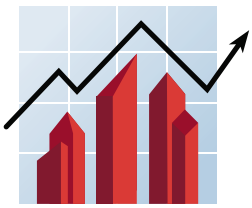
THE AMERICAN INSTITUTE OF ARCHITECTS

AIA Architecture Billings Index

Designing the Construction Future:

Reviewing the Performance and Extending the Applications of the AIA's Architecture Billings Index

By Kermit Baker, Ph.D., Hon. AIA; James Chu; and Jennifer Riskus



Billings at U.S. architecture firms have proven to be an accurate leading indicator of national trends in building construction. This update evaluates how the AIA's Architecture Billings Index (ABI) performed during this past construction cycle, introduces a new component of the ABI, and discusses how the construction industry can use this information to make better business planning decisions.

The authors acknowledge the assistance of Ken Simonson, chief economist of the Associated General Contractors of America, in the preparation of this paper.

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I. Introduction and Overview

In 2005, the Economics and Market Research group at the American Institute of Architects (AIA) published a monograph entitled "Business Trends at Architecture Firms as a Leading Indicator for the Construction Industry."[1] Its purpose was to demonstrate how business activity at U.S. architecture firms could be used as a leading indicator for spending on the construction of nonresidential buildings, and to introduce the Architecture Billings Index as such an indicator. Since this last analysis was completed, the nonresidential building sector has gone through its most pronounced business cycle in decades. A central purpose of this analysis is to evaluate how the ABI performed since the last analysis and whether it continued to be an accurate, leading indicator of building activity.

Also, this update provides information to help the construction industry better utilize the ABI in planning activities. An extensive description of the design process is presented, including:

- an overview of the architecture profession;
- the steps in the architectural design process;
- factors that influence the duration of the design process; and
- the relationship between design and construction.

Additionally, a new indicator is introduced in this update: design contracts. Design contracts, or other authorizations to proceed with design activity, provide an indication of future design billings at architecture firms. Much as construction contract awards provide an indication of future construction spending, design contracts are expected to provide a similar window into future design activity and an early indicator of subsequent construction contract awards. Trends in the dollar volume of design contracts, therefore, can fill an important gap between more subjective trends in project inquiries and actual design billings.

Finally, this update provides a few examples of companies using the ABI in their internal planning process. These case studies demonstrate how the ABI can help companies and organizations doing business in the nonresidential building industry more accurately anticipate future levels of construction activity, and therefore make better business decisions.

The Nonresidential Building Sector and Business Cycles

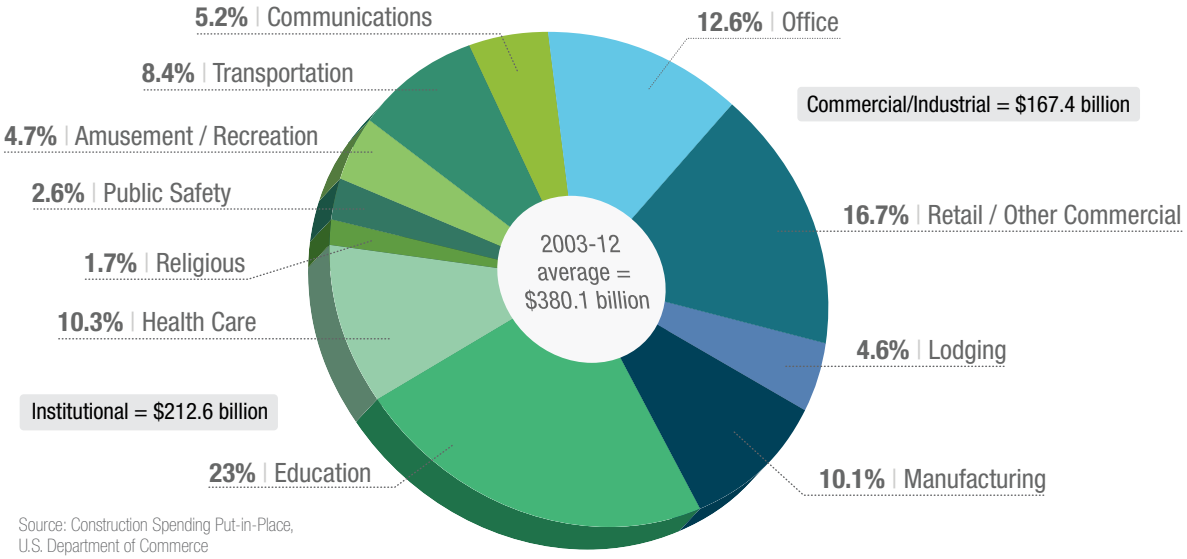
Even with significant declines in nonresidential building activity during this past downturn, the U.S. nonresidential building industry[2] remains one of the larger sectors of the economy. Construction spending for nonresidential buildings averaged more than $380 billion annually over the past decade, or almost 3 percent of total activity in the economy over this period. About 44 percent of spending, on average, has come from the more volatile commercial and industrial sectors, with the remaining 56 percent from the typically more stable institutional building categories. Two-thirds of spending in the commercial/industrial sector came from offices and retail/other commercial buildings, while 60 percent of institutional spending came from education and health-care facilities.

1 This monograph was later published in the October 2005 issue of *Business Economics* as "Architecture Billings as a Leading indicator of Construction" by Kermit Baker and Diego Saltes.

2 Nonresidential building construction for this analysis is defined to include the following categories from the U.S. Census Bureau's Value of Construction Put in Place in the United States data series (c-30): lodging, office, commercial, manufacturing, health care, educational, religious, public safety, amusement and recreation, transportation, and communication. The first four categories on this list are defined as "commercial/industrial" construction, with the remaining defined as "institutional" construction. Other construction categories included in the Census Bureau's nonresidential construction category—power, highway and street, sewage and waste disposal, water supply, and conservation and development—are not included in this analysis because they entail minimal involvement of architects (see Appendix A).

Institutional Categories Have Accounted for Over Half of Spending on Nonresidential Buildings

Share of U.S. nonresidential building construction spending, 2003-2012



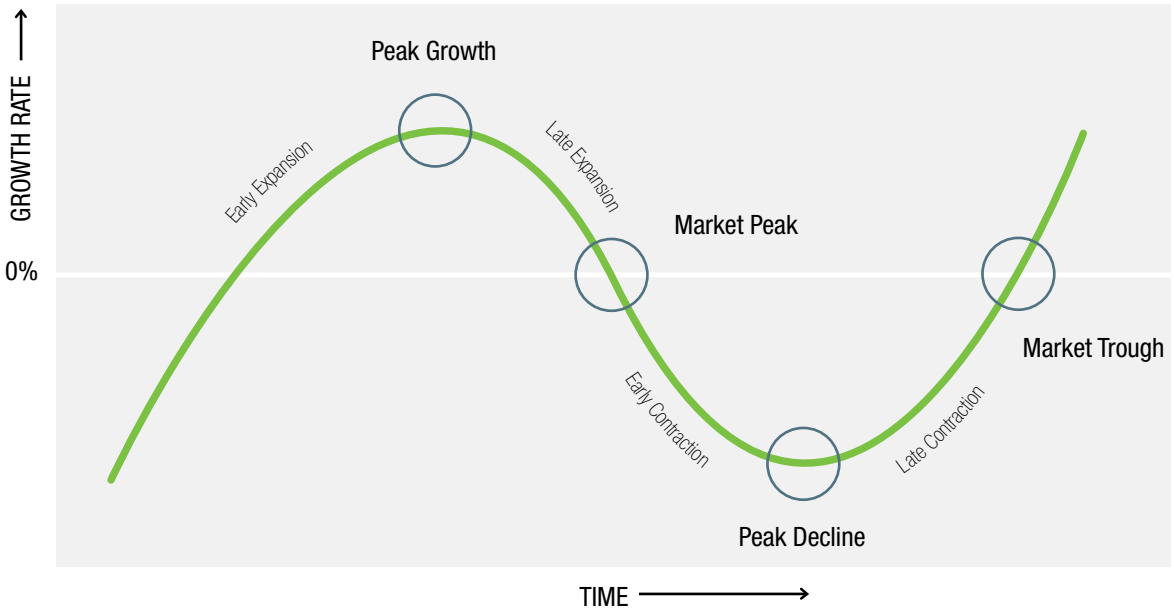
Source: Construction Spending Put-in-Place, U.S. Department of Commerce

All industries are subject to business cycles, but some industries are more affected by them than others. Industries that rely on major investments, such as new or renovated facilities, generally have more pronounced business cycles because businesses tend to delay these investments if they are concerned about business conditions and initiate them once they are more comfortable with the economic outlook and the future demand for these facilities. This typically creates a boom or bust in spending patterns for nonresidential buildings, which contributes to the development of more extreme business cycles in this industry.

