	229,807	244,249
Ending Cash Balance - Year 10	2,380,291	1,322,912	242,020	326,162	179,747	184,104

Accounting Categories

The revenues accounted for in financial statements include sales of product, sales of by-product, and interest on working capital. The sales of product are gross sales of various products from the product line of each manufacturer. Sales of by-product includes the sale of sawdust, chips, and other by-products of production. Interest on working capital is the interest earned on the firm's cash balance. This balance is assumed to be invested in a short-term investment that earns four percent.

The primary categories of expenses are raw materials, operating expenses, and income taxes. Raw material expense, also termed cost of goods sold, includes costs for wood inputs to the production process. Hardwood lumber would be the raw material input for secondary manufacturers and processed wood products would be materials for tertiary manufacturers. Raw material costs tend to be a large percentage of total operating cost,

suggesting that utilization of raw material is an important factor in financial success for these firms.

Labor and administrative costs are the first group of operating expenses. Labor expenditures are compensation for production employees, including wages, benefits, workers' compensation, and other costs. Administrative expenses include several different expenditures. The primary administrative costs are the salary, benefits, and bonuses for administrative personnel such as managers, supervisors, and secretaries. Other administrative costs would include professional fees, insurance, property tax, and office expenses.

Lease costs would include the monthly payments for the use of industrial space within the park. The members of the park would each enter a long-term lease with the development corporation when the park has been developed. This lease would include land, buildings, parking, and industrial utility hookups. The lease would also each member's share of the costs of infrastructure and park services. Although park members would not be responsible for real property, they would be responsible for expenses for machinery, equipment, and other production expenses.

The third category of operating costs includes expenses for utilities and supplies and maintenance. Utility expenses would include payments for monthly service of industrial utility services such as electricity, gas, water and sewer, and telephone. Supplies and maintenance costs would include expenditures for items such as hardware, glue, and varnish, as well as outlays for regular and breakdown maintenance of equipment and machinery.

The expense categories for payments and depreciation account for costs associated with purchasing and owning equipment and machinery. Payments on debts for these capital investments are made quarterly and are divided into principle and interest. The income statement shows that principle is considered an operating cost and interest is subtracted to determine Earnings Before Taxes. Depreciation accounts for the cost of a plant asset over the useful life of that asset. Although depreciation is not a cash expense, it is a tax deduction and is therefore considered an operating cost.

The final group of operating expenses is marketing fees, which account for the cost of sales. Marketing fees are paid to the marketing corporation to compensate for inventory costs, sales staff salaries and benefits, and in-park transportation. The preliminary analysis of manufacturing alternatives assumes that the marketing fee will be five percent of gross sales. This expense will be adjusted to account for real sales cost when financial statements for the marketing corporation have been completed. The financial feasibility of manufacturing alternatives will then be re-evaluated to assure that they are still feasible.

Income tax expenses are estimated to be twenty-eight percent of the taxable income on the pro-forma income statement. An operating business makes quarterly tax payments based on projected income and adjustments are made at the end of the fiscal year. Refunds are received if income is overestimated and additional tax payments are made if income is underestimated. Because the financial statements used in the analysis are based on projections, quarterly tax payments are shown on the cash flow statement and no year-end adjustment is necessary.

Dividends to shareholders are not technically an expense, but are shown on the cash flow statement as a cash outflow. No dividend is paid during the first year because earnings are retained in order to increase working capital to the level required for normal production levels. In the subsequent years of operation, dividends of seventy percent of net income will be distributed. These dividends reduce owners' equity in the business and provide return on shareholders' investment. The remainder of net income is retained by the business to increase working capital and to allow for future business expansions.

There are several entries on the balance sheet that must be also addressed. The cash entry in the year 0 pro-forma balance sheet represents the owners' initial investment in the firm, which is the equivalent of the sum of the first three months' operating expenses and raw materials cost. The average collection and average payment periods are assumed to be forty-five days. Therefore, accounts receivable is the equivalent of forty-five days of sales and accounts payable is equivalent to forty-five days of operating costs. Finally, taxes payable is assumed to be zero because the balance statements are based on the end of the fiscal year, when the firm has no income tax obligation.

Pro-forma Statements of Manufacturing Alternatives

The following section will outline assumptions made in arriving at projections for use in pro-forma financial statements and will compare the cost structures of the different manufacturing alternatives. Two general guidelines were used in determining lease and marketing costs for each manufacturer. The lease was determined by estimating needs for land, improvements, and maintenance and capitalizing those costs over thirty years. Although thirty years is a long period, it is used because the park is considered a long-term investment and capitalizing over a long period will reduce the amount of the monthly payments. The second assumption made for all manufacturers is that marketing fees will be five percent of gross sales, as previously discussed.

Costs for the edge-glued panel and solid dimension manufacturers were generally updated from studies by Araman and Hansen (1983) and Huber et.al. (1980), respectively, by the producers price index. Exceptions to this method are found in projections of revenues and raw material cost. The revenues for the edge-glued panel manufacturer were estimated by multiplying current market prices by the production levels in the study. The current panel prices listed in Table 14 were determined by contacting several manufacturers in Southwest Virginia. It is important to determine prices for each length produced because the relationship between length and per-unit price is not linear and is not easily estimated. The price for sawdust and scraps was assumed to be \$20/ton. It is also important to note that the utilization rate of 65% in Araman and Hansen's (1983) study was increased to 75% for this feasibility analysis. The increase was necessary to account for changes in technology that correspond to increased raw material prices since the publication of the study. Profitability of the panel manufacturer are very sensitive to changes in utilization rate because raw materials make up such a large percentage of total costs. Finally, the raw material cost was estimated by multiplying the raw material requirements by current prices from the Hardwood Market Report.

The revenues for the solid dimension manufacturer were determined by the same method as for panels. The prices found in Table 15 were determined by contacting producers in Southwest Virginia and asking prices for each specific product. The price for

Table 14. Edge-glued panel prices (\$/bd.ft.) in Southwest Virginia for various lengths and species.

Length (inches)	4/4 thickness				5/4 thickness			
	R. Oak	W. Oak	Y. Poplar	H. Maple	R. Oak	W. Oak	Y. Poplar	H. Maple
15	1.36	1.12	0.88	1.29	1.70	1.50	1.11	1.66
18	1.38	1.14	0.89	1.32	1.73	1.52	1.13	1.69
21	1.43	1.18	0.92	1.36	1.79	1.57	1.17	1.75
25	1.48	1.22	0.95	1.40	1.85	1.62	1.21	1.80
29	1.52	1.26	0.98	1.45	1.90	1.67	1.24	1.86
33	1.57	1.30	1.01	1.49	1.96	1.72	1.28	1.91
38	1.62	1.33	1.04	1.53	2.02	1.77	1.32	1.97
45	1.68	1.39	1.09	1.60	2.11	1.85	1.38	2.06
50	1.75	1.45	1.13	1.67	2.19	1.93	1.43	2.14
60	1.85	1.52	1.19	1.75	2.31	2.03	1.51	2.25
75	2.05	1.70	1.33	1.95	2.57	2.26	1.68	2.51
100	2.77	2.29	1.79	2.63	3.46	3.04	2.26	3.38

Source: Summit Dimension Manufacturing (1998)

sawdust and scraps was assumed to be \$20/ton. Other financial data was simply updated from the study by Huber et.al (1980). Raw material cost was estimated by using lumber prices from the Hardwood Market Report.

The financial projections for the pallet manufacturer were determined by using the PPI to update data from the study by White et.al. (1980). Because this is a labor intensive operation where technology has had little impact, the cost structure can be assumed to have remained relatively constant since the date of the study. Prices from the Hardwood Market Report was used to estimate raw material cost.

The pro-forma financial statements for the millwork operation were constructed from revenue and cost projections for a hypothetical mill. Raw material costs were projected by using prices from the Hardwood Market Report and estimates of raw material demand. The price for flooring was taken from the Weekly Hardwood Review. The high-end flooring price was used because the products of the operation will receive a premium because they are custom products. Millwork prices were estimated to be \$3000/MBF. This estimate is found to be very conservative when compared to

Table 15. Solid dimension prices (\$/bd.ft.) in Southwest Virginia for various dimensions and species.

Dimensions (inches)	Red Oak	White Oak	Yellow Poplar	Hard Maple
16x5	2.75	2.27	1.78	2.61
20x5	2.75	2.27	1.78	2.61
25x3	2.25	1.86	1.45	2.14
29x3	2.25	1.86	1.45	2.14
40x3	2.40	1.98	1.55	2.28

Source: Summit Dimension Manufacturing (1998)

standard pine millwork from local sources. Other financial projections for the millwork operation can be found in Appendix E.

The pro-forma statements for custom cabinet and furniture operations were also based on cost and revenue projections for hypothetical manufacturers. These operations are very similar and the pro-forma statements are also similar. The annual sales for both operations was assumed to be \$250,000 because it is difficult to project annual production or per-unit price for custom products. The cost projections for these manufacturers can be found in Appendices F and G.

Analysis of Pro-Forma Financial Statements

The cost structures for the different manufacturing alternatives for the park can be compared by examining Table 16, which shows the percentage of total cost for each cost category. The operations are best compared at different manufacturing levels: secondary and tertiary.

The most important observation about the cost structures for secondary manufacturers is that raw materials are a large portion of total cost for all alternatives. Raw material cost is largest for the solid dimension operation, where there are the fewest production steps.

The pallet operation has a smaller relative raw material cost because the production process for this operation is more complex. The relative importance of raw material cost suggests that profitability of the secondary producers will be sensitive to raw material costs and that utilization will be important for these operations.

Table 16. Percentage of total cost in each cost category for manufacturing alternatives for wood products industrial park in Southwest Virginia.

	Glued Panels	Solid Dim.	Pallets	Millwork	Cabinets	Furniture
Raw Materials	70.0 %	74.6 %	63.8 %	66.7 %	30.5 %	30.1 %
Labor	9.2	10.1	13.2	11.6	26.1	25.8
Utilities	1.2	2.0	2.1	2.9	2.9	5.8
Supplies and Maintenance	3.2	0.7	0.5	2.9	5.9	5.8
Administrative	5.6	7.8	11.8	5.8	11.8	11.6
Lease	2.2	0.9	2.2	1.7	5.0	5.0
Market Fees	5.6	5.9	5.3	5.4	5.4	5.4
Depreciation	1.6	1.1	0.6	1.5	4.9	5.5
Principle Payments	1.5	1.0	0.5	1.5	4.6	5.1

Labor is the second largest cost category for the secondary manufacturing alternatives. The labor-administrative ratio is an interesting measure to examine for these producers. This ratio is larger for operations that have more production employees, such as the solid dimension manufacturing. The pallet operation has a smaller ratio of labor-administrative costs because it has fewer employees and because the foreman for this operation is also involved in the production process. The labor-administrative cost ratio for the millwork producer is higher than would be expected for this small operation because the administrative personnel are less involved in the production process.

A final important note on secondary manufacturing alternatives is that depreciation and principal costs are larger proportions of total cost for operations that require large capital investments. The edge-glued panel manufacturer has the largest relative depreciation and principal costs because of the large expense of the machinery and equipment. The pallet manufacturer has relatively small depreciation and principal cost because this operation is labor intensive and requires only a small capital investment.

The operating costs for tertiary manufacturing alternatives are better distributed among cost categories. The most important difference between these operations and the secondary alternatives is that relative raw material cost is much less and that relative labor costs are much greater. The tertiary manufacturing alternatives are much more labor

intensive operations, so there will be less management emphasis on production output and more emphasis on quality of workmanship. Administrative cost is also more important for these operations because they have fewer employees and the manager is also a production employee.

FINANCIAL FEASIBILITY OF MANUFACTURING ALTERNATIVES

The financial feasibility of manufacturing alternatives was evaluated using net present value, internal rate of return, and payback period. Net present value was calculated using a fifteen percent discount rate. Alternatives with a positive net present value are considered feasible operations. Internal rate of return was calculated to show the true return on investment for each alternative. Payback period was computed to evaluate the importance of risk associated with cash flows. The yearly cash flows for a ten year period and the financial evaluation criterion are found in Table 17. Owners' equity at the end of the period was treated as a Year 10 cash flow so that equity was considered in the analysis.

All manufacturing alternatives are feasible by the standards of this study. The net present values range from \$29,370 for the custom furniture operation to \$1,175,653 for the solid dimension operation. The internal rate of return ranges from 18.99% for the pallet operation to 44.52% for the solid dimension manufacturer. The payback period is as low as 2.9 years for the solid dimension producer and is as long as 9 years for the furniture operation. The shorter payback period for the secondary manufacturing alternatives is important because it reduces the risk associated with investment in these operations. The lumber market is quite variable and these operations are particularly sensitive to changes in raw material price. The longer payback periods for the tertiary manufacturers is not as important because these operations have more steady cash flows.

Table 17. Summary of feasibility analysis for manufacturing alternatives for wood products industrial park in Southwest Virginia.

Year	Industry					
	Edge-Glued Panels	Solid Dimension	Pallets	Custom Millwork	Cabinets	Furniture
	----- Annual Cash Flow -----					
0	(778,392)	(375,497)	(109,160)	(130,780)	(44,975)	(45,623)
1	0	0	0	0	0	0
2	242,926	183,373	24,963	22,153	6,549	4,371
3	246,058	185,141	25,215	22,548	6,841	4,677
4	249,214	186,923	25,470	22,946	7,134	4,985
5	252,392	188,717	25,726	23,347	7,430	5,296
6	255,593	190,525	25,984	23,751	7,728	5,609
7	258,817	192,345	26,243	24,158	8,029	5,924
8	262,064	194,178	26,505	24,568	8,831	6,241
9	265,335	196,025	26,768	24,981	8,635	6,561
10	2,651,657	1,479,851	136,194	333,866	179,762	185,551
NPV	859,396	725,267	24,686	42,533	28,383	20,663
IRR	29.30%	38.96%	18.99%	19.64%	22.48%	20.28%
Payback	4.2	3.0	5.3	6.7	7.1	9.0

PARK FORMATION ALTERNATIVES

Chapter 2 included a discussion on the three steps to be used in creating park formation alternatives: list product supply and raw material demand for each manufacturing alternative, create product flow accounts to track product flow through the park, and match primary manufacturing facilities to demand for lumber. The completion of all three tasks may seem excessive for the simple problem in the case study, but would be necessary in more complex cases where many different manufacturing alternatives were being considered. Tracking product flow through the park and determining primary product demand can be difficult in these large cases.

Table 18. Raw material requirements for manufacturing alternatives for a wood products industrial park in Southwest Virginia.

Manufacturer	Material	Volume Required
Edge-Glued Panels	4/4 Dry Lumber	
	FAS	318 MBF
	#1C	530
	#2C	1060
	#3A	742
	5/4 Dry Lumber	
	FAS	140 MBF
	#1C	234
	#2C	468
	#3A	328
Solid Dimension	4/4 Dry Lumber	
	#1C	150 MBF
	#2C	700
	#3A	150
Millwork	4/4 Dry Lumber	
	FAS	60 MBF
	#1C	150
	#2C	270
	#3A	120
Pallets	4/4 Green Lumber	
	#2C	782 MBF
	#3C	782
Cabinets	4/4 Dry Lumber	
	FAS	1.80 MBF
	#1C	1.67
	#2C	2.23
	Dimension Panels	
	26"x25"	5.41 MBF
	26"x29"	7.90
	26"x45"	11.90
	Dimension Pieces	
	16"x5"	0.73 MBF
	20"x5"	0.73
	25"x3"	0.89
	29"x3"	0.89
	40"x3"	0.83
Moulding	1.00 MBF	
Furniture	4/4 Dry Lumber	
	FAS	3.00 MBF
	#1C	3.34
	#2C	4.46
	Dimension Panels	
	26"x15"	5.98 MBF
	26"x25"	5.41
	26"x45"	4.76
	26"x75"	3.90
	26"x100"	2.89
	Moulding	1.00 MBF

Table 19. Production of manufacturing alternatives for a wood products park in Southwest Virginia.

Manufacturer	Product	Volume/Quantity Produced
Edge-Glued Panels	Dimension Panels	
	26"x15"	109 MBF
	26"x18"	168
	26"x21"	169
	26"x25"	169
	26"x29"	168
	26"x33"	180
	26"x38"	171
	26"x45"	230
	26"x50"	47
	26"x60"	124
	26"x75"	112
26"x100"	81	
Solid Dimension	Dimension Pieces	
	16"x5"	310 MBF
	20"x5"	320
	25"x3"	70
	29"x3"	140
40"x3"	160	
Millwork	Custom Flooring	200 MBF
	Custom Mouldings	100 MBF
Pallets	Pallets	68750 Pallets
Cabinets	Cabinets	1000 Pieces
Furniture	Furniture	1000 Pieces

The production and raw material requirements for each of the manufacturing alternatives are found in Tables 18 and 19. There are several important relationships that can be found in this data. The first important observation is that there is a great variance in the scale of the alternatives. The most obvious difference is found between the scales of production for the dimension mills and the custom cabinet and furniture operations. Larger furniture manufacturers would better match the other park members, but available marketshare for a large furniture or cabinet producer is questionable. Furthermore, the smaller producers would offer smaller investment opportunities to local investors. The second important observation is that the best opportunities for transfer of products within the park is between secondary and tertiary manufacturers. This relationship is vital in increasing the value-added within the park and within the region. Attracting new

industries that could utilize the park's products in their production process would be an immediate task of the development corporation.

Create Product Flow Accounts

Three different park formation alternatives were created: all manufacturing alternatives (Formation 1), only secondary manufacturing alternatives (Formation 2), and only secondary producers that provide breakdown of lumber into dimension parts, flooring, or moulding (Formation 3). Illustrations in Figures 11, 12, and 13 aid in distinguishing between the three park formation alternatives.

Product flow accounts found in Tables 20, 21, and 22 list information that is important in designing the primary manufacturing and marketing corporations. These tables are also useful in creating pro-forma financial statements for the development corporation and its subsidiaries.

The internal transfer of products for each park formation alternative is found in the “in-park sales” accounts. Note that the only internal transfer of non-primary products occurs only in Formation 1, where there are tertiary manufacturers. The “external sales” accounts shows the volume of each non-primary product that the marketing corporation will need to sell outside of the park. This information is important in determining the amount of inventory space and size of the sales force needed by the marketing corporation.

The “external sales” accounts in Tables 20, 21, and 22 are also important because they shows the volume of lumber demanded by the secondary and tertiary manufacturers in each park formation alternative. The primary manufacturing corporation must produce at least enough lumber to meet these demands. The volume of lumber that would be produced in each formation was determined by assuming that the logs that would be procured for the park would be a mixture of Grade 2 and 3 logs. Yield tables in Hanks et.al (1980) show that this mixture of logs will yield lumber in grade proportions that

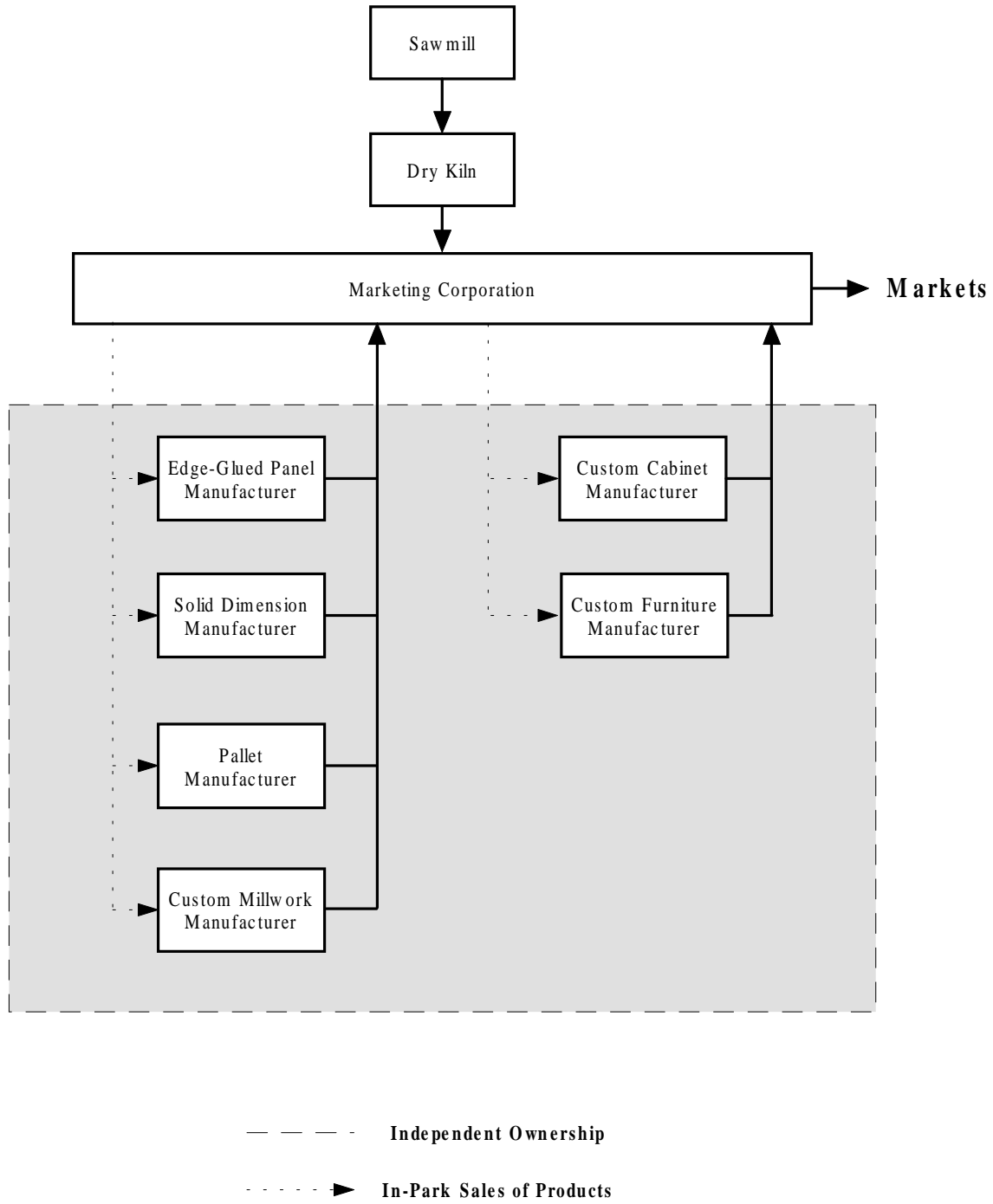


Figure 8. Diagram of Formation Alternative 1 for a wood products industrial park in Southwest Virginia.

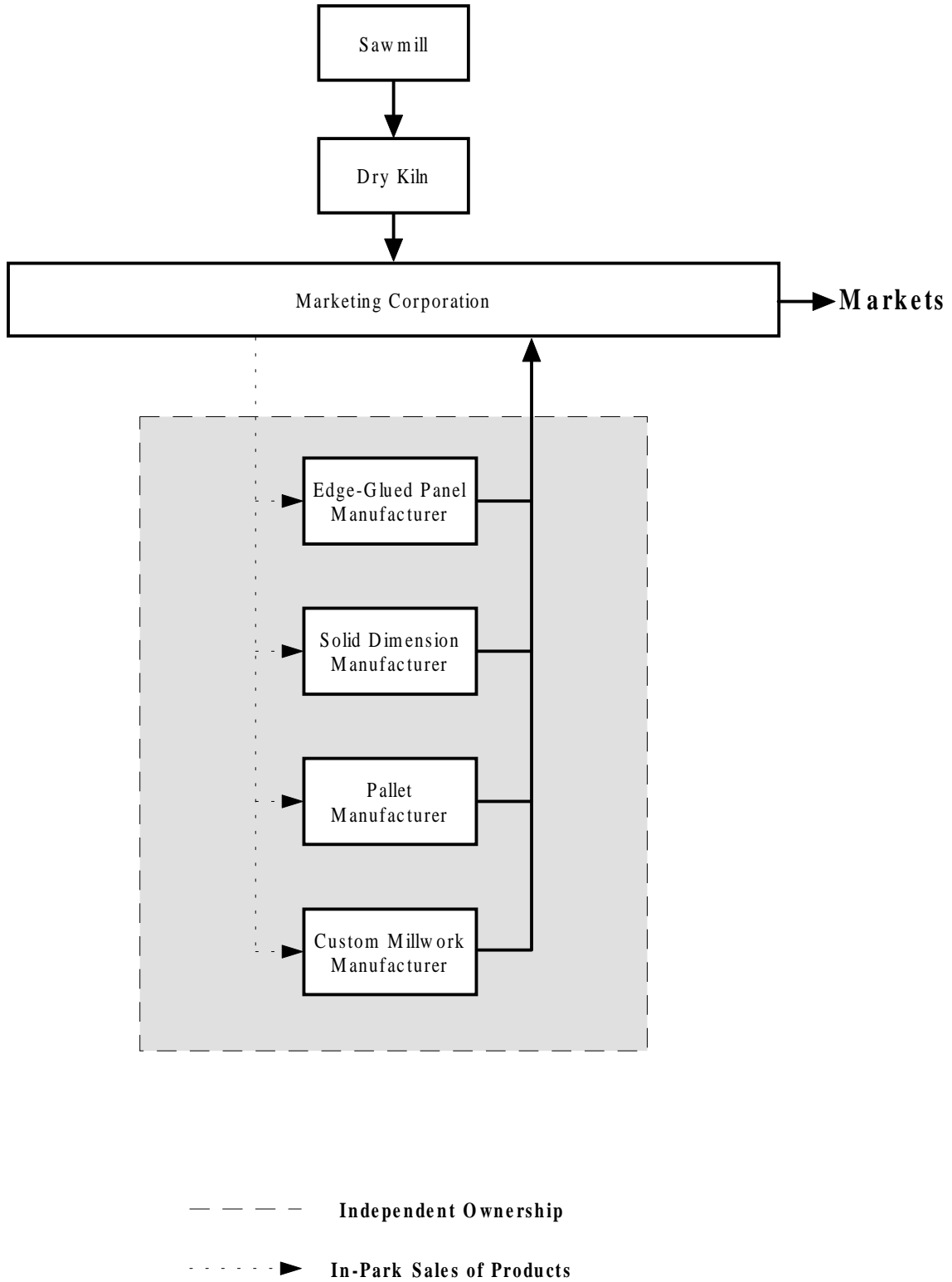


Figure 9. Diagram of Formation Alternative 2 for a wood products industrial park in Southwest Virginia.

