Pi-C

PURDUE INDEX FOR CONSTRUCTION

Purdue Index for Construction

Economic, Stability, Social, Development, Quality

I. EXECUTