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The Economic & Financial Performance of **RELOCATABLE BUILDINGS** in the U.S. Modular Building Industry

Prepared by:
Sage Policy Group

On behalf of:
**Modular Building Institute
Educational Foundation**

JANUARY
2012



**Sage Policy
Group, Inc.**

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About the Author



Anirban Basu is Chairman & CEO of Sage Policy Group, Inc., an economic and policy consulting firm in Baltimore, Maryland. Mr. Basu is one of the Mid-Atlantic region's most recognizable economists, in part because of his consulting work on behalf of numerous clients, including prominent developers, bankers, brokerage houses, energy suppliers and law firms. On behalf of government agencies and non-profit organizations, Mr. Basu has written several high-profile economic development strategies.

In recent years, he has focused upon health economics, the economics of education and economic development. He currently lectures at Johns Hopkins University in micro-, macro-, international and urban economics.

In 2007, Mr. Basu was selected by the *Daily Record* newspaper as one of Maryland's 50 most influential people. The *Baltimore Business Journal* named him one of the region's 20 most powerful business leaders in 2010.

Mr. Basu is involved with numerous organizations in a voluntary capacity, including serving as a Baltimore City Public School System board member and as a board member to the Baltimore Children's Museum and to the Baltimore School for the Arts. Mr. Basu is also on the board of First Mariner Bank. He is also chairman of the Baltimore County Economic Advisory Committee and economic advisor to the Baltimore-Washington Corridor Chamber of Commerce.

Mr. Basu earned his B.S. in Foreign Service at Georgetown University in 1990. He earned his Master's in Public Policy from Harvard University's John F. Kennedy School of Government, and his Master's in Economics from the University of Maryland, College Park. His Juris Doctor was earned at the University of Maryland School of Law in 2003.

About Accu Val Associates, Inc.

AccuVal Associates, Inc provides valuation and advisory services that enable corporations to make strategic business decisions. The company offers its services for financing, financial reporting, tax management, litigation support, risk management, asset management, and business planning. It also provides its services for completing a merger or acquisition; coping with bankruptcy or reorganization; consolidating operations; managing risk of business interruption; and planning for succession. The company serves its clients in accommodation and food services; administrative and support services; agriculture, forestry, and fishing; arts, entertainment, and recreation; construction; education; finance and insurance; healthcare and social assistance; information; and manufacturing industries. It also serves its clients in mining, quarrying, and oil and gas extraction; professional, scientific, and technical services; public administration; real estate; rental and leasing; retail; transportation and warehousing; utilities; waste management and remediation services; and wholesale industries. The company was founded in 1988 and is headquartered in Mequon, Wisconsin with additional offices in Los Angeles, California; Boca Raton, Florida; Atlanta, Georgia; Chicago, Illinois; Lexington, Kentucky; Coram and Carle Place, New York; Providence, Rhode Island; Dallas, Austin, and Houston, Texas; Toronto, Canada; and Singapore.

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Executive Summary

INTRODUCTION

The U.S. modular building industry may be characterized as the stealth segment within the U.S. construction industry. Many economic stakeholders appear not to be aware of the industry's presence except perhaps in its role as suppliers of temporary classrooms and storage units at various construction sites.

However, the industry has evolved into a leading-edge segment. It is clearly positioned to be at the vanguard of the nation's construction industry because of a set of easily identifiable advantages. While traditional building is subject to the vagaries of weather, site conditions, and other uncontrollable factors that can and often present builders with a constantly changing series of problems to solve before actual construction work can proceed, modular construction operates in controlled, predictable settings. Outdoor building sites are subject to theft of expensive materials, weather damage, and to waste from the inability to use materials in a most effective manner.

Modular construction can eliminate many of the basic problems of traditional construction by transforming the building process from a one-at-a-time, totally on-site method to one that applies lessons from industrial production. Modular construction moves from 60 percent to 90 percent of building activity to an enclosed space. By building in modules, this construction process allows for simultaneous work on individual modules and the components of these modules, saving time by eliminating the need to build sequentially. Building at this scale affords economies in purchasing, greater control over materials and building techniques, and preserves materials, which bolsters profitability. Quality control opportunities are substantially expanded, which limits liability and is more consistent with customer satisfaction.

Permanent and relocatable modular buildings serve the needs of diverse customers in many different settings. For most markets, the industry can supply either permanent or relocatable buildings to meet distinct requirements. Examples of markets and the different ways in which the industry can support their operations include education, general office, retail, hospitality, healthcare, storage, security and control, and industrial.

PURPOSE OF THIS STUDY & KEY ANALYTICAL FINDINGS

The objective of this Sage Policy Group, Inc. (Sage) study is to provide stakeholders with an appreciation of how the U.S. modular building industry has performed in recent years, including during a period of severe retrenchment within the U.S. construction sector. By analyzing the performance of more than 14,000 relocatable modular units between 2004 and 2010 in terms of utilization, rental income and sales income, the study team was able to generate the following key analytical findings.

..... Leasing, Utilization & Distribution of Relocatable Units

- The North American modular building inventory exceeds 550,000 relocatable units in recent years, including units owned and operated by public schools.
- This inventory expanded steadily from 2004 to 2008 until the entire building industry began to adjust.
- Inventory shrank significantly from 2008 to 2010, a reflection of the rapid response of modular building industry participants.
- While the industry worked quickly to reallocate inventory resources, demand from 2008 to 2010 fell more sharply than did units in place.
- Based on a sample of over 100,000 units made available to the Sage study team, demand for modular units grew steadily until 2008 and fell a relatively modest 6 percent from 2008 to 2009. From 2009 to 2010, units on lease decreased by 6 percent.
- The economic downturn substantially impacted the distribution of units leased from 2004 to 2010. Classroom units represented 27 percent of the lease mix in 2004, but only 16 percent in 2010, while the share of storage units decreased from 21 percent to 18 percent.
- On the other hand, mobile office units were consistently one-third or more of the total. The share of modular complex units grew from 16 percent to 27 percent.
- Trends strongly indicate an industry that diligently manages inventories and has opportunistically identified demand when and where it exists. The most significant trends in recent years have been shifts in the market from classroom and storage units towards mobile office and especially modular complex units.

..... The Industry's Financial Performance

- With the exception of storage and miscellaneous units, average monthly rent has tended to increase steadily over time.
- For all units, average annual increases were 4 percent. By way of comparison, a standard measure of inflation in the U.S. over the 2004-2010 period was 2.3 percent per year.
- Mobile office monthly rents were 22 percent higher in 2010 than in 2004.
- Classroom and modular complex monthly rents were up 14 to 9 percent over that period.
- Only storage monthly rents fell, down 15 percent.
- Overall, weighted unit rents were up 25 percent as more expensive modular complex units became more commonplace and less expensive storage units lost industry market share.
- In recent years, annual rental income from mobile office and modular complex units has become dominant, with these two types of units contributing more than 70 percent of all annual rental income in 2010.
- By contrast, classroom units, which contributed 28 percent of total income in 2004 contributed just 15 percent in 2010.
- For the 10,784 units in the detailed study sample (of more than 14,000 units) that were held by the purchaser for more than a year, rental income clearly represents the primary source of income.
- Net lifetime rent for these units is estimated at \$229 million while gross sales revenue was \$146 million against total acquisition costs of \$121 million.
- After an average holding period of 7.7 years, the annual return on the initial investment in acquiring these units was **16 percent**.
- If one considers all units in the study sample that were eventually sold, including those sold less than one year after initial purchase, the average annual return on investment was **18 percent**, which was achieved after an average holding period of 5.8 years.