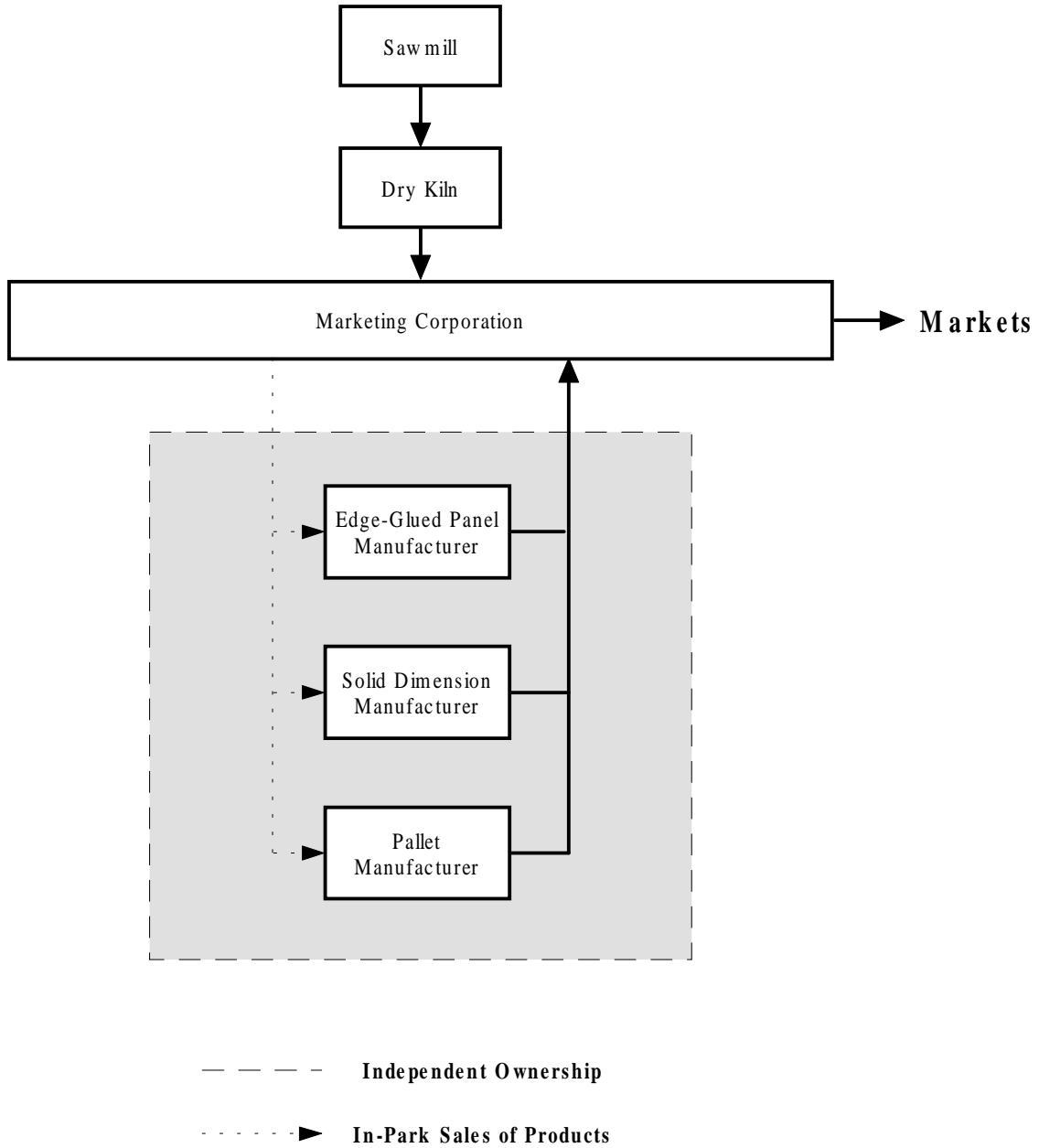


Figure 10. Diagram of Formation Alternative 3 for a wood products industrial park in Southwest Virginia.

Table 20. Park production and in-park and external sales (assuming unlimited lumber production) for Formation Alternative 1 of a wood products industrial park in Southwest Virginia

Product	Park Member Production	Total Sales	
		In-Park	External
4/4 Lumber			
Green #2C		782.0 MBF	
Green #3A		782.0	
Dry FAS		382.5	
Dry #1C		835.0	
Dry #2C		2036.7	
Dry #3A		1012.0	
5/4 Lumber			
Dry FAS		140.0 MBF	
Dry #1C		234.0	
Dry #2C		468.0	
Dry #3A		328.0	
26" Dimension Panels			
15"	108.9 MBF	5.9 MBF	103.0 MBF
18"	167.7		167.7
21"	169.4		169.4
25"	169.4	10.8	158.6
29"	167.7	7.9	159.8
33"	179.8		179.8
38"	171.2		171.2
45"	229.9	16.7	213.3
50"	46.7		46.7
60"	124.5		124.5
75"	112.4	3.9	108.5
100"	81.3	2.9	78.4
Dimension Pieces			
16"x5"	310.0 MBF	0.7 MBF	309.3 MBF
20"x5"	320.0	0.7	319.3
25"x3"	70.0	0.9	69.1
29"x3"	140.0	0.9	139.1
40"x3"	160.0	0.8	159.2
Flooring	200.0 MBF		200.0 MBF
Moulding	100.0 MBF	2.0 MBF	98.0 MBF
Pallets	68750 Pallets		68750 Pallets
Cabinets	1000 Pieces		1000 Pieces
Furniture	1000 Pieces		1000 Pieces

Table 21. Park production and in-park and external sales (assuming unlimited lumber production) for Formation Alternative 2 of a wood products industrial park in Southwest Virginia.

Product	Park Member Production	Total Sales	
		In-Park	External
4/4 Lumber			
Green #2C		782.0 MBF	
Green #3A		782.0	
Dry FAS		378.0	
Dry #1C		830.0	
Dry #2C		2030.0	
Dry #3A		1012.0	
5/4 Lumber			
Dry FAS		140.0 MBF	
Dry #1C		234.0	
Dry #2C		468.0	
Dry #3A		328.0	
26" Dimension Panels			
15"	108.9 MBF		108.9 MBF
18"	167.7		167.7
21"	169.4		169.4
25"	169.4		169.4
29"	167.7		167.7
33"	179.8		179.8
38"	171.2		171.2
45"	229.9		229.9
50"	46.7		46.7
60"	124.5		124.5
75"	112.4		112.4
100"	81.3		81.3
Dimension Pieces			
16"x5"	310.0 MBF		310.0 MBF
20"x5"	320.0		320.0
25"x3"	70.0		70.0
29"x3"	140.0		140.0
40"x3"	160.0		160.0
Flooring	200.0 MBF		200.0 MBF
Moulding	100.0 MBF		100.0 MBF
Pallets	68,750 Pallets		68,750 Pallets

Table 22. Park production and in-park and external sales (assuming unlimited lumber production) for Formation Alternative 3 of a wood products industrial park in Southwest Virginia.

Product	Park Member Production	Total Sales	
		In-Park	External
4/4 Lumber (MBF)			
Green #2C			
Green #3A			
Dry FAS		378.00 MBF	
Dry #1C		830.00	
Dry #2C		2030.00	
Dry #3A		1012.00	
5/4 Lumber (MBF)			
Dry FAS		140.00 MBF	
Dry #1C		234.00	
Dry #2C		468.00	
Dry #3A		328.00	
26" Dimension Panels (MBF)			
15"	108.9 MBF		108.9 MBF
18"	167.7		167.7
21"	169.4		169.4
25"	169.4		169.4
29"	167.7		167.7
33"	179.8		179.8
38"	171.2		171.1
45"	229.9		229.9
50"	46.7		46.7
60"	124.5		124.5
75"	112.4		112.4
100"	81.3		81.3
Dimension Pieces (MBF)			
16"x5"	310.0 MBF		310.0 MBF
20"x5"	320.0		320.0
25"x3"	70.0		70.0
29"x3"	140.0		140.0
40"x3"	160.0		160.0
Flooring (MBF)	200.0 MBF		200.0 MBF
Moulding (MBF)	100.0 MBF		100.0 MBF

most closely match the needs of the park. Table 23 shows accounts for lumber that have been adjusted to consider the production of the sawmill and dry kilns.

The volumes in the “external sales” account of Table 23 represent lumber that must be sold outside of the park each year. Note that the largest concentration of this lumber is in the high-grade categories. This grade distribution is important because there is a larger profit margin in producing and drying high-grade lumber than in low-grades. The lower-grade surplus lumber may not be dried, but instead would be sold as green products such as mine props or railroad ties. An strong log procurement strategy would also help to decrease the surplus volume of low-grade lumber.

Excess primary manufacturing capacity is advantageous to the park for three reasons. The excess capacity provides opportunity for easy expansion in the park in the future. The park will likely be a dynamic entity and should therefore be planned with attention to flexibility. The excess capacity, in conjunction with inventories, would also account for peaks in demand by park members. Finally, although the agreements between the primary corporation and park members are the most important factor in marketing lumber produced in the park, excess capacity would give the park the option to sell lumber and other primary products outside of the park.

Table 23. Lumber production (MBF) and in-park and external lumber sales (MBF) for three park formation alternatives for wood products industrial park in Southwest Virginia.

Product	Formation 1			Formation 2			Formation 3		
	Production	In-Park Sales	External Sales	Production	In-park Sales	External Sales	Production	In-Park Sales	External Sales
4/4 Lumber (MBF)									
Green #2C	782.0	782.0	0.0	782.0	782.0	0.0			0.0
Green #3A	782.0	782.0	0.0	782.0	782.0	0.0			0.0
Dry FAS	516.0	382.5	133.5	516.0	378.0	138.0	516.0	378.0	138.0
Dry #1C	1715.1	835.0	880.1	1715.1	830.0	885.1	1715.1	830.0	885.1
Dry #2C	2074.1	2036.7	37.4	2074.1	2030.0	44.1	2074.1	2030.0	44.1
Dry #3A	1391.0	1012.0	379.0	1391.0	1012.0	379.0	1391.0	1012.0	379.0
5/4 Lumber (MBF)									
Dry FAS	172.6	140.0	32.6	172.6	140.0	32.6	172.6	140.0	32.6
Dry #1C	409.5	234.0	175.5	409.5	234.0	175.5	409.5	234.0	175.5
Dry #2C	470.9	468.0	2.9	470.9	468.0	2.9	470.9	468.0	2.9
Dry #3A	409.5	328.0	81.5	409.5	328.0	81.5	409.5	328.0	81.5

Design of Primary Manufacturing Facilities

The final step in creating park formation alternatives is to match primary manufacturing and marketing facilities to the demands of the park. The primary corporation for Formation 1 operates a bandmill producing approximately 8725 MBF per year and dry kilns producing approximately 7160 MBF annually. The mill is a typical band mill with a ring debarker, a bandsaw, a linebar resaw, a band edger, a dropsaw trimmer, and a greenchain. The kiln facilities consist of two 65 MBF kilns, a 45 MBF kiln, a 30 MBF kiln, and a 815 MBF predrier. Oak lumber is predried to a moisture content of thirty percent and then kiln-dried to a moisture of nine percent. The larger kilns will be used primarily for drying oak. Poplar and hard maple are air-dried before being kilned, with hard maple being air-dried in drying sheds that provide protected from precipitation. The kiln facilities are somewhat oversized, but allow for a conservative drying schedule and future expansion. This kiln setup will be used in all three primary corporations because the demand for kiln-dried lumber remains constant in all formation alternatives. The primary corporation will employ nineteen production workers, three maintenance workers, and three administrative personnel.

The marketing corporation for Formation 1 is composed of a sales staff and warehouses for lumber and finished goods. The lumber is stored in closed buildings with a floor and a non-controlled environment. It is a priority that the marketing corporation monitor the moisture content of lumber and strategically plan inventory to prevent moisture from entering the wood. The marketing corporation should also work closely with the primary manufacturing corporation to schedule production to meet the demands of customers. The inventory space for lumber, assumed to be for two full kiln charges, is approximately 64,000 sq.ft.

The finished goods are stored in a warehouse with a controlled environment. The inventory level is assumed to be three weeks production of both glued panels and solid dimension pieces. The custom products should need little storage space because they are generally delivered upon production. Storage space for these products, however, was assumed to be sufficient for eight days production. The pallets do not require controlled

storage because they are made of green lumber and are stored outdoors. The total space in the finished goods warehouse for Formation 1 is 55,212 sq.ft.

The primary corporation for Formation 2 is the same as that for Formation 1 because the lumber requirements are essentially the same. The volume of lumber demanded by the custom cabinet and furniture operations is minimal when compared to the total lumber demand, so it is assumed that this demand is simply added to the lumber surplus and sold outside of the park.

The marketing corporation also changes only slightly to account for the absence of the cabinet and furniture manufacturers. The finished good warehouse space decreases by 3462 sq.ft. The total of variable expenses such as labor, utilities, and maintenance is also less than for Formation 1. The total change in the marketing corporation is minimal because these two operation are much smaller in scale than the other park members.

The final formation alternative has changes in both the primary manufacturing corporation and the marketing corporation to account for the absence of the pallet manufacturer. The sawmill will produce only 7160 MBF in comparison to annual production of 8725 MBF in Formations 1 and 2. This mill's capital investment will be the same as that for other formation alternatives because the same machinery and equipment is required to produce at both production levels. Because variable costs remain the same, the total of variable expenses during the year will be less than for other formations. The cost structure of the mill in this formation suggests that the per unit cost of milling will be higher than for other alternatives because machinery is not fully utilized. Drying facilities are the same as for the two previous formation alternatives because the demand for kiln dried lumber is the same.

The marketing corporation will see only small changes due to the loss of another park member. The pallet manufacturer did not require warehouse space and therefore the only change is the total variable cost associated with selling pallets.

FINANCIAL FEASIBILITY OF DEVELOPMENT CORPORATION ALTERNATIVES

The process for determining the financial feasibility of the development corporation for the different park formation alternatives is similar to that used to determine the feasibility of secondary manufacturers. The first step is to create pro-forma financial statements for the primary manufacturing, marketing, and development corporations. These statements are summarized in Table 24. Complete financial statements for the development corporation and its subsidiaries can be found in the Appendices.

The operating costs for the primary manufacturing corporation include labor, utilities, supplies and maintenance, administrative, lease, and marketing fees. The labor costs were projected by estimating the number of employees and the wages and benefits for those employees. Utility expenses were projected by estimating electrical needs based on a study by Patterson and Brock (1986) and determining electrical expense by contacting American Electrical Power, who provides service in the region. Supply and maintenance expenses were projected by estimating wages and benefits for maintenance employees for the sawmill and adding other sawmill maintenance costs and the kiln supply and maintenance expense. Kiln supply and maintenance expense was estimated as a percent of total capital investment, where the percentage rate was the same as that for the sawmill and panel producer. Administrative expenses were projected by summing the salaries and benefits for administrative personnel and an estimate of other administrative expenses for professional services, insurance, property tax, and other administrative expenses. The estimate for lease expenses was based on the building and land requirements. Finally, market fees were projected by allocating a proportion of marketing corporation's total cost to the primary corporation.

Other important financial estimates for the primary manufacturing corporation were those for raw material costs, capital investment, revenues, and payments to the development corporation. The raw material cost projection was based on the estimated log needs of the mill and prices from Timber-Mart South that were adjusted to account for logging and delivery expenses. Costs for boiler fuel were also calculated. Capital

Table 24. Summary of pro-forma financial statements for development corporation and its subsidiaries in a wood products industrial park in Southwest Virginia.

	Formation 1	Formation 2	Formation 3
Balance Statement			
Development Corporation			
Cash - Year 0	\$ 7,096,424	\$ 7,070,789	\$ 6,991,439
Cash - Year 10	6,519,673	6,445,336	5,951,562
Owner's Equity - Year 0	12,507	12,509,424	12,417,460
Owner's Equity - Year 10	15,074,558	15,040,817	14,425,902
Primary Manufacturing Corporation			
Cash - Year 0	\$ 6,075,848	\$ 6,075,848	\$ 6,047,230
Cash - Year 10	6,971,524	6,971,524	6,874,055
Owner's Equity - Year 0	11,799,244	11,799,244	11,776,069
Owner's Equity - Year 10	8,918,048	8,918,048	8,825,277
Marketing Corporation			
Cash - Year 0	\$ 377,954	\$ 367,387	\$ 323,018
Cash - Year 10	350,822	340,911	296,851
Owner's Equity - Year 0	567,247	554,446	479,398
Owner's Equity - Year 10	369,436	356,507	305,606
Income Statement			
Development Corporation			
Gross Sales - Year 1	\$ 374,957	\$ 345,876	\$ 333,182
Net Income - Year 1	(6,925,817)	(6,908,640)	(6,832,935)
Gross Sales - Year 10	4,250,924	4,218,058	3,911,993
Net Income - Year 10	2,486,845	2,488,879	2,279,674
Primary Manufacturing Corporation			
Gross Sales - Year 1	\$ 4,638,828	\$ 4,638,828	\$ 4,335,636
Net Income - Year 1	(3,063,621)	(3,063,621)	(3,252,344)
Gross Sales - Year 10	6,345,500	6,345,500	5,925,019
Net Income - Year 10	3,594,364	3,594,364	3,326,510
Marketing Corporation			
Gross Sales - Year 1	\$ 500,743	\$ 459,070	\$ 426,174
Net Income - Year 1	(191,072)	(190,476)	(166,256)
Gross Sales - Year 10	660,879	605,480	562,314
Net Income - Year 10	72,539	70,856	62,618
Cash Flow Sheet			
Development Corporation			
Beginning Cash Balance - Year 1	\$ 7,096,424	\$ 7,070,789	\$ 6,991,439
Dividends - Year 1	0	0	0
Dividends - Year 2	1,677,538	1,680,185	1,530,720
Dividends - Year 10	1,865,134	1,866,659	1,709,756
Ending Cash Balance - Year 10	6,519,673	6,445,336	5,951,562
Primary Manufacturing Corporation			
Beginning Cash Balance - Year 1	\$ 6,075,848	\$ 6,075,848	\$ 6,047,230
Dividends - Year 1	0	0	0
Dividends - Year 2	3,473,006	3,473,006	3,200,890
Dividends - Year 10	3,594,364	3,594,364	3,326,510
Ending Cash Balance - Year 10	6,971,524	6,971,524	6,874,055
Marketing Corporation			
Beginning Cash Balance - Year 1	\$ 377,954	\$ 367,387	\$ 323,018
Dividends - Year 1	0	0	0
Dividends - Year 2	67,291	65,608	58,138
Dividends - Year 10	72,539	70,856	62,618
Ending Cash Balance - Year 10	350,882	340,911	296,851

investment costs were based on general estimates for individual investments in machinery and equipment. Revenues were projected by estimating production and using prices from the Hardwood Market Report. These prices were also used in the analysis of secondary manufacturers. Payments to the development corporation were estimated as one hundred percent of the earnings each year, as long as there was not substantial downward fluctuation in the cash balance. It is also important to note that income tax was not estimated because the relationship between the primary manufacturing corporation and the development corporation should be structured such that the tax is minimal.

The operating costs for the marketing corporation are structured similarly to those of the primary manufacturing corporation. Labor, utilities, supplies and maintenance, and lease costs were estimated by the same methods as for the primary corporation. Administrative cost projections are based on estimates of office costs, travel expenses, and salaries and benefits for administrative personnel.

Other financial projections for the marketing corporation are based on estimates of capital expenditures, revenues, and payment to owners. The capital investment consists solely of two forklifts and a front-end loader. Revenues in the form of marketing fees are based on markup to achieve an acceptable rate of return on the investment by the development corporation. The marketing fees are allocated among park members based on each member's proportional use of the facilities and personnel. The payment to development corporation were estimated as one hundred percent of the earnings each year because there was no significant downward fluctuation in the cash balance. As with the primary corporation, income taxes are assumed to be zero because the relationship between the marketing corporation and the development corporation is assumed to minimize income tax.

The cost structure of the development corporation is somewhat different than that for the primary manufacturing and marketing corporations. There are no labor costs for the development corporation because it has no production capability. Utility costs are minimal and are based on the estimated utility requirements of the corporation's office and maintenance shop. The supplies and maintenance costs were projected based on the expense associated with one maintenance worker, who is primarily responsible for

groundwork and other simple maintenance. The cost of contracted work was estimated to be the same as the cost of the maintenance worker. Administrative expense projections are based on the salaries and benefits for the development corporation president, the park manager, and the secretary. Principle and interest are based on the payments for land and buildings for the entire park, which are assumed to be financed at a rate of eight percent over thirty years. The development corporation is assumed to purchase one hundred acres of land for the park, regardless of the manufacturing formation.

The capital investment for the development corporation is assumed to be the sum of investments in the primary and marketing corporations and the investment in office equipment and furniture. Dividends are assumed to be seventy-five percent of earnings. The remaining twenty-five percent is retained to finance future expansions within the park. Development corporation revenues are assumed to come from two sources, with

Table 25. Financial evaluation criterion for formation alternatives for a wood products industrial park in Southwest Virginia.

Year	Formation 1	Formation 2	Formation 3
	----- Annual Cash Flow -----		
0	\$ (7,096,424)	\$ (7,070,789)	\$ (6,991,439)
1	0	0	0
2	1,677,538	1,680,185	1,530,720
3	1,700,403	1,702,914	1,552,541
4	1,723,432	1,725,805	1,574,520
5	1,746,628	1,748,862	1,596,657
6	1,769,990	1,772,085	1,618,953
7	1,793,521	1,795,475	1,641,410
8	1,817,221	1,819,033	1,664,029
9	1,841,091	1,842,761	1,686,810
10	16,939,691	16,907,476	16,135,657
NPV	3,887,943	3,914,443	3,209,827
IRR	23.00%	23.08%	21.78%
Payback Period	5.14	5.12	5.46

lease revenues from the park's members as the first segment of revenues. The payments from the primary manufacturing and marketing corporations are assumed to be the second source of revenues.

The final step in the financial analysis is to evaluate the formation alternatives using financial evaluation criterion. Net present value, internal rate of return, and payback period were determined for each park formation alternative. Table 25 shows that all of the alternatives are financially feasible, and feasibility criteria are relatively similar. Feasibility criteria for Formations 1 and 2 are most similar because the custom cabinet and furniture manufacturers are small scale operators and do not present substantial revenue to the development corporation. Formation 3 is less profitable than the other formations primarily because the sawmill is not operating at full capacity, making the primary corporation less profitable.

PREFERRED PARK FORMATION

Choosing a preferred formation from among the park formation alternatives will always involve the use of judgment. There are often conflicting goals for the park and satisfaction of at least some goals may not easily measured. The goals for the case study, however, are relatively straight-forward and the choice of a preferred alternative does not involve a complex decision.

The first goal of the park is a quantitative thresh-hold goal: to meet the minimal acceptable rate of fifteen percent return on investment. Consideration of this goal does not necessarily lead to a preferred formation, but could eliminate alternatives from further consideration. All three of the formation alternatives meet the minimum acceptable rate of return.

The second goal is that the park provide local investment opportunities. Because this is not a thresh-hold type of goal, preferred alternatives based on this goal may be chosen. Formation 1 provides the most investment opportunities because it has the most park members. Formation 2 provides the next highest level of investment opportunities, while Formation 3 provides the fewest. Formation 3 also has fewer opportunities that do not require large investments.

The third goal for the park is that local jobs are created. Formation 1 also best meets this goal because it provides a total of ninety-four new jobs. Formation 2 provides eighty-two jobs and Formation 3 will create seventy-one positions.

Therefore, the preferred park formation is Formation 1 because it is the best alternative in choice-making Goals 2 and 3 and meets the minimum thresh-hold for Goal 1. The second choice from among the alternatives would be Formation 2.

RE-EVALUATION OF MANUFACTURING ALTERNATIVES

It is necessary to re-evaluate the financial feasibility of the manufacturing alternatives in the preferred formation because the marketing costs have now been determined. Recall that in the original analysis marketing fees were assumed to be five percent of gross sales. The actual marketing fees, based on the analysis of the marketing corporation, were inserted into the spreadsheets for the manufacturing alternatives in place of originally estimated market fees. The financial evaluation criterion were recalculated. The results for the financial criteria are found in Table 25.

Note that in Formation 1, the preferred formation, the custom cabinet and furniture operations are financially infeasible. Therefore, these manufacturing alternatives should not be included in the park. The infeasibility of these operations under the new marketing fees could have been predicted because the original fee of five percent was obviously an under-estimate of marketing costs for a custom manufacturer of a finished product. Therefore, Formation 2 replaces Formation 1 as the preferred park formation because the latter contains the infeasible manufacturing alternatives.

Table 26. Re-evaluation of the financial feasibility of secondary and tertiary manufacturing alternatives for a wood products industrial park in Southwest Virginia.

Manufacturer	Formation 1		Formation 2		Formation 3	
	NPV	IRR	NPV	IRR	NPV	IRR
Glued Panels	\$ 995,276	31.45%	\$ 992,531	31.41%	\$ 996,649	31.48%
Solid Dimension	716,871	38.69%	709,875	38.47%	713,373	38.58%
Millwork	36,793	19.02%	36,131	18.95%	37,235	19.07%
Pallets	33,407	19.71%	32,659	19.61%		
Cabinets	(22,047)	8.16%				
Furniture	(29,189)	4.96%				

SENSITIVITY ANALYSIS

A sensitivity analysis was performed for the development, primary manufacturing, and marketing corporations of the preferred park formation alternative. Variables that could have a large impact on feasibility were examined, particularly variables that compose a large percentage of the operating costs and important inputs related to revenues and production. In order to examine impacts on a relative scale, the internal rate of return and net present value were determined based on percentage changes in the projections for each variable. The results of the sensitivity analysis are found in Tables 27, 28, and 29; results are graphically illustrated in Figures 11, 12, and 13.

Figure 11 shows that the most sensitive factors in profitability of the development corporation are capital investment and receipts from subsidiaries. Capital investment has the most influence in increasing IRR and decreases in receipts from subsidiaries has the largest negative impact. Most of the management focus should be on the management of capital investments, ensuring that production from equipment and machinery is high.