Though it is generally not a perfectly regular, predictable, or repeating phenomenon, a business cycle is commonly identified as a sequence of four phases with four distinctive points that serve as eight guideposts for defining them:

- **Early expansion:** The period of acceleration in the pace of economic activity. This is the phase in the cycle when the economy is recovering from the last downturn and expanding into a period of new growth.
- **Peak growth:** The point where the rate of growth reaches its high point for that cycle.
- **Late expansion:** After the economy reaches a point of peak growth, growth begins to slow.
- **Market peak:** The point when actual economic output (not the rate of growth) is at its peak for that cycle.
- **Early contraction:** The phase immediately after the market peak when slow growth transitions to a period of accelerating decline.
- **Peak decline:** The point of a business cycle where the rate of decline is at its steepest.
- **Late contraction:** The period when the pace of decline begins to slow.
- **Market trough:** The point when economic output is at its lowest for that cycle.

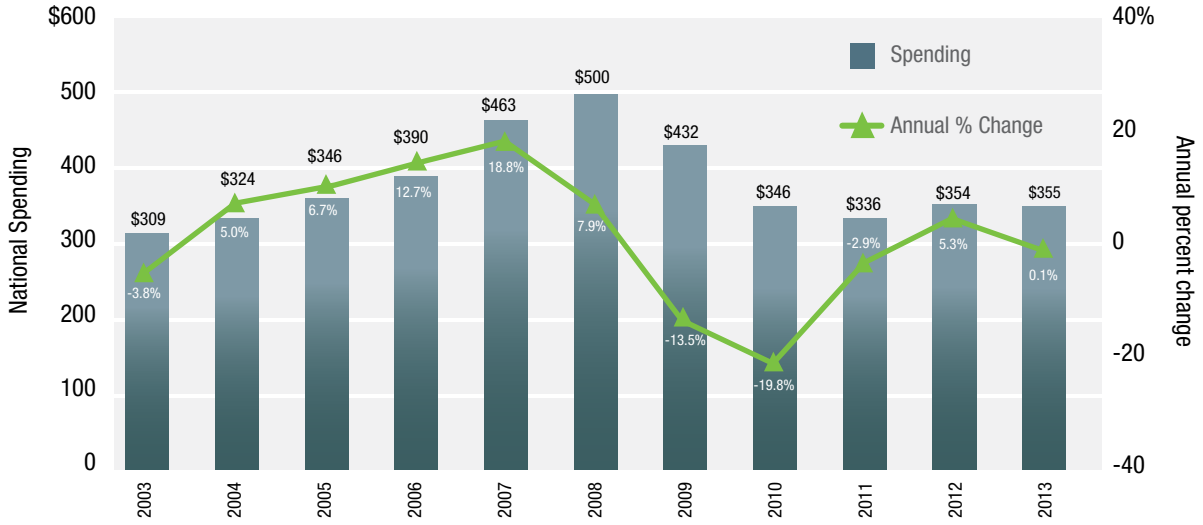
Phases of the Business Cycle



This pattern is discernible when looking at the change in construction activity over the past construction cycle. Spending on nonresidential buildings emerged from a downturn in 2004, and spending continued to accelerate through 2007. Growth continued through 2008, but the rate of growth declined that year. Spending declined in 2009, and the pace of decline accelerated in 2010. The downturn continued through 2011, but the pace of decline moderated significantly that year. In 2012, a recovery began in building construction spending.

National Spending on Nonresidential Buildings Is Extremely Cyclical

National spending ($billion) and annual percent change in spending on nonresidential buildings*



Note: Nonresidential construction categories covered include those referenced in Appendix A.
Source: U.S. Department of Commerce, Construction Spending Put-in-Place, from 8/1/2013 release.

II. Documenting the Design and Construction Process

Demographics of the Architecture Profession and ABI Survey Panel

The AIA estimates that there were approximately 17,500 AIA member–owned architecture firms in the U.S. in 2011.[3] That number increased in the mid-2000s as the economy expanded, and design and construction activity grew. However, the Great Recession took its toll, and the number of AIA member–owned firms declined by approximately 6 percent from 2008 to the estimated 17,500 in 2011.

Architecture firms are typically small, with more than 80 percent having fewer than 10 employees. However, while architecture firms with 50 or more employees account for a small share of firms, they employ nearly 40 percent of all architecture firm staff nationally. In addition, these larger firms generated an estimated 43 percent of the total $26 billion in revenue reported by architecture firms in 2011.[4]

Largest Architecture Firms Generate Nearly Half of All Firm Billings

Share of total firms, staff, and gross billings in the profession by firm size

Firm Size (# emp.)	Share of Firms	Share of Staff	Share of Billings
1	26%	3%	2%
2 to 4	37%	12%	8%
5 to 9	18%	13%	11%
10 to 19	10%	15%	14%
20 to 49	6%	20%	22%
50 to 99	2%	15%	16%
100 or more	1%	22%	27%

Source: *The Business of Architecture: 2012 AIA Firm Survey Report*

3 See "The Business of Architecture: 2012 AIA Firm Survey Report." Separately, the U.S. Census Bureau reports a total of 25,000 businesses in the U.S. that are classified under the architectural services designation. (U.S. Census Bureau, 2007 Economic Census) One reason for the different estimates is that at many smaller architecture practices, the owners may not be members of the AIA and therefore are not included in the count of member-owned firms.

4 Using a broader definition, the Census Bureau reports that total receipts from all businesses in the architectural and related services industry (including landscape architectural services, drafting services, building inspection services, geophysical survey and mapping services, surveying and mapping [except geophysical] services, and testing laboratories) in the U.S. were $56.4 billion in 2011. (U.S. Census Bureau, Quarterly Services Survey)

Similar to the overall architecture profession, the firms that participate on the monthly ABI survey panel primarily have a nonresidential specialization. Nearly two-thirds of firms on the survey panel have a nonresidential building specialization (37 percent institutional, 25 percent commercial/industrial), while just 20 percent specialize in a combination of single-family construction, multifamily construction, and home improvements. The remaining 18 percent of firms participating in the ABI panel have a mixed specialization; they do not receive half or more of their billings from any single major sector. The panel composition is reasonably reflective of the architecture profession overall, where approximately 61 percent of firm billings in 2011 were from institutional projects, 25 percent from commercial/industrial projects, and just 14 percent from residential projects, according to the "2012 AIA Firm Survey Report." (See Section III for more information on the composition of the ABI survey panel.)

Design Services Provided by Architects

Architecture firms offer a variety of services to their clients, ranging from predesign and planning, project design, and construction management to operations and management for the completed building. The majority of the services performed by architects—typically accounting for two-thirds of firm billings—is for project design. A typical design project consists of five phases that proceed sequentially through the project delivery process.

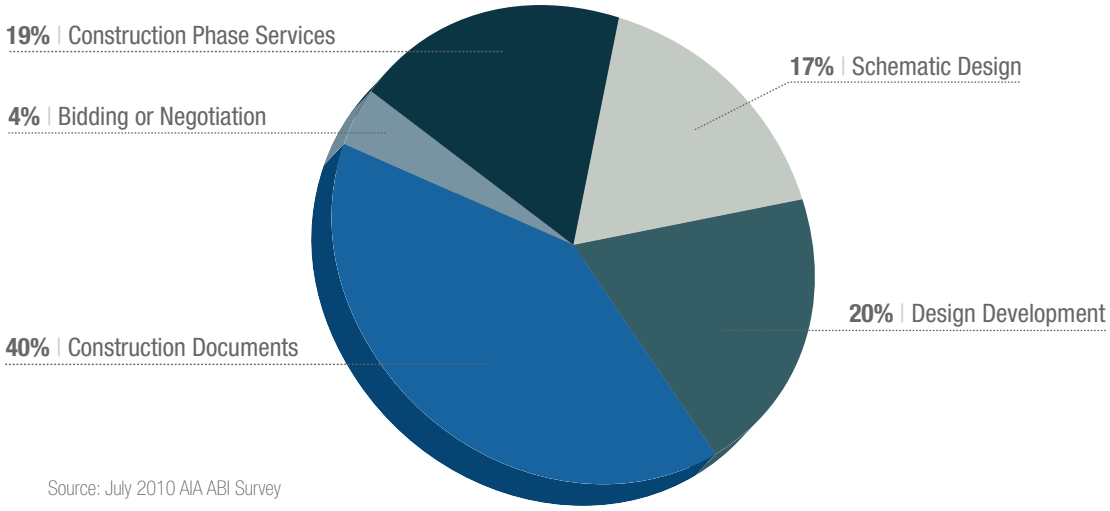
The first phase is schematic design, in which the architect and client discuss project goals and requirements, and develop a basic schematic for the work. The second phase is design development, in which the architect creates the project drawings and specifies detailed design elements and major building systems. Next the architect prepares the construction documents for the project, which include much more detailed and specific plans—including material specifications—sufficient for a contractor to develop a construction bid. These plans are then submitted to contractors for their bids. At the conclusion of the bidding and negotiation phase, the client evaluates contractor estimates, selects the winning bid, and awards the construction contract. The final phase is construction administration, in which the architect's role is to work with the contractor and owner to ensure that the project is built as specified in the plans and construction documents, and consistent with the design intent.[5]

Architectural service billings are typically back-loaded, with the greatest share of billings incurred during the last three phases of the project delivery process. The schematic design and design development phases together typically account for just over one-third of total billings, even though they often account for a larger portion of the length of the design and documentation phases. The construction documents phase alone accounts for 40 percent, on average. The final two phases, biddings and negotiations and construction administration, typically account for slightly less than one-quarter of billings.