EDUCATION
Relocatable Administration Offices
Days to complete: 87

.....> Durability of Units

- An estimated 20 percent of units had been held for 10 years to 25 years when they were sold.
- Given improving technology, materials science, and greater knowledge regarding how units fare under varying climatic conditions, the useful life of modular units is likely to expand.
- This will increase the economically useful life of modular units, which in turn will support even higher returns to an industry that has already been experiencing 17 to 18 percent annual returns on modular units.
- Undoubtedly, the rates of return calculated by this study would have been even more substantial had the U.S. construction industry not suffered its historic downturn.

CONCLUSION

The U.S. modular building industry has proved unusually resilient in the wake of the worst national construction downturn since the Great Depression. Despite falling utilization, particular in the classroom and storage categories, the industry has remained opportunistic, including by increasing the share of units in the modular complex units and mobile office categories, which are associated with higher average rents. As a result, weighted unit rents were up 25 percent between 2004 and 2010, a testament to the industry's flexibility even in the most hostile economic environments.

"After an average holding period of 7.7 years, the annual return on the initial investment in acquiring these units was **16 percent.**"

Given modular building's inherent advantages vis-à-vis site-based construction, the industry will be at the vanguard of industry growth going forward. The industry is not particularly well understood, which serves as a barrier to entry and a source of sustained profitability for savvy industry participants.



Real Estate Presentation Center
Days to complete: 53



Community Health Center
Days to complete: 48

The Economic & Financial Performance of RELOCATABLE BUILDINGS in the U.S. Modular Building Industry

I. INTRODUCTION

This Sage Policy Group, Inc. (Sage) report addresses recent operational and financial trends in the modular construction and building sector. The industry has demonstrated substantial capacity to respond to changes that have convulsed the commercial construction industry in recent years. The Sage study team concludes that because the modular building industry is associated with substantial barriers to entry, including a lack of knowledge regarding opportunities within the industry, industry participants have been able to maintain financial viability and in some cases profitability even as the broader construction industry has tumbled.

Modular construction produces buildings and complexes that to the unpracticed eye are interchangeable with traditionally constructed buildings. Modular building performance is similarly identical to other structures and in some cases superior because of the opportunities for quality control that a controlled manufacturing environment provides relative to site-built construction. Some modular units are utilized largely for storage, another growing aspect of economic life in America. What follows is a statistical overview of the U.S. modular building industry. Sage would like to thank AccuVal, a provider of corporate valuation and advisory services headquartered in Milwaukee, for providing detailed, analyzable inventory and cost data used to drive key portions of the analysis.

II. THE INDUSTRY

MODULAR BUILDING

Despite being a multibillion dollar industry, modular construction and modular buildings may represent the stealth division of the nation's construction industry. While many would recognize modular units used as offices at work sites or as temporary classrooms at schools, the fastest growing category of modular buildings, modular complexes are indistinguishable to all but the most informed observers from on-site construction.

In total, the modular construction and modular buildings industry in North America generates \$5 billion in total revenue. Roughly 60 percent of this revenue is attributable to relocatable buildings while the remainder is generated by permanent modular buildings.¹

Multi-story buildings with brick veneers and architectural details bear no apparent relation to the trailers that temporarily house construction workers. Yet both are products of a construction process that fundamentally transforms traditional building techniques and creates opportunities for technical innovation, cost effectiveness and savings, and substantially reduced completion schedules.

Traditional construction occurs at the ultimate building location in a sequence of typically non-overlapping steps. In the most basic ways, traditional construction has not changed in millennia. A site is chosen; a foundation is built. Some type of frame is constructed for the entire building. Closing the building envelope is a major milestone because it reduces the negative effects of weather on construction. A sequence of tasks is completed to finish the interior space, including plumbing, HVAC, electrical and finishes.

While the technology of construction materials, equipment, and techniques continuously evolves, traditional building is subject to the vagaries of weather, site conditions, and other uncontrollable factors that can and often present builders with a constantly changing series of problems to solve before the actual construction work can proceed. Working in the ambient environment also creates a continuously changing "workplace" for the workers. Heat and cold, rain and snow can all impact productivity, worker safety, build quality and other critical components of construction. Outdoor building sites are subject to theft, to weather-damaged materials, and to waste from the inability to use materials in the most effective, efficient manner.

Modular construction can eliminate many of the basic problems of traditional construction by transforming the building process from a one-at-a-time, totally on-site method to one that applies lessons from industrial production. The basic steps of modular construction and its major benefits are summarized below.

Modular construction moves 60 percent to 90 percent of building activity to an enclosed space. By building in modules, this construction process allows for simultaneous work on individual modules and the components of these modules, saving time by eliminating the need to build sequentially. Building at this scale affords economies in purchasing, greater control over materials and building techniques, and preserves materials, which bolsters profitability. Quality control opportunities are substantially expanded, which limits liability and is more consistent with customer satisfaction.

¹ Modular Building Institute, "Permanent Modular Construction: 2011 Annual Report", www.modular.org.

Construction in an enclosed space eliminates the need to deal with on-site weather conditions and to rush to enclose space. Weather-related damage to materials no longer occurs. Workplace environments are better for workers who have a consistent work location. Higher throughput justifies easier availability of specialized equipment and allows for more sophisticated and efficient scheduling of tasks and work crews. Moreover, less is required of individual workers, who do not face the range of shifting variables in a controlled manufacturing environment.

Completed modules are delivered to the building site where foundation work can be scheduled while modules are being built, saving time through the simultaneous scheduling of work steps. On-site assembly of modules can be accomplished in days or weeks instead of the months of on-site work needed to achieve the same results. Environmental damage to sites is reduced. Shorter completion schedules reduce financing and supervisory costs.

Final construction steps such as exterior finishes, roofing, and landscaping can create a structure that is visually indistinguishable from a site-built structure. The time for completing a permanent structure can be cut in half, reduced to as little as a few months. Limited need for on-site construction activities minimizes interference with ongoing functions in nearby buildings and spaces. Relocatable structures can be delivered and operational within as few as 24 hours.



PERMANENT VERSUS RELOCATABLE BUILDINGS

Modular structures can be divided into two broad categories defined by the expected period of use for the completed building. Permanent modular construction creates buildings for any purpose and of virtually any size that are designed to last for decades and to remain in their specific location for the duration of their useful life. Relocatable buildings are structures designed to meet time limited purposes and to be reused and repurposed many times. While these buildings are designed to be moved from location to location as market needs require, the buildings are also designed to comply with all applicable codes and regulations regardless of location or use.