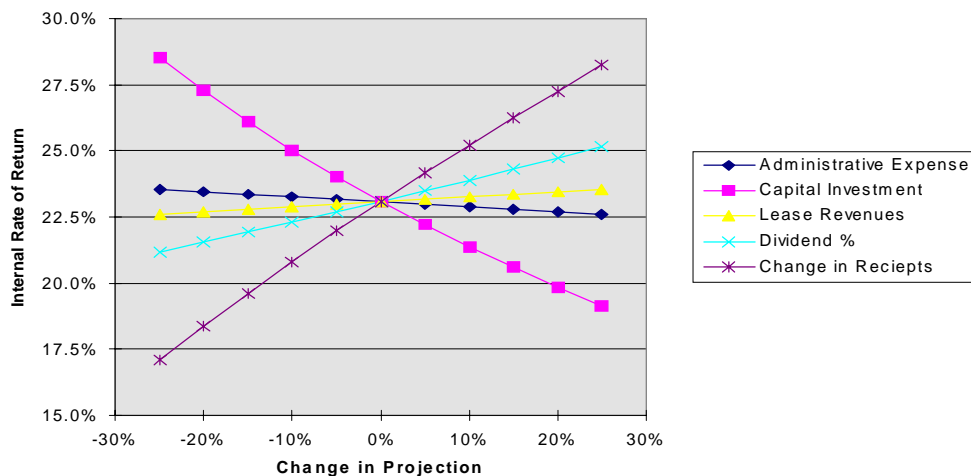


Figure 11. Sensitivity analysis for development corporation for preferred park formation for wood products industrial park in Southwest Virginia.

Table 27. Internal rates of return for development corporation after changing a financial category while holding other categories static.

% Change in Category	Financial Category Changed				
	Administrative Expense	Capital Investment	Lease Revenues	Dividend %	Change in Receipts
+25.00%	22.61%	19.15%	23.55%	25.18%	28.22%
+20.00%	22.70%	19.85%	23.46%	24.74%	27.25%
+15.00%	22.80%	20.59%	23.36%	24.32%	26.25%
+10.00%	22.89%	21.37%	23.27%	23.90%	25.22%
+5.00%	22.99%	22.20%	23.18%	23.49%	24.17%
0.00%	23.08%	23.08%	23.08%	23.08%	23.08%
-5.00%	23.18%	24.02%	22.99%	22.69%	21.97%
-10.00%	23.28%	25.03%	22.90%	22.30%	20.81%
-15.00%	23.37%	26.11%	22.80%	21.92%	19.62%
-20.00%	23.47%	27.28%	22.71%	21.55%	18.38%
-25.00%	23.57%	28.55%	22.61%	21.18%	17.09%

Table 28. Internal rates of return for marketing corporation after changing a financial category while holding other categories static.

% Change in Category	Financial Category Changed			
	Labor Expense	Administrative Expense	Warehouse Expense	Market Fees
+25.00%	8.76%	2.48%	5.31%	41.96%
+20.00%	10.08%	5.17%	7.36%	37.29%
+15.00%	11.37%	7.77%	9.36%	32.33%
+10.00%	12.63%	10.28%	11.31%	27.04%
+5.00%	13.86%	12.71%	13.21%	21.33%
0.00%	15.07%	15.07%	15.07%	15.07%
-5.00%	16.25%	17.37%	16.89%	8.08%
-10.00%	17.42%	19.61%	18.68%	0.05%
-15.00%	18.56%	21.80%	20.43%	-22.18%
-20.00%	19.69%	23.95%	22.16%	-43.72%
-25.00%	20.80%	26.06%	23.86%	-89.47%

Table 29. Internal rates of return for primary manufacturing corporation after changing a financial category while holding other categories static.

% Change in Category	Financial Category Changed			
	Lumber Sales	Log Cost	Labor Cost	Capital Investment
+25.00%	53.68%	37.89%	40.03%	34.99%
+20.00%	51.26%	38.51%	40.22%	36.05%
+15.00%	48.79%	39.13%	40.41%	37.18%
+10.00%	46.26%	39.75%	40.60%	38.37%
+5.00%	43.66%	40.37%	40.79%	39.64%
0.00%	40.98%	40.98%	40.98%	40.98%
-5.00%	38.22%	41.59%	41.17%	42.41%
-10.00%	35.37%	42.21%	41.36%	43.94%
-15.00%	32.42%	42.82%	41.55%	45.58%
-20.00%	29.36%	43.42%	41.74%	47.34%
-25.00%	26.18%	44.03%	41.92%	49.23%

Machinery downtime would be important, particularly in the primary manufacturing corporation, where the majority of the capital investment is concentrated and from where the largest proportion of income is generated. These results also indicate that the projections of capital investments and returns are very important. Note, however, that a twenty-five percent decrease in any one of the variables does not reduce IRR below the minimum acceptable rate of return of fifteen percent.

The most sensitive factor in the financial success of the primary manufacturing corporation is lumber sales (Figure 12). Other factors considered in the sensitivity analysis do not have a profound impact on return on investment. The estimate for lumber sales is based on lumber price and production. While it is likely that some of the decrease in lumber prices would be passed on to log suppliers in the form of reduced log prices, the remainder would have to be absorbed in sales income. Estimates of lumber cost were as good as could be expected because they come from *The Hardwood Market Report*. Production was estimated very conservatively and could be higher because the machinery and equipment in the mill may not be operated at maximum capacity.

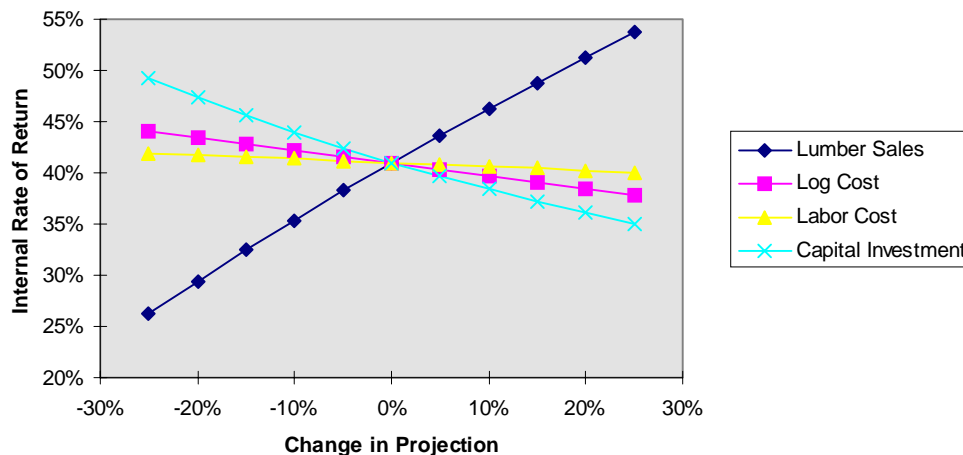


Figure 12. Sensitivity analysis for primary manufacturing corporation for preferred park formation for wood products industrial park in Southwest Virginia

Sensitivity analyses for the marketing corporation are not as important as those for the development and primary manufacturing corporations in terms of impact on park feasibility because the return on investment of the marketing corporation is only a small proportion of the total income of the development corporation. Furthermore, the marketing corporation's incomes are based on mark-up pricing and marketing fees could be increased to account for increased expenses. With these important points made, the factor with the largest impact on the IRR of the marketing corporation is marketing fees (Figure 13). The estimates for marketing fees should be reasonably accurate because they were created based on a contractual relationship between the marketing corporation and the park members. Administrative costs have the next largest impact on IRR and could be lowered by reducing administrative expenses such as travel and other administrative activities. This cost-cutting strategy should be used cautiously because customer service is directly impacted by expenditures for these activities.

A breakeven analysis is the last component of the sensitivity analysis. The breakeven levels for the development and marketing corporations are the total dollars of sales that will yield an internal rate of return of zero. The receipts from subsidiaries and

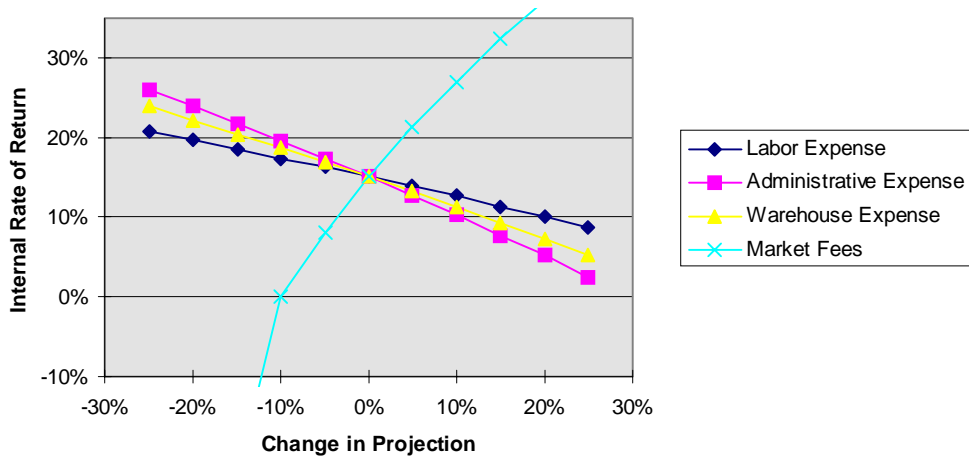


Figure 13. Sensitivity analysis marketing corporation for preferred park formation for wood products industrial park in Southwest Virginia.

lease income must total \$761,281 in a normal operating year for the development corporation to break even. The marketing corporation must receive \$526,892 per year to break even. The breakeven for the primary manufacturing corporation, which is based on unit sales of lumber, is 3534 MBF, assuming that lumber is sold in the same species and grade distribution as at normal production.

RATIO ANALYSIS

The financial ratios discussed in the methods and procedures chapter were calculated for the development, primary manufacturing, and marketing corporations of the preferred park formation alternative (Table 30). The most important ratios are those for the development corporation, but some of the ratios for the subsidiaries provide insight into the management of the development corporation.

Table 30. Important financial ratios for the development, primary manufacturing, and marketing corporations for the preferred park formation for a wood products industrial park in Southwest Virginia.

Ratio	Development	Primary	Marketing
Current Ratio	0.69	9.74	2.67
Quick Ratio	0.69	8.34	3.67
Debt/Equity	0.48	0.00	0.00
Coverage Ratio	10.00	0.00	0.00
Capital Turnover Ratio	0.28	1.23	1.31
Inventory Turnover Ratio	0.00	1.71	0.00
Average Inventory Period	0	213	0
Receivables Turnover Ratio	8.00	7.53	7.89
Average Collection Period	45	48	46
Payables Turnover Ratio	12.00	8.00	5.32
Average Payment Period	30	45	69
Profit Margin	0.58	0.56	0.11
Return on Assets	0.16	0.37	0.14
Return on Equity	0.24	0.39	0.18

The low current ratio of 0.26 for the development corporation in the first year means that the development corporation has a negative working capital for that year. This ratio is low because no return is realized on the investments in the subsidiaries and because current assets are tied up in these subsidiaries. The current ratios for the primary manufacturing and marketing corporations for the first year are 9.74 and 2.67, respectively. Although the current ratio for the development corporation is low during the first year, it increases to 2.21 and 3.75 in Years 2 and 3, when the subsidiaries begin making payments. The development corporation, therefore, is relatively illiquid during the first year of operation, but becomes much more liquid in Year 2.

The quick ratio is the same as the current ratio for the development and marketing corporations because neither carries any inventory. The primary manufacturing corporation has a quick ratio of 8.34, but the difference between the current and quick ratios over-exaggerates the illiquidity of inventory because lumber is a relatively liquid asset.

The leverage ratios are only relevant for the development corporation because the subsidiaries have no debt. The debt/equity ratio of 0.48 for the development corporation implies that the firm uses financing conservatively and is not highly levered. The coverage ratio of 10.0 suggests that the development corporation is able to handle risk and uncertainty. Therefore, variable interest and shorter repayment periods should be negotiated to reduce the interest expense over time.

The capital turnover ratio is the most important financial efficiency ratio because the others are based only on assumptions made during the construction of pro-forma balance sheets. The capital turnover ratio for the development corporation is fairly low due to the relatively large amounts of non-productive assets, namely cash and land. This ratio could be improved by attracting more members into the park to occupy available land and by investing part of the large cash balance in other investments, where it would receive a larger rate of return. The capital turnover ratios for the subsidiaries are only slightly higher than that for the development corporation.

The inventory turnover ratio and average inventory period are only applicable for the primary manufacturing corporation because the development and marketing

corporations do not have inventories. The inventory turnover ratio for the primary manufacturing corporation is 1.71 and the average inventory period is 213 days. It would be difficult to change these ratios because the schedule for air-drying lumber is not easily influenced without increased capital cost. The receivable and payable ratios in Table 30 are based on assumption made about the accounts receivable and accounts payable for each of the corporations. These ratios could be influenced through the contracts between the development corporation and the park members.

The final type of ratios calculated for the development corporation and its subsidiaries are profitability ratios. The profit margin of 0.58 for the development corporation means that fifty-eight percent of net sales is earned as profit. This ratio is high because there are relatively few operating expenses for the development corporation, which is in essence an investment company. The profit margin for the primary manufacturing corporation is also high because payments for capital investments in machinery and equipment are made in the first year. In contrast, the profit margin for the marketing corporation is very low because it is not designed to be profitable, but is simply set up to provide a return of fifteen percent for investors.

Return on assets and return on equity are also relatively low because of the large capital investments involved in all three operations. More labor intensive operations would have higher return on assets and return on equity.

It is difficult to compare the ratios for these operations to those of other operations because ratios for these types of industries are not available. There are sources of ratios for individual components of these corporations such as a sawmill or kilning operation, but those ratios are not comparable to the ratios of this analysis. Therefore, the utility of this analysis is simply to point out strengths and weaknesses of the development corporation and its subsidiaries.

Conclusions from the ratio analysis are that the immediate management effort should focus on three key areas. The first management concern should be to develop a recruitment program that can be used to determine what new types of manufacturers are compatible the goals of the park and to actively recruit businesses in these industries for membership in the park. The second management concern is to invest the large cash

balances of the development and primary manufacturing corporations in alternative investments that will provide a return that is larger than the current four percent. The final management focus should concentrate on negotiating for variable interest and shorter repayment periods for debts on land and buildings.

FINANCIAL PLAN

An actual financial plan will not be constructed for the development corporation and its subsidiaries because it would only repeat information discussed earlier in this chapter. The outline for a well-written financial plan would be as follows:

- I. Review of financial evaluation criterion
- II. Discussion of factors important to park profitability
- III. Discussion of areas requiring management focus
- IV. Proposal for financing
- App. Pro-forma financial statements.

The particular information that would be included in each section of the financial plan can be found in the previous sections of this chapter. The first section of the financial plan should include a discussion of net present value, internal rate of return, and payback period for the three park formation alternatives. Section II should outline the results of the sensitivity analysis, focusing on a discussion of the importance of keeping capital investments productive and achieving the projected of lumber sales. The third section should discuss the financial ratios and their implication on park management. The final section should outline the start-up requirements and financing requirements for the preferred formation. An appendix containing pro-forma financial statements for all of the formation alternatives should complete the financial plan.

CHAPTER 4: SUMMARY

The financial feasibility analysis of a wood products industrial park is complex because of the many interests in the park, the multiple goals of the park, and the large number of formation alternatives available. These factors were considered in Chapter 2 when a methodology for performing a financial feasibility analysis was created. The first step in the methodology is to determine the goals of the park. The start-up costs and financing requirements for secondary and tertiary manufacturers are then determined. Pro-forma financial statements are constructed for each secondary and tertiary manufacturing alternative and serve as a basis for the calculation of net present value and internal rate of return. Secondary and tertiary manufacturing alternatives are then evaluated based on financial performance, as indicated by NPV, IRR, and payback period. Infeasible alternatives are not considered for inclusion in the park.

Park formation alternatives are generated from feasible secondary and tertiary manufacturing operations by forming groups of compatible industries. Primary manufacturing and marketing facilities are then designed to meet the demands of each park formation alternative. The financial feasibility of the development corporation and its subsidiaries is evaluated for each park formation in a manner similar to that used to determine the financial feasibility of park members. Net present value and internal rate of return are the chief evaluation criteria. A preferred park formation alternative is then selected, based on how well it meets the goals of the park.

Further analysis of the preferred park formation includes a re-evaluation of secondary and tertiary manufacturers and a sensitivity and ratio analysis for the development, primary manufacturing, and marketing corporations. Secondary and tertiary manufacturers must be re-evaluated to account for changes in projections that occur during the analysis of the development corporation. Examples of these changes are changes in lease and marketing fees. The sensitivity analysis points out factors important to the financial success of the development corporation in the preferred park. A ratio

analysis is used to determine the strong and weak areas for the development corporation and make preliminary management recommendations. Finally, a financial plan is written that can be used in soliciting financial support for the park.

The case study in Chapter 3 was not an actual feasibility study, but a tutorial for employing the methodology discussed in Chapter 2. This case study was based on creating a wood products industrial park in Southwest Virginia. The ideal park, based on the assumptions set forth in the analysis, consisted of a dimension panel operation, a solid dimension operation, a custom millwork operation, a pallet operation, and primary manufacturing and marketing facilities. This park was determined to be financially feasible and to meet all of the goals of the investors in the park. Manufacturing alternatives considered, but not included, in the park were custom furniture and cabinet manufacturers.

This manual can be used primarily as a guidebook in determining the financial feasibility of actual wood products industrial parks. This manual should be used in conjunction with professional services and other literature. This manual can also serve as a foundation for creating more detailed methodologies that analyze the market and technical feasibility of a WPIP and for evaluating the community impacts of a park. Further research in these areas will compliment the utility of this project.

The primary limitation of this methodology is that it is a static model; it does not consider the dynamic changes associated with management of an industrial park. For example, the structure of a wood products industrial park would change relatively frequently, reacting to changes in the markets for wood products. The model does not, however, consider the impacts of variable park structure. Furthermore, the methodology does not consider the financial implication of future expansions in the park.

The methods in this manual could be used in performing a sensitivity analysis that would investigate the effects of changes in park structure on the economic feasibility of a wood products industrial park. This sensitivity analysis would be structured as a what-if analysis where the changes in the park formation are inserted into the spreadsheets of the initial WPIP feasibility analysis. The analysis would indicate the financial impact of changing park structure to include more or less members. The sensitivity analysis

discussed in Chapters 2 and 3 serves as a model for additional analyses that consider changes in park formation.

Financial feasibility analyses could also be used to periodically evaluate changes in the park. The initial feasibility analysis of a WPIP would be important in increasing interest in a park and developing a park that is profitable. Further analysis, after the park is operable, would allow park managers to assess the impact of changes in park structure. These analyses could be based on the original park analysis, updated to consider new prices and costs, park expansion opportunities, and changes in park membership. Changes in membership would be particularly important because they have an impact on product flow within the park. Continuous financial evaluation in conjunction with sensitivity analyses would give managers and developers a good estimate of the impact of dynamic effects on park profitability.

There were four particular points that surfaced during the completion of this project that would be very important to any industrial park developer. These points should be considered when developing a WPIP, performing a financial analysis of a park, and contracting services related to park development. The four points are: financial data can be very difficult to obtain, a park must be well-managed to succeed, a WPIP is a very complex entity, and a financial analysis is only one consideration in a series of park development tools.

The most difficult task in performing a financial feasibility analysis can be collecting reliable financial data. A large amount of financial research must be completed before beginning to assess financial feasibility. The financial data in the case study of this manual was developed by updating technical bulletins and by consulting with industry experts. These estimates of costs and revenues, however, are not adequate for a real-world feasibility study. An industrial park developer would need more local and real data. Application of this manual would require networking with a variety of industry members and local information sources. An analyst must strike a balance between available resources and detail in data. Sensitivity analysis is a powerful tool because it points out areas where data reliability is an important issue.

Discussions with members of established parks reiterated that a wood products industrial park must be carefully founded and well-managed in order to achieve long-term financial success. The constraints and requirements for membership that are set forth in membership agreements must be legally binding and enforceable. The governing body of the park must have the power to interpret rules, must be able to institute changes in the park, and must be representative of all park interests. Legal services would be important to an industrial park developer because they would assist in developing membership rules that are fair, complete, and require compliance.

A wood products industrial park is a very complex entity that is composed of a variety of interests. These interests can change frequently and place many demands upon park managers. The complexity of a WPIP makes economic analysis a difficult task, particularly any analysis that considers the dynamic nature of park structure. Furthermore, the maximization of a numerical goal, such as return on investment, is a very difficult matter because of the many factors that must be considered.

The financial analysis of a WPIP is only one consideration in park development. Legal considerations are a factor that must receive a large amount of a developer's attention. Furthermore, market and technical assumptions must be carefully developed, because they are the basis for financial analysis. Finally, both positive and negative impacts of the park on the community must be considered in developing the park.

The financial analysis of a wood products industrial park does not require the application of state-of-the-art techniques or use of high-tech equipment. Instead, this analysis involves the use of traditional financial evaluation criterion in a non-traditional manner. Furthermore, this analysis must be recognized as a static analysis. It must be repeated periodically and used in conjunction with sensitivity analyses to maintain a financially successful park.

LITERATURE CITED

- American Electric Power. 1998. Personal Correspondence with David Bennett, Roanoke, VA.
- Araman, P.A., and B.G. Hansen. 1993. *Conventional Processing of Standard Size Edge-Glued Blanks for Furniture and Cabinet Parts: a Feasibility Study*. Res. Pap. NE-524. Broomall, PA: U.S. Dept. of Agric., Forest Service, Northeastern Forest Experiment Station. 11 p.
- Blair, J.P. and R. Premus. 1987. Major Factors in Industrial Location: A Review. *Economic Development Quarterly*. 1:72-85.
- Bodenman, J.E. 1991. Analysis of Hardwood Manufacturing Location and Expansion Decisions: Northern and Central Appalachian Region. Master's Thesis. The Pennsylvania State University, University Park, PA.
- Bowlby, K. 1988. The Corporate Location Decision: A Priority View of Multiple Criteria. *Economic Development Review*. Spring: 37-39.
- Clifton, D.S., and D.E. Fyffe. 1977. *Project Feasibility Analysis: A Guide to Profitable New Ventures*. New York: John Wiley and Sons. 340 pp.
- Conley, K.A. 1994. *Contribution of the Forest Products Industry to the Economy of Southwest Virginia*. Report (On file, Dept. of Forestry). VPI&SU. 139 pp.
- Conway, H.M. and L.L. Liston. 1981. *Industrial Park Growth: An Environmental Success Story*. Atlanta: Conway Publications. 328 pp.
- Deaton, B.J. 1979. *Industrial Site Development Considerations for Rural Communities*. VPI&SU Cooperative Extension Service. Virginia Agricultural Economics Paper No. 300.
- Doeringer, P.B. and D.G. Terkla. 1990. How Intangible Factors Contribute to Economic Development: Lessons From a Mature Local Economy. *World Development*. 18(9): 1,295-1,308.
- Fassl, J. 1989. High-tech Systems Key to Site Choice. *Food Engineering*. March 1989: 115-118.

- Galbraith, C. and A.F. DeNoble. 1988. Location Decisions by High Technology Firms: A Comparison of Firm Size, Industry Type, and Institutional Form. *ENTREPRENEURSHIP Theory and Practice*. Winter: 31-47.
- Greenhut, M.L. 1956. *Plant Location in Theory and Practice: The Economics of Space*. Chapel Hill, NC: University of North Carolina Press. 338 p.
- Hanks, L.F., G.L. Gammon, R.L. Brisbin, and E.D. Rast. 1980. *Hardwood Log Grades and Lumber Grade Yields for Factory Lumber Logs*. U.S.D.A. For. Ser. Res. Pap. NE-468. Broomall, PA: Northeast. For. Exp. Stn., Forest Service, U.S. Department of Agriculture. 92 p.
- Hardwood Market Report*. 1998. Memphis, TN. 73(12).
- Hardwood Review. 1998. *Weekly Hardwood Review*. G. Barrett, ed. Charlotte, NC.
- Hastings, S.E. and F.M. Goode. 1982. Improved Measures of Industrial Location Factors. *Growth and Change*. 13(4): 25-31.
- Huber, H.H., H.N. Rosen, and H.A. Stewart. 1980. *Feasibility Projection for a Small Furniture Dimension Plant Using Low Grade Hardwoods*. Utilization of Low Grade Hardwoods Symp. Nashville, TN. pp 61-71.
- Johnson, T.G., A. Jenkins, J.A. Scrivani, and J.M. Foreman. 1995. *Virginia's Timber Industry - An Assessment of Timber Product Output and Use, 1995*. Resource Bull. SRS-19. Asheville, N.C.: U.S. Department of Agriculture, Forest Service, Southern Research Station. 37 p.
- Jones, K.D., G.W. Zinn, D.W. Patterson, J.P. Armstrong, and L.T. Moore. 1988. *Design and Feasibility Analysis for a Wood Products Industrial Park*. U.S. Dept. of Commerce, Econ. Dev. Admin., Washington, D.C.
- Kinnard, W.N., Jr., S.D. Messner, and B.N. Boyce. 1979. *Industrial Real Estate*. 3rd. ed. Washington, D.C.: Society of Industrial and Office Realtors. 688 pp.
- Lamb, F.M. 1998. Personal Correspondence, Blacksburg, VA.
- Lopez, R.A. and N.R. Henderson. 1989. The Determinants of Location Choices for Food Processing Plants. *Agribusiness*. 5(6): 619-632.
- Luppold, W.G. 1989. *Shifting Demand for Eastern Hardwood Lumber*. Presented at the Conference on Hardwood Forest Product Opportunities: Creating and Expanding Businesses. Pittsburgh, PA. October 17, 1989.