5 See Appendix B for more detailed definitions of the design phases of a construction project.

Construction Documents Phase Accounts for Greatest Share of Design Phase Billings

Share of total design costs derived from given phase of basic design services



Source: July 2010 AIA ABI Survey

Length of the Design and Documentation Phases

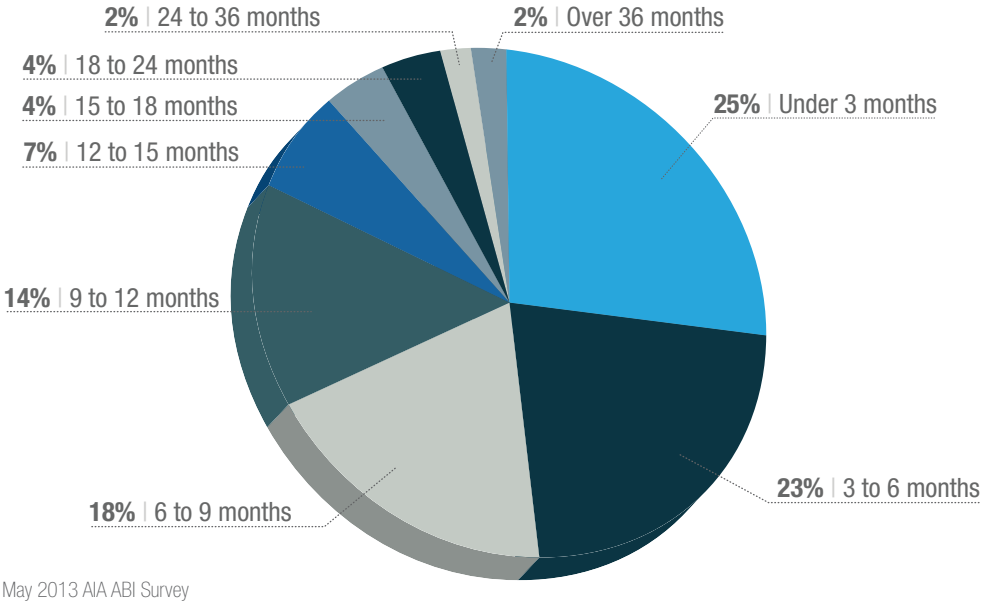
For the majority of projects, the design and documentation phases—defined as the authorization to proceed on design activity through the bidding phase—last less than nine months. However, because there are few typical design projects, there is a tremendous amount of variation in terms of the duration of the design and documentation phases. There are many factors that can affect the length of this phase of a project. Having a public (as opposed to private) client or designing larger, more complex projects are two major factors cited by architecture firms as having the greatest potential to increase project design time.[6] Projects that are retrofits or rehabilitations (as opposed to new construction) and buildings with a proposed LEED (Leadership in Energy and Environmental Design) certification are also factors with the potential to increase design time. On the other hand, more collaborative project delivery processes such as design/build, construction management, and integrated project delivery can result in projects that have shorter overall project schedules than projects using a traditional design/bid/build project delivery method.

On average, nearly half of architecture firm billings are from projects where the design and documentation phases last less than six months, and two-thirds of billings are from projects where the design and documentation phases last less than nine months. Just a small share of architecture firm billings is from projects where the design and documentation phases last for more than two years.

6 For more information on factors that impact the length of design time, see the August 2013 *AIArchitect* article "Firm Billings Up Nationwide, But Construction Sector Still Lags."

Design Phase for Most Projects Lasts Less Than a Year

Duration of project design activity by revenue in a typical year recently, averages across all firms



Source: May 2013 AIA ABI Survey

Architecture Firm Billings Not Producing Domestic Construction Activity

There are some instances where projects that contribute to firm billings do not end up directly translating into construction activity. A few examples of project billings that firms may report that are unlikely to produce construction activity include:

- **Stalled and abandoned projects.** Some projects enter, and may even make it all the way through, the design phase but then are delayed or are permanently abandoned and never proceed to construction. These projects were much more common during the last economic downturn, as lending tightened and project financing became more difficult to obtain, according to an AIA report released in 2011.[7] These delayed and abandoned projects accounted for an estimated 11.5 percent of architecture firm billings, according to a September 2013 AIA survey.
- **International projects.** While most architecture firms in the U.S. have a local or regional focus, some firms also work on international projects, defined as projects outside of the U.S. for a foreign client, a U.S. client, or the U.S. government. Approximately 12 percent of firms reported having billings from international projects, according to a July 2013 AIA survey, but many firms manage these projects out of a foreign office that doesn't report its billings in the ABI survey. Even for firms that report international work, these billings account for an average of just under 8 percent of total billings at their office, according to the same survey. On average, therefore, foreign billings at firms that participate in the ABI survey account for only a small share of total billings.

7 AIA report "Stalled Construction Projects and Financing Problems: An Agenda to Keep Construction of America's Buildings and Infrastructure Going," published November 2011.

- **Beyond Project Design.** As described earlier, some architecture firms provide services to their clients that do not directly result in construction activity. Project design services account for a majority of firm billings, while services such as planning and predesign, construction, and operations and maintenance generally account for much smaller shares of firm billings. Although this additional work is included in architecture firm billings, it typically does not translate into construction activity.

Architecture Firm Billings and Construction Spending by Sector

On average, nonresidential design billings at architecture firms are much more likely to come from institutional projects (e.g., education, health care, government, recreation, and transportation) than from commercial/industrial projects (e.g., office, retail, hospitality, and warehouses). Still, design billings do not precisely match the corresponding value of this construction activity. For example, institutional projects account for a higher share of both architecture firm billings and construction spending, but that share is higher for the design work due to the fact that institutional projects often have more technically complex systems and custom design elements than do many office, retail, hospitality, and warehouse facilities.

CASE STUDY

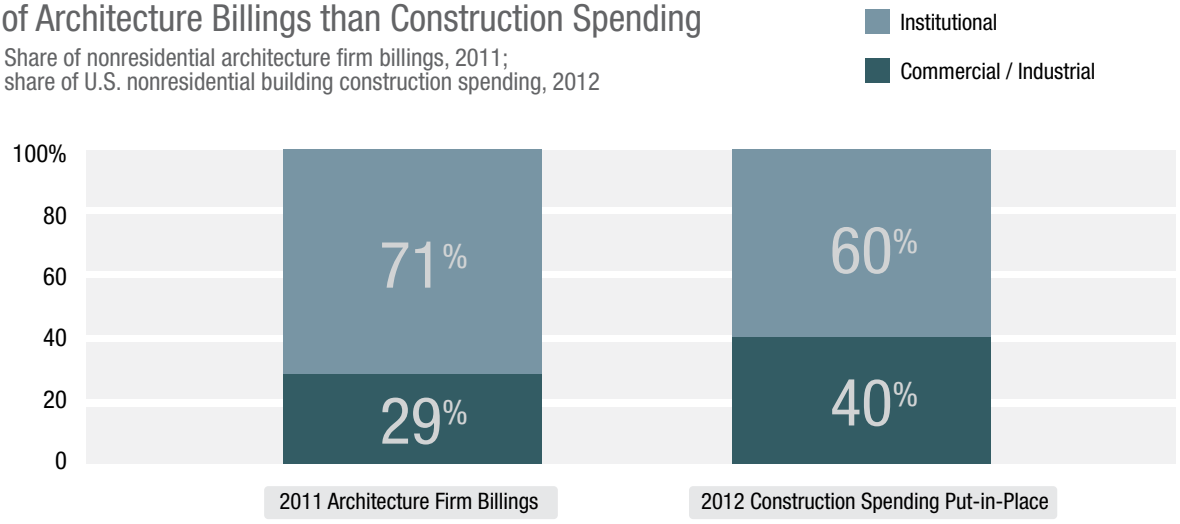
JOHNSON CONTROLS

Johnson Controls is a publicly traded company with annual billings of more than $42 billion in 2013 and 170,000 employees working in 1,300 locations worldwide. While they provide many services to the buildings services and automotive industry, their primary business units related to buildings are Building Efficiency, which develops systems and services for nonresidential buildings, and Global Workplace Solutions, which provides services needed throughout the building lifecycle (e.g., set-up, installation, engineering, commissioning).