As noted earlier, permanent modular buildings for commercial purposes in North America generate about \$2 billion in annual revenue. Another \$4 billion in annual revenue is estimated for commercial construction of permanent modular buildings outside of North America. The United Kingdom is a particularly large market and considered the world leader in high-rise modular construction. Markets in China and India are difficult to measure, but are expected to approach \$1 billion in annual revenue within a few years.²

The relocatable market in North America comprises over 550,000 individual units with an estimated value of as much as \$6 billion. A slight majority of these units is dedicated to the education market where 180,000 units are owned and operated by public school districts and another 120,000 classroom units are owned and leased by companies in the industry. The remaining 250,000 units, which are owned and leased by the industry, serve other markets. Annual revenue for this part of the commercial modular building industry is \$3 billion. The largest source of revenue is leasing activity (45 percent), followed by sales (30 percent), and service (25 percent).³

Whether intended for permanent or temporary use, the modular building product can be a visually appealing, award winning structure. Two examples discussed on the next page reflect the predictability of the modular construction process.



² Ibid.

³ Modular Building Institute, "Relocatable buildings: 2011 annual report" www.modular.org

Permanent Modular Buildings:

Police facilities in Trenton, New Jersey

New police facilities in Trenton, New Jersey were designed to provide a police presence on the city's east and west sides instead of concentrating all police functions in the central headquarters structure built in the 1930s. With more residential locations, facility design was intended to complement older, nearby restored brick houses. These new buildings were also intended to support the revitalization and redevelopment of surrounding neighborhoods.

Modular construction reduced total construction time by 50 percent compared to a site built structure while meeting the special needs of a police facility (e.g., factory-built fire-rated walls for the site-installed elevator eliminated the need for a conventional site-built elevator shaft). Combining wood and steel construction in walls and roof systems allowed for larger spans in the building and floors capable of supporting unusually heavy loads. Energy efficiency was embedded during modular construction and enhanced by final construction tasks undertaken at the site (e.g., special insulation board installed during the construction of the brick exterior).

With their deliberate architectural reflection of older housing styles, high peaked roofs, and front entrances with masonry columns, these facilities have been an aesthetic addition to their respective communities as well as an extension of public safety to Trenton's east and west sides.



Relocatable Modular Buildings:

Pre-construction sales center in Burnaby, British Columbia

A sales center for four high-rise residential buildings combines seven factory-built modules that provide the amount and quality of space required by the client. A design collaboration of the client's architect, interior designer, and sales team, the sales center duplicates the interior materials, exterior materials and finishes of the suites in the proposed high-rise buildings. These model suites are also built at the exact scale of the units to be situated with the high-rise buildings.

Construction combined the seven factory-built modules with a temporary foundation (pad and block wood foundation) that was custom built to accommodate the sloping site. Site work included a patio off the model suite. Heat and air conditioning are facilitated by factory-built in-floor duct work. The 4,500 square-foot center was completed in 149 days.



The developer's intention is to use the sales centre until the project is sold out. Because of its modular construction, the sales center need not be demolished when that goal is met, but can be disassembled and reused at another location.

Kitchen, Dressing Room, & Office
Days to complete: 61



EDUCATION
Green Relocatable Classroom
4,800 total sq. ft.
Days to complete: 74



III. MARKETS SERVED

Permanent and relocatable modular buildings serve the needs of diverse customers in many different settings. For most markets, the industry can supply either permanent or relocatable buildings to meet distinct requirements. Examples of markets and the different ways in which the industry can support their operations include the following:

EDUCATION

The industry can deliver permanent single classrooms or complete campuses to any type of school at any level from pre-kindergarten to graduate-level university. These permanent units can be delivered in as few as 90 days with minimal need for on-site work and the least possible interference for students or teachers. Materials can be traditional or modern, wood, steel, and/or concrete to suit any architectural requirements.

Temporary classrooms can be delivered and operational within as little as 24 hours. Single classrooms or clusters of multiple modules are routinely delivered. The industry uses state or third-parties to inspect, test, and certify units.



GENERAL OFFICE

Whether used as a corporate headquarters, satellite bureaus, institutional and administrative buildings, or offices for small businesses, permanent modular single- and multi-story buildings can be assembled in an infinite number of configurations. Structures can include all features of modern office buildings (e.g., conference rooms, lobbies, kitchens, restrooms, and large open spaces for cubicles or other partition systems). In addition to the buildings' themselves, the industry can effectively address needs for storm water management, landscaping, parking, and other site needs.

To meet time limited needs for expanded space, temporary office space of any type and any configuration can be a cost-effective solution. Relocatable structures avoid capital costs and the need to maintain space once a spike in space requirements is past.



RETAIL/HOSPITALITY

Because modular construction can radically reduce completion times for permanent retail and hospitality space, opportunities to generate revenue can be accelerated. In a retail world that increasingly uses pop-up stores to take advantage of seasonal opportunities or to test larger concepts, temporary modular space can provide operating stores within a day. Combining temporary and permanent structures, customers can meet immediate needs and be flexible with respect to shifting consumer demands. Applications include disparate uses such as hotels and motels, restaurants and diners, banks, golf pro shops, convenience stores, gas stations, car washes, college bookstores, and concession stands.



HEALTHCARE

Accelerated construction schedules can also help healthcare organizations respond to emerging needs. Industry experience includes permanent modular construction for medical, surgical, clinical, and dental use. Relocatable modules can meet similar needs in an even more compressed timeframe, even a few days. Because these modules can be moved as needed, they can facilitate responding to the healthcare needs of special populations (e.g., people in disaster areas, the homeless) that cannot be effectively served by traditional healthcare facilities.

EQUIPMENT & STORAGE

Permanent modules can meet the particular needs of equipment and material storage (e.g., non-combustibility, durability, strength). High-tolerance heated and air conditioned buildings can be made of wood, steel, or precast concrete with exteriors of steel, brick, stone aggregate, or stucco and can meet needs for security in potentially hostile environments. Relocatable modules can provide similar capabilities where needs are of short duration, including at construction sites.

SECURITY & CONTROL

Permanent and temporary modular buildings can be custom built to address a variety of access and control situations such as toll booths, tickets sales offices, guard stands, and weigh stations. Permanent modular structures can include much larger, more complex buildings -- e.g., correctional facilities ranging from small regional jail cells to maximum security prisons.

INDUSTRIAL

Permanent and relocatable modules can also benefit industrial customers who need space for one- and two-story modular in-plant offices, mezzanines, and storage platforms. These industrial buildings are custom engineered to suit each application, made of non-combustible steel construction and assembled in a manner that locks panels together quickly and easily.



INDUSTRIAL
EMSA
Antimina Permanent Camp.



STORAGE
Social Facility / Restrooms
Days to complete: 16



EDUCATION
Classrooms & Office Space
Days to complete: 101

IV. OPERATING TRENDS FOR RELOCATABLE BUILDINGS

Basic operating characteristics and trends of the relocatable building segment of the industry can be examined by considering changes in inventory, trends in units leased, and utilization. These data describe an industry that is nimble in responding to changes in the marketplace and opportunistic in aligning with higher growth and higher revenue opportunities. Some in the industry have described relocatable units as “chess pieces” that can be strategically moved between various regional economies and industries as circumstances demand.

The total inventory of relocatable buildings is approximately 550,000 units. Of these roughly 370,000 units are owned and leased by companies in the industry. The other 180,000 relocatable units are owned and operated by public school districts across the country.⁴

The following discussion is based on data for a large sample of units (approximately 25 percent of the total) owned and leased by companies in the industry. The units in this dataset (roughly 120,000 to 180,000 units depending on the year) are considered representative of the overall inventory of relocatable units owned and leased by the industry. These data are available for the period from 2004 through 2010 and provide a consistent data set that can illustrate trends in the overall inventory and changes in the industry over a 7-year period that included one of the most spectacular downturns in commercial building construction in the United States. While the data are considered representative, the relationship of the sample to the universe of all relocatable units over the 2004 to 2010 period is not well understood. Consequently, trend data and distributional data provide better insights into the industry than the absolute numbers and totals.