- Luppold, W.G. and G.P. Dempsey. 1989. *Current Trends in Regional Hardwood Lumber Production and Timber Usage*. General Technical Report NC-132. St. Paul, MN: North Central Forest Experiment Station, Forest Service, U.S. Department of Agriculture. pp. 210-206.
- Luppold, W.G. 1991. *Hardwood Lumber Demand in the 1990's*. Proceedings of the Annual Hardwood Synopsum. Hardwood Research Council. Memphis TN. (19th). pp. 57-63.
- Luppold, W.G. 1993. Decade of Change in the Hardwood Industry. Proceedings of the Annual Hardwood Synopsum. Hardwood Research Council. Memphis TN. (21st). pp. 11-24
- Luppold, W.G. and G.P. Dempsey. 1994. *Factors Affecting Regional Changes in Hardwood Lumber Production*. Forest Products Journal. 44(6) pp. 8-14.
- Martens, D.G. and B.G. Hansen. 1980. *Manufacturing Hardwood Parquet Flooring from Southern Hardwoods*. Utilization of Low Grade Hardwoods Symp. Nashville, TN. pp 94-102.
- Martin, S.A., K.A. Weitz, R.A. Cushman, A.Sharma, R.C. Lindrooth, and S.R. Moran. 1996. *Eco-Industrial Parks: A Case Study and Analysis of Economic, Environmental, Technical, and Regulatory Issues*. Research Triangle Institute Project Number 6050 FR. Research Triangle Park, NC. 189 pp.
- Miller, R.E. and P.D. Blair. 1985. *Input-Output Analysis: Foundations and Extensions*. Englewood Cliffs, NJ: Prentice Hall.
- Minnesota IMPLAN Group. 1997. *IMPLAN Pro documentation*. Stillwater, MN: Minnesota IMPLAN Group, Inc. 378 pp.
- Moriarty, B.M. 1980. *Industrial Location and Community Development*. Chapel Hill, NC: University of North Carolina Press. 381 pp.
- Oksansen, E.H. and J.R. Williams. 1984. Industrial Location and Inter-Industry Linkages. *Empirical Economics*. 1:139-150
- Olmi, A.M. 1992. *Selecting the Legal Structure for Your Firm*. Washington, D.C.: Small Business Administration, Office of Business Development. 5 p.
- Patterson, D.W. and S.M. Brock. 1986. *Electricity Usage and Residues Production at West Virginia Sawmills*. West Virginia Forestry Notes.. Morgantown, WV: College of Agriculture and Forestry, West Virginia University. No. 138 (12) pp.1-3

- Raitz, K. 1988. Advantages of Place as Perceived by Sunbelt Promoters. *Growth and Change*. 19(4): 14-29.
- Random Lengths, Inc. 1998. *Random Lengths*. J. Heitz, ed. Eugene, OR.
- Ross, S.A., R.W. Westerfield, and B.D. Jordan. 1991. *Fundamentals of Corporate Finance*. Homewood, IL: Irwin. 758 pp.
- Schmenner, R.W. 1982. *Making Business Location Decisions*. Englewood Cliffs, NJ: Prentice-Hall, Inc. 268 pp.
- Sinclair, S.A. 1992. *Forest Products Marketing*. New York: McGraw-Hill, Inc. 391 pp.
- Smith, D.M. 1981. *Industrial Location: An Economic Geographical Analysis*. New York: John Wiley and Sons.
- Summit Dimension Manufacturing. 1998. Personal Correspondence with Jim Nickerbocker, Chilhowie, VA.
- Thompson, M.T. 1992. *Forest Statistics for the Southern Mountains of Virginia, 1992*. Res. Bull. SE-130. Asheville, NC: U.S. Dept. of Agric., Forest Service, Southeastern Forest Experiment Station. 50 pp.
- Timber Mart South. 1998. *Timber Mart South, First Quarter, 1998*. Highlands, NC. 23(4).
- U.S. Department of Agriculture. 1990. *An Analysis of the Timber Situation in the United States: 1989-2040*. Gen. Tech. Report RM-199. Fort Collins, CO: Rocky Mountain Forest and Range Experiment Station, Forest Service, U.S. Department of Agriculture. 269 p.
- Urban Land Institute. 1989. *Business and Industrial Park Development Handbook*. Washington, D.C.: Urban Land Institute. 380 pp.
- Virginia Department of Forestry. 1992. *Virginia Forest Products Directory*. Charlottesville, VA: Virginia Department of Forestry. 110 pp.
- Virginia Department of Forestry. 1994. *Virginia's Forests: Our Common Wealth*. Charlottesville, VA: Virginia Department of Forestry. 24 p.
- Weygandt, J.J. and D.E. Kieso. 1995. *Financial Accounting*. New York: John Wiley and Sons. 681 pp.
- Wheat, L.F. 1986. The Determinants of 1963-77 Regional Manufacturing Growth: Why the South and West Grow. *Journal of Regional Science*. 26(4): 635-660.

White, M.S. 1998. Personal Correspondence, Blacksburg, VA.

White, M.S., C.C. Brunner, E.C. Brindley, and S.G. Berry. 1980. *Economics of a Small-Scale Pallet Manufacturing Plant Using Low Grade Southern Hardwoods*. Utilization of Low Grade Hardwoods Symp. Nashville, TN. pp 38-48.

Wyatt, J.W. and M.B. Wyatt. 1972. *Business Law: Principles and Cases*. 6th. ed. New York: McGraw Hill. 1024 pp.

Appendix A

Pro-forma Financial Statements for Edge-Glued Panel Manufacturer

Figure A1. Pro-Forma Balance Sheet for Edge-Glued Panel Manufacturer

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Current Assets											
Cash	778,392	1,036,706	1,181,745	1,327,829	1,474,964	1,623,159	1,772,420	1,922,756	2,074,175	2,226,684	2,380,291
Accounts Receivable	430,726	574,296	574,296	574,296	574,296	574,296	574,296	574,296	574,296	574,296	574,296
Prepaid Expenses	0	0	0	0	0	0	0	0	0	0	0
Inventory	0	0	0	0	0	0	0	0	0	0	0
Supplies	0	0	0	0	0	0	0	0	0	0	0
Total Current Assets	1,209,119	1,611,002	1,756,041	1,902,125	2,049,260	2,197,455	2,346,716	2,497,053	2,648,471	2,800,980	2,954,587
Non-Current Assets											
Equipment	92,450	92,450	92,450	92,450	92,450	92,450	92,450	92,450	92,450	92,450	92,450
Less: Accumulated Depreciation	0	7,396	14,792	22,188	29,584	36,980	44,376	51,772	59,168	66,564	73,960
Machinery	683,350	683,350	683,350	683,350	683,350	683,350	683,350	683,350	683,350	683,350	683,350
Less: Accumulated Depreciation	0	54,668	109,336	164,004	218,672	273,340	328,008	382,676	437,344	492,012	546,680
Office Equipment	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000
Less: Accumulated Depreciation	0	2,000	4,000	6,000	8,000	10,000	12,000	14,000	16,000	18,000	20,000
Total Non-Current Assets	800,800	736,736	672,672	608,608	544,544	480,480	416,416	352,352	288,288	224,224	160,160
TOTAL ASSETS	2,009,919	2,347,738	2,428,713	2,510,733	2,593,804	2,677,935	2,763,132	2,849,405	2,936,759	3,025,204	3,114,747
Current Liabilities											
Accounts Payable	268,290	357,719	357,719	357,719	357,719	357,719	357,719	357,719	357,719	357,719	357,719
Wages Payable	280,500	374,000	374,000	374,000	374,000	374,000	374,000	374,000	374,000	374,000	374,000
Taxes Payable	0	0	0	0	0	0	0	0	0	0	0
Principle Due, Equipment	6,308	6,828	7,391	8,001	8,660	9,374	10,147	10,983	11,889	12,869	0
Principle Due, Machinery	46,629	50,473	54,634	59,137	64,012	69,289	75,000	81,183	87,875	95,118	0
Principle Due, Office Equipment	1,706	1,847	1,999	2,164	2,342	2,535	2,744	2,970	3,215	3,480	0
Interest Payable	62,452	57,947	53,072	47,794	42,081	35,898	29,205	21,959	14,117	5,629	0
Total Current Liabilities	665,885	848,815	848,815	848,815	848,815	848,815	848,815	848,815	848,815	848,815	731,719
Non-Current Liabilities											
Remaining Principle, Equipment	86,142	86,142	79,313	71,922	63,921	55,261	45,887	35,740	24,757	12,869	(0)
Remaining Principle, Machinery	636,721	636,721	586,248	531,614	472,477	408,465	339,176	264,176	182,993	95,118	(0)
Remaining Principle, Office Equipment	23,294	23,294	21,448	19,449	17,285	14,943	12,409	9,665	6,695	3,480	0
Total Non-Current Liabilities	746,156	746,156	687,008	622,985	553,683	478,669	397,472	309,581	214,445	111,467	(0)
Owner's Equity											
Contributed Capital	597,877	752,767	811,915	875,939	945,240	1,020,254	1,101,452	1,189,343	1,284,478	1,387,457	1,616,019
Retained Earnings	0	0	80,975	162,995	246,066	330,197	415,394	501,667	589,021	677,466	767,009
Total Owner's Equity	597,877	752,767	892,890	1,038,933	1,191,306	1,350,451	1,516,846	1,691,009	1,873,500	2,064,923	2,383,028
TOTAL LIABILITIES AND OWNER'S EQUITY	2,009,919	2,347,738	2,428,713	2,510,733	2,593,804	2,677,935	2,763,132	2,849,405	2,936,759	3,025,204	3,114,747

Generated with data from: (Araman and Hansen, Hardwood Market Report, Summit Dimension Products)

Figure A2. Pro-Forma Income Statement for Edge-Glued Panel Manufacturer

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Gross Sales/Revenues	3,445,812	4,594,370	4,600,171	4,606,015	4,611,900	4,617,828	4,623,798	4,629,812	4,635,869	4,641,969
Less: Returns and Allowances	0	0	0	0	0	0	0	0	0	0
Net Sales	3,445,812	4,594,370	4,600,171	4,606,015	4,611,900	4,617,828	4,623,798	4,629,812	4,635,869	4,641,969
Less: Cost of Goods Sold	2,146,316	2,861,755	2,861,755	2,861,755	2,861,755	2,861,755	2,861,755	2,861,755	2,861,755	2,861,755
Gross Margin	1,299,495	1,732,615	1,738,416	1,744,260	1,750,145	1,756,073	1,762,043	1,768,057	1,774,113	1,780,214
Operating Expenses										
Labor	280,500	374,000	374,000	374,000	374,000	374,000	374,000	374,000	374,000	374,000
Utilities	37,725	50,300	50,300	50,300	50,300	50,300	50,300	50,300	50,300	50,300
Supplies and Maintenance	98,436	131,248	131,248	131,248	131,248	131,248	131,248	131,248	131,248	131,248
Administrative	171,750	229,000	229,000	229,000	229,000	229,000	229,000	229,000	229,000	229,000
Lease	89,400	89,400	89,400	89,400	89,400	89,400	89,400	89,400	89,400	89,400
Market Fees	170,734	227,645	227,645	227,645	227,645	227,645	227,645	227,645	227,645	227,645
Depreciation	64,064	64,064	64,064	64,064	64,064	64,064	64,064	64,064	64,064	64,064
Principle Payments	54,644	59,148	64,024	69,301	75,014	81,198	87,891	95,136	102,978	111,467
Total Operating Expenses	967,252	1,224,805	1,229,681	1,234,958	1,240,671	1,246,855	1,253,548	1,260,793	1,268,635	1,277,124
Earnings Before Int. and Taxes	332,243	507,809	508,735	509,301	509,474	509,218	508,495	507,264	505,478	503,090
Less: Interest Expense	62,452	57,947	53,072	47,794	42,081	35,898	29,205	21,959	14,117	5,629
Earnings Before Taxes	269,791	449,862	455,664	461,507	467,392	473,320	479,291	485,304	491,361	497,461
Less: Income Taxes	75,542	125,961	127,586	129,222	130,870	132,530	134,201	135,885	137,581	139,289
NET INCOME (LOSS)	194,250	323,901	328,078	332,285	336,523	340,791	345,089	349,419	353,780	358,172

Generated with data from: (Araman and Hansen, Hardwood Market Report, Summit Dimension Products)

Figure A3. Pro-Forma Cash Flow Statement for Edge-Glued Panel Manufacturer

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
CASH INFLOW										
Cash Sales	0	0	0	0	0	0	0	0	0	0
Credit Sale Receipts	3,243,942	4,325,257	4,325,257	4,325,257	4,325,257	4,325,257	4,325,257	4,325,257	4,325,257	4,325,257
Other Receipts	31,136	41,468	47,270	53,113	58,999	64,926	70,897	76,910	82,967	89,067
Total Cash Inflows	3,275,078	4,366,725	4,372,526	4,378,370	4,384,255	4,390,183	4,396,153	4,402,167	4,408,224	4,414,324
CASH OUTFLOWS										
Labor	280,500	374,000	374,000	374,000	374,000	374,000	374,000	374,000	374,000	374,000
Utilities	37,725	50,300	50,300	50,300	50,300	50,300	50,300	50,300	50,300	50,300
Supplies and Maintenance	98,436	131,248	131,248	131,248	131,248	131,248	131,248	131,248	131,248	131,248
Administrative	171,750	229,000	229,000	229,000	229,000	229,000	229,000	229,000	229,000	229,000
Raw Materials	2,146,316	2,861,755	2,861,755	2,861,755	2,861,755	2,861,755	2,861,755	2,861,755	2,861,755	2,861,755
Lease	89,400	89,400	89,400	89,400	89,400	89,400	89,400	89,400	89,400	89,400
Principle	54,644	59,148	64,024	69,301	75,014	81,198	87,891	95,136	102,978	111,467
Interest	62,452	57,947	53,072	47,794	42,081	35,898	29,205	21,959	14,117	5,629
Income Tax	75,542	125,961	127,586	129,222	130,870	132,530	134,201	135,885	137,581	139,289
Dividends	0	242,926	246,058	249,214	252,392	255,593	258,817	262,064	265,335	268,629
Total Cash Outflows	3,016,764	4,221,686	4,226,443	4,231,234	4,236,061	4,240,921	4,245,817	4,250,748	4,255,715	4,260,717
NET CASH FLOW	258,314	145,039	146,083	147,135	148,195	149,262	150,336	151,419	152,509	153,607
Beginning Cash Balance	778,392	1,036,706	1,181,745	1,327,829	1,474,964	1,623,159	1,772,420	1,922,756	2,074,175	2,226,684
ENDING CASH BALANCE	1,036,706	1,181,745	1,327,829	1,474,964	1,623,159	1,772,420	1,922,756	2,074,175	2,226,684	2,380,291

Generated with data from: (Araman and Hansen, Hardwood Market Report, Summit Dimension Products)

Appendix B

Pro-forma Financial Statements for Solid Dimension Manufacturer

Figure B1. Pro-Forma Balance Sheet for Solid Dimension Manufacturer

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Current Assets											
Cash	375,497	564,332	646,220	728,698	811,769	895,439	979,711	1,064,590	1,150,080	1,236,186	1,322,912
Accounts Receivable	219,458	292,928	292,928	292,928	292,928	292,928	292,928	292,928	292,928	292,928	292,928
Prepaid Expenses	0	0	0	0	0	0	0	0	0	0	0
Inventory	0	0	0	0	0	0	0	0	0	0	0
Supplies	0	0	0	0	0	0	0	0	0	0	0
Total Current Assets	594,955	857,260	939,148	1,021,626	1,104,698	1,188,368	1,272,640	1,357,519	1,443,009	1,529,114	1,615,840
Non-Current Assets											
Equipment	118,900	118,900	118,900	118,900	118,900	118,900	118,900	118,900	118,900	118,900	118,900
Less: Accumulated Depreciation	0	9,512	19,024	28,536	38,048	47,560	57,072	66,584	76,096	85,608	95,120
Machinery	133,400	133,400	133,400	133,400	133,400	133,400	133,400	133,400	133,400	133,400	133,400
Less: Accumulated Depreciation	0	10,672	21,344	32,016	42,688	53,360	64,032	74,704	85,376	96,048	106,720
Office Equipment	7,250	7,250	7,250	7,250	7,250	7,250	7,250	7,250	7,250	7,250	7,250
Less: Accumulated Depreciation	0	580	1,160	1,740	2,320	2,900	3,480	4,060	4,640	5,220	5,800
Total Non-Current Assets	259,550	238,786	218,022	197,258	176,494	155,730	134,966	114,202	93,438	72,674	51,910
TOTAL ASSETS	854,505	1,096,046	1,157,170	1,218,884	1,281,192	1,344,098	1,407,606	1,471,721	1,536,447	1,601,788	1,667,750
Current Liabilities											
Accounts Payable	138,853	185,138	185,138	185,138	185,138	185,138	185,138	185,138	185,138	185,138	185,138
Wages Payable	150,485	200,647	200,647	200,647	200,647	200,647	200,647	200,647	200,647	200,647	200,647
Taxes Payable	0	0	0	0	0	0	0	0	0	0	0
Principle Due, Equipment	8,113	8,782	9,506	10,290	11,138	12,056	13,050	14,125	15,290	16,550	0
Principle Due, Machinery	9,103	9,853	10,665	11,544	12,496	13,526	14,641	15,848	17,154	18,569	0
Principle Due, Office Equipment	495	535	580	627	679	735	796	861	932	1,009	0
Interest Payable	20,241	18,782	17,201	15,491	13,639	11,635	9,466	7,117	4,576	1,824	0
Total Current Liabilities	327,291	423,737	423,737	423,737	423,737	423,737	423,737	423,737	423,737	423,737	385,785
Non-Current Liabilities											
Remaining Principle, Equipment	110,787	110,787	102,005	92,499	82,209	71,071	59,015	45,965	31,840	16,550	(0)
Remaining Principle, Machinery	124,297	124,297	114,444	103,779	92,234	79,738	66,212	51,571	35,723	18,569	(0)
Remaining Principle, Office Equipment	6,755	6,755	6,220	5,640	5,013	4,334	3,598	2,803	1,941	1,009	0
Total Non-Current Liabilities	241,839	241,839	222,669	201,918	179,456	155,143	128,826	100,339	69,504	36,128	(0)
Owner's Equity											
Contributed Capital	285,375	430,470	449,641	470,392	492,853	517,166	543,484	571,970	602,805	636,182	710,262
Retained Earnings	0	0	61,124	122,838	185,146	248,051	311,560	375,675	440,401	505,742	571,704
Total Owner's Equity	285,375	430,470	510,765	593,230	677,999	765,218	855,043	947,645	1,043,206	1,141,924	1,281,966
TOTAL LIABILITIES AND OWNER'S EQUITY	854,505	1,096,046	1,157,170	1,218,884	1,281,192	1,344,098	1,407,606	1,471,721	1,536,447	1,601,788	1,667,750

Generated with data from: (Huber et al., Hardwood Market Report, Summit Dimension Products)

Figure B2. Pro-Forma Income Statement for Solid Dimension Manufacturer

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9
Gross Sales/Revenues	1,755,661	2,343,428	2,346,703	2,350,003	2,353,325	2,356,672	2,360,043	2,363,438	2,366,858
Less: Returns and Allowances	0	0	0	0	0	0	0	0	0
Net Sales	1,755,661	2,343,428	2,346,703	2,350,003	2,353,325	2,356,672	2,360,043	2,363,438	2,366,858
Less: Cost of Goods Sold	1,110,825	1,481,100	1,481,100	1,481,100	1,481,100	1,481,100	1,481,100	1,481,100	1,481,100
Gross Margin	644,836	862,328	865,603	868,903	872,225	875,572	878,943	882,338	885,758
Operating Expenses									
Labor	150,485	200,647	200,647	200,647	200,647	200,647	200,647	200,647	200,647
Utilities	29,365	39,153	39,153	39,153	39,153	39,153	39,153	39,153	39,153
Supplies and Maintenance	10,875	14,500	14,500	14,500	14,500	14,500	14,500	14,500	14,500
Administrative	56,276	75,035	75,035	75,035	75,035	75,035	75,035	75,035	75,035
Lease	18,655	18,655	18,655	18,655	18,655	18,655	18,655	18,655	18,655
Market Fees	87,032	116,043	116,043	116,043	116,043	116,043	116,043	116,043	116,043
Depreciation	20,764	20,764	20,764	20,764	20,764	20,764	20,764	20,764	20,764
Principle Payments	17,711	19,171	20,751	22,461	24,313	26,317	28,487	30,835	33,377
Total Operating Expenses	391,163	503,967	505,548	507,258	509,110	511,114	513,283	515,632	518,173
Earnings Before Int. and Taxes	253,673	358,361	360,056	361,644	363,116	364,458	365,660	366,707	367,585
Less: Interest Expense	20,241	18,782	17,201	15,491	13,639	11,635	9,466	7,117	4,576
Earnings Before Taxes	233,431	339,579	342,855	346,154	349,477	352,823	356,194	359,589	363,009
Less: Income Taxes	65,361	95,082	95,999	96,923	97,853	98,791	99,734	100,685	101,643
NET INCOME (LOSS)	168,071	244,497	246,855	249,231	251,623	254,033	256,460	258,904	261,366

Generated with data from: (Huber et al., Hardwood Market Report, Summit Dimension Products)

Figure B3. Pro-Forma Cash Flow Statement for Solid Dimension Manufacturer.

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
CASH INFLOW										
Cash Sales	0	0	0	0	0	0	0	0	0	0
Credit Sale Receipts	1,653,609	2,204,812	2,204,812	2,204,812	2,204,812	2,204,812	2,204,812	2,204,812	2,204,812	2,204,812
Other Receipts	15,020	22,573	25,849	29,148	32,471	35,818	39,188	42,584	46,003	49,376
Total Cash Inflows	1,668,629	2,227,385	2,230,661	2,233,960	2,237,283	2,240,629	2,244,000	2,247,396	2,250,815	2,254,188
CASH OUTFLOWS										
Labor	150,485	200,647	200,647	200,647	200,647	200,647	200,647	200,647	200,647	200,647
Utilities	29,365	39,153	39,153	39,153	39,153	39,153	39,153	39,153	39,153	39,153
Supplies and Maintenance	10,875	14,500	14,500	14,500	14,500	14,500	14,500	14,500	14,500	14,500
Administrative	56,276	75,035	75,035	75,035	75,035	75,035	75,035	75,035	75,035	75,035
Raw Materials	1,110,825	1,481,100	1,481,100	1,481,100	1,481,100	1,481,100	1,481,100	1,481,100	1,481,100	1,481,100
Lease	18,655	18,655	18,655	18,655	18,655	18,655	18,655	18,655	18,655	18,655
Principle	17,711	19,171	20,751	22,461	24,313	26,317	28,487	30,835	33,377	36,013
Interest	20,241	18,782	17,201	15,491	13,639	11,635	9,466	7,117	4,576	1,925
Income Tax	65,361	95,082	95,999	96,923	97,853	98,791	99,734	100,685	101,643	102,601
Dividends	0	183,373	185,141	186,923	188,717	190,525	192,345	194,178	196,025	197,873
Total Cash Outflows	1,479,794	2,145,497	2,148,183	2,150,888	2,153,613	2,156,357	2,159,121	2,161,905	2,164,710	2,167,506
NET CASH FLOW	188,835	81,888	82,478	83,072	83,670	84,272	84,879	85,490	86,106	86,682
Beginning Cash Balance	375,497	564,332	646,220	728,698	811,769	895,439	979,711	1,064,590	1,150,080	1,236,186
ENDING CASH BALANCE	564,332	646,220	728,698	811,769	895,439	979,711	1,064,590	1,150,080	1,236,186	1,322,868

Generated with data from: (Huber et al., Hardwood Market Report, Summit Dimension Products)

Appendix C

Pro-forma Financial Statements for Pallet Manufacturer

Figure C1. Pro-Forma Balance Sheet for Pallet Manufacturer

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Current Assets											
Cash	109,160	133,775	145,460	157,229	169,083	181,022	193,047	205,159	217,358	229,644	242,020
Accounts Receivable	58,679	78,180	78,180	78,180	78,180	78,180	78,180	78,180	78,180	78,180	78,180
Prepaid Expenses	0	0	0	0	0	0	0	0	0	0	0
Inventory	0	0	0	0	0	0	0	0	0	0	0
Supplies	0	0	0	0	0	0	0	0	0	0	0
Total Current Assets	167,839	211,955	223,640	235,409	247,263	259,202	271,227	283,339	295,538	307,825	320,200
Non-Current Assets											
Equipment	14,500	14,500	14,500	14,500	14,500	14,500	14,500	14,500	14,500	14,500	14,500
Less: Accumulated Depreciation	0	1,160	2,320	3,480	4,640	5,800	6,960	8,120	9,280	10,440	11,600
Machinery	26,100	26,100	26,100	26,100	26,100	26,100	26,100	26,100	26,100	26,100	26,100
Less: Accumulated Depreciation	0	2,088	4,176	6,264	8,352	10,440	12,528	14,616	16,704	18,792	20,880
Office Equipment	1,450	1,450	1,450	1,450	1,450	1,450	1,450	1,450	1,450	1,450	1,450
Less: Accumulated Depreciation	0	116	232	348	464	580	696	812	928	1,044	1,160
Total Non-Current Assets	42,050	38,686	35,322	31,958	28,594	25,230	21,866	18,502	15,138	11,774	8,410
TOTAL ASSETS	209,889	250,641	258,962	267,367	275,857	284,432	293,093	301,841	310,676	319,599	328,610
Current Liabilities											
Accounts Payable	34,457	45,943	45,943	45,943	45,943	45,943	45,943	45,943	45,943	45,943	45,943
Wages Payable	57,159	76,212	76,212	76,212	76,212	76,212	76,212	76,212	76,212	76,212	76,212
Taxes Payable	0	0	0	0	0	0	0	0	0	0	0
Principle Due, Equipment	989	1,071	1,159	1,255	1,358	1,470	1,591	1,723	1,865	2,018	0
Principle Due, Machinery	1,781	1,928	2,087	2,259	2,445	2,646	2,865	3,101	3,356	3,633	0
Principle Due, Office Equipment	99	107	116	125	136	147	159	172	186	202	0
Interest Payable	3,279	3,043	2,787	2,510	2,210	1,885	1,534	1,153	741	296	0
Total Current Liabilities	97,765	128,303	128,303	128,303	128,303	128,303	128,303	128,303	128,303	128,303	122,155
Non-Current Liabilities											
Remaining Principle, Equipment	13,511	13,511	12,440	11,280	10,025	8,667	7,197	5,606	3,883	2,018	0
Remaining Principle, Machinery	24,319	24,319	22,391	20,305	18,046	15,601	12,955	10,090	6,989	3,633	(0)
Remaining Principle, Office Equipment	1,351	1,351	1,244	1,128	1,003	867	720	561	388	202	0
Total Non-Current Liabilities	39,181	39,181	36,075	32,713	29,074	25,135	20,871	16,256	11,261	5,853	(0)
Owner's Equity											
Contributed Capital	72,944	83,157	86,263	89,625	93,264	97,203	101,466	106,081	111,077	116,484	128,486
Retained Earnings	0	0	8,321	16,726	25,216	33,791	42,452	51,200	60,035	68,958	77,969
Total Owner's Equity	72,944	83,157	94,584	106,351	118,480	130,994	143,919	157,282	171,112	185,442	206,455
TOTAL LIABILITIES AND OWNER'S EQUITY	209,889	250,641	258,962	267,367	275,857	284,432	293,093	301,841	310,676	319,599	328,610