The Building Efficiency division has been using the ABI for the last several years as a leading indicator for construction starts, particularly for institutional buildings. They use the ABI to help determine turning points in the business cycle, and also to forecast business and staffing needs. Johnson Controls began using the ABI when they were looking for an earlier predictor of construction trends than construction starts. Their use of the ABI also coincided with their expansion into the equipment market in the last decade. In general, Johnson Controls has found that data on design phase billings from the ABI is a good predictor of construction activity and is useful for resource planning and stockholder guidance.

Institutional Projects Account for Larger Share of Architecture Billings than Construction Spending

Share of nonresidential architecture firm billings, 2011;
share of U.S. nonresidential building construction spending, 2012



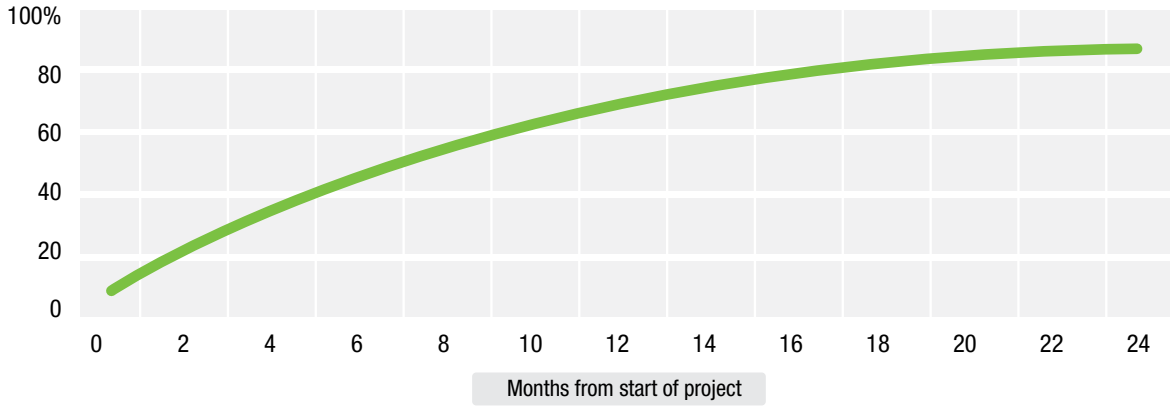
Sources: *AIA Business of Architecture*, 2012 and Construction Spending Put-in-Place, U.S. Department of Commerce

Spending During the Construction Phase

On average, institutional projects also tend to have a longer construction phase than commercial/industrial projects. And, in contrast to architecture firm billings on projects which are more likely to be back-loaded, construction activity tends to be front-loaded, with the majority of the spending occurring in the earlier phases of construction. According to U.S. Census Bureau data on the timing of construction spending, almost half of construction spending (46 percent) occurs during the first six months of a project, and this share increases slowly to 70 percent after 12 months and 89 percent after 24 months. The typical back-loading of spending during the design phase and front-loading during the construction phase reduces the timing between design billings and construction spending from what would be estimated merely by looking at average design time and construction time for a typical project.

70% of Nonresidential Construction Spending Occurs Within First Year of Project

Cumulative % of project value put in place each month for Private Nonresidential Construction Projects, averages across all nonresidential projects



Source: U.S. Census Bureau, Construction Length of Time Statistics

III. Construction of the ABI and Analysis of Predictive Ability

Developing and Computing the ABI

Beginning in late 1995, the AIA assembled a national panel of architecture firms to participate in an ongoing survey to measure their business conditions. Since then, the ABI survey has been conducted monthly across a nationally representative panel of architecture firms. Currently, about 700 architecture firms actively participate in this program, an increase from the approximately 300 firms that participated when the last analysis was completed in 2004. Firms included in this survey provide architectural services as their principal design service; however, they may also provide engineering, interior design, landscape architecture, planning, urban design, or related services. Most firms provide some predesign or construction-phase services (e.g., construction management) in addition to their architectural design services.

Firms that participate in the ABI survey also provide the AIA with information on key firm characteristics, such as their regional location, annual billings, construction sectors served, and number of employees. The panel of architecture firms participating in the ABI survey is selected to reflect the characteristics of the broader universe of approximately 17,500 U.S. architecture firms in the AIA database in terms of size, location, and building-type specialization.

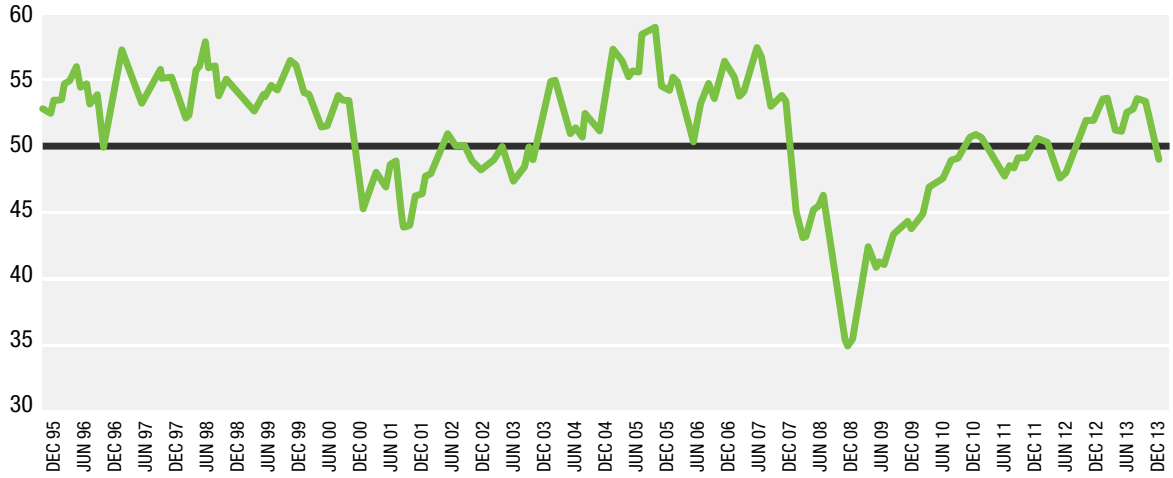
On the first business day of each month, participating firms are e-mailed a link to an electronic questionnaire. They are asked to report whether billings during the previous month significantly increased (by 5 percent or more), remained about the same, or significantly decreased (by 5 percent or more) from the prior month. If a firm doesn't bill monthly, it is requested to estimate the work that will be billed for that period. The ABI is computed as a diffusion index, with the monthly score calculated as the percentage of firms reporting a significant increase plus half the percentage of firms reporting no change8. Comparisons are always made to the previous month. Diffusion indexes, typically centered at a score of 50, frequently are used to measure change in economic activity. If an equal share of firms report an increase as report a decrease, the score for that month will be 50. A score above 50 indicates that firms in aggregate are reporting an increase in activity that month compared to the previous month, while a score below 50 indicates that firms are reporting a decrease in activity. To allow for meaningful comparisons with other months, the monthly scores are seasonally adjusted, meaning that they reflect how architecture firm billings for any month compare to the typical billings for that month in previous years.

Over its almost two-decade history, the ABI has tracked two major design and construction cycles. Late 1995 through 2000 was an expansionary period for design revenue, followed by a downturn lasting from 2001 through 2003. The next expansionary period ran from 2004 through 2007, followed by the Great Recession, which ran from 2008 into 2012 for nonresidential design activity. The recent recovery began around midyear 2012, and, at the time of this update, is still unfolding.

8 In a given month, if 25 percent of firms reported a significant increase in billings from the prior month, 50 percent reported no change, and 25 percent reported a decline, the ABI score would be 25 + ½ of 50, or 50.

The Architecture Billings Index Reflects the Cycle of Design Revenue at U.S. Architecture Firms

Diffusion Index: 50 signifies no change from prior month; index computed as three-month moving averages, seasonally adjusted.