This sample of units expanded steadily from 2004 to 2008. Inventory shrank significantly from 2008 to 2010. This inventory shrinkage occurred during one of the more substantial downturns in commercial building in recent memory and likely reflects that change in the overall building and construction industry.

Within the overall inventory, the composition of types of units has shifted significantly. The number of classroom units has remained almost unchanged from 2004 to 2010, despite an increase of more than one-third in the total number of units in the sample. Storage units have experienced a similar trend. The most dramatic change has been in the miscellaneous category, which has grown on average 22 percent annually although it remains a small share of the total sample.

Mobile offices available for use increased steadily over the 2004-2010 period and units used in modular complexes have grown at an even greater rate, more than doubling in number over the total period. These two types of units, which constituted one-half of the total inventory in 2004, accounted for 62 percent of modular inventory by 2010. As a share of total inventory, modular complex units have nearly doubled, growing from 17 percent to 26 percent of the total. As shown later in the report, this reallocation of inventory allows the industry to be better aligned with higher revenue markets of significant size and to diminish presence in struggling segments. Exhibits 1 and 2 present the total numbers of units in place and the distribution of those units by type of unit and by year from 2004 through 2010.

4

Ibid.

Exhibit 1. Units in place

Type of unit	2004	2005	2006	2007	2008	2009	2010	CAGR (1)
Classroom	30,286	31,356	30,964	28,951	35,811	32,981	30,087	0%
Mobile Office	41,548	42,117	45,111	51,412	64,013	61,576	58,589	6%
Modular Complex	20,187	23,992	25,315	26,364	46,532	44,844	42,651	13%
Miscellaneous	2,145	1,601	2,549	2,511	4,582	5,782	6,941	22%
Storage	24,747	24,165	27,400	24,188	29,346	26,910	25,173	0%
Total	118,913	123,231	131,339	133,426	180,285	172,092	163,441	5%

Note. 1. CAGR = compound annual growth rate.

Source: AccuVal, Modular Building Institute, Sage

Exhibit 2. Distribution of units in place

Type of unit	2004	2005	2006	2007	2008	2009	2010
Classroom	25%	25%	24%	22%	20%	19%	18%
Mobile Office	35%	34%	34%	39%	36%	36%	36%
Modular Complex	17%	19%	19%	20%	26%	26%	26%
Miscellaneous	2%	1%	2%	2%	3%	3%	4%
Storage	21%	20%	21%	18%	16%	16%	15%
Total	100%	100%	100%	100%	100%	100%	100%

Source: Sage, AccuVal, Modular Building Institute

The effects of the economic recession can also be seen in the numbers of leased units. While the industry worked quickly to reallocate inventory resources, demand in 2009 and especially in 2010 fell more sharply than did units in place. Indeed, demand for modular units grew steadily until 2008 and fell a relatively modest 6 percent from 2008 to 2009. From 2009 to 2010, units on lease decreased by 17 percent. Exhibit 3 provides statistical detail regarding leased units.

The economic downturn substantially impacted the distribution of units leased from 2004 to 2010. Classroom units were 27 percent of the lease mix in 2004, but only 16 percent in 2010, while the share of storage units decreased from 21 percent to 18 percent. On the other hand, mobile office units barely changed from 34 percent to 33 percent of the total. The share of modular complex units was up substantially from 16 percent to 27 percent. Year-to-year changes in distribution are detailed in Exhibit 4.

The growing importance of modular complex and mobile office units can be seen in the bar chart on page 22 (Exhibit 5). These two types of modular units constitute half of all leased units in 2004. By 2010, they account for 60 percent of the total. Classroom and storage units are of somewhat less importance to the mix of units actually being leased. Miscellaneous units are the least common type of unit, but have gained market share over time.

Exhibit 3. Units on lease (based on approximately 100,000-unit sample)

Type of unit	2004	2005	2006	2007	2008	2009	2010	CAGR (1)
Classroom	25,498	26,207	24,205	22,731	25,489	23,255	17,172	-6%
Mobile Office	32,359	34,748	37,356	42,912	48,496	45,488	35,577	2%
Modular Complex	15,545	20,043	20,637	21,276	35,745	34,294	28,689	11%
Miscellaneous	1,566	1,014	1,773	1,772	3,152	3,908	5,402	23%
Storage	19,598	19,187	21,006	18,662	22,033	20,122	19,521	0%
Total	94,566	101,199	104,977	107,353	134,915	127,067	106,361	2%

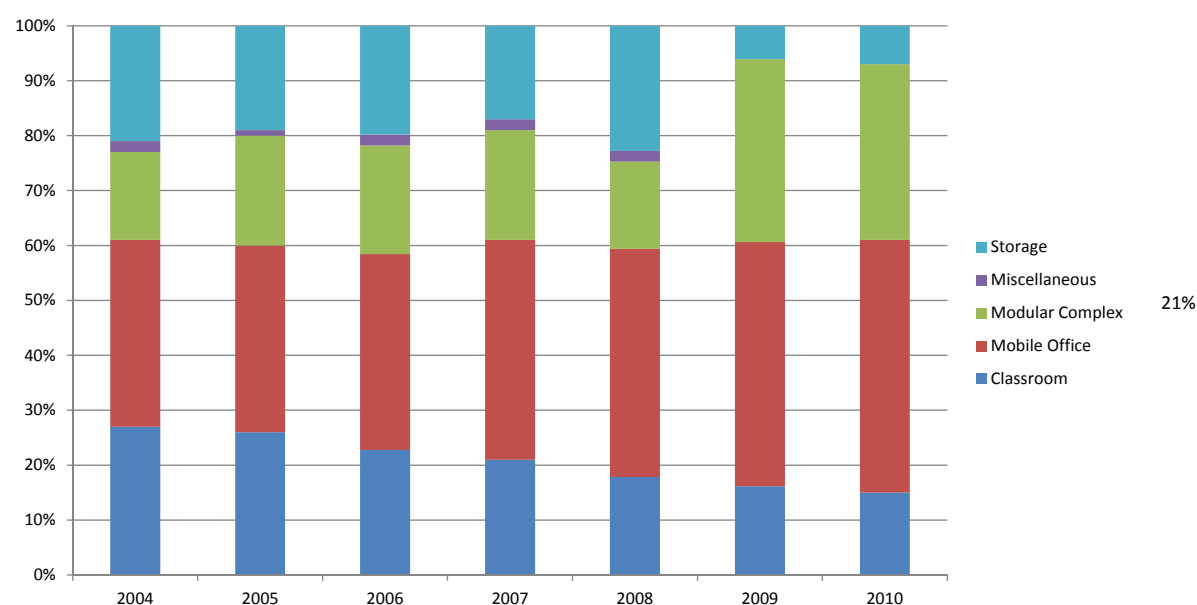
Note. 1. CAGR = compound annual growth rate.