Generated with data from: (White et.al., Hardwood Market Report)

Figure C2. Pro-Forma Income Statement for Pallet Manufacturer

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Gross Sales/Revenues	469,434	625,441	625,908	626,379	626,853	627,331	627,812	628,296	628,784	629,276
Less: Returns and Allowances	0	0	0	0	0	0	0	0	0	0
Net Sales	469,434	625,441	625,908	626,379	626,853	627,331	627,812	628,296	628,784	629,276
Less: Cost of Goods Sold	275,655	367,540	367,540	367,540	367,540	367,540	367,540	367,540	367,540	367,540
Gross Margin	193,779	257,901	258,368	258,839	259,313	259,791	260,272	260,756	261,244	261,736
Operating Expenses										
Labor	57,159	76,212	76,212	76,212	76,212	76,212	76,212	76,212	76,212	76,212
Utilities	8,842	11,789	11,789	11,789	11,789	11,789	11,789	11,789	11,789	11,789
Supplies and Maintenance	2,121	2,828	2,828	2,828	2,828	2,828	2,828	2,828	2,828	2,828
Administrative	50,852	67,802	67,802	67,802	67,802	67,802	67,802	67,802	67,802	67,802
Lease	12,525	12,525	12,525	12,525	12,525	12,525	12,525	12,525	12,525	12,525
Market Fees	23,253	31,005	31,005	31,005	31,005	31,005	31,005	31,005	31,005	31,005
Depreciation	3,364	3,364	3,364	3,364	3,364	3,364	3,364	3,364	3,364	3,364
Principle Payments	2,869	3,106	3,362	3,639	3,939	4,264	4,615	4,996	5,407	5,853
Total Operating Expenses	160,985	208,630	208,886	209,164	209,463	209,788	210,140	210,520	210,932	211,378
Earnings Before Int. and Taxes	32,794	49,271	49,482	49,676	49,850	50,003	50,132	50,236	50,312	50,358
Less: Interest Expense	3,279	3,043	2,787	2,510	2,210	1,885	1,534	1,153	741	296
Earnings Before Taxes	29,515	46,228	46,695	47,166	47,640	48,118	48,599	49,083	49,571	50,063
Less: Income Taxes	8,264	12,944	13,075	13,206	13,339	13,473	13,608	13,743	13,880	14,018
NET INCOME (LOSS)	21,251	33,284	33,621	33,959	34,301	34,645	34,991	35,340	35,691	36,045

Generated with data from: (White et.al., Hardwood Market Report)

Figure C3. Pro-Forma Cash Flow Statement for Pallet Manufacturer

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
CASH INFLOW										
Cash Sales	0	0	0	0	0	0	0	0	0	0
Credit Sale Receipts	441,814	589,086	589,086	589,086	589,086	589,086	589,086	589,086	589,086	589,086
Other Receipts	4,366	5,351	5,818	6,289	6,763	7,241	7,722	8,206	8,694	9,186
Total Cash Inflows	446,181	594,436	594,904	595,375	595,849	596,326	596,807	597,292	597,780	598,271
CASH OUTFLOWS										
Labor	57,159	76,212	76,212	76,212	76,212	76,212	76,212	76,212	76,212	76,212
Utilities	8,842	11,789	11,789	11,789	11,789	11,789	11,789	11,789	11,789	11,789
Supplies and Maintenance	2,121	2,828	2,828	2,828	2,828	2,828	2,828	2,828	2,828	2,828
Administrative	50,852	67,802	67,802	67,802	67,802	67,802	67,802	67,802	67,802	67,802
Raw Materials	275,655	367,540	367,540	367,540	367,540	367,540	367,540	367,540	367,540	367,540
Lease	12,525	12,525	12,525	12,525	12,525	12,525	12,525	12,525	12,525	12,525
Principle	2,869	3,106	3,362	3,639	3,939	4,264	4,615	4,996	5,407	5,853
Interest	3,279	3,043	2,787	2,510	2,210	1,885	1,534	1,153	741	296
Income Tax	8,264	12,944	13,075	13,206	13,339	13,473	13,608	13,743	13,880	14,018
Dividends	0	24,963	25,215	25,470	25,726	25,984	26,243	26,505	26,768	27,034
Total Cash Outflows	421,566	582,751	583,135	583,521	583,910	584,301	584,696	585,093	585,493	585,896
NET CASH FLOW	24,615	11,685	11,769	11,854	11,939	12,025	12,112	12,199	12,287	12,375
Beginning Cash Balance	109,160	133,775	145,460	157,229	169,083	181,022	193,047	205,159	217,358	229,644
ENDING CASH BALANCE	133,775	145,460	157,229	169,083	181,022	193,047	205,159	217,358	229,644	242,020

Generated with data from: (White et.al., Hardwood Market Report)

Appendix D

Pro-forma Financial Statements for Millwork Manufacturer

Figure D1. Pro-Forma Balance Sheet for Millwork Operation

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Current Assets											
Cash	130,780	156,599	174,903	193,339	211,908	230,611	249,448	268,420	287,530	306,777	326,162
Accounts Receivable	69,307	92,321	92,321	92,321	92,321	92,321	92,321	92,321	92,321	92,321	92,321
Prepaid Expenses	0	0	0	0	0	0	0	0	0	0	0
Inventory	0	0	0	0	0	0	0	0	0	0	0
Supplies	0	0	0	0	0	0	0	0	0	0	0
Total Current Assets	200,087	248,920	267,224	285,660	304,229	322,931	341,768	360,741	379,850	399,097	418,483
Non-Current Assets											
Equipment	125,000	125,000	125,000	125,000	125,000	125,000	125,000	125,000	125,000	125,000	125,000
Less: Accumulated Depreciation	0	10,000	20,000	30,000	40,000	50,000	60,000	70,000	80,000	90,000	100,000
Machinery	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000
Less: Accumulated Depreciation	0	800	1,600	2,400	3,200	4,000	4,800	5,600	6,400	7,200	8,000
Office Equipment	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500
Less: Accumulated Depreciation	0	120	240	360	480	600	720	840	960	1,080	1,200
Total Non-Current Assets	136,500	125,580	114,660	103,740	92,820	81,900	70,980	60,060	49,140	38,220	27,300
TOTAL ASSETS	336,587	374,500	381,884	389,400	397,049	404,831	412,748	420,801	428,990	437,317	445,783
Current Liabilities											
Accounts Payable	42,984	57,313	57,313	57,313	57,313	57,313	57,313	57,313	57,313	57,313	57,313
Wages Payable	60,000	80,000	80,000	80,000	80,000	80,000	80,000	80,000	80,000	80,000	80,000
Taxes Payable	0	0	0	0	0	0	0	0	0	0	0
Principle Due, Equipment	8,530	9,233	9,994	10,818	11,709	12,674	13,719	14,850	16,074	17,399	0
Principle Due, Machinery	682	739	799	865	937	1,014	1,098	1,188	1,286	1,392	0
Principle Due, Office Equipment	102	111	120	130	141	152	165	178	193	209	0
Interest Payable	10,645	9,877	9,046	8,147	7,173	6,119	4,978	3,743	2,406	959	0
Total Current Liabilities	122,944	157,272	157,272	157,272	157,272	157,272	157,272	157,272	157,272	157,272	137,313
Non-Current Liabilities											
Remaining Principle, Equipment	116,470	116,470	107,238	97,244	86,427	74,717	62,043	48,324	33,474	17,399	(0)
Remaining Principle, Machinery	9,318	9,318	8,579	7,780	6,914	5,977	4,963	3,866	2,678	1,392	0
Remaining Principle, Office Equipment	1,398	1,398	1,287	1,167	1,037	897	745	580	402	209	(0)
Total Non-Current Liabilities	127,186	127,186	117,104	106,191	94,378	81,591	67,751	52,769	36,553	19,000	(0)
Owner's Equity											
Contributed Capital	86,457	90,042	100,124	111,037	122,850	135,637	149,477	164,459	180,675	198,228	237,187
Retained Earnings	0	0	7,384	14,900	22,549	30,331	38,248	46,301	54,490	62,817	71,283
Total Owner's Equity	86,457	90,042	107,509	125,938	145,399	165,968	187,726	210,760	235,165	261,045	308,470
TOTAL LIABILITIES AND OWNER'S EQUITY	336,587	374,500	381,884	389,400	397,049	404,831	412,748	420,801	428,990	437,317	445,783

Generated with data from: (Lamb, Hardwood Market Report)

Figure D2. Pro-Forma Income Statement for Millwork Operation

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Gross Sales/Revenues	554,458	738,566	739,298	740,036	740,778	741,526	742,280	743,039	743,803	744,573
Less: Returns and Allowances	0	0	0	0	0	0	0	0	0	0
Net Sales	554,458	738,566	739,298	740,036	740,778	741,526	742,280	743,039	743,803	744,573
Less: Cost of Goods Sold	343,875	458,500	458,500	458,500	458,500	458,500	458,500	458,500	458,500	458,500
Gross Margin	210,583	280,066	280,798	281,535	282,278	283,026	283,780	284,539	285,303	286,073
Operating Expenses										
Labor	60,000	80,000	80,000	80,000	80,000	80,000	80,000	80,000	80,000	80,000
Utilities	15,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000
Supplies and Maintenance	15,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000
Administrative	30,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000
Lease	11,548	11,548	11,548	11,548	11,548	11,548	11,548	11,548	11,548	11,548
Market Fees	27,461	36,615	36,615	36,615	36,615	36,615	36,615	36,615	36,615	36,615
Depreciation	10,920	10,920	10,920	10,920	10,920	10,920	10,920	10,920	10,920	10,920
Principle Payments	9,314	10,082	10,913	11,813	12,786	13,840	14,981	16,216	17,553	19,000
Total Operating Expenses	179,244	229,165	229,996	230,896	231,870	232,924	234,064	235,299	236,636	238,083
Earnings Before Int. and Taxes	31,339	50,901	50,802	50,640	50,409	50,103	49,715	49,239	48,667	47,990
Less: Interest Expense	10,645	9,877	9,046	8,147	7,173	6,119	4,978	3,743	2,406	959
Earnings Before Taxes	20,694	41,023	41,755	42,493	43,236	43,984	44,737	45,496	46,261	47,030
Less: Income Taxes	5,794	11,487	11,692	11,898	12,106	12,315	12,526	12,739	12,953	13,169
NET INCOME (LOSS)	14,900	29,537	30,064	30,595	31,130	31,668	32,211	32,757	33,308	33,862

Generated with data from: (Lamb, Hardwood Market Report)

Figure D3. Pro-Forma Cash Flow Statement for Millwork Operation

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
CASH INFLOW										
Cash Sales	0	0	0	0	0	0	0	0	0	0
Credit Sale Receipts	521,765	695,687	695,687	695,687	695,687	695,687	695,687	695,687	695,687	695,687
Other Receipts	5,231	6,264	6,996	7,734	8,476	9,224	9,978	10,737	11,501	12,271
Total Cash Inflows	526,996	701,951	702,683	703,420	704,163	704,911	705,665	706,424	707,188	707,958
CASH OUTFLOWS										
Labor	60,000	80,000	80,000	80,000	80,000	80,000	80,000	80,000	80,000	80,000
Utilities	15,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000
Supplies and Maintenance	15,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000
Administrative	30,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000
Raw Materials	343,875	458,500	458,500	458,500	458,500	458,500	458,500	458,500	458,500	458,500
Lease	11,548	11,548	11,548	11,548	11,548	11,548	11,548	11,548	11,548	11,548
Principle	9,314	10,082	10,913	11,813	12,786	13,840	14,981	16,216	17,553	19,000
Interest	10,645	9,877	9,046	8,147	7,173	6,119	4,978	3,743	2,406	959
Income Tax	5,794	11,487	11,692	11,898	12,106	12,315	12,526	12,739	12,953	13,169
Dividends	0	22,153	22,548	22,946	23,347	23,751	24,158	24,568	24,981	25,396
Total Cash Outflows	501,177	683,647	684,247	684,852	685,461	686,074	686,692	687,314	687,941	688,572
NET CASH FLOW	25,820	18,304	18,436	18,569	18,702	18,837	18,973	19,109	19,247	19,385
Beginning Cash Balance	130,780	156,599	174,903	193,339	211,908	230,611	249,448	268,420	287,530	306,777
ENDING CASH BALANCE	156,599	174,903	193,339	211,908	230,611	249,448	268,420	287,530	306,777	326,162

Generated with data from: (Lamb, Hardwood Market Report)

Appendix E

Pro-forma Financial Statements for Custom Furniture Manufacturer

Figure E1. Pro-Forma Balance Sheet for Custom Furniture Manufacturer

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Current Assets											
Cash	45,623	52,776	66,952	81,231	95,613	110,098	124,688	139,383	154,183	169,090	184,104
Accounts Receivable	23,666	31,514	31,514	31,514	31,514	31,514	31,514	31,514	31,514	31,514	31,514
Prepaid Expenses	0	0	0	0	0	0	0	0	0	0	0
Inventory	0	0	0	0	0	0	0	0	0	0	0
Supplies	0	0	0	0	0	0	0	0	0	0	0
Total Current Assets	69,289	84,289	98,466	112,745	127,127	141,612	156,202	170,896	185,697	200,604	215,618
Non-Current Assets											
Equipment	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000
Less: Accumulated Depreciation	0	2,000	4,000	6,000	8,000	10,000	12,000	14,000	16,000	18,000	20,000
Machinery	132,500	132,500	132,500	132,500	132,500	132,500	132,500	132,500	132,500	132,500	132,500
Less: Accumulated Depreciation	0	10,600	21,200	31,800	42,400	53,000	63,600	74,200	84,800	95,400	106,000
Office Equipment	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500
Less: Accumulated Depreciation	0	120	240	360	480	600	720	840	960	1,080	1,200
Total Non-Current Assets	159,000	146,280	133,560	120,840	108,120	95,400	82,680	69,960	57,240	44,520	31,800
TOTAL ASSETS	228,289	230,569	232,026	233,585	235,247	237,012	238,882	240,856	242,937	245,124	247,418
Current Liabilities											
Accounts Payable	6,563	8,750	8,750	8,750	8,750	8,750	8,750	8,750	8,750	8,750	8,750
Wages Payable	45,000	60,000	60,000	60,000	60,000	60,000	60,000	60,000	60,000	60,000	60,000
Taxes Payable	0	0	0	0	0	0	0	0	0	0	0
Principle Due, Equipment	1,706	1,847	1,999	2,164	2,342	2,535	2,744	2,970	3,215	3,480	0
Principle Due, Machinery	9,041	9,787	10,593	11,467	12,412	13,435	14,542	15,741	17,039	18,443	0
Principle Due, Office Equipment	102	111	120	130	141	152	165	178	193	209	0
Interest Payable	12,400	11,506	10,537	9,490	8,355	7,128	5,799	4,360	2,803	1,118	0
Total Current Liabilities	74,812	91,999	91,999	91,999	91,999	91,999	91,999	91,999	91,999	91,999	68,750
Non-Current Liabilities											
Remaining Principle, Equipment	23,294	23,294	21,448	19,449	17,285	14,943	12,409	9,665	6,695	3,480	0
Remaining Principle, Machinery	123,459	123,459	113,672	103,079	91,612	79,200	65,765	51,223	35,482	18,443	(0)
Remaining Principle, Office Equipment	1,398	1,398	1,287	1,167	1,037	897	745	580	402	209	(0)
Total Non-Current Liabilities	148,150	148,150	136,407	123,694	109,935	95,040	78,919	61,468	42,578	22,132	(0)
Owner's Equity											
Contributed Capital	5,326	(9,580)	2,164	14,876	28,635	43,530	59,651	77,102	95,992	116,438	161,819
Retained Earnings	0	0	1,457	3,016	4,677	6,443	8,312	10,287	12,367	14,554	16,849
Total Owner's Equity	5,326	(9,580)	3,620	17,891	33,313	49,972	67,964	87,389	108,359	130,992	178,668
TOTAL LIABILITIES AND OWNER'S EQUITY	228,289	230,569	232,026	233,585	235,247	237,012	238,882	240,856	242,937	245,124	247,418

Generated with data from: (Lamb, Hardwood Market Report)

Figure E2. Pro-Forma Income Statement for Custom Furniture Manufacturer

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Gross Sales/Revenues	189,325	252,111	252,678	253,249	253,825	254,404	254,988	255,575	256,167	256,764
Less: Returns and Allowances	0	0	0	0	0	0	0	0	0	0
Net Sales	189,325	252,111	252,678	253,249	253,825	254,404	254,988	255,575	256,167	256,764
Less: Cost of Goods Sold	52,500	70,000	70,000	70,000	70,000	70,000	70,000	70,000	70,000	70,000
Gross Margin	136,825	182,111	182,678	183,249	183,825	184,404	184,988	185,575	186,167	186,764
Operating Expenses										
Labor	45,000	60,000	60,000	60,000	60,000	60,000	60,000	60,000	60,000	60,000
Utilities	10,125	13,500	13,500	13,500	13,500	13,500	13,500	13,500	13,500	13,500
Supplies and Maintenance	10,125	13,500	13,500	13,500	13,500	13,500	13,500	13,500	13,500	13,500
Administrative	20,250	27,000	27,000	27,000	27,000	27,000	27,000	27,000	27,000	27,000
Lease	11,548	11,548	11,548	11,548	11,548	11,548	11,548	11,548	11,548	11,548
Market Fees	9,375	12,500	12,500	12,500	12,500	12,500	12,500	12,500	12,500	12,500
Depreciation	12,720	12,720	12,720	12,720	12,720	12,720	12,720	12,720	12,720	12,720
Principle Payments	10,850	11,744	12,712	13,760	14,894	16,122	17,451	18,889	20,446	22,132
Total Operating Expenses	129,993	162,512	163,480	164,528	165,662	166,890	168,219	169,657	171,214	172,900
Earnings Before Int. and Taxes	6,832	19,599	19,198	18,721	18,162	17,514	16,769	15,918	14,953	13,864
Less: Interest Expense	12,400	11,506	10,537	9,490	8,355	7,128	5,799	4,360	2,803	1,118
Earnings Before Taxes	(5,568)	8,094	8,661	9,232	9,807	10,386	10,970	11,558	12,150	12,746
Less: Income Taxes	0	2,266	2,425	2,585	2,746	2,908	3,072	3,236	3,402	3,569
NET INCOME (LOSS)	(5,568)	5,827	6,236	6,647	7,061	7,478	7,898	8,322	8,748	9,177

Generated with data from: (Lamb, Hardwood Market Report)

Figure E3. Pro-Forma Cash Flow Statement for Custom Furniture Manufacturer

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
CASH INFLOW										
Cash Sales	0	0	0	0	0	0	0	0	0	0
Credit Sale Receipts	178,125	237,500	237,500	237,500	237,500	237,500	237,500	237,500	237,500	237,500
Other Receipts	1,825	2,111	2,678	3,249	3,825	4,404	4,988	5,575	6,167	6,764
Total Cash Inflows	179,950	239,611	240,178	240,749	241,325	241,904	242,488	243,075	243,667	244,264
CASH OUTFLOWS										
Labor	45,000	60,000	60,000	60,000	60,000	60,000	60,000	60,000	60,000	60,000
Utilities	10,125	13,500	13,500	13,500	13,500	13,500	13,500	13,500	13,500	13,500
Supplies and Maintenance	10,125	13,500	13,500	13,500	13,500	13,500	13,500	13,500	13,500	13,500
Administrative	20,250	27,000	27,000	27,000	27,000	27,000	27,000	27,000	27,000	27,000
Raw Materials	52,500	70,000	70,000	70,000	70,000	70,000	70,000	70,000	70,000	70,000
Lease	11,548	11,548	11,548	11,548	11,548	11,548	11,548	11,548	11,548	11,548
Principle	10,850	11,744	12,712	13,760	14,894	16,122	17,451	18,889	20,446	22,132
Interest	12,400	11,506	10,537	9,490	8,355	7,128	5,799	4,360	2,803	1,118
Income Tax	0	2,266	2,425	2,585	2,746	2,908	3,072	3,236	3,402	3,569
Dividends	0	4,371	4,677	4,985	5,296	5,609	5,924	6,241	6,561	6,883
Total Cash Outflows	172,797	225,434	225,899	226,368	226,839	227,314	227,793	228,275	228,760	229,249
NET CASH FLOW	7,152	14,177	14,279	14,382	14,485	14,590	14,695	14,800	14,907	15,014
Beginning Cash Balance	45,623	52,776	66,952	81,231	95,613	110,098	124,688	139,383	154,183	169,090
ENDING CASH BALANCE	52,776	66,952	81,231	95,613	110,098	124,688	139,383	154,183	169,090	184,104

Generated with data from: (Lamb, Hardwood Market Report)

Appendix F

Pro-forma Financial Statements for Custom Cabinet Manufacturer

Figure F1. Pro-Forma Balance Sheet for Custom Cabinet Manufacturer

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Current Assets											
Cash	44,975	54,660	68,163	81,763	95,461	109,258	123,154	137,151	151,247	165,446	179,747
Accounts Receivable	23,662	31,523	31,523	31,523	31,523	31,523	31,523	31,523	31,523	31,523	31,523
Prepaid Expenses	0	0	0	0	0	0	0	0	0	0	0
Inventory	0	0	0	0	0	0	0	0	0	0	0
Supplies	0	0	0	0	0	0	0	0	0	0	0
Total Current Assets	68,637	86,183	99,686	113,287	126,985	140,782	154,678	168,674	182,771	196,969	211,270
Non-Current Assets											
Equipment	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000
Less: Accumulated Depreciation	0	2,000	4,000	6,000	8,000	10,000	12,000	14,000	16,000	18,000	20,000
Machinery	115,000	115,000	115,000	115,000	115,000	115,000	115,000	115,000	115,000	115,000	115,000
Less: Accumulated Depreciation	0	9,200	18,400	27,600	36,800	46,000	55,200	64,400	73,600	82,800	92,000
Office Equipment	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500
Less: Accumulated Depreciation	0	120	240	360	480	600	720	840	960	1,080	1,200
Total Non-Current Assets	141,500	130,180	118,860	107,540	96,220	84,900	73,580	62,260	50,940	39,620	28,300
TOTAL ASSETS	210,137	216,363	218,546	220,827	223,205	225,682	228,258	230,934	233,711	236,589	239,570
Current Liabilities											
Accounts Payable	6,563	8,750	8,750	8,750	8,750	8,750	8,750	8,750	8,750	8,750	8,750
Wages Payable	45,000	60,000	60,000	60,000	60,000	60,000	60,000	60,000	60,000	60,000	60,000
Taxes Payable	0	0	0	0	0	0	0	0	0	0	0
Principle Due, Equipment	1,706	1,847	1,999	2,164	2,342	2,535	2,744	2,970	3,215	3,480	0
Principle Due, Machinery	7,847	8,494	9,194	9,952	10,772	11,660	12,622	13,662	14,788	16,007	0
Principle Due, Office Equipment	102	111	120	130	141	152	165	178	193	209	0
Interest Payable	11,035	10,239	9,378	8,445	7,436	6,343	5,160	3,880	2,494	995	0
Total Current Liabilities	72,253	89,441	89,441	89,441	89,441	89,441	89,441	89,441	89,441	89,441	68,750
Non-Current Liabilities											
Remaining Principle, Equipment	23,294	23,294	21,448	19,449	17,285	14,943	12,409	9,665	6,695	3,480	0
Remaining Principle, Machinery	107,153	107,153	98,659	89,465	79,512	68,740	57,079	44,458	30,796	16,007	0
Remaining Principle, Office Equipment	1,398	1,398	1,287	1,167	1,037	897	745	580	402	209	(0)
Total Non-Current Liabilities	131,845	131,845	121,393	110,080	97,835	84,580	70,233	54,702	37,892	19,696	0
Owner's Equity											
Contributed Capital	6,039	(4,922)	5,530	16,842	29,088	42,343	56,690	72,220	89,031	107,227	147,613
Retained Earnings	0	0	2,183	4,463	6,841	9,318	11,894	14,570	17,347	20,226	23,207
Total Owner's Equity	6,039	(4,922)	7,713	21,306	35,929	51,661	68,585	86,791	106,378	127,453	170,820
TOTAL LIABILITIES AND OWNER'S EQUITY	210,137	216,363	218,546	220,827	223,205	225,682	228,258	230,934	233,711	236,589	239,570

Generated with data from: (Lamb, Hardwood Market Report)

Figure F2. Pro-Forma Income Statement for Custom Cabinet Manufacturer

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Gross Sales/Revenues	189,299	252,186	252,727	253,271	253,818	254,370	254,926	255,486	256,050	256,618
Less: Returns and Allowances	0	0	0	0	0	0	0	0	0	0
Net Sales	189,299	252,186	252,727	253,271	253,818	254,370	254,926	255,486	256,050	256,618
Less: Cost of Goods Sold	52,500	70,000	70,000	70,000	70,000	70,000	70,000	70,000	70,000	70,000
Gross Margin	136,799	182,186	182,727	183,271	183,818	184,370	184,926	185,486	186,050	186,618
Operating Expenses										
Labor	45,000	60,000	60,000	60,000	60,000	60,000	60,000	60,000	60,000	60,000
Utilities	10,125	13,500	13,500	13,500	13,500	13,500	13,500	13,500	13,500	13,500
Supplies and Maintenance	10,125	13,500	13,500	13,500	13,500	13,500	13,500	13,500	13,500	13,500
Administrative	20,250	27,000	27,000	27,000	27,000	27,000	27,000	27,000	27,000	27,000
Lease	11,548	11,548	11,548	11,548	11,548	11,548	11,548	11,548	11,548	11,548
Market Fees	9,375	12,500	12,500	12,500	12,500	12,500	12,500	12,500	12,500	12,500
Depreciation	11,320	11,320	11,320	11,320	11,320	11,320	11,320	11,320	11,320	11,320
Principle Payments	9,655	10,451	11,313	12,245	13,255	14,347	15,530	16,810	18,196	19,696
Total Operating Expenses	127,398	159,819	160,681	161,613	162,623	163,715	164,898	166,178	167,564	169,064
Earnings Before Int. and Taxes	9,401	22,367	22,046	21,657	21,196	20,655	20,028	19,308	18,486	17,554
Less: Interest Expense	11,035	10,239	9,378	8,445	7,436	6,343	5,160	3,880	2,494	995
Earnings Before Taxes	(1,635)	12,128	12,668	13,212	13,760	14,312	14,868	15,427	15,991	16,559
Less: Income Taxes	0	3,396	3,547	3,699	3,853	4,007	4,163	4,320	4,478	4,637
NET INCOME (LOSS)	(1,635)	8,732	9,121	9,513	9,907	10,304	10,705	11,108	11,514	11,923