Note: data presented as of 1/1/2014

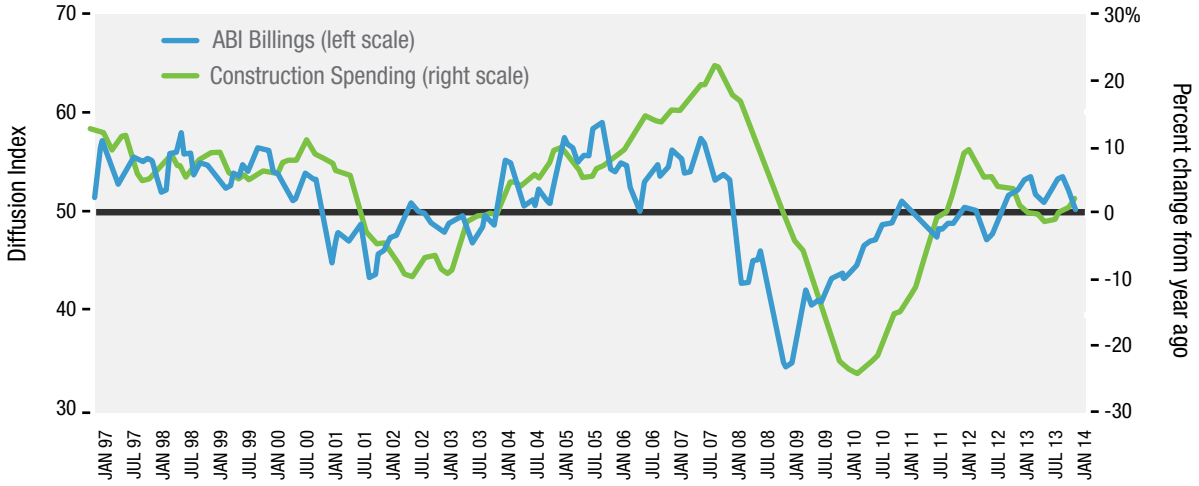
Source: Architecture Billings Index (ABI), The American Institute of Architects

Relationship of the ABI to Nonresidential Building Activity

A major purpose of this analysis is to determine more precisely the nature of the relationship between design billings, whether construction-related or not, and construction spending. The ABI is computed as a diffusion index that measures changes in architecture firm billings from the previous month. In order to meaningfully compare this indicator with construction activity, construction spending data needed to be analyzed in a different format. The solution was to convert construction spending to the annual percentage change in spending, computed as the current level of spending compared to the same period from the prior year.[9] Year-over-year changes in construction spending were found to be a better indicator than month-to-month percentage changes, which are much more volatile even when seasonally adjusted. When the ABI and percentage change in construction spending series are graphed, the phases of the business cycle for each generally do not align because the ABI trends typically precede those in building construction spending.

9 In an effort to reduce the apparently random month-to-month variation in both the ABI and construction spending, both are computed as three-month moving averages for this analysis.

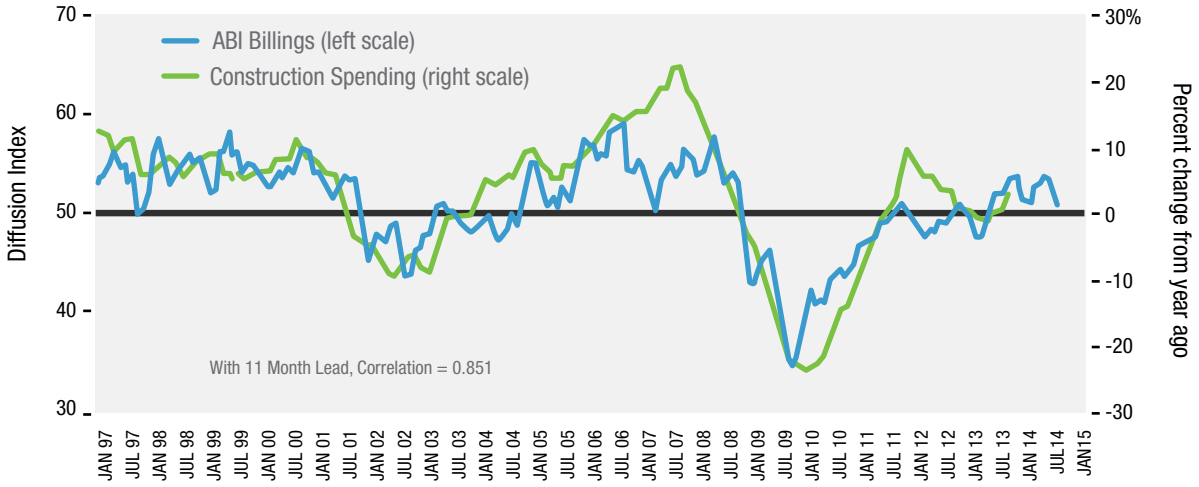
Trends in Design Activity Consistently Precede Trends in Construction Spending



Note: ABI presented as three-month moving average; construction spending presented on three months moving averages and year-over-year percent change

To determine the precise relationship between the ABI and the change in building construction spending, their correlation was computed. To determine the timing relationship between these two series, correlations were analyzed and compared for each of the lags by shifting the ABI data set forward on a one-month increment basis. The highest correlation was found to be at 11 months, meaning that the ABI provides the best fit with building construction spending over the period studied when it is shifted forward by 11 months.

Cyclical Patterns Match Best When ABI Is Shifted Forward 11 Months

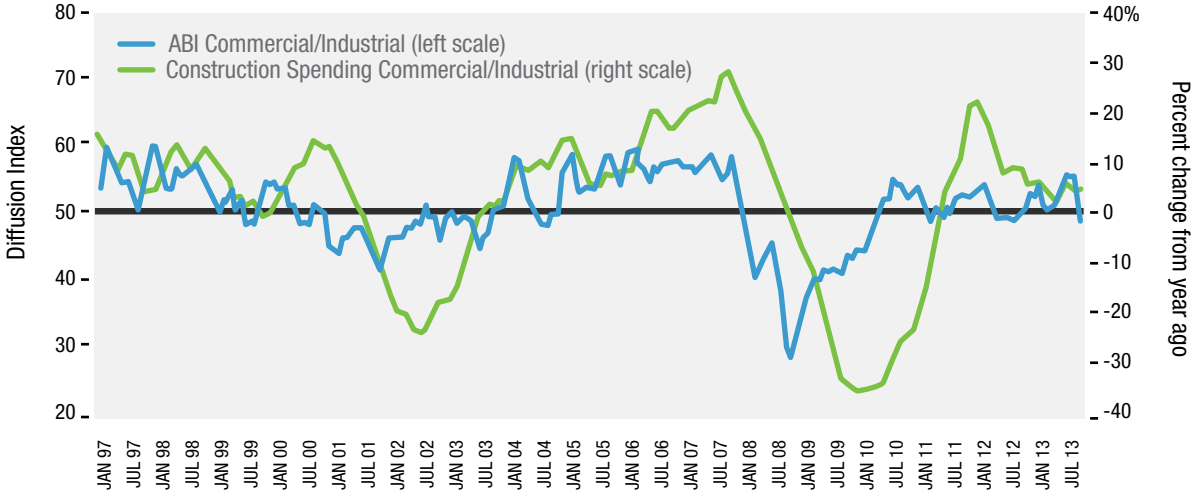


Note: ABI presented as three-month moving average; construction spending presented on three months moving averages and year-over-year percent change

Nonresidential Building Sectors: Commercial/Industrial and Institutional Buildings

The relationship of architecture firm billings and nonresidential building activity varies by building type, so separate correlation analysis was undertaken for the building sector–specific indices. Commercial/industrial construction spending levels tend to be quite volatile over the cycle. For example, commercial/industrial spending levels saw maximum rates of decline at about 25 percent during the 2001–2003 downturn and about 35 percent during the 2009–2012 downturn. In contrast, peak declines for overall nonresidential building activity were about 10 percent and 25 percent respectively. Likewise, the commercial/industrial ABI—the score obtained from architecture firms that concentrate their practice on commercial and industrial facilities—is more cyclical than the overall national ABI. Greater cyclicality generally makes it easier to identify the cyclical pattern and determine its relationship with the ABI.

Commercial/Industrial ABI Also Leads Commercial/Industrial Construction Spending



Note: ABI presented as three-month moving average; construction spending presented on three months moving averages and year-over-year percent change

The greater cyclicality of the commercial/industrial building sector helps to produce a relatively high correlation with the corresponding ABI for firms concentrating in that building sector. With an 11-month lead in the commercial/industrial ABI over commercial/industrial building spending, the correlation between the two series is almost as high as the overall national ABI with total nonresidential building spending.