Source: AccuVal, Modular Building Institute

Exhibit 4. Distribution of units on lease (based on approximately 100,000-unit sample)

Type of unit	2004	2005	2006	2007	2008	2009	2010
Classroom	27%	26%	23%	21%	19%	18%	16%
Mobile Office	34%	34%	36%	40%	36%	36%	33%
Modular Complex	16%	20%	20%	20%	26%	27%	27%
Miscellaneous	2%	1%	2%	2%	2%	3%	5%
Storage	21%	19%	20%	17%	16%	16%	18%
Total	100%	100%	100%	100%	100%	100%	100%

Exhibit 5. Chart of distribution of units on lease



Unit utilization or the percentage of inventory that is leased reflects a pattern of aggressive industry management during a time of economic adjustment. Overall utilization was at or above 80 percent from 2004 through 2007, but dropped to 75 percent in 2008 and to 65 percent in 2010 as shown in Exhibit 6.

Trends in utilization can be examined by setting the 2004 rates to 100 and prorating subsequent rates to that benchmark. As shown in Exhibit 7, utilization rates for classroom and storage units consistently declined from their 2004 levels in each subsequent year through 2010. On the other hand, utilization rates for mobile offices and modular complex units were significantly above their 2004 levels for the years 2005 through 2007, before falling off thereafter. In other words, the downturn in construction activity and demand for modular units was so profound that even active management of the modular fleet did not eliminate declines in utilization. However, industry adjustments to newly emerging economic realities was swift and reflected in stable or rising utilization in certain key categories, including an increase in storage unit utilization in 2010.

Exhibit 6. Utilization of units in place

Type of unit	2004	2005	2006	2007	2008	2009	2010	CAGR (1)
Classroom	84%	84%	78%	79%	71%	71%	57%	-6%
Mobile Office	78%	83%	83%	83%	76%	74%	61%	-4%
Modular Complex	77%	84%	82%	81%	77%	76%	67%	-2%
Miscellaneous	73%	63%	70%	71%	69%	68%	78%	1%
Storage	79%	79%	77%	77%	75%	75%	78%	0%
Weighted average	80%	82%	80%	80%	75%	74%	65%	-3%

Note. 1. CAGR = compound annual growth rate.

Source: Sage, AccuVal

Exhibit 7. Indexed utilization of units in place (2004 = 100)

Type of unit	2004	2005	2006	2007	2008	2009	2010
Classroom	100	99	93	93	85	84	68
Mobile Office	100	106	106	107	97	95	78
Modular Complex	100	108	106	105	100	99	87
Miscellaneous	100	87	95	97	94	93	107
Storage	100	100	97	97	95	94	98
Weighted average	100	103	101	101	94	93	82

Source: Sage, AccuVal

In summary, the operational trends for the modular building industry over the 7-year period ending in 2010 only partially reflect the ravages of the economic downturn, particularly in 2009 and 2010 and particularly in the U.S. construction industry. At the same time, trends strongly indicate an industry that diligently manages inventories and has opportunistically identified demand when and where it exists. The most significant trends have been shifts in the market from classroom and storage units towards mobile office and modular complex units. Miscellaneous units, which have never amounted to more than 5 percent of all units or leased units, have consistently been a small part of the marketplace.

V. THE RELOCATABLE BUILDING INDUSTRY'S FINANCIAL PERFORMANCE

Financial performance of the relocatable modular building industry is a function primarily of rental revenue, but also includes proceeds from the sale of units and from the provision of services. In any given year, a small share of units is sold. Of the units that are sold, a few are held only a few months before sale. More typical is the sale of a unit that has already been leased for 6 or more years.

AVERAGE MONTHLY RENT

Exhibit 8 presents average monthly rents for each type of unit included in the dataset of units used to describe operating trends. With the exception of miscellaneous units, average monthly rent has tended to increase steadily over time, or in the case of storage units, to decrease over time, but have demonstrated year-to-year volatility. Miscellaneous units have never amounted to more than 5 percent of the market. As a result, a small number of units at very high rents can radically change the average monthly rent for all miscellaneous units. This likely explains the volatility of monthly rents for these units. For all units, average annual increases were 4 percent. By way of comparison, a standard measure of inflation in the U.S. over the 2004-2010 period was 2.3 percent per year.⁵

Indexed trends in monthly rents, shown in Exhibit 9 and illustrated in Exhibit 10, reinforce the finding that most rents have moved modestly higher from 2004 to 2010. Mobile office monthly rents were 22 percent higher in 2010 than in 2004 as were miscellaneous units. Classroom and modular complex monthly rents were up 14 to 9 percent over that period. Only storage monthly rents fell, down 15 percent. Overall, rents were up 25 percent. As Exhibit 10 clarifies, monthly rent trends for classrooms and mobile offices (as well as the weighted average for all unit monthly rents) are quite similar. Monthly rents for modular complex units and for storage units are, respectively, well above and below most other rents.

Exhibit 8. Average monthly rent

Type of unit	2004	2005	2006	2007	2008	2009	2010	CAGR (1)
Classroom	\$266	\$279	\$293	\$275	\$297	\$299	\$304	2%
Mobile Office	\$245	\$250	\$302	\$289	\$327	\$316	\$298	3%
Modular Complex	\$456	\$507	\$557	\$584	\$531	\$526	\$495	1%
Miscellaneous	\$324	\$541	\$991	\$976	\$902	\$983	\$455	6%
Storage	\$104	\$95	\$101	\$99	\$107	\$101	\$88	-3%
Weighted average (2)	\$257	\$282	\$321	\$323	\$353	\$356	\$322	4%

Notes:

1. CAGR = compound annual growth rate.

2. The disproportionate increase in weighted average is due largely to a shift in the allocation of units, with more expensive mobile office and modular complex units increasing in market share and less expensive storage units declining rapidly in terms of industry share.

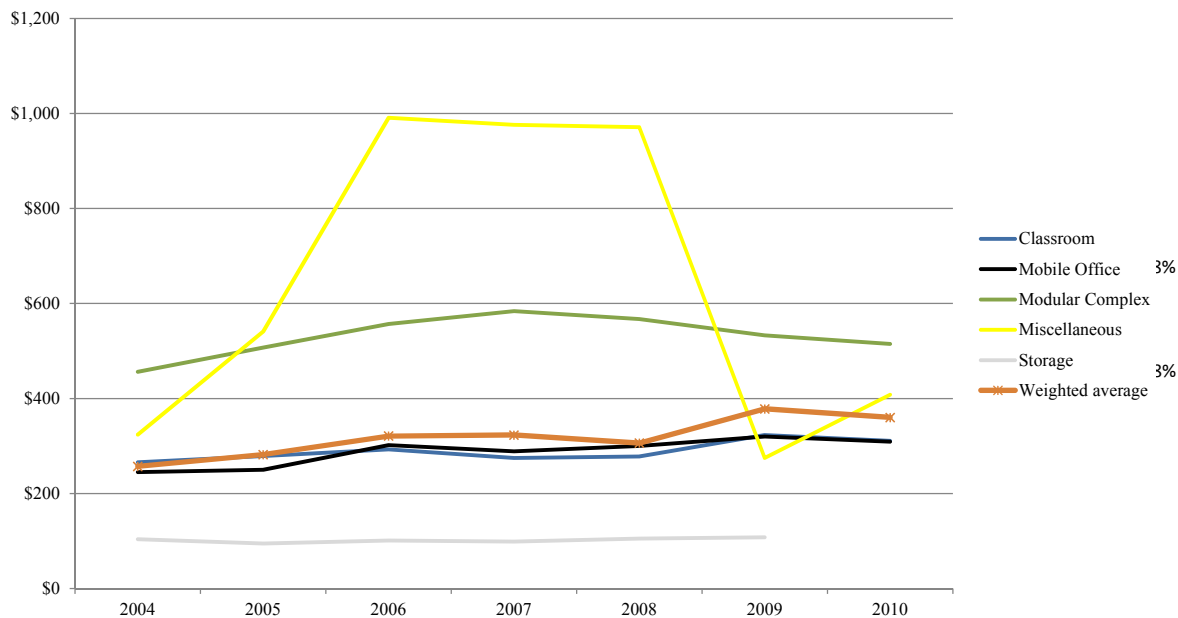
Source: Sage, AccuVal

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Implicit Price Deflators for Gross Domestic Product, Bureau of Economic Analysis, U.S. Department of Commerce.