Generated with data from: (Lamb, Hardwood Market Report)

Figure F3. Pro-Forma Cash Flow Statement for Custom Cabinet Manufacturer

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
CASH INFLOW										
Cash Sales	0	0	0	0	0	0	0	0	0	0
Credit Sale Receipts	178,125	237,500	237,500	237,500	237,500	237,500	237,500	237,500	237,500	237,500
Other Receipts	1,799	2,186	2,727	3,271	3,818	4,370	4,926	5,486	6,050	6,618
Total Cash Inflows	179,924	239,686	240,227	240,771	241,318	241,870	242,426	242,986	243,550	244,118
CASH OUTFLOWS										
Labor	45,000	60,000	60,000	60,000	60,000	60,000	60,000	60,000	60,000	60,000
Utilities	10,125	13,500	13,500	13,500	13,500	13,500	13,500	13,500	13,500	13,500
Supplies and Maintenance	10,125	13,500	13,500	13,500	13,500	13,500	13,500	13,500	13,500	13,500
Administrative	20,250	27,000	27,000	27,000	27,000	27,000	27,000	27,000	27,000	27,000
Raw Materials	52,500	70,000	70,000	70,000	70,000	70,000	70,000	70,000	70,000	70,000
Lease	11,548	11,548	11,548	11,548	11,548	11,548	11,548	11,548	11,548	11,548
Principle	9,655	10,451	11,313	12,245	13,255	14,347	15,530	16,810	18,196	19,696
Interest	11,035	10,239	9,378	8,445	7,436	6,343	5,160	3,880	2,494	995
Income Tax	0	3,396	3,547	3,699	3,853	4,007	4,163	4,320	4,478	4,637
Dividends	0	6,549	6,841	7,134	7,430	7,728	8,029	8,331	8,635	8,942
Total Cash Outflows	170,239	226,183	226,626	227,072	227,522	227,974	228,430	228,889	229,351	229,817
NET CASH FLOW	9,685	13,503	13,600	13,698	13,797	13,896	13,996	14,097	14,198	14,301
Beginning Cash Balance	44,975	54,660	68,163	81,763	95,461	109,258	123,154	137,151	151,247	165,446
ENDING CASH BALANCE	54,660	68,163	81,763	95,461	109,258	123,154	137,151	151,247	165,446	179,747

Generated with data from: (Lamb, Hardwood Market Report)

Appendix G

Pro-forma Financial Statements for Park Formation Alternative 1

**Figure G1. Pro-forma Balance Sheet for Development Corporation, Park Formation
Alternative 1.**

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Current Assets											
Cash	7,096,424	274,348	937,269	1,607,811	2,286,030	2,971,980	3,665,718	4,367,300	5,076,782	5,794,220	6,519,673
Leases Receivable	44,032	44,032	44,032	44,032	44,032	44,032	44,032	44,032	44,032	44,032	0
Prepaid Expenses											
Total Current Assets	7,140,456	318,380	981,300	1,651,843	2,330,061	3,016,012	3,709,750	4,411,332	5,120,813	5,838,252	6,519,673
Non-Current Assets											
Land	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000
Buildings	3,815,302	3,815,302	3,815,302	3,815,302	3,815,302	3,815,302	3,815,302	3,815,302	3,815,302	3,815,302	3,815,302
Less: Accumulated Depreciation	101,741	101,741	203,483	305,224	406,966	508,707	610,448	712,190	813,931	915,672	1,017,414
Office Equipment	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000
Less: Accumulated Depreciation		2,000	4,000	6,000	8,000	10,000	12,000	14,000	16,000	18,000	20,000
Equity in Primary Corporation	11,799,244	8,965,370	8,960,112	8,954,854	8,949,596	8,944,338	8,939,080	8,933,822	8,928,564	8,923,306	8,918,048
Equity in Marketing Corporation	567,247	369,436	369,436	369,436	369,436	369,436	369,436	369,436	369,436	369,436	369,436
Total Non-Current Assets	17,105,051	14,071,367	13,962,367	13,853,368	13,744,369	13,635,369	13,526,370	13,417,370	13,308,371	13,199,372	13,090,372
TOTAL ASSETS	24,245,507	14,389,746	14,943,668	15,505,211	16,074,430	16,651,381	17,236,120	17,828,702	18,429,184	19,037,623	19,610,045
Current Liabilities											
Accounts Payable	33,188	33,188	33,188	33,188	33,188	33,188	33,188	33,188	33,188	33,188	0
Wages Payable	0	0	0	0	0	0	0	0	0	0	0
Taxes Payable											
Principle Due, Land	8,827	9,534	10,296	11,120	12,010	12,970	14,008	15,129	16,339	17,646	19,058
Principle Due, Buildings	33,679	36,374	39,284	42,426	45,820	49,486	53,445	57,720	62,338	67,325	72,711
Interest Payable	385,224	381,824	378,151	374,185	369,901	365,275	360,278	354,882	349,054	342,760	335,962
Capital Investments Payable	6,503,802	0	0	0	0	0	0	0	0	0	0
Total Current Liabilities	6,964,720	460,918	460,918	460,918	460,918	460,918	460,918	460,918	460,918	460,918	427,731
Non-Current Liabilities											
Remaining Principle, Land	991,173	981,639	971,343	960,223	948,213	935,243	921,235	906,106	889,767	872,121	853,063
Remaining Principle, Buildings	3,781,623	3,745,249	3,705,965	3,663,539	3,617,719	3,568,233	3,514,788	3,457,068	3,394,729	3,327,404	3,254,693
Total Non-Current Liabilities	4,772,795	4,726,888	4,677,308	4,623,762	4,565,932	4,503,475	4,436,023	4,363,173	4,284,496	4,199,525	4,107,756
Owner's Equity											
Contributed Capital	12,507,991	8,642,761	8,679,461	8,720,073	8,764,913	8,814,324	8,868,675	8,928,366	8,993,829	9,065,528	9,762,906
Retained Earnings	0	559,179	1,125,980	1,700,457	2,282,667	2,872,663	3,470,503	4,076,244	4,689,941	5,311,652	5,311,652
Total Owner's Equity	12,507,991	9,201,940	9,805,441	10,420,530	11,047,580	11,686,987	12,339,179	13,004,610	13,683,769	14,377,180	15,074,558
TOTAL LIABILITIES AND OWNER'S EQUITY	24,245,507	14,389,746	14,943,668	15,505,211	16,074,430	16,651,381	17,236,120	17,828,702	18,429,184	19,037,623	19,610,045

**Figure G2. Pro-forma Income Statement for Development Corporation, Park Formation
Alternative 1**

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Gross Revenues	374,957	3,903,523	3,945,866	3,988,513	4,031,468	4,074,731	4,118,307	4,162,196	4,206,400	4,250,924
Less: Returns and Allowances										
Net Sales	374,957	3,903,523	3,945,866	3,988,513	4,031,468	4,074,731	4,118,307	4,162,196	4,206,400	4,250,924
Less: Cost of Goods Sold										
Gross Margin	374,957	3,903,523	3,945,866	3,988,513	4,031,468	4,074,731	4,118,307	4,162,196	4,206,400	4,250,924
Operating Expenses										
Labor	0	0	0	0	0	0	0	0	0	0
Utilities	18,000	18,000	18,000	18,000	18,000	18,000	18,000	18,000	18,000	18,000
Supplies and Maintenance	37,500	37,500	37,500	37,500	37,500	37,500	37,500	37,500	37,500	37,500
Administrative	210,000	210,000	210,000	210,000	210,000	210,000	210,000	210,000	210,000	210,000
Capital Investments	6,503,802	0	0	0	0	0	0	0	0	0
Principle	42,507	45,907	49,580	53,546	57,830	62,456	67,453	72,849	78,677	84,971
Depreciation	103,741	103,741	103,741	103,741	103,741	103,741	103,741	103,741	103,741	103,741
Total Operating Expenses	6,915,550	415,149	418,821	422,788	427,071	431,698	436,694	442,090	447,918	454,213
Earnings Before Int. and Taxes	(6,540,593)	3,488,375	3,527,045	3,565,726	3,604,396	3,643,034	3,681,612	3,720,105	3,758,482	3,796,711
Less: Interest Expense	385,224	381,824	378,151	374,185	369,901	365,275	360,278	354,882	349,054	342,760
Earnings Before Taxes	(6,925,817)	3,106,551	3,148,894	3,191,541	3,234,495	3,277,759	3,321,334	3,365,223	3,409,428	3,453,951
Less: Income Taxes	0	869,834	881,690	893,631	905,659	917,773	929,974	942,263	954,640	967,106
NET INCOME (LOSS)	(6,925,817)	2,236,717	2,267,203	2,297,909	2,328,837	2,359,987	2,391,361	2,422,961	2,454,788	2,486,845

Figure G3. Pro-forma Cash Flow Statement for Development Corporation, Park Formation Alternative 1

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
CASH INFLOW										
Lease Receipts	352,252	352,252	352,252	352,252	352,252	352,252	352,252	352,252	352,252	352,252
Cash Dividends	0	3,540,297	3,556,123	3,571,949	3,587,774	3,603,600	3,619,426	3,635,251	3,651,077	3,666,903
Other Receipts	22,705	10,974	37,491	64,312	91,441	118,879	146,629	174,692	203,071	231,769
Total Cash Inflows	374,957	3,903,523	3,945,866	3,988,513	4,031,468	4,074,731	4,118,307	4,162,196	4,206,400	4,250,924
CASH OUTFLOWS										
Labor	0	0	0	0	0	0	0	0	0	0
Utilities	18,000	18,000	18,000	18,000	18,000	18,000	18,000	18,000	18,000	18,000
Supplies and Maintenance	37,500	37,500	37,500	37,500	37,500	37,500	37,500	37,500	37,500	37,500
Administrative	210,000	210,000	210,000	210,000	210,000	210,000	210,000	210,000	210,000	210,000
Capital Investment	6,503,802									
Principle	42,507	45,907	49,580	53,546	57,830	62,456	67,453	72,849	78,677	84,971
Interest	385,224	381,824	378,151	374,185	369,901	365,275	360,278	354,882	349,054	342,760
Income Tax	0	869,834	881,690	893,631	905,659	917,773	929,974	942,263	954,640	967,106
Dividends	0	1,677,538	1,700,403	1,723,432	1,746,628	1,769,990	1,793,521	1,817,221	1,841,091	1,865,134
Total Cash Outflows	7,197,033	3,240,603	3,275,324	3,310,295	3,345,517	3,380,993	3,416,725	3,452,714	3,488,962	3,525,471
NET CASH FLOW	(6,822,076)	662,921	670,542	678,219	685,951	693,738	701,582	709,482	717,438	725,453
Beginning Cash Balance	7,096,424	274,348	937,269	1,607,811	2,286,030	2,971,980	3,665,718	4,367,300	5,076,782	5,794,220
ENDING CASH BALANCE	274,348	937,269	1,607,811	2,286,030	2,971,980	3,665,718	4,367,300	5,076,782	5,794,220	6,519,673

Figure G4. Pro-forma Balance Sheet for Primary Manufacturing Corporation, Park Formation Alternative 1.

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Current Assets											
Cash	6,075,848	3,558,346	3,937,588	4,316,830	4,696,072	5,075,314	5,454,556	5,833,798	6,213,040	6,592,282	6,971,524
Accounts Receivable	579,853	778,018	778,018	778,018	778,018	778,018	778,018	778,018	778,018	778,018	778,018
Prepaid Expenses	0	0	0	0	0	0	0	0	0	0	0
Inventory	727,398	727,398	727,398	727,398	727,398	727,398	727,398	727,398	727,398	727,398	727,398
Supplies	0	0	0	0	0	0	0	0	0	0	0
Total Current Assets	7,383,099	5,063,761	5,443,003	5,822,245	6,201,487	6,580,729	6,959,971	7,339,213	7,718,455	8,097,697	8,476,939
Non-Current Assets											
Equipment	120,000	120,000	120,000	120,000	120,000	120,000	120,000	120,000	120,000	120,000	120,000
Less: Accumulated Depreciation	0	9,600	19,200	28,800	38,400	48,000	57,600	67,200	76,800	86,400	96,000
Machinery	4,661,250	4,661,250	4,661,250	4,661,250	4,661,250	4,661,250	4,661,250	4,661,250	4,661,250	4,661,250	4,661,250
Less: Accumulated Depreciation	0	372,900	745,800	1,118,700	1,491,600	1,864,500	2,237,400	2,610,300	2,983,200	3,356,100	3,729,000
Office Equipment	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000
Less: Accumulated Depreciation	0	2,000	4,000	6,000	8,000	10,000	12,000	14,000	16,000	18,000	20,000
Total Non-Current Assets	4,806,250	4,421,750	4,037,250	3,652,750	3,268,250	2,883,750	2,499,250	2,114,750	1,730,250	1,345,750	961,250
TOTAL ASSETS	12,189,349	9,485,511	9,480,253	9,474,995	9,469,737	9,464,479	9,459,221	9,453,963	9,448,705	9,443,447	9,438,189
Current Liabilities											
Accounts Payable	116,643	155,524	155,524	155,524	155,524	155,524	155,524	155,524	155,524	155,524	155,524
Wages Payable	273,462	364,616	364,616	364,616	364,616	364,616	364,616	364,616	364,616	364,616	364,616
Taxes Payable	0	0	0	0	0	0	0	0	0	0	0
Principle Due, Equipment	0	0	0	0	0	0	0	0	0	0	0
Principle Due, Machinery	0	0	0	0	0	0	0	0	0	0	0
Principle Due, Office Equipment	0	0	0	0	0	0	0	0	0	0	0
Interest Payable	0	0	0	0	0	0	0	0	0	0	0
Total Current Liabilities	390,105	520,141	520,141	520,141	520,141	520,141	520,141	520,141	520,141	520,141	520,141
Non-Current Liabilities											
Remaining Principle, Equipment	0	0	0	0	0	0	0	0	0	0	0
Remaining Principle, Machinery	0	0	0	0	0	0	0	0	0	0	0
Remaining Principle, Office Equipment	0	0	0	0	0	0	0	0	0	0	0
Total Non-Current Liabilities	0	0	0	0	0	0	0	0	0	0	0
Owner's Equity											
Contributed Capital	11,799,244	8,965,370	8,960,112	8,954,854	8,949,596	8,944,338	8,939,080	8,933,822	8,928,564	8,923,306	8,918,048
Retained Earnings	0	0	0	0	0	0	0	0	0	0	0
Total Owner's Equity	11,799,244	8,965,370	8,960,112	8,954,854	8,949,596	8,944,338	8,939,080	8,933,822	8,928,564	8,923,306	8,918,048
TOTAL LIABILITIES AND OWNER'S EQUITY	12,189,349	9,485,511	9,480,253	9,474,995	9,469,737	9,464,479	9,459,221	9,453,963	9,448,705	9,443,447	9,438,189

Generated with data from: (White, Lamb, American Electric Power, Hardwood Market Report, Patterson and Brock, and Timber Mart South)

Figure G5. Pro-forma Income Statement for Primary Manufacturing Corporation, Park Formation Alternative 1.

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Gross Sales/Revenues	4,638,828	6,224,142	6,239,312	6,254,482	6,269,651	6,284,821	6,299,991	6,315,160	6,330,330	6,345,500
Less: Returns and Allowances	0	0	0	0	0	0	0	0	0	0
Net Sales	4,638,828	6,224,142	6,239,312	6,254,482	6,269,651	6,284,821	6,299,991	6,315,160	6,330,330	6,345,500
Less: Cost of Goods Sold	933,145	1,244,193	1,244,193	1,244,193	1,244,193	1,244,193	1,244,193	1,244,193	1,244,193	1,244,193
Gross Margin	3,705,683	4,979,949	4,995,119	5,010,288	5,025,458	5,040,628	5,055,797	5,070,967	5,086,137	5,101,306
Operating Expenses										
Labor	273,462	364,616	364,616	364,616	364,616	364,616	364,616	364,616	364,616	364,616
Utilities	36,237	48,316	48,316	48,316	48,316	48,316	48,316	48,316	48,316	48,316
Supplies and Maintenance	200,040	266,720	266,720	266,720	266,720	266,720	266,720	266,720	266,720	266,720
Administrative	142,500	190,000	190,000	190,000	190,000	190,000	190,000	190,000	190,000	190,000
Lease	37,298	37,298	37,298	37,298	37,298	37,298	37,298	37,298	37,298	37,298
Market Fees	161,619	215,492	215,492	215,492	215,492	215,492	215,492	215,492	215,492	215,492
Depreciation	384,500	384,500	384,500	384,500	384,500	384,500	384,500	384,500	384,500	384,500
Capital Investment	4,806,250	0	0	0	0	0	0	0	0	0
Total Operating Expenses	6,041,907	1,506,943	1,506,943	1,506,943	1,506,943	1,506,943	1,506,943	1,506,943	1,506,943	1,506,943
Earnings Before Int. and Taxes	(2,336,224)	3,473,006	3,488,176	3,503,345	3,518,515	3,533,685	3,548,854	3,564,024	3,579,194	3,594,364
Less: Interest Expense	727,398	0	0	0	0	0	0	0	0	0
Earnings Before Taxes	(3,063,621)	3,473,006	3,488,176	3,503,345	3,518,515	3,533,685	3,548,854	3,564,024	3,579,194	3,594,364
Less: Income Taxes	0	0	0	0	0	0	0	0	0	0
NET INCOME (LOSS)	(3,063,621)	3,473,006	3,488,176	3,503,345	3,518,515	3,533,685	3,548,854	3,564,024	3,579,194	3,594,364

Generated with data from: (White, Lamb, American Electric Power, Hardwood Market Report, Patterson and Brock, and Timber Mart South)

**Figure G6. Pro-forma Cash Flow Statement for Primary Manufacturing Corporation,
Park Formation Alternative 1.**

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
CASH INFLOW										
Cash Sales	0	0	0	0	0	0	0	0	0	0
Credit Sale Receipts	4,395,794	5,861,059	5,861,059	5,861,059	5,861,059	5,861,059	5,861,059	5,861,059	5,861,059	5,861,059
Other Receipts	243,034	142,334	157,504	172,673	187,843	203,013	218,182	233,352	248,522	263,691
Total Cash Inflows	4,638,828	6,003,392	6,018,562	6,033,732	6,048,901	6,064,071	6,079,241	6,094,410	6,109,580	6,124,750
CASH OUTFLOWS										
Labor	273,462	364,616	364,616	364,616	364,616	364,616	364,616	364,616	364,616	364,616
Utilities	36,237	48,316	48,316	48,316	48,316	48,316	48,316	48,316	48,316	48,316
Supplies and Maintenance	200,040	266,720	266,720	266,720	266,720	266,720	266,720	266,720	266,720	266,720
Administrative	142,500	190,000	190,000	190,000	190,000	190,000	190,000	190,000	190,000	190,000
Raw Materials	933,145	1,244,193	1,244,193	1,244,193	1,244,193	1,244,193	1,244,193	1,244,193	1,244,193	1,244,193
Lease	37,298	37,298	37,298	37,298	37,298	37,298	37,298	37,298	37,298	37,298
Capital Investment	4,806,250	0	0	0	0	0	0	0	0	0
Interest	727,398	0	0	0	0	0	0	0	0	0
Income Tax	0	0	0	0	0	0	0	0	0	0
Dividends	0	3,473,006	3,488,176	3,503,345	3,518,515	3,533,685	3,548,854	3,564,024	3,579,194	3,594,364
Total Cash Outflows	7,156,330	5,624,150	5,639,320	5,654,490	5,669,659	5,684,829	5,699,999	5,715,168	5,730,338	5,745,508
NET CASH FLOW	(2,517,502)	379,242	379,242	379,242	379,242	379,242	379,242	379,242	379,242	379,242
Beginning Cash Balance	6,075,848	3,558,346	3,937,588	4,316,830	4,696,072	5,075,314	5,454,556	5,833,798	6,213,040	6,592,282
ENDING CASH BALANCE	3,558,346	3,937,588	4,316,830	4,696,072	5,075,314	5,454,556	5,833,798	6,213,040	6,592,282	6,971,524

**Generated with data from: (White, Lamb, American Electric Power, Hardwood Market Report,
Patterson and Brock, and Timber Mart South)**

**Figure G7. Pro-forma Balance Sheet for Marketing Corporation, Park Formation
Alternative 1.**

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Current Assets											
Cash	377,954	203,282	219,682	236,082	252,482	268,882	285,282	301,682	318,082	334,482	350,882
Accounts Receivable	62,593	81,954	81,954	81,954	81,954	81,954	81,954	81,954	81,954	81,954	81,954
Prepaid Expenses	0	0	0	0	0	0	0	0	0	0	0
Inventory	0	0	0	0	0	0	0	0	0	0	0
Supplies	0	0	0	0	0	0	0	0	0	0	0
Total Current Assets	440,547	285,236	301,636	318,036	334,436	350,836	367,236	383,636	400,036	416,436	432,836
Non-Current Assets											
Equipment	180,000	180,000	180,000	180,000	180,000	180,000	180,000	180,000	180,000	180,000	180,000
Less: Accumulated Depreciation	0	14,400	28,800	43,200	57,600	72,000	86,400	100,800	115,200	129,600	144,000
Machinery	0	0	0	0	0	0	0	0	0	0	0
Less: Accumulated Depreciation	0	0	0	0	0	0	0	0	0	0	0
Office Equipment	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000
Less: Accumulated Depreciation	0	2,000	4,000	6,000	8,000	10,000	12,000	14,000	16,000	18,000	20,000
Total Non-Current Assets	205,000	188,600	172,200	155,800	139,400	123,000	106,600	90,200	73,800	57,400	41,000
TOTAL ASSETS	645,547	473,836	473,836	473,836	473,836	473,836	473,836	473,836	473,836	473,836	473,836
Current Liabilities											
Accounts Payable	0	0	0	0	0	0	0	0	0	0	0
Wages Payable	78,300	104,400	104,400	104,400	104,400	104,400	104,400	104,400	104,400	104,400	104,400
Taxes Payable	0	0	0	0	0	0	0	0	0	0	0
Principle Due, Equipment	0	0	0	0	0	0	0	0	0	0	0
Principle Due, Machinery	0	0	0	0	0	0	0	0	0	0	0
Principle Due, Office Equipment	0	0	0	0	0	0	0	0	0	0	0
Interest Payable	0	0	0	0	0	0	0	0	0	0	0
Total Current Liabilities	78,300	104,400	104,400	104,400	104,400	104,400	104,400	104,400	104,400	104,400	104,400
Non-Current Liabilities											
Remaining Principle, Equipment	0	0	0	0	0	0	0	0	0	0	0
Remaining Principle, Machinery	0	0	0	0	0	0	0	0	0	0	0
Remaining Principle, Office Equipment	0	0	0	0	0	0	0	0	0	0	0
Total Non-Current Liabilities	0	0	0	0	0	0	0	0	0	0	0
Owner's Equity											
Contributed Capital	567,247	369,436	369,436	369,436	369,436	369,436	369,436	369,436	369,436	369,436	369,436
Retained Earnings	0	0	0	0	0	0	0	0	0	0	0
Total Owner's Equity	567,247	369,436	369,436	369,436	369,436	369,436	369,436	369,436	369,436	369,436	369,436
TOTAL LIABILITIES AND OWNER'S EQUITY	645,547	473,836	473,836	473,836	473,836	473,836	473,836	473,836	473,836	473,836	473,836

Generated with data from: (Lamb)

**Figure G8. Pro-forma Income Statement for Marketing Corporation, Park Formation
Alternative 1.**

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Gross Sales/Revenues	500,743	655,631	656,287	656,943	657,599	658,255	658,911	659,567	660,223	660,879
Less: Returns and Allowances	0	0	0	0	0	0	0	0	0	0
Net Sales	500,743	655,631	656,287	656,943	657,599	658,255	658,911	659,567	660,223	660,879
Less: Cost of Goods Sold	0	0	0	0	0	0	0	0	0	0
Gross Margin	500,743	655,631	656,287	656,943	657,599	658,255	658,911	659,567	660,223	660,879
Operating Expenses										
Labor	78,300	104,400	104,400	104,400	104,400	104,400	104,400	104,400	104,400	104,400
Utilities	24,000	32,000	32,000	32,000	32,000	32,000	32,000	32,000	32,000	32,000
Supplies and Maintenance	18,000	24,000	24,000	24,000	24,000	24,000	24,000	24,000	24,000	24,000
Administrative	184,275	245,700	245,700	245,700	245,700	245,700	245,700	245,700	245,700	245,700
Lease	165,840	165,840	165,840	165,840	165,840	165,840	165,840	165,840	165,840	165,840
Market Fees	0	0	0	0	0	0	0	0	0	0
Depreciation	16,400	16,400	16,400	16,400	16,400	16,400	16,400	16,400	16,400	16,400
Capital Investment	205,000	0	0	0	0	0	0	0	0	0
Total Operating Expenses	691,815	588,340	588,340	588,340	588,340	588,340	588,340	588,340	588,340	588,340
Earnings Before Int. and Taxes	(191,072)	67,291	67,947	68,603	69,259	69,915	70,571	71,227	71,883	72,539
Less: Interest Expense	0	0	0	0	0	0	0	0	0	0
Earnings Before Taxes	(191,072)	67,291	67,947	68,603	69,259	69,915	70,571	71,227	71,883	72,539
Less: Income Taxes	0	0	0	0	0	0	0	0	0	0
NET INCOME (LOSS)	(191,072)	67,291	67,947	68,603	69,259	69,915	70,571	71,227	71,883	72,539

Generated with data from: (Lamb)

Figure G9. Pro-forma Cash Flow Statement for Marketing Corporation, Park Formation Alternative 1.