CASE STUDY

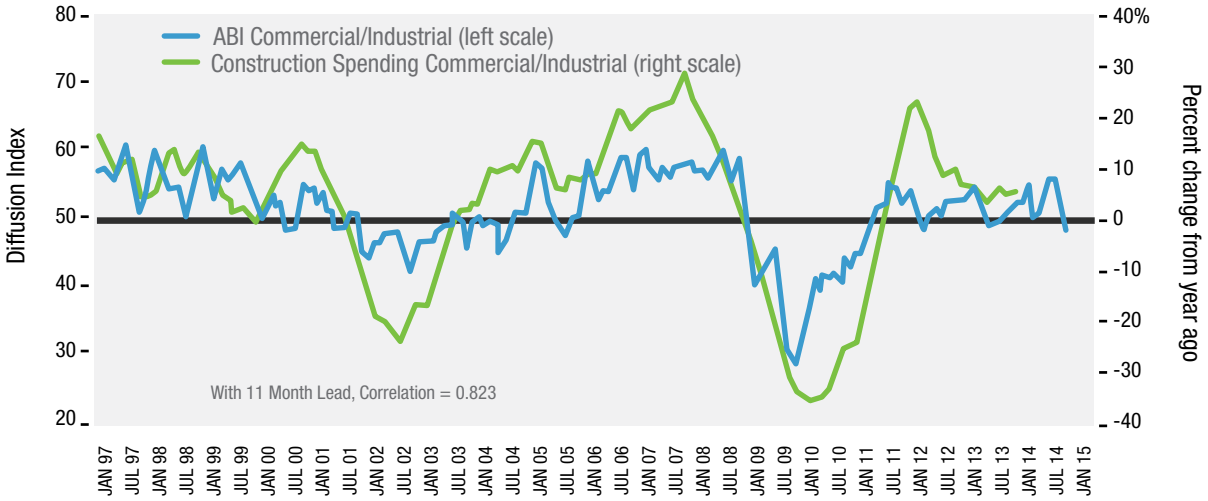
ADD INC.

ADD Inc. is a multidisciplinary design firm with 200 employees working in offices in Boston and Miami. While half of their billings are from multifamily residential projects, they also work on dormitories, mixed-use commercial projects, hospitality, and interiors. Annual billings have averaged more than $35 million in recent years, and are primarily from regional projects, although they have been involved in projects across the country in the past.

ADD Inc. uses the ABI primarily to track topline industry revenue trends for firm strategic planning purposes. Given the composition and location of their project workload, they have found that the ABI leads their firm's net fee revenue dollars by approximately six to eight months and therefore serves as a good indicator of how firm business will generally be trending over the coming year. This allows them to prepare for market fluctuations and ramp up hiring, if necessary. They also refer to the regional indexes since they have offices in two different areas of the country.

ADD Inc. finds the ABI to be a valuable tool not only because of its close relationship to their firm revenue, but because it is broad enough to reflect the industry and give them a more holistic picture of changing business conditions. They also appreciate that it is respected by business leaders through its publication in *The Wall Street Journal*, which enhances its acceptance and credibility by their Board members.

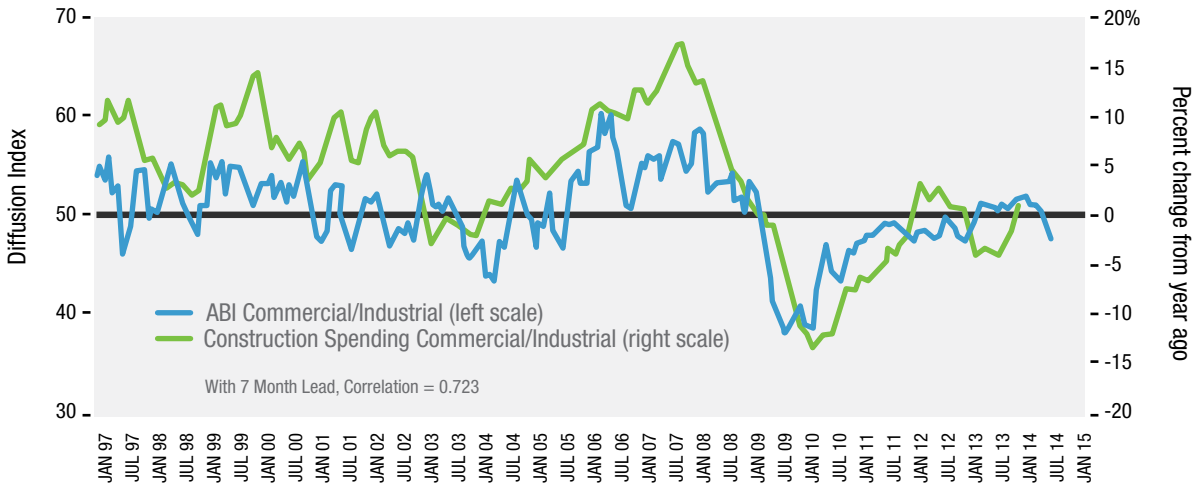
Commercial/Industrial ABI Lead Over Commercial/Industrial Construction Spending Is 11 Months



Note: ABI presented as three-month moving average; construction spending presented on three months moving averages and year-over-year percent change

Institutional building cycles tend not to be as pronounced as commercial/industrial cycles. In part, this is because there is a larger public presence in the institutional market, and public spending tends to be more balanced over the cycle. Also the types of facilities covered by the institutional category tend to be more diverse. Since this category encompasses a broad range of building types (education, health care, religious, public safety, amusement and recreation, transportation facilities, and communication facilities), it also reflects diversity in its client base (e.g., state and local governments, federal government, educational institutions, health-care providers, other nonprofit institutions, and entertainment/amusement companies) that responds to a wide range of economic signals. The lead of design billings at institutional firms with construction spending on these facilities at seven months is a bit shorter than for the commercial/industrial sector, possibly because design activity for institutional buildings may be more back-loaded than for typical commercial/industrial projects, while construction activity may be just the opposite. The more collaborative project delivery models often utilized in institutional projects allow for off-site prefabrication and assembly of building systems that are later installed on-site, which can accelerate the construction spending.

7 Months Is Best Lead for Institutional ABI Over Institutional Construction Spending



Note: ABI presented as three-month moving average; construction spending presented on three months moving averages and year-over-year percent change

Even though the lead between design billings and construction activity is shorter on average for institutional projects, key reference points for these projects typically occur later in the construction cycle. The lead between the overall ABI and residential construction spending is zero months, rising to 11 months for commercial/industrial construction and 15 months for institutional construction.

Summarizing the Relationship Between the ABI and Nonresidential Building Spending

Overall, the ABI performed well in anticipating future levels of nonresidential building activity, and this relationship improved during this past construction cycle. The ABI lead (national and sector-specific) over building construction spending (total and sector-specific) ranges from seven to 11 months, and the related correlations between the ABI and spending levels are consistently high.

Best Relationships Between National or Sector ABI and Relevant Construction Spending Measure Range from 10 to 12 Months

	ABI lead over construction spending	Correlation
Total construction spending on nonresidential buildings	10 mos.	0.846*
	11 mos.	**0.851***
	12 mos.	0.849*
Spending on commercial/industrial buildings	10 mos.	0.812*
	11 mos.	**0.823***
	12 mos.	0.818*
Spending on Institutional buildings	6 mos.	0.716*
	7 mos.	**0.723***
	8 mos.	0.719*

*All correlation on this table significant at the 0.01 level (2-tailed).

CASE STUDY

GILBANE

Gilbane, Inc. is one of the largest privately held family-owned real estate development and construction firms in the industry. It provides a full slate of facility-related services for clients in the education, health care, life sciences, corporate, sports and recreation, criminal justice, public, developer, and aviation markets. Gilbane, with nearly $4 billion in annual revenues and over 2,500 employees, has more than 50 offices worldwide with its corporate headquarters located in Providence, R.I.

Gilbane offers services ranging from construction, project management, and strategic planning to property management. The ABI and other industry economic data are vital in Gilbane's planning of large-scale multiyear projects and contribute to their success with them.

Additionally, Gilbane uses the ABI in developing and strategizing its internal business outlook by helping to manage its budget during the ups and downs of the economy. The marketing team used the analysis during this past recession to manage its response to RFPs and seek new leads in the global construction marketplace. Being well-prepared for market movements, Gilbane added resources to the marketing team to boost its business transactions and construction activities. The increased work procured during the downturn was a major contribution to stabilizing its bottom line during this challenging period.

The relationship between the ABI and nonresidential building spending significantly improved in recent years, with the correlation rising from 0.82 over the 1995–2003 period to 0.90 in recent years. While increasing the number of firms participating in the ABI panel has no doubt contributed to this improvement, the main reason for higher correlation is the increased cyclicality of design and construction activity during this past cycle.

The lead of the ABI over construction activity has also shown some variation. Averaging 14 months between 1995 and 2003, the lead shortened to 11 months during the 2004 to 2007 upturn, and then increased to 12 months since 2008. While financing delays and the general increase in the number of stalled projects played a role in increasing this lead in recent years, the fact that a higher share of projects during the downturn was smaller-scale facilities no doubt mitigated the timing relationship somewhat.