Exhibit 9. Indexed average monthly rent (2004 = 100)

Type of unit	2004	2005	2006	2007	2008	2009	2010
Classroom	100	105	110	103	112	112	114
Mobile Office	100	102	123	118	134	129	122
Modular Complex	100	111	122	128	117	115	109
Miscellaneous	100	167	306	302	279	304	141
Storage	100	92	97	95	103	97	85
Weighted average	100	110	125	125	137	138	125

Exhibit 10. Chart of average monthly rent

Source: Sage

Annual rental income encompasses average monthly rent, utilization rates and the number of units that are on lease. For each type of unit, annual rental income is the product of the total number of units, the average utilization of those types of units, and the average annual rent for that type of unit (i.e. average monthly rent times 12). These annual rental income calculations are made for each unit type by year. Exhibit 11 shows how this cumulative annual rental income has trended over time for each type of unit. Total cumulative annual rental income peaked in 2008 and has drifted downward since then. On average, total income decreased at a modest rate from 2004 to 2010. This overall decline in total rental income is attributable to sharp decreases in income for classroom, storage, and miscellaneous units that more than outweighed increased income emerging from mobile office and modular complex units.

Income from mobile office and modular complex units peaked in 2008, and has declined since those peaks. Over the 2004 to 2010 period, trends for the three other types of units have been inconsistent although each had sharp declines in annual income in 2010 relative to levels achieved in 2004. Annual rental income for classroom and storage units in 2010 was significantly below their 2004 levels. Miscellaneous unit annual rental income showed the most dramatic growth and volatility, but the overall impact of this growth was muted by the small share of the market these units constituted.

The upshot of these trends is the dominant positions that annual rental income from mobile office and modular complex units has achieved by 2010. As illustrated in Exhibit 13, these two types of units contributed more than 70 percent of all annual rental income. Classroom units, which contributed 28 percent of total income in 2004, contributed just 15 percent in 2010.

Exhibit 11. Annual rental income (in \$millions)

Type of unit	2004	2005	2006	2007	2008	2009	2010	CAGR (1)
Classroom	\$81	\$88	\$85	\$75	\$91	\$83	\$63	-4%
Mobile Office	\$95	\$104	\$135	\$149	\$190	\$172	\$127	5%
Modular Complex	\$85	\$122	\$138	\$149	\$228	\$216	\$170	12%
Miscellaneous	\$6	\$7	\$21	\$21	\$34	\$46	\$30	30%
Storage	\$24	\$22	\$25	\$22	\$28	\$24	\$21	-3%
Total	\$292	\$343	\$405	\$416	\$572	\$543	\$410	6%

Note. 1. CAGR = compound annual growth rate.

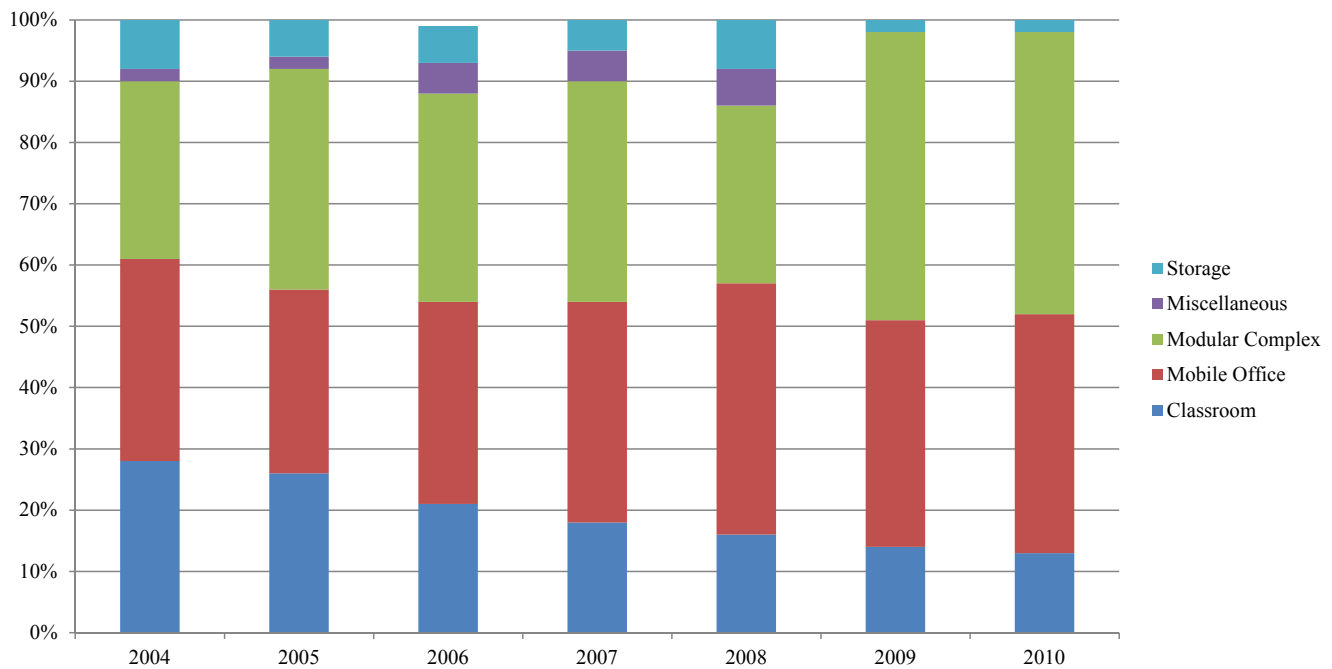
Source: Sage, AccuVal

Exhibit 12. Indexed annual rental income (2004 = 100)

Type of unit	2004	2005	2006	2007	2008	2009	2010
Classroom	100	108	104	92	112	102	77
Mobile Office	100	110	142	157	200	181	134
Modular Complex	100	143	162	175	268	255	200
Miscellaneous	100	108	347	341	561	758	485
Storage	100	90	104	90	116	100	85
Weighted average	100	117	139	142	196	186	140

Source: Sage

Exhibit 13. Chart of distribution of annual rental income



Source: Sage

Some fraction of the inventory of modular units is sold each year. These sales allow for an assessment of the return on investment available to the industry for those units that have been purchased, rented for varying lengths of time, and then sold. A database of more than 14,000 such sales analyzed by Sage provides a robust foundation for examining performance.⁶

In reviewing financial information for units that were sold, two groups were created -- those units sold within a year of being acquired and units held for longer than a year. While rental income was generated by both groups, it is assumed that the different lengths of the holding periods reflect different approaches to maximizing the return on available modular units.