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
CASH INFLOW										
Cash Sales	0	0	0	0	0	0	0	0	0	0
Credit Sale Receipts	485,625	647,500	647,500	647,500	647,500	647,500	647,500	647,500	647,500	647,500
Other Receipts	15,118	8,131	8,787	9,443	10,099	10,755	11,411	12,067	12,723	13,379
Total Cash Inflows	500,743	655,631	656,287	656,943	657,599	658,255	658,911	659,567	660,223	660,879
CASH OUTFLOWS										
Labor	78,300	104,400	104,400	104,400	104,400	104,400	104,400	104,400	104,400	104,400
Utilities	24,000	32,000	32,000	32,000	32,000	32,000	32,000	32,000	32,000	32,000
Supplies and Maintenance	18,000	24,000	24,000	24,000	24,000	24,000	24,000	24,000	24,000	24,000
Administrative	184,275	245,700	245,700	245,700	245,700	245,700	245,700	245,700	245,700	245,700
Raw Materials	0	0	0	0	0	0	0	0	0	0
Lease	165,840	165,840	165,840	165,840	165,840	165,840	165,840	165,840	165,840	165,840
Capital Investment	205,000	0	0	0	0	0	0	0	0	0
Interest	0	0	0	0	0	0	0	0	0	0
Income Tax	0	0	0	0	0	0	0	0	0	0
Dividends	0	67,291	67,947	68,603	69,259	69,915	70,571	71,227	71,883	72,539
Total Cash Outflows	675,415	639,231	639,887	640,543	641,199	641,855	642,511	643,167	643,823	644,479
NET CASH FLOW	(174,672)	16,400	16,400	16,400	16,400	16,400	16,400	16,400	16,400	16,400
Beginning Cash Balance	377,954	203,282	219,682	236,082	252,482	268,882	285,282	301,682	318,082	334,482
ENDING CASH BALANCE	203,282	219,682	236,082	252,482	268,882	285,282	301,682	318,082	334,482	350,882

Generated with data from: (Lamb)

Appendix H

Pro-forma Financial Statements for Park Formation Alternative 2

**Figure H1. Pro-forma Balance Sheet for Development Corporation, Park Formation
Alternative 2.**

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Current Assets											
Cash	7,070,789	258,676	915,263	1,579,427	2,251,222	2,930,702	3,617,923	4,312,940	5,015,811	5,726,590	6,445,336
Leases Receivable	40,472	40,472	40,472	40,472	40,472	40,472	40,472	40,472	40,472	40,472	0
Prepaid Expenses											
Total Current Assets	7,111,261	299,147	955,735	1,619,899	2,291,694	2,971,174	3,658,395	4,353,412	5,056,282	5,767,062	6,445,336
Non-Current Assets											
Land	950,000	950,000	950,000	950,000	950,000	950,000	950,000	950,000	950,000	950,000	950,000
Buildings	3,544,726	3,544,726	3,544,726	3,544,726	3,544,726	3,544,726	3,544,726	3,544,726	3,544,726	3,544,726	3,544,726
Less: Accumulated Depreciation	94,526	94,526	189,052	283,578	378,104	472,630	567,156	661,682	756,208	850,734	945,260
Office Equipment	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000
Less: Accumulated Depreciation		2,000	4,000	6,000	8,000	10,000	12,000	14,000	16,000	18,000	20,000
Equity in Primary Corporation	11,799,244	8,965,370	8,960,112	8,954,854	8,949,596	8,944,338	8,939,080	8,933,822	8,928,564	8,923,306	8,918,048
Equity in Marketing Corporation	554,446	356,507	356,507	356,507	356,507	356,507	356,507	356,507	356,507	356,507	356,507
Total Non-Current Assets	16,778,889	13,745,077	13,643,293	13,541,509	13,439,725	13,337,941	13,236,157	13,134,373	13,032,589	12,930,805	12,829,021
TOTAL ASSETS	23,890,150	14,044,224	14,599,028	15,161,408	15,731,419	16,309,115	16,894,551	17,487,785	18,088,871	18,697,867	19,274,357
Current Liabilities											
Accounts Payable	33,188	33,188	33,188	33,188	33,188	33,188	33,188	33,188	33,188	33,188	0
Wages Payable	0	0	0	0	0	0	0	0	0	0	0
Taxes Payable											
Principle Due, Land	8,386	9,057	9,782	10,564	11,409	12,322	13,308	14,372	15,522	16,764	18,105
Principle Due, Buildings	31,291	33,794	36,498	39,417	42,571	45,976	49,655	53,627	57,917	62,551	67,555
Interest Payable	359,578	356,404	352,976	349,274	345,275	340,957	336,293	331,256	325,816	319,941	313,596
Capital Investments Payable	6,493,235	0	0	0	0	0	0	0	0	0	0
Total Current Liabilities	6,925,677	432,442	432,442	432,442	432,442	432,442	432,442	432,442	432,442	432,442	399,255
Non-Current Liabilities											
Remaining Principle, Land	941,614	932,557	922,775	912,211	900,802	888,480	875,173	860,801	845,279	828,515	810,410
Remaining Principle, Buildings	3,513,435	3,479,641	3,443,143	3,403,726	3,361,155	3,315,179	3,265,524	3,211,897	3,153,980	3,091,429	3,023,875
Total Non-Current Liabilities	4,455,049	4,412,198	4,365,919	4,315,937	4,261,957	4,203,659	4,140,697	4,072,698	3,999,258	3,919,944	3,834,285
Owner's Equity											
Contributed Capital	12,509,424	8,639,522	8,672,967	8,710,060	8,751,096	8,796,396	8,846,304	8,901,192	8,961,464	9,027,554	9,722,891
Retained Earnings	0	560,062	1,127,700	1,702,968	2,285,922	2,876,617	3,475,109	4,081,453	4,695,706	5,317,926	5,317,926
Total Owner's Equity	12,509,424	9,199,584	9,800,667	10,413,028	11,037,019	11,673,013	12,321,412	12,982,645	13,657,170	14,345,480	15,040,817
TOTAL LIABILITIES AND OWNER'S EQUITY	23,890,150	14,044,224	14,599,028	15,161,408	15,731,419	16,309,115	16,894,551	17,487,785	18,088,871	18,697,867	19,274,357

**Figure H2. Pro-forma Income Statement for Development Corporation, Park Formation
Alternative 2.**

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Gross Revenues	345,876	3,872,736	3,914,825	3,957,217	3,999,914	4,042,919	4,086,234	4,129,860	4,173,801	4,218,058
Less: Returns and Allowances										
Net Sales	345,876	3,872,736	3,914,825	3,957,217	3,999,914	4,042,919	4,086,234	4,129,860	4,173,801	4,218,058
Less: Cost of Goods Sold										
Gross Margin	345,876	3,872,736	3,914,825	3,957,217	3,999,914	4,042,919	4,086,234	4,129,860	4,173,801	4,218,058
Operating Expenses										
Labor	0	0	0	0	0	0	0	0	0	0
Utilities	18,000	18,000	18,000	18,000	18,000	18,000	18,000	18,000	18,000	18,000
Supplies and Maintenance	37,500	37,500	37,500	37,500	37,500	37,500	37,500	37,500	37,500	37,500
Administrative	210,000	210,000	210,000	210,000	210,000	210,000	210,000	210,000	210,000	210,000
Capital Investments	6,493,235	0	0	0	0	0	0	0	0	0
Principle	39,677	42,851	46,279	49,981	53,980	58,298	62,962	67,999	73,439	79,314
Depreciation	96,526	96,526	96,526	96,526	96,526	96,526	96,526	96,526	96,526	96,526
Total Operating Expenses	6,894,938	404,877	408,305	412,007	416,006	420,324	424,988	430,025	435,465	441,340
Earnings Before Int. and Taxes	(6,549,062)	3,467,858	3,506,520	3,545,209	3,583,908	3,622,595	3,661,246	3,699,835	3,738,335	3,776,717
Less: Interest Expense	359,578	356,404	352,976	349,274	345,275	340,957	336,293	331,256	325,816	319,941
Earnings Before Taxes	(6,908,640)	3,111,455	3,153,544	3,195,936	3,238,633	3,281,638	3,324,953	3,368,579	3,412,520	3,456,777
Less: Income Taxes	0	871,207	882,992	894,862	906,817	918,859	930,987	943,202	955,506	967,897
NET INCOME (LOSS)	(6,908,640)	2,240,247	2,270,551	2,301,074	2,331,816	2,362,780	2,393,966	2,425,377	2,457,014	2,488,879

Figure H3. Pro-forma Cash Flow Statement for Development Corporation, Park Formation Alternative 2.

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
CASH INFLOW										
Lease Receipts	323,774	323,774	323,774	323,774	323,774	323,774	323,774	323,774	323,774	323,774
Cash Dividends	0	3,538,615	3,554,440	3,570,266	3,586,092	3,601,917	3,617,743	3,633,569	3,649,394	3,665,220
Other Receipts	22,102	10,347	36,611	63,177	90,049	117,228	144,717	172,518	200,632	229,064
Total Cash Inflows	345,876	3,872,736	3,914,825	3,957,217	3,999,914	4,042,919	4,086,234	4,129,860	4,173,801	4,218,058
CASH OUTFLOWS										
Labor	0	0	0	0	0	0	0	0	0	0
Utilities	18,000	18,000	18,000	18,000	18,000	18,000	18,000	18,000	18,000	18,000
Supplies and Maintenance	37,500	37,500	37,500	37,500	37,500	37,500	37,500	37,500	37,500	37,500
Administrative	210,000	210,000	210,000	210,000	210,000	210,000	210,000	210,000	210,000	210,000
Capital Investment	6,493,235									
Principle	39,677	42,851	46,279	49,981	53,980	58,298	62,962	67,999	73,439	79,314
Interest	359,578	356,404	352,976	349,274	345,275	340,957	336,293	331,256	325,816	319,941
Income Tax	0	871,207	882,992	894,862	906,817	918,859	930,987	943,202	955,506	967,897
Dividends	0	1,680,185	1,702,914	1,725,805	1,748,862	1,772,085	1,795,475	1,819,033	1,842,761	1,866,659
Total Cash Outflows	7,157,990	3,216,148	3,250,661	3,285,422	3,320,434	3,355,698	3,391,216	3,426,990	3,463,021	3,499,312
NET CASH FLOW	(6,812,114)	656,588	664,164	671,794	679,480	687,221	695,018	702,870	710,780	718,746
Beginning Cash Balance	7,070,789	258,676	915,263	1,579,427	2,251,222	2,930,702	3,617,923	4,312,940	5,015,811	5,726,590
ENDING CASH BALANCE	258,676	915,263	1,579,427	2,251,222	2,930,702	3,617,923	4,312,940	5,015,811	5,726,590	6,445,336

Figure H4. Pro-forma Balance Sheet for Primary Manufacturing Corporation, Park Formation Alternative 2.

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Current Assets											
Cash	6,075,848	3,558,346	3,937,588	4,316,830	4,696,072	5,075,314	5,454,556	5,833,798	6,213,040	6,592,282	6,971,524
Accounts Receivable	579,853	778,018	778,018	778,018	778,018	778,018	778,018	778,018	778,018	778,018	778,018
Prepaid Expenses	0	0	0	0	0	0	0	0	0	0	0
Inventory	727,398	727,398	727,398	727,398	727,398	727,398	727,398	727,398	727,398	727,398	727,398
Supplies	0	0	0	0	0	0	0	0	0	0	0
Total Current Assets	7,383,099	5,063,761	5,443,003	5,822,245	6,201,487	6,580,729	6,959,971	7,339,213	7,718,455	8,097,697	8,476,939
Non-Current Assets											
Equipment	120,000	120,000	120,000	120,000	120,000	120,000	120,000	120,000	120,000	120,000	120,000
Less: Accumulated Depreciation	0	9,600	19,200	28,800	38,400	48,000	57,600	67,200	76,800	86,400	96,000
Machinery	4,661,250	4,661,250	4,661,250	4,661,250	4,661,250	4,661,250	4,661,250	4,661,250	4,661,250	4,661,250	4,661,250
Less: Accumulated Depreciation	0	372,900	745,800	1,118,700	1,491,600	1,864,500	2,237,400	2,610,300	2,983,200	3,356,100	3,729,000
Office Equipment	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000
Less: Accumulated Depreciation	0	2,000	4,000	6,000	8,000	10,000	12,000	14,000	16,000	18,000	20,000
Total Non-Current Assets	4,806,250	4,421,750	4,037,250	3,652,750	3,268,250	2,883,750	2,499,250	2,114,750	1,730,250	1,345,750	961,250
TOTAL ASSETS	12,189,349	9,485,511	9,480,253	9,474,995	9,469,737	9,464,479	9,459,221	9,453,963	9,448,705	9,443,447	9,438,189
Current Liabilities											
Accounts Payable	116,643	155,524	155,524	155,524	155,524	155,524	155,524	155,524	155,524	155,524	155,524
Wages Payable	273,462	364,616	364,616	364,616	364,616	364,616	364,616	364,616	364,616	364,616	364,616
Taxes Payable	0	0	0	0	0	0	0	0	0	0	0
Principle Due, Equipment	0	0	0	0	0	0	0	0	0	0	0
Principle Due, Machinery	0	0	0	0	0	0	0	0	0	0	0
Principle Due, Office Equipment	0	0	0	0	0	0	0	0	0	0	0
Interest Payable	0	0	0	0	0	0	0	0	0	0	0
Total Current Liabilities	390,105	520,141	520,141	520,141	520,141	520,141	520,141	520,141	520,141	520,141	520,141
Non-Current Liabilities											
Remaining Principle, Equipment	0	0	0	0	0	0	0	0	0	0	0
Remaining Principle, Machinery	0	0	0	0	0	0	0	0	0	0	0
Remaining Principle, Office Equipment	0	0	0	0	0	0	0	0	0	0	0
Total Non-Current Liabilities	0	0	0	0	0	0	0	0	0	0	0
Owner's Equity											
Contributed Capital	11,799,244	8,965,370	8,960,112	8,954,854	8,949,596	8,944,338	8,939,080	8,933,822	8,928,564	8,923,306	8,918,048
Retained Earnings	0	0	0	0	0	0	0	0	0	0	0
Total Owner's Equity	11,799,244	8,965,370	8,960,112	8,954,854	8,949,596	8,944,338	8,939,080	8,933,822	8,928,564	8,923,306	8,918,048
TOTAL LIABILITIES AND OWNER'S EQUITY	12,189,349	9,485,511	9,480,253	9,474,995	9,469,737	9,464,479	9,459,221	9,453,963	9,448,705	9,443,447	9,438,189

Generated with data from: (White, Lamb, American Electric Power, Hardwood Market Report, Patterson and Brock, and Timber Mart South)

Figure H5. Pro-forma Income Statement for Primary Manufacturing Corporation, Park Formation Alternative 2.

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Gross Sales/Revenues	4,638,828	6,224,142	6,239,312	6,254,482	6,269,651	6,284,821	6,299,991	6,315,160	6,330,330	6,345,500
Less: Returns and Allowances	0	0	0	0	0	0	0	0	0	0
Net Sales	4,638,828	6,224,142	6,239,312	6,254,482	6,269,651	6,284,821	6,299,991	6,315,160	6,330,330	6,345,500
Less: Cost of Goods Sold	933,145	1,244,193	1,244,193	1,244,193	1,244,193	1,244,193	1,244,193	1,244,193	1,244,193	1,244,193
Gross Margin	3,705,683	4,979,949	4,995,119	5,010,288	5,025,458	5,040,628	5,055,797	5,070,967	5,086,137	5,101,306
Operating Expenses										
Labor	273,462	364,616	364,616	364,616	364,616	364,616	364,616	364,616	364,616	364,616
Utilities	36,237	48,316	48,316	48,316	48,316	48,316	48,316	48,316	48,316	48,316
Supplies and Maintenance	200,040	266,720	266,720	266,720	266,720	266,720	266,720	266,720	266,720	266,720
Administrative	142,500	190,000	190,000	190,000	190,000	190,000	190,000	190,000	190,000	190,000
Lease	37,298	37,298	37,298	37,298	37,298	37,298	37,298	37,298	37,298	37,298
Market Fees	161,619	215,492	215,492	215,492	215,492	215,492	215,492	215,492	215,492	215,492
Depreciation	384,500	384,500	384,500	384,500	384,500	384,500	384,500	384,500	384,500	384,500
Capital Investment	4,806,250	0	0	0	0	0	0	0	0	0
Total Operating Expenses	6,041,907	1,506,943	1,506,943	1,506,943	1,506,943	1,506,943	1,506,943	1,506,943	1,506,943	1,506,943
Earnings Before Int. and Taxes	(2,336,224)	3,473,006	3,488,176	3,503,345	3,518,515	3,533,685	3,548,854	3,564,024	3,579,194	3,594,364
Less: Interest Expense	727,398	0	0	0	0	0	0	0	0	0
Earnings Before Taxes	(3,063,621)	3,473,006	3,488,176	3,503,345	3,518,515	3,533,685	3,548,854	3,564,024	3,579,194	3,594,364
Less: Income Taxes	0	0	0	0	0	0	0	0	0	0
NET INCOME (LOSS)	(3,063,621)	3,473,006	3,488,176	3,503,345	3,518,515	3,533,685	3,548,854	3,564,024	3,579,194	3,594,364

Generated with data from: (White, Lamb, American Electric Power, Hardwood Market Report, Patterson and Brock, and Timber Mart South)

**Figure H6. Pro-forma Cash Flow Statement for Primary Manufacturing Corporation,
Park Formation Alternative 2.**

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
CASH INFLOW										
Cash Sales	0	0	0	0	0	0	0	0	0	0
Credit Sale Receipts	4,395,794	5,861,059	5,861,059	5,861,059	5,861,059	5,861,059	5,861,059	5,861,059	5,861,059	5,861,059
Other Receipts	243,034	142,334	157,504	172,673	187,843	203,013	218,182	233,352	248,522	263,691
Total Cash Inflows	4,638,828	6,003,392	6,018,562	6,033,732	6,048,901	6,064,071	6,079,241	6,094,410	6,109,580	6,124,750
CASH OUTFLOWS										
Labor	273,462	364,616	364,616	364,616	364,616	364,616	364,616	364,616	364,616	364,616
Utilities	36,237	48,316	48,316	48,316	48,316	48,316	48,316	48,316	48,316	48,316
Supplies and Maintenance	200,040	266,720	266,720	266,720	266,720	266,720	266,720	266,720	266,720	266,720
Administrative	142,500	190,000	190,000	190,000	190,000	190,000	190,000	190,000	190,000	190,000
Raw Materials	933,145	1,244,193	1,244,193	1,244,193	1,244,193	1,244,193	1,244,193	1,244,193	1,244,193	1,244,193
Lease	37,298	37,298	37,298	37,298	37,298	37,298	37,298	37,298	37,298	37,298
Capital Investment	4,806,250	0	0	0	0	0	0	0	0	0
Interest	727,398	0	0	0	0	0	0	0	0	0
Income Tax	0	0	0	0	0	0	0	0	0	0
Dividends	0	3,473,006	3,488,176	3,503,345	3,518,515	3,533,685	3,548,854	3,564,024	3,579,194	3,594,364
Total Cash Outflows	7,156,330	5,624,150	5,639,320	5,654,490	5,669,659	5,684,829	5,699,999	5,715,168	5,730,338	5,745,508
NET CASH FLOW	(2,517,502)	379,242	379,242	379,242	379,242	379,242	379,242	379,242	379,242	379,242
Beginning Cash Balance	6,075,848	3,558,346	3,937,588	4,316,830	4,696,072	5,075,314	5,454,556	5,833,798	6,213,040	6,592,282
ENDING CASH BALANCE	3,558,346	3,937,588	4,316,830	4,696,072	5,075,314	5,454,556	5,833,798	6,213,040	6,592,282	6,971,524

Generated with data from: (White, Lamb, American Electric Power, Hardwood Market Report, Patterson and Brock, and Timber Mart South)

**Figure H7. Pro-forma Balance Sheet for Marketing Corporation, Park Formation
Alternative 2.**

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Current Assets											
Cash	367,387	193,311	209,711	226,111	242,511	258,911	275,311	291,711	308,111	324,511	340,911
Accounts Receivable	57,384	75,029	75,029	75,029	75,029	75,029	75,029	75,029	75,029	75,029	75,029
Prepaid Expenses	0	0	0	0	0	0	0	0	0	0	0
Inventory	0	0	0	0	0	0	0	0	0	0	0
Supplies	0	0	0	0	0	0	0	0	0	0	0
Total Current Assets	424,770	268,340	284,740	301,140	317,540	333,940	350,340	366,740	383,140	399,540	415,940
Non-Current Assets											
Equipment	180,000	180,000	180,000	180,000	180,000	180,000	180,000	180,000	180,000	180,000	180,000
Less: Accumulated Depreciation	0	14,400	28,800	43,200	57,600	72,000	86,400	100,800	115,200	129,600	144,000
Machinery	0	0	0	0	0	0	0	0	0	0	0
Less: Accumulated Depreciation	0	0	0	0	0	0	0	0	0	0	0
Office Equipment	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000
Less: Accumulated Depreciation	0	2,000	4,000	6,000	8,000	10,000	12,000	14,000	16,000	18,000	20,000
Total Non-Current Assets	205,000	188,600	172,200	155,800	139,400	123,000	106,600	90,200	73,800	57,400	41,000
TOTAL ASSETS	629,770	456,940	456,940	456,940	456,940	456,940	456,940	456,940	456,940	456,940	456,940
Current Liabilities											
Accounts Payable	0	0	0	0	0	0	0	0	0	0	0
Wages Payable	75,325	100,433	100,433	100,433	100,433	100,433	100,433	100,433	100,433	100,433	100,433
Taxes Payable	0	0	0	0	0	0	0	0	0	0	0
Principle Due, Equipment	0	0	0	0	0	0	0	0	0	0	0
Principle Due, Machinery	0	0	0	0	0	0	0	0	0	0	0
Principle Due, Office Equipment	0	0	0	0	0	0	0	0	0	0	0
Interest Payable	0	0	0	0	0	0	0	0	0	0	0
Total Current Liabilities	75,325	100,433	100,433	100,433	100,433	100,433	100,433	100,433	100,433	100,433	100,433
Non-Current Liabilities											
Remaining Principle, Equipment	0	0	0	0	0	0	0	0	0	0	0
Remaining Principle, Machinery	0	0	0	0	0	0	0	0	0	0	0
Remaining Principle, Office Equipment	0	0	0	0	0	0	0	0	0	0	0
Total Non-Current Liabilities	0	0	0	0	0	0	0	0	0	0	0
Owner's Equity											
Contributed Capital	554,446	356,507	356,507	356,507	356,507	356,507	356,507	356,507	356,507	356,507	356,507
Retained Earnings	0	0	0	0	0	0	0	0	0	0	0
Total Owner's Equity	554,446	356,507	356,507	356,507	356,507	356,507	356,507	356,507	356,507	356,507	356,507
TOTAL LIABILITIES AND OWNER'S EQUITY	629,770	456,940	456,940	456,940	456,940	456,940	456,940	456,940	456,940	456,940	456,940

Generated with data from: (Lamb)

**Figure H8. Pro-forma Income Statement for Marketing Corporation, Park Formation
Alternative 2.**

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Gross Sales/Revenues	459,070	600,232	600,888	601,544	602,200	602,856	603,512	604,168	604,824	605,480
Less: Returns and Allowances	0	0	0	0	0	0	0	0	0	0
Net Sales	459,070	600,232	600,888	601,544	602,200	602,856	603,512	604,168	604,824	605,480
Less: Cost of Goods Sold	0	0	0	0	0	0	0	0	0	0
Gross Margin	459,070	600,232	600,888	601,544	602,200	602,856	603,512	604,168	604,824	605,480
Operating Expenses										
Labor	75,325	100,433	100,433	100,433	100,433	100,433	100,433	100,433	100,433	100,433
Utilities	23,088	30,784	30,784	30,784	30,784	30,784	30,784	30,784	30,784	30,784
Supplies and Maintenance	17,316	23,088	23,088	23,088	23,088	23,088	23,088	23,088	23,088	23,088
Administrative	154,505	206,006	206,006	206,006	206,006	206,006	206,006	206,006	206,006	206,006
Lease	157,913	157,913	157,913	157,913	157,913	157,913	157,913	157,913	157,913	157,913
Market Fees	0	0	0	0	0	0	0	0	0	0
Depreciation	16,400	16,400	16,400	16,400	16,400	16,400	16,400	16,400	16,400	16,400
Capital Investment	205,000	0	0	0	0	0	0	0	0	0
Total Operating Expenses	649,546	534,624	534,624	534,624	534,624	534,624	534,624	534,624	534,624	534,624
Earnings Before Int. and Taxes	(190,476)	65,608	66,264	66,920	67,576	68,232	68,888	69,544	70,200	70,856
Less: Interest Expense	0	0	0	0	0	0	0	0	0	0
Earnings Before Taxes	(190,476)	65,608	66,264	66,920	67,576	68,232	68,888	69,544	70,200	70,856
Less: Income Taxes	0	0	0	0	0	0	0	0	0	0
NET INCOME (LOSS)	(190,476)	65,608	66,264	66,920	67,576	68,232	68,888	69,544	70,200	70,856

Generated with data from: (Lamb)

Figure H9. Pro-forma Cash Flow Statement for Marketing Corporation, Park Formation Alternative 2.