Design and Construction Activity Has Been More Closely Linked During Recent Downturn

Period	ABI Lead*	Correlation
1995-2003	14 months	0.820
2004-2007	11 months	0.595
2008-2013**	12 months	0.903

*Lead over total nonresidential building spending
**Analysis conducted through Q3-2013

IV. Design Contracts as a New Leading Indicator

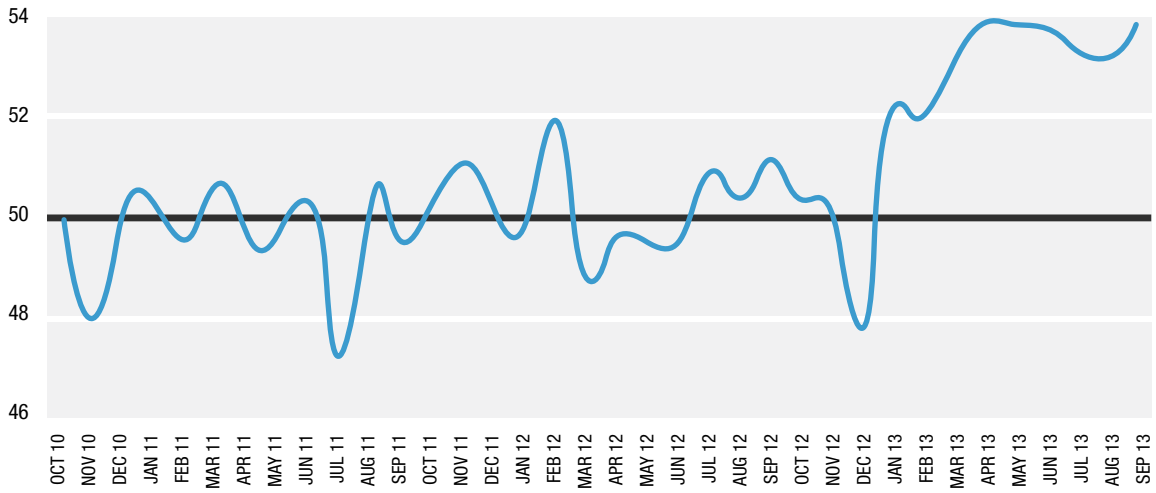
In addition to collecting data on architecture firm billings from our ABI survey panel every month, panelists are also asked about inquiries for new work (e.g., bids, requests for proposals [RFPs], solicitations, invitations for interviews). As with billings, they are asked to indicate whether those inquiries have increased, decreased, or remained the same from the previous month. However, because reporting trends in new project inquiries is rather subjective on the part of the panelists, the AIA has been investigating a more rigorous way of estimating future levels of billings activity.

Responses by ABI panelists indicated that, in their view, the most accurate predictor of future design workloads would be the monthly change in the dollar value of new design contracts—agreements between the client and architecture firm on the scope of and compensation for the design activity. In a recent AIA survey, architecture firms indicated that 88 percent of their projects have a signed design contract, and that nearly all billable work for a project is typically completed after that contract is signed. However, in an effort to include projects with more informal arrangements, firms are asked to include all new projects in which they have a letter of agreement or a formal authorization to proceed—effectively anything that provides assurance that a firm can bill a client for future design services.

The AIA began collecting data on design contracts in October 2010 and now has three years of data—enough to seasonally adjust the index, although it remains too early to determine the exact relationship between design contracts and subsequent architecture billings. However, through visual analysis it does appear that when firms report an increase in design contracts, an increase in firm billings follows within the next six months or so. In the future, this new indicator should prove valuable by providing even earlier insight into future design and construction work.

New Design Contracts Indicator Provides Earlier Insight Into Future Work

Value of design contracts, diffusion index: 50=no change from previous month, seasonally adjusted



V. Appendices

Appendix A. U.S. Census Bureau's Value of Construction Put in Place

The construction data used for this analysis are intended to encompass nonresidential buildings that may be designed by architects. The specific building types used are defined to include/(exclude) the following categories from the U.S. Census Bureau's Value of Construction Put in Place (CPIP) in the United States data series (C-30)—http://www.census.gov/construction/c30/c30index.html. The categories used were consistent with the original 2004 AIA analysis of the ABI. The series used in this analysis included spending data through Q3-2013 (Table A.1).

TABLE A.1

U.S. Census Bureau Category Of Value Of Construction Put In Place

Value of Construction Put in Place		
Nonresidential Category	**Used for Analysis**	**Sectors**
Lodging	Included	Commercial/Industrial
Office	Included	Commercial/Industrial
Commercial	Included	Commercial/Industrial
Health Care	Included	Institutional
Educational	Included	Institutional
Religious	Included	Institutional
Public Safety	Included	Institutional
Amusement and Recreation	Included	Institutional
Transportation	Included	Institutional
Communication	Included	Institutional
Power	**(excluded)**	**N/A**
Sewage and Waste Disposal	**(excluded)**	**N/A**
Highway and Street	**(excluded)**	**N/A**
Conservation and Development	**(excluded)**	**N/A**
Water Supply	**(excluded)**	**N/A**
Manufacturing	Included	Commercial/Industrial

Source: U.S. Census Bureau, Construction Value Put in Place

Supplemental Analysis of Construction Spending Categories

This analysis was designed to include nonresidential construction categories that were exclusively or primarily composed of buildings. Two categories, however—transportation and communication—contain substantial portions of both building and non-building activity, and therefore the extent of the architect involvement in the design of facilities in these categories is unclear. Therefore, the decision to include them or not in the ABI analysis was not obvious.

A correlation analysis was conducted with both these categories included in the building spending totals, with one included and the other excluded, and with both excluded from the analysis. As seen in the table below, the highest correlation values for all four calculations resulted from an 11-month lead. The overall correlation analysis was only modestly different for each of the four options. Both categories were included in the definition of total building spending, thereby allowing the most inclusive definition of building activity. This definition of building activity is consistent with that used in the analysis for the original 2005 "Business Trends at Architecture Firms as a Leading Indicator for the Construction Industry."

TABLE A.2

Highest Correlation Values Between the ABI and Alternative Definitions of Building Construction Spending

	Correlation Values		
Alternative Definitions of Building Construction	**10 Months**	**11 Months**	**12 Months**
National ABI with building construction **including transportation and communications** categories	**.846**	**.851**	**.849**
National ABI with building construction **including transportation and excluding communications** category	**.838**	**.844**	**.843**
National ABI with building construction **including communications and excluding transportation** category	**.845**	**.851**	**.848**
National ABI with building construction **excluding transportation and communications** categories	**.836**	**.842**	**.842**

Detailed Building Construction Spending Categories

The U.S. Census Bureau aggregates building construction categories for its monthly releases. Annually, though, more project detail is available to see more precisely what types of facilities are being constructed. The table below provides a summary of spending for the detailed project categories for the year 2012. Since this detail is available only on an annual basis, it couldn't be used to develop the correlation and lead estimates required for this analysis.

TABLE A.3

2012 Annual Value of Construction Put in Place–Commercial / Industrial

(Millions of dollars. Details may not add to totals since all types of construction are not shown separately.)

	ABI Category	Private [1]	State and Local [2]	Federal [3]
Total		577,930	251,656	27,367
Nonresidential		297,673	246,973	25,783
Lodging	COMMERCIAL/INDUSTRIAL	10,783		
Office	COMMERCIAL/INDUSTRIAL	27,963	5,989	4,482
General		25,551		
Financial		1,998		
Commercial	COMMERCIAL/INDUSTRIAL	43,163	1,399	1,741
Automotive		4,843	928	
Sales		2,110		
Service/parts		2,151		
Parking		582	784	
Food/beverage		5,714		
Food		2,458		
Dining/drinking		2,295		
Fast Food		962		
Multi-retail		14,831		
General merchandise		3,833		
Shopping center		7,883		
Shopping mall		2,195		
Other commercial		3,827		
Drug store		785		
Building supply store		494		
Other stores		1,938		
Warehouse		6,996	171	
General commercial		6,529		
Mini-storage		356		
Farm		6,951		
Manufacturing	COMMERCIAL/INDUSTRIAL	45,833		
Food/beverage/tobacco		4,093		
Textile/apparel/leather/furniture[4]		171		
Wood		338		
Paper		1,120		
Print/publishing		88		
Petroleum/coal		4,499		
Chemical		10,706		
Plastic/rubber		1,528		
Nonmetallic mineral		855		
Primary metal		4,713		
Fabricated metal		1,732		
Machinery		1,620		
Computer/electronic/electrical		10,197		
Transportation equipment		3,176		
Miscellaneous		996		

2012 Annual Value of Construction Put in Place–Institutional

(Millions of dollars. Details may not add to totals since all types of construction are not shown separately.)