Exhibit 14 presents key data regarding units held for 1 year or longer. For the total 10,784 units in this group, rental income clearly represents the primary source of income. Net lifetime rent for these units is estimated at \$229 million while gross sales revenue was \$146 million against total acquisition costs of \$121 million. *After an average holding period of 7.7 years, the annual return on the initial investment in acquiring these units was 16 percent.*⁷ Financial results varied substantially from year to year. Average annual returns for units sold in 2010 was 5 percent while returns for units sold in 2005 was over 100 percent. The 2005 returns may reflect data anomalies. During that year, only 128 units were sold and any anomalies would tend to have a disproportionate impact on the relatively small number of sales.

⁶ The database of sales was provided by the Modular Building Institute. See Appendix for discussion of this database.

⁷ To account for unit maintenance costs, the study team presumed that on average units generate annual maintenance expenses equal to 10 percent of the purchase price of the unit. These maintenance costs are reflected in the calculations presented in exhibits 14-16.

Exhibit 14. Financials for units sold after being held 1 year or more (\$ in millions)

Year	Total cost	Total sales price	Gross lifetime rent	Net lifetime rent (1)	No. of sales	Average cost	Average sales price	CAGR (2)	Years held
2004	\$4.4	\$5.6	\$40.1	\$37.3	407	\$10,745	\$13,783	42%	6.5
2005	\$2.5	\$3.3	\$48.3	\$47.3	128	\$19,186	\$26,136	109%	4.1
2006	\$39.0	\$44.9	\$47.8	\$28.1	3,361	\$11,602	\$13,360	13%	5.0
2007	\$15.1	\$17.9	\$25.9	\$19.1	2,178	\$6,932	\$8,198	22%	4.5
2008	\$35.0	\$47.3	\$98.4	\$61.3	3,148	\$11,107	\$15,011	11%	10.6
2009	\$6.0	\$8.1	\$18.5	\$11.7	516	\$11,652	\$15,738	11%	11.3
2010	\$19.0	\$19.0	\$42.0	\$17.9	1,046	\$18,138	\$18,186	5%	12.7
Total or weighted average	\$120.9	\$146.1	\$321.1	\$228.6	10,784	\$11,208	\$13,549	16%	7.7

Note.

1. Net lifetime rent assumes that annual maintenance and other expenses equal 10 percent of the cost of units.

2. CAGR = compound annual growth rate.

Sources: Sage analysis of AccuVal data

For units sold after being held less than 1 year, financial data are summarized in Exhibit 15. Because of the short holding time, the annualized returns on investment on these units are substantially higher than for units held for several years. For this group of 3,716 units the average annual return on investment was 237 percent. Total sales prices were \$71 million and net lifetime rent totaled \$15 million for a total revenue figure of \$85 million or 55 percent more than the total cost of acquisition of \$55 million. Year-to-year variations are substantial. Annualized returns range from the negative to over 800 percent. Annual sales of units ranged from no reported units in 2009 to 1,529 units in 2006. Remarkably, 37 percent of all units sold in 2007 were held for less than 1 year, perhaps a reflection of industry participants working to reduce capacity and increase short-term cash flow.

Exhibit 15. Financials for units sold after being held less than 1 year (\$ in millions)

Year	Total cost	Total sales price	Gross lifetime rent	Net lifetime rent (1)	No. of sales	Average cost	Average sales price	CAGR (2)	Years held
2004	\$3.4	\$4.3	\$2.2	\$2.1	173	\$19,486	\$24,811	846%	0.28
2005	\$11.6	\$14.3	\$11.2	\$10.8	379	\$30,711	\$37,843	762%	0.36
2006	\$22.8	\$29.4	\$1.5	\$0.7	1,529	\$14,880	\$19,257	123%	0.35
2007	\$13.9	\$18.5	\$1.3	\$0.8	1,301	\$10,679	\$14,194	148%	0.36
2008	\$2.8	\$3.8	\$0.4	\$0.2	296	\$9,424	\$12,684	128%	0.43
2009	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
2010	\$0.3	\$0.2	\$0.1	\$0.1	38	\$7,606	\$4,171	-19%	0.87
Total/ weighted average	\$54.7	\$70.5	\$16.7	\$14.7	3,716	\$14,729	\$18,961	237%	0.36

Notes:

1. Net lifetime rent assumes that annual maintenance and other expenses equal 10 percent of the cost of units.

2. CAGR = compound annual growth rate.

Sources: Sage analysis of AccuVal data

Harvard University, Relocatable Child Care Center

Received Innovation in Green Design Award from USGBC-MA Chapter for best in sustainable, replicable and cost effective design and building.



Exhibit 16 presents financial data for all 14,500 units that were sold. For this group of units, the average annual return on investment was almost 18 percent (17.8%), achieved after an average holding period of 5.8 years. Variations between years are substantial. It is noteworthy that returns on investment in several years and consistently from 2008 through 2010 were below average. This is consistent with the collapse of the construction and real estate industries in the current recession.

Exhibit 16. Financials for all units sold (\$ in millions)

Year	Total cost	Total sales price	Gross lifetime rent	Net lifetime rent (1)	No. of sales	Average cost	Average sales price	CAGR (2)	Years held
2004	\$7.7	\$9.9	\$42.3	\$39.4	580	\$13,352	\$17,072	48%	4.7
2005	\$14.1	\$17.7	\$59.5	\$58.1	507	\$27,801	\$34,887	262%	1.3
2006	\$61.7	\$74.3	\$49.3	\$28.9	4,890	\$12,627	\$15,204	15%	3.6
2007	\$29.0	\$36.3	\$27.2	\$19.9	3,479	\$8,333	\$10,440	24%	3.0
2008	\$37.8	\$51.0	\$98.8	\$61.6	3,444	\$10,962	\$14,811	12%	9.7
2009	\$6.0	\$8.1	\$18.5	\$11.7	516	\$11,652	\$15,738	11%	11.3
2010	\$19.3	\$19.2	\$42.1	\$18.0	1,084	\$17,768	\$17,695	6%	12.3
Total/ weighted average	\$175.6	\$216.6	\$337.7	\$243.3	14,500	\$12,111	\$14,936	17.8%	5.8

Notes:

1. Net lifetime rent assumes that annual maintenance and other expenses equal 10 percent of the cost of units.

2. CAGR = compound annual growth rate.

Sources: Sage analysis of AccuVal data

The 14,500 units that were sold and for which data on financial conditions are available represent a relatively small share of the overall inventory of units that have been available since 2004. While there are no other data regarding sales prices, there exist data characterizing rental income for an inventory of roughly 100,000 units between 2004 and 2010. The estimated lifetime rental income for the total inventory is somewhat lower on average than the rental income for the units that were sold. If this lower rental income is more representative, then using this rental income might be a better reflection of the investment returns for modular units.