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
CASH INFLOW										
Cash Sales	0	0	0	0	0	0	0	0	0	0
Credit Sale Receipts	444,375	592,500	592,500	592,500	592,500	592,500	592,500	592,500	592,500	592,500
Other Receipts	14,695	7,732	8,388	9,044	9,700	10,356	11,012	11,668	12,324	12,980
Total Cash Inflows	459,070	600,232	600,888	601,544	602,200	602,856	603,512	604,168	604,824	605,480
CASH OUTFLOWS										
Labor	75,325	100,433	100,433	100,433	100,433	100,433	100,433	100,433	100,433	100,433
Utilities	23,088	30,784	30,784	30,784	30,784	30,784	30,784	30,784	30,784	30,784
Supplies and Maintenance	17,316	23,088	23,088	23,088	23,088	23,088	23,088	23,088	23,088	23,088
Administrative	154,505	206,006	206,006	206,006	206,006	206,006	206,006	206,006	206,006	206,006
Raw Materials	0	0	0	0	0	0	0	0	0	0
Lease	157,913	157,913	157,913	157,913	157,913	157,913	157,913	157,913	157,913	157,913
Capital Investment	205,000	0	0	0	0	0	0	0	0	0
Interest	0	0	0	0	0	0	0	0	0	0
Income Tax	0	0	0	0	0	0	0	0	0	0
Dividends	0	65,608	66,264	66,920	67,576	68,232	68,888	69,544	70,200	70,856
Total Cash Outflows	633,146	583,832	584,488	585,144	585,800	586,456	587,112	587,768	588,424	589,080
NET CASH FLOW	(174,076)	16,400	16,400	16,400	16,400	16,400	16,400	16,400	16,400	16,400
Beginning Cash Balance	367,387	193,311	209,711	226,111	242,511	258,911	275,311	291,711	308,111	324,511
ENDING CASH BALANCE	193,311	209,711	226,111	242,511	258,911	275,311	291,711	308,111	324,511	340,911

Generated with data from: (Lamb)

Appendix I

Pro-forma Financial Statements for Park Formation Alternative 3

**Figure II. Pro-forma Balance Sheet for Development Corporation, Park Formation
Alternative 3.**

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Current Assets											
Cash	6,991,439	251,963	855,662	1,466,635	2,084,935	2,710,613	3,343,723	3,984,319	4,632,455	5,288,184	5,951,562
Leases Receivable	38,917	38,917	38,917	38,917	38,917	38,917	38,917	38,917	38,917	38,917	0
Prepaid Expenses											
Total Current Assets	7,030,356	290,880	894,579	1,505,552	2,123,852	2,749,530	3,382,640	4,023,237	4,671,372	5,327,102	5,951,562
Non-Current Assets											
Land	925,000	925,000	925,000	925,000	925,000	925,000	925,000	925,000	925,000	925,000	925,000
Buildings	3,429,726	3,429,726	3,429,726	3,429,726	3,429,726	3,429,726	3,429,726	3,429,726	3,429,726	3,429,726	3,429,726
Less: Accumulated Depreciation	91,459	91,459	182,919	274,378	365,837	457,297	548,756	640,216	731,675	823,134	914,594
Office Equipment	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000
Less: Accumulated Depreciation		2,000	4,000	6,000	8,000	10,000	12,000	14,000	16,000	18,000	20,000
Equity in Primary Corporation	11,776,069	8,752,728	8,760,789	8,768,850	8,776,911	8,784,972	8,793,033	8,801,094	8,809,155	8,817,216	8,825,277
Equity in Marketing Corporation	479,398	305,606	305,606	305,606	305,606	305,606	305,606	305,606	305,606	305,606	305,606
Total Non-Current Assets	16,543,734	13,344,600	13,259,201	13,173,803	13,088,405	13,003,006	12,917,608	12,832,210	12,746,811	12,661,413	12,576,014
TOTAL ASSETS	23,574,090	13,635,480	14,153,781	14,679,355	15,212,256	15,752,536	16,300,248	16,855,446	17,418,183	17,988,514	18,527,577
Current Liabilities											
Accounts Payable	33,188	33,188	33,188	33,188	33,188	33,188	33,188	33,188	33,188	33,188	0
Wages Payable	0	0	0	0	0	0	0	0	0	0	0
Taxes Payable											
Principle Due, Land	8,165	8,819	9,524	10,286	11,109	11,998	12,957	13,994	15,114	16,323	17,628
Principle Due, Buildings	30,276	32,698	35,314	38,139	41,190	44,485	48,044	51,887	56,038	60,521	65,363
Interest Payable	348,378	345,303	341,981	338,394	334,521	330,337	325,818	320,938	315,667	309,975	303,828
Capital Investments Payable	6,420,338	0	0	0	0	0	0	0	0	0	0
Total Current Liabilities	6,840,345	420,007	420,007	420,007	420,007	420,007	420,007	420,007	420,007	420,007	386,819
Non-Current Liabilities											
Remaining Principle, Land	916,835	908,016	898,492	888,206	877,097	865,099	852,142	838,148	823,034	806,712	789,083
Remaining Principle, Buildings	3,399,450	3,366,753	3,331,439	3,293,300	3,252,111	3,207,626	3,159,582	3,107,695	3,051,657	2,991,136	2,925,773
Total Non-Current Liabilities	4,316,285	4,274,769	4,229,931	4,181,506	4,129,208	4,072,725	4,011,724	3,945,843	3,874,691	3,797,847	3,714,856
Owner's Equity											
Contributed Capital	12,417,460	8,430,465	8,476,090	8,525,249	8,578,230	8,635,341	8,696,917	8,763,320	8,834,939	8,912,195	9,567,437
Retained Earnings	0	510,240	1,027,754	1,552,594	2,084,812	2,624,464	3,171,600	3,726,276	4,288,547	4,858,465	4,858,465
Total Owner's Equity	12,417,460	8,940,705	9,503,843	10,077,842	10,663,042	11,259,805	11,868,518	12,489,597	13,123,486	13,770,660	14,425,902
TOTAL LIABILITIES AND OWNER'S EQUITY	23,574,090	13,635,480	14,153,781	14,679,355	15,212,256	15,752,536	16,300,248	16,855,446	17,418,183	17,988,514	18,527,577

**Figure I2. Pro-forma Income Statement for Development Corporation, Park Formation
Alternative 3.**

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Gross Revenues	333,182	3,580,444	3,620,855	3,661,556	3,702,550	3,743,840	3,785,427	3,827,313	3,869,501	3,911,993
Less: Returns and Allowances										
Net Sales	333,182	3,580,444	3,620,855	3,661,556	3,702,550	3,743,840	3,785,427	3,827,313	3,869,501	3,911,993
Less: Cost of Goods Sold										
Gross Margin	333,182	3,580,444	3,620,855	3,661,556	3,702,550	3,743,840	3,785,427	3,827,313	3,869,501	3,911,993
Operating Expenses										
Labor	0	0	0	0	0	0	0	0	0	0
Utilities	18,000	18,000	18,000	18,000	18,000	18,000	18,000	18,000	18,000	18,000
Supplies and Maintenance	37,500	37,500	37,500	37,500	37,500	37,500	37,500	37,500	37,500	37,500
Administrative	210,000	210,000	210,000	210,000	210,000	210,000	210,000	210,000	210,000	210,000
Capital Investments	6,420,338	0	0	0	0	0	0	0	0	0
Principle	38,441	41,516	44,838	48,425	52,299	56,483	61,001	65,881	71,152	76,844
Depreciation	93,459	93,459	93,459	93,459	93,459	93,459	93,459	93,459	93,459	93,459
Total Operating Expenses	6,817,738	400,476	403,797	407,384	411,258	415,442	419,960	424,841	430,111	435,803
Earnings Before Int. and Taxes	(6,484,557)	3,179,969	3,217,058	3,254,172	3,291,292	3,328,398	3,365,466	3,402,473	3,439,390	3,476,189
Less: Interest Expense	348,378	345,303	341,981	338,394	334,521	330,337	325,818	320,938	315,667	309,975
Earnings Before Taxes	(6,832,935)	2,834,666	2,875,076	2,915,778	2,956,772	2,998,062	3,039,648	3,081,535	3,123,723	3,166,214
Less: Income Taxes	0	793,706	805,021	816,418	827,896	839,457	851,102	862,830	874,642	886,540
NET INCOME (LOSS)	(6,832,935)	2,040,959	2,070,055	2,099,360	2,128,876	2,158,604	2,188,547	2,218,705	2,249,080	2,279,674

Figure I3. Pro-forma Cash Flow Statement for Development Corporation, Park Formation Alternative 3.

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
CASH INFLOW										
Lease Receipts	311,337	311,337	311,337	311,337	311,337	311,337	311,337	311,337	311,337	311,337
Cash Dividends	0	3,259,028	3,275,291	3,291,553	3,307,816	3,324,078	3,340,340	3,356,603	3,372,865	3,389,128
Other Receipts	21,844	10,079	34,226	58,665	83,397	108,425	133,749	159,373	185,298	211,527
Total Cash Inflows	333,182	3,580,444	3,620,855	3,661,556	3,702,550	3,743,840	3,785,427	3,827,313	3,869,501	3,911,993
CASH OUTFLOWS										
Labor	0	0	0	0	0	0	0	0	0	0
Utilities	18,000	18,000	18,000	18,000	18,000	18,000	18,000	18,000	18,000	18,000
Supplies and Maintenance	37,500	37,500	37,500	37,500	37,500	37,500	37,500	37,500	37,500	37,500
Administrative	210,000	210,000	210,000	210,000	210,000	210,000	210,000	210,000	210,000	210,000
Capital Investment	6,420,338									
Principle	38,441	41,516	44,838	48,425	52,299	56,483	61,001	65,881	71,152	76,844
Interest	348,378	345,303	341,981	338,394	334,521	330,337	325,818	320,938	315,667	309,975
Income Tax	0	793,706	805,021	816,418	827,896	839,457	851,102	862,830	874,642	886,540
Dividends	0	1,530,720	1,552,541	1,574,520	1,596,657	1,618,953	1,641,410	1,664,029	1,686,810	1,709,756
Total Cash Outflows	7,072,657	2,976,745	3,009,882	3,043,257	3,076,872	3,110,730	3,144,831	3,179,178	3,213,772	3,248,615
NET CASH FLOW	(6,739,476)	603,699	610,973	618,299	625,678	633,110	640,596	648,136	655,729	663,378
Beginning Cash Balance	6,991,439	251,963	855,662	1,466,635	2,084,935	2,710,613	3,343,723	3,984,319	4,632,455	5,288,184
ENDING CASH BALANCE	251,963	855,662	1,466,635	2,084,935	2,710,613	3,343,723	3,984,319	4,632,455	5,288,184	5,951,562

Figure I4. Pro-forma Balance Sheet for Primary Manufacturing Corporation, Park Formation Alternative 3.

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Current Assets											
Cash	6,047,230	3,341,006	3,733,567	4,126,128	4,518,689	4,911,250	5,303,811	5,696,372	6,088,933	6,481,494	6,874,055
Accounts Receivable	541,954	724,925	724,925	724,925	724,925	724,925	724,925	724,925	724,925	724,925	724,925
Prepaid Expenses	0	0	0	0	0	0	0	0	0	0	0
Inventory	727,398	727,398	727,398	727,398	727,398	727,398	727,398	727,398	727,398	727,398	727,398
Supplies	0	0	0	0	0	0	0	0	0	0	0
Total Current Assets	7,316,582	4,793,328	5,185,889	5,578,450	5,971,011	6,363,572	6,756,133	7,148,694	7,541,255	7,933,816	8,326,377
Non-Current Assets											
Equipment	120,000	120,000	120,000	120,000	120,000	120,000	120,000	120,000	120,000	120,000	120,000
Less: Accumulated Depreciation	0	9,600	19,200	28,800	38,400	48,000	57,600	67,200	76,800	86,400	96,000
Machinery	4,661,250	4,661,250	4,661,250	4,661,250	4,661,250	4,661,250	4,661,250	4,661,250	4,661,250	4,661,250	4,661,250
Less: Accumulated Depreciation	0	372,900	745,800	1,118,700	1,491,600	1,864,500	2,237,400	2,610,300	2,983,200	3,356,100	3,729,000
Office Equipment	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000
Less: Accumulated Depreciation	0	2,000	4,000	6,000	8,000	10,000	12,000	14,000	16,000	18,000	20,000
Total Non-Current Assets	4,806,250	4,421,750	4,037,250	3,652,750	3,268,250	2,883,750	2,499,250	2,114,750	1,730,250	1,345,750	961,250
TOTAL ASSETS	12,122,832	9,215,078	9,223,139	9,231,200	9,239,261	9,247,322	9,255,383	9,263,444	9,271,505	9,279,566	9,287,627
Current Liabilities											
Accounts Payable	107,259	143,012	143,012	143,012	143,012	143,012	143,012	143,012	143,012	143,012	143,012
Wages Payable	239,504	319,339	319,339	319,339	319,339	319,339	319,339	319,339	319,339	319,339	319,339
Taxes Payable	0	0	0	0	0	0	0	0	0	0	0
Principle Due, Equipment	0	0	0	0	0	0	0	0	0	0	0
Principle Due, Machinery	0	0	0	0	0	0	0	0	0	0	0
Principle Due, Office Equipment	0	0	0	0	0	0	0	0	0	0	0
Interest Payable	0	0	0	0	0	0	0	0	0	0	0
Total Current Liabilities	346,763	462,351	462,351	462,351	462,351	462,351	462,351	462,351	462,351	462,351	462,351
Non-Current Liabilities											
Remaining Principle, Equipment	0	0	0	0	0	0	0	0	0	0	0
Remaining Principle, Machinery	0	0	0	0	0	0	0	0	0	0	0
Remaining Principle, Office Equipment	0	0	0	0	0	0	0	0	0	0	0
Total Non-Current Liabilities	0	0	0	0	0	0	0	0	0	0	0
Owner's Equity											
Contributed Capital	11,776,069	8,752,728	8,760,789	8,768,850	8,776,911	8,784,972	8,793,033	8,801,094	8,809,155	8,817,216	8,825,277
Retained Earnings	0	0	0	0	0	0	0	0	0	0	0
Total Owner's Equity	11,776,069	8,752,728	8,760,789	8,768,850	8,776,911	8,784,972	8,793,033	8,801,094	8,809,155	8,817,216	8,825,277
TOTAL LIABILITIES AND OWNER'S EQUITY	12,122,832	9,215,078	9,223,139	9,231,200	9,239,261	9,247,322	9,255,383	9,263,444	9,271,505	9,279,566	9,287,627

Generated with data from: (White, Lamb, American Electric Power, Hardwood Market Report, Patterson and Brock, and Timber Mart South)

Figure I5. Pro-forma Income Statement for Primary Manufacturing Corporation, Park Formation Alternative 3.

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Gross Sales/Revenues	4,335,636	5,799,400	5,815,102	5,830,805	5,846,507	5,862,210	5,877,912	5,893,614	5,909,317	5,925,019
Less: Returns and Allowances	0	0	0	0	0	0	0	0	0	0
Net Sales	4,335,636	5,799,400	5,815,102	5,830,805	5,846,507	5,862,210	5,877,912	5,893,614	5,909,317	5,925,019
Less: Cost of Goods Sold	858,073	1,144,097	1,144,097	1,144,097	1,144,097	1,144,097	1,144,097	1,144,097	1,144,097	1,144,097
Gross Margin	3,477,563	4,655,302	4,671,005	4,686,707	4,702,410	4,718,112	4,733,815	4,749,517	4,765,219	4,780,922
Operating Expenses										
Labor	239,504	319,339	319,339	319,339	319,339	319,339	319,339	319,339	319,339	319,339
Utilities	30,798	41,064	41,064	41,064	41,064	41,064	41,064	41,064	41,064	41,064
Supplies and Maintenance	200,040	266,720	266,720	266,720	266,720	266,720	266,720	266,720	266,720	266,720
Administrative	142,500	190,000	190,000	190,000	190,000	190,000	190,000	190,000	190,000	190,000
Lease	37,298	37,298	37,298	37,298	37,298	37,298	37,298	37,298	37,298	37,298
Market Fees	161,619	215,492	215,492	215,492	215,492	215,492	215,492	215,492	215,492	215,492
Depreciation	384,500	384,500	384,500	384,500	384,500	384,500	384,500	384,500	384,500	384,500
Capital Investment	4,806,250	0	0	0	0	0	0	0	0	0
Total Operating Expenses	6,002,509	1,454,412	1,454,412	1,454,412	1,454,412	1,454,412	1,454,412	1,454,412	1,454,412	1,454,412
Earnings Before Int. and Taxes	(2,524,946)	3,200,890	3,216,593	3,232,295	3,247,998	3,263,700	3,279,402	3,295,105	3,310,807	3,326,510
Less: Interest Expense	727,398	0	0	0	0	0	0	0	0	0
Earnings Before Taxes	(3,252,344)	3,200,890	3,216,593	3,232,295	3,247,998	3,263,700	3,279,402	3,295,105	3,310,807	3,326,510
Less: Income Taxes	0	0	0	0	0	0	0	0	0	0
NET INCOME (LOSS)	(3,252,344)	3,200,890	3,216,593	3,232,295	3,247,998	3,263,700	3,279,402	3,295,105	3,310,807	3,326,510

Generated with data from: (White, Lamb, American Electric Power, Hardwood Market Report, Patterson and Brock, and Timber Mart South)

Figure I6. Pro-forma Cash Flow Statement for Primary Manufacturing Corporation, Park Formation Alternative 3.

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
CASH INFLOW										
Cash Sales	0	0	0	0	0	0	0	0	0	0
Credit Sale Receipts	4,093,746	5,458,329	5,458,329	5,458,329	5,458,329	5,458,329	5,458,329	5,458,329	5,458,329	5,458,329
Other Receipts	241,889	133,640	149,343	165,045	180,748	196,450	212,152	227,855	243,557	259,260
Total Cash Inflows	4,335,636	5,591,969	5,607,671	5,623,374	5,639,076	5,654,779	5,670,481	5,686,183	5,701,886	5,717,588
CASH OUTFLOWS										
Labor	239,504	319,339	319,339	319,339	319,339	319,339	319,339	319,339	319,339	319,339
Utilities	30,798	41,064	41,064	41,064	41,064	41,064	41,064	41,064	41,064	41,064
Supplies and Maintenance	200,040	266,720	266,720	266,720	266,720	266,720	266,720	266,720	266,720	266,720
Administrative	142,500	190,000	190,000	190,000	190,000	190,000	190,000	190,000	190,000	190,000
Raw Materials	858,073	1,144,097	1,144,097	1,144,097	1,144,097	1,144,097	1,144,097	1,144,097	1,144,097	1,144,097
Lease	37,298	37,298	37,298	37,298	37,298	37,298	37,298	37,298	37,298	37,298
Capital Investment	4,806,250	0	0	0	0	0	0	0	0	0
Interest	727,398	0	0	0	0	0	0	0	0	0
Income Tax	0	0	0	0	0	0	0	0	0	0
Dividends	0	3,200,890	3,216,593	3,232,295	3,247,998	3,263,700	3,279,402	3,295,105	3,310,807	3,326,510
Total Cash Outflows	7,041,860	5,199,408	5,215,110	5,230,813	5,246,515	5,262,218	5,277,920	5,293,622	5,309,325	5,325,027
NET CASH FLOW	(2,706,225)	392,561	392,561	392,561	392,561	392,561	392,561	392,561	392,561	392,561
Beginning Cash Balance	6,047,230	3,341,006	3,733,567	4,126,128	4,518,689	4,911,250	5,303,811	5,696,372	6,088,933	6,481,494
ENDING CASH BALANCE	3,341,006	3,733,567	4,126,128	4,518,689	4,911,250	5,303,811	5,696,372	6,088,933	6,481,494	6,874,055

Generated with data from: (White, Lamb, American Electric Power, Hardwood Market Report, Patterson and Brock, and Timber Mart South)

**Figure I7. Pro-forma Balance Sheet for Marketing Corporation, Park Formation
Alternative 3.**

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Current Assets											
Cash	323,108	170,851	184,851	198,851	212,851	226,851	240,851	254,851	268,851	282,851	296,851
Accounts Receivable	53,272	69,729	69,729	69,729	69,729	69,729	69,729	69,729	69,729	69,729	69,729
Prepaid Expenses	0	0	0	0	0	0	0	0	0	0	0
Inventory	0	0	0	0	0	0	0	0	0	0	0
Supplies	0	0	0	0	0	0	0	0	0	0	0
Total Current Assets	376,379	240,581	254,581	268,581	282,581	296,581	310,581	324,581	338,581	352,581	366,581
Non-Current Assets											
Equipment	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000
Less: Accumulated Depreciation	0	12,000	24,000	36,000	48,000	60,000	72,000	84,000	96,000	108,000	120,000
Machinery	0	0	0	0	0	0	0	0	0	0	0
Less: Accumulated Depreciation	0	0	0	0	0	0	0	0	0	0	0
Office Equipment	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000
Total Non-Current Assets	175,000	161,000	147,000	133,000	119,000	105,000	91,000	77,000	63,000	49,000	35,000
TOTAL ASSETS	551,379	401,581	401,581	401,581	401,581	401,581	401,581	401,581	401,581	401,581	401,581
Current Liabilities											
Accounts Payable	0	0	0	0	0	0	0	0	0	0	0
Wages Payable	71,981	95,975	95,975	95,975	95,975	95,975	95,975	95,975	95,975	95,975	95,975
Taxes Payable	0	0	0	0	0	0	0	0	0	0	0
Principle Due, Equipment	0	0	0	0	0	0	0	0	0	0	0
Principle Due, Machinery	0	0	0	0	0	0	0	0	0	0	0
Principle Due, Office Equipment	0	0	0	0	0	0	0	0	0	0	0
Interest Payable	0	0	0	0	0	0	0	0	0	0	0
Total Current Liabilities	71,981	95,975	95,975	95,975	95,975	95,975	95,975	95,975	95,975	95,975	95,975
Non-Current Liabilities											
Remaining Principle, Equipment	0	0	0	0	0	0	0	0	0	0	0
Remaining Principle, Machinery	0	0	0	0	0	0	0	0	0	0	0
Remaining Principle, Office Equipment	0	0	0	0	0	0	0	0	0	0	0
Total Non-Current Liabilities	0	0	0	0	0	0	0	0	0	0	0
Owner's Equity											
Contributed Capital	479,398	305,606	305,606	305,606	305,606	305,606	305,606	305,606	305,606	305,606	305,606
Retained Earnings	0	0	0	0	0	0	0	0	0	0	0
Total Owner's Equity	479,398	305,606	305,606	305,606	305,606	305,606	305,606	305,606	305,606	305,606	305,606
TOTAL LIABILITIES AND OWNER'S EQUITY	551,379	401,581	401,581	401,581	401,581	401,581	401,581	401,581	401,581	401,581	401,581

Generated with data from: (Lamb)

**Figure I8. Pro-forma Income Statement for Marketing Corporation, Park Formation
Alternative 3.**

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Gross Sales/Revenues	426,174	557,834	558,394	558,954	559,514	560,074	560,634	561,194	561,754	562,314
Less: Returns and Allowances	0	0	0	0	0	0	0	0	0	0
Net Sales	426,174	557,834	558,394	558,954	559,514	560,074	560,634	561,194	561,754	562,314
Less: Cost of Goods Sold	0	0	0	0	0	0	0	0	0	0
Gross Margin	426,174	557,834	558,394	558,954	559,514	560,074	560,634	561,194	561,754	562,314
Operating Expenses										
Labor	71,981	95,975	95,975	95,975	95,975	95,975	95,975	95,975	95,975	95,975
Utilities	22,064	29,418	29,418	29,418	29,418	29,418	29,418	29,418	29,418	29,418
Supplies and Maintenance	16,547	22,063	22,063	22,063	22,063	22,063	22,063	22,063	22,063	22,063
Administrative	136,204	181,605	181,605	181,605	181,605	181,605	181,605	181,605	181,605	181,605
Lease	156,635	156,635	156,635	156,635	156,635	156,635	156,635	156,635	156,635	156,635
Market Fees	0	0	0	0	0	0	0	0	0	0
Depreciation	14,000	14,000	14,000	14,000	14,000	14,000	14,000	14,000	14,000	14,000
Capital Investments	175,000	0	0	0	0	0	0	0	0	0
Total Operating Expenses	592,431	499,696	499,696	499,696	499,696	499,696	499,696	499,696	499,696	499,696
Earnings Before Int. and Taxes	(166,256)	58,138	58,698	59,258	59,818	60,378	60,938	61,498	62,058	62,618
Less: Interest Expense	0	0	0	0	0	0	0	0	0	0
Earnings Before Taxes	(166,256)	58,138	58,698	59,258	59,818	60,378	60,938	61,498	62,058	62,618
Less: Income Taxes	0	0	0	0	0	0	0	0	0	0
NET INCOME (LOSS)	(166,256)	58,138	58,698	59,258	59,818	60,378	60,938	61,498	62,058	62,618

Generated with data from: (Lamb)

Figure I9. Pro-forma Cash Flow Statement for Marketing Corporation, Park Formation Alternative 3.

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
CASH INFLOW										
Cash Sales	0	0	0	0	0	0	0	0	0	0
Credit Sale Receipts	413,250	551,000	551,000	551,000	551,000	551,000	551,000	551,000	551,000	551,000
Other Receipts	12,924	6,834	7,394	7,954	8,514	9,074	9,634	10,194	10,754	11,314
Total Cash Inflows	426,174	557,834	558,394	558,954	559,514	560,074	560,634	561,194	561,754	562,314
CASH OUTFLOWS										
Labor	71,981	95,975	95,975	95,975	95,975	95,975	95,975	95,975	95,975	95,975
Utilities	22,064	29,418	29,418	29,418	29,418	29,418	29,418	29,418	29,418	29,418
Supplies and Maintenance	16,547	22,063	22,063	22,063	22,063	22,063	22,063	22,063	22,063	22,063
Administrative	136,204	181,605	181,605	181,605	181,605	181,605	181,605	181,605	181,605	181,605
Raw Materials	0	0	0	0	0	0	0	0	0	0
Lease	156,635	156,635	156,635	156,635	156,635	156,635	156,635	156,635	156,635	156,635
Capital Investment	175,000	0	0	0	0	0	0	0	0	0
Interest	0	0	0	0	0	0	0	0	0	0
Income Tax	0	0	0	0	0	0	0	0	0	0
Dividends	0	58,138	58,698	59,258	59,818	60,378	60,938	61,498	62,058	62,618
Total Cash Outflows	578,431	543,834	544,394	544,954	545,514	546,074	546,634	547,194	547,754	548,314
NET CASH FLOW	(152,256)	14,000	14,000	14,000	14,000	14,000	14,000	14,000	14,000	14,000
Beginning Cash Balance	323,108	170,851	184,851	198,851	212,851	226,851	240,851	254,851	268,851	282,851
ENDING CASH BALANCE	170,851	184,851	198,851	212,851	226,851	240,851	254,851	268,851	282,851	296,851

Generated with data from: (Lamb)

Vita

James Walters was born in Woodstock, Virginia on June 23, 1973. He attended Stonewall Jackson High School and graduated in June of 1991. Received a B.S. in Forestry from Virginia Polytechnic Institute and State University in 1996 and is scheduled to receive a M.S. in Forestry from the same institution in 1998. He is currently working as an extension associate for Virginia Tech.