	ABI Category	Private [1]	State and Local [2]	Federal [3]
Health Care	INSTITUTIONAL	30,767	7,021	4,009
Hospital		20,713	5,492	
Medical building		6,232	993	
Special care		3,822	536	
Educational	INSTITUTIONAL	16,440	65,740	2,437
Preschool		376		
Primary/secondary		2,744	39,360	
Elementary			11,083	
Middle/junior high			7,579	
High			20,337	
Higher education		10,913	23,350	
Instructional		5,864		
Dormitory		2,939		
Sports/recreation		704		
Other educational		2,006	2,183	
Gallery/museum		1,357		
Religious	INSTITUTIONAL	3,739		
House of worship		3,068		
Other religious		671		
Auxiliary building		510		
Public Safety	INSTITUTIONAL	121	7,428	2,747
Correctional			4,949	
Detention			3,157	
Police/sheriff			1,792	
Other public safety			2,478	
Fire/rescue			1,599	
Amusement and Recreation	INSTITUTIONAL	5,788	8,776	414
Theme/amusement park		251		
Sports		1,011	1,036	
Fitness		1,236		
Performance/meeting center		519	1,796	
Social center		511	969	
Movie theater/studio		364		
Park/camp			4,862	
Transportation	INSTITUTIONAL	11,372	24,582	2,256
Air		1,048	9,833	
Passenger terminal			5,005	
Runway			4,338	
Land		10,295	12,798	
Passenger terminal			2,887	
Mass transit			6,864	
Railroad		9,787	856	
Water			1,951	
Dock/marina			1,488	
Dry dock/marine terminal			463	
Communication **	INSTITUTIONAL	17,320		

** No detail is provided by the U.S. Census Bureau on the composition of this category, though it likely includes both building and nonbuilding projects.

2012 Annual Value of Construction Put in Place–Exclusions from Analysis

(Millions of dollars. Details may not add to totals since all types of construction are not shown separately.)

	ABI Category	Private	State and Local	Federal
Residential	(EXCLUDED)	280,257	4,683	1,584
New single family		132,015		
New multifamily		22,231	3,963	
Improvements [4]		126,011		
Power	(EXCLUDED)	83,151	9,940	977
Electric		66,809	7,506	
Gas		9,308	2,137	
Oil		7,034		
Distribution			2,137	
Highway and Street	(EXCLUDED)		79,656	702
Pavement			47,695	
Lighting			1,738	
Retaining wall			851	
Tunnel			1,342	
Bridge			26,873	
Toll/weigh			339	
Maintenance building			179	
Rest facility			640	
Sewage and Waste Disposal	(EXCLUDED)	600	20,709	
Sewage/dry waste			11,982	
Plant			2,984	
Line/pump station			8,898	
Waste water			8,728	
Plant			7,287	
Line/drain			1,440	
Water Supply	(EXCLUDED)	417	12,705	
Plant			4,898	
Well			341	
Line			5,532	
Pump station			597	
Reservoir			652	
Tank Tower			685	
Conservation and Development	(EXCLUDED)		2,215	4,075
Dam/levee			725	
Breakwater/jetty			846	
Dredging			186	

1 Total private construction includes the following categories of construction not shown separately: highway and street and conservation and development.

2 Total state and local construction includes the following categories of construction not shown separately: lodging, religious, communication, and manufacturing.

3 Total federal construction includes the following categories of construction not shown separately: lodging, religious, communication, sewage and waste disposal, water supply, and manufacturing.

4 Private residential improvements do not include expenditures on rental, vacant, or seasonal properties.

Appendix B. Definitions of Design Phases, Excerpted from the AIA Best Practice, "Defining the Architect's Basic Services"

Schematic Design Phase Services

During the schematic design phase, an architect consults with the owner to determine project goals and requirements. Often this determines the program for the project. The program, or architectural program, is the term used to define the required functions of the project. It should include estimated square footage of each usage type and any other elements that achieve the project goals.

An architect commonly develops study drawings, documents, or other media that illustrate the concepts of the design and include spatial relationships, scale, and form for the owner to review during this phase. Schematic design also is the research phase of the project, when zoning requirements or jurisdictional restrictions are discovered and addressed.

This phase produces a final schematic design, to which the owner agrees after consultation and discussions with the architect. Costs are estimated based on overall project volume. The design then moves forward to the design development phase.

Deliverables: Schematic design often produces a site plan, floor plan(s), sections, an elevation, and other illustrative materials; computer images, renderings, or models. Typically the drawings include overall dimensions, and a construction cost is estimated. Note: The contract may actually spell out what is to be delivered.

Design Development Phase Services

Design development (DD) services use the initial design documents from the schematic phase and take them one step further. This phase lays out mechanical, electrical, plumbing, structural, and architectural details.

Typically referred to as DD, this phase results in drawings that often specify design elements, such as material types and location of windows and doors. The level of detail provided in the DD phase is determined by the owner's request and the project requirements. The DD phase often ends with a formal presentation to, and approval by, the owner.

Deliverables: Design development often produces floor plans, sections, and elevations with full dimensions. These drawings typically include door and window details, and outline material specifications.

Construction Document Phase Services

The next phase is construction documents (CDs). Once the owner and architect are satisfied with the documents produced during DD, the architect moves forward and produces drawings with greater detail. These drawings typically include specifications for construction details and materials.

Once CDs are satisfactorily produced, the architect sends them to contractors for pricing or bidding, if part of the contract. The level of detail in CDs may vary, depending on the owner's preference. If the CD set is not 100 percent complete, this is noted on the CD set when it is sent out for bid. This phase results in the contractors' final estimate of project costs. To learn more about the most common ways owners select a contractor, see Best Practice 05.03.01, "Qualifications-Based vs. Low-Bid Contractor Selection."

Deliverables: The construction document phase produces a set of drawings that include all pertinent information required for the contractor to price and build the project.

Bid or Negotiation Phase Services

The first step of this phase is preparation of the bid documents to go out to potential contractors for pricing. The bid document set often includes an advertisement for bids, instructions to bidders, the bid form, bid documents, the owner-contractor agreement, labor and material payment bond, and any other sections necessary for successful price bids. For some projects that have unique aspects or complex requirements, the architect and owner elect to have a prebid meeting for potential contractors.

After bid sets are distributed, both the owner and architect wait for bids to come in. The owner, with the help of the architect, evaluates the bids and selects a winning bid. Any negotiation with the bidder of price or project scope, if necessary, should be done before the contract for construction is signed.

The final step is to award the contract to the selected bidder with a formal letter of intent to allow construction to begin.

Deliverables: The final deliverable is a construction contract. Once this document is signed, project construction can begin.

Construction Phase Services

Contract administration (CA) services are rendered at the owner's discretion and are outlined in the owner-architect construction agreement. Different owner-architect-contractor agreements require different levels of services on the architect's part. CA services begin with the initial contract for construction and terminate when the final certificate of payment is issued.

The architect's core responsibility during this phase is to help the contractor to build the project as specified in the CDs as approved by the owner. Questions may arise onsite that require the architect to develop architectural sketches: drawings issued after construction documents have been released that offer additional clarification to finish the project properly. Different situations may require the architect to issue a Change in Services to complete the project.

Deliverables: A successfully built and contracted project.

VI. References

1. *Business Economics*, October 2005: "Architecture Billings as a Leading Indicator of Construction"
2. The American Institute of Architects, July 2007: "Defining the Architect's Basic Services"
3. *AIArchitect*, The American Institute of Architects, July 2010: "Business Conditions Weak But Improving at Commercial Firms"
4. *AIArchitect*, The American Institute of Architects, November 2010: "After Slight Growth in September, Architecture Firm Billings Decline in October"
5. The American Institute of Architects, November 2011: "Stalled Construction Projects and Financing Problems: An Agenda to Keep Construction of America's Buildings and Infrastructure Going"
6. The American Institute of Architects, 2012: "The Business of Architecture: 2012 AIA Firm Survey Report"
7. *AIArchitect*, The American Institute of Architects, May 2013: "Design Activity Hits the Brakes in April"
8. *AIArchitect,* The American Institute of Architects, July 2013: "Architecture Firm Billings Increase at Modest Pace in June"
9. *AIArchitect,* The American Institute of Architects, August 2013: "Firm Billings Up Nationwide, But Construction Sector Still Lags"
10. *AIArchitect*, The American Institute of Architects, September 2013: "With August Gains, Nearly a Year of Steady Non-Residential Billings Growth"
11. U.S. Census Bureau, U.S. Department of Commerce: "Construction Length of Time Statistics"
12. U.S. Census Bureau, U.S. Department of Commerce: "Quarterly Services Survey"
13. U.S. Census Bureau, U.S. Department of Commerce: "Value of Construction Put in Place"