Exhibit 17 compares the annual returns on investment using the two estimates of rent (one based on units that were sold and one based on those that were not between 2004 and 2010). The estimated net lifetime rent per unit for all units in place is \$15,195 or 93 percent of the estimated rent for the average unit that was sold. This lower rental income does reduce the average annual return, but not substantially. *As shown, the estimated range for annual investment returns is 17.1 to 17.8 percent.*

Exhibit 17. Two estimates of investment returns on units

Rent basis	Average cost per unit	Average sales price per unit	Net lifetime rent per unit	Rent + sales price	Years held	CAGR (1)
Rent based on units sold	\$10,845	\$14,936	\$16,287	\$31,223	5.78	17.8%
Rent based on all units in place	\$10,845	\$14,936	\$15,195	\$30,130	5.78	17.1%

Note. 1. CAGR = compound annual growth rate.

Sources: AccuVal, Sage

The returns on investment earned by the relocatable segment of the modular construction and building industry over the period from 2004 through 2010 are remarkable and robust. Even with the virtual collapse of the commercial construction and real estate sectors in recent years, the modular building industry has demonstrated a notable ability to maintain profitability. While there is no assurance that these historic returns are any predictor of future performance, the chess-like ability of the industry to reallocate and redeploy assets as the market changes suggests that the modular industry has an unusual facility to weather severe downturns and sustain financial performance.



VI. THE DURABILITY OF RELOCATABLE MODULAR UNITS

A potential issue for the modular construction industry is the estimated life or durability of relocatable units. The database of sold units provides information characterizing the age of the unit when it was sold. The average age of a sold unit was 5.8 years. When units held for less than 1 year are excluded, the average age of a sold unit was 7.7 years.

As shown in Exhibit 18, roughly three-quarters of sold units were held less than 1 year, held 1 to 5 years, or held 5 to 10 years. An estimated 20 percent of units had been held for 10 years to 25 years when they were sold. For all units held up to 15 years, the average sales price exceeded the original cost by 20 percent or more. The return on investment for these units declined as units were held for longer periods.

Exhibit 18. Distribution of age of unit when sold

Age of unit when sold	No. of units	Share of units sold	Sales price as share of cost	CAGR (1)
Less than 1 year	3,716	26%	129%	236%
1 year up to 5 years	3,948	27%	120%	31%
5 years up to 10 years	3,812	26%	126%	17%
10 years up to 15 years	2,090	14%	123%	13%
15 years up to 25 years	934	6%	100%	10%
Total	14,500			

Note. 1. CAGR = compound annual growth rate.

Sources: Sage, AccuVal

Given improving technology, materials science, and greater knowledge regarding how units fare under varying climatic conditions, the useful life of modular units is likely to expand. This will increase the economically useful life of modular units, which in turn will support even higher returns to an industry that has already been experiencing 17 to 18 percent average annual returns on modular units. Undoubtedly, the rates of return calculated by this study would have been even more substantial had the U.S. construction industry not suffered its historic downturn.

As a final point, maintenance of units is very important. Every player in the industry seems to agree with this proposition. Unfortunately, an industry-wide database of information regarding the level of maintenance per unit does not exist. The study team used a maintenance cost of 10 percent of unit price per annum to generate its rate of return calculations, but even this fails to fully capture the nuances involved with properly maintaining a relocatable unit. Presumably, the better the quality of maintenance, the higher the long-term rate of return on investments in relocatable units.



APPENDIX

Exhibit A-1. Annual summary of operating and financial factors

Year	Type of unit	Unit Count	Share of total	On Lease	Utilization	Average rent/month	Total rental revenue (millions)
2004	Classroom	30,286	25%	25,498	84%	\$266	\$81
	Mobile Office	41,548	35%	32,359	78%	\$245	\$95
	Modular Complex	20,187	17%	15,545	77%	\$456	\$85
	Miscellaneous	2,145	2%	1,566	73%	\$324	\$6
	Storage	24,747	21%	19,598	79%	\$104	\$24
	Total/weighted average	118,913		94,566	80%	\$257	\$292
2005	Classroom	31,356	25%	26,207	84%	\$279	\$88
	Mobile Office	42,117	34%	34,748	83%	\$250	\$104
	Modular Complex	23,992	19%	20,043	84%	\$507	\$122
	Miscellaneous	1,601	1%	1,014	63%	\$541	\$7
	Storage	24,165	20%	19,187	79%	\$95	\$22
	Total/weighted average	123,231		101,199	82%	\$282	\$343
2006	Classroom	30,964	24%	24,205	78%	\$293	\$85
	Mobile Office	45,111	34%	37,356	83%	\$302	\$135
	Modular Complex	25,315	19%	20,637	82%	\$557	\$138
	Miscellaneous	2,549	2%	1,773	70%	\$991	\$21
	Storage	27,400	21%	21,006	77%	\$101	\$25
	Total/weighted average	131,339		104,977	80%	\$321	\$405
2007	Classroom	28,951	22%	22,731	79%	\$275	\$75
	Mobile Office	51,412	39%	42,912	83%	\$289	\$149
	Modular Complex	26,364	20%	21,276	81%	\$584	\$149
	Miscellaneous	2,511	2%	1,772	71%	\$976	\$21
	Storage	24,188	18%	18,662	77%	\$99	\$22
	Total/weighted average	133,426		107,353	80%	\$323	\$416
2008	Classroom	35,811	20%	25,489	71%	\$297	\$91
	Mobile Office	64,013	36%	48,496	76%	\$327	\$190
	Modular Complex	46,532	26%	35,745	77%	\$531	\$228
	Miscellaneous	4,582	3%	3,152	69%	\$902	\$34
	Storage	29,346	16%	22,033	75%	\$107	\$28
	Total/weighted average	180,285		134,915	75%	\$353	\$572
2009	Classroom	32,981	19%	23,255	71%	\$299	\$83
	Mobile Office	61,576	36%	45,488	74%	\$316	\$172
	Modular Complex	44,844	26%	34,294	76%	\$526	\$216
	Miscellaneous	5,782	3%	3,908	68%	\$983	\$46
	Storage	26,910	16%	20,122	75%	\$101	\$24
	Total/weighted average	172,092		127,067	74%	\$356	\$543
2010	Classroom	30,087	18%	17,172	57%	\$304	\$63
	Mobile Office	58,589	36%	35,577	61%	\$298	\$127
	Modular Complex	42,651	26%	28,689	67%	\$495	\$170
	Miscellaneous	6,941	4%	5,402	78%	\$455	\$30
	Storage	25,173	15%	19,521	78%	\$88	\$21
	Total/weighted average	163,441		106,361	65%	\$322	\$410

Source: Sage, AccuVal



Exhibit A-1 summarizes data on the modular building industry's operating and financial characteristics for 2004 through 2010. These data support much of this report's analyses.

Database of sold units

AccuVal Associates Inc. has compiled a database of transactions for individual modular units. The entire database comprises almost 17,000 records for individual transactions. The individual data fields for the transactions are listed below.

- Individual unit identifier
- Classification of unit
- Date Acquired
- Date Sold
- Cost
- Sales Price
- Lifetime Rent
- Average Monthly Rent
- Location

Sage reviewed the entire database for completeness of records and other potential problems. Approximately 10 percent of the records clearly had incomplete data and could not be used. Another 3 percent appeared to have inaccurate data. The remaining 14,500 records had complete data and holding periods that stretched from a few weeks to 25 years.



Mosaic Homes Display Center
Days to complete: 71



Sage Policy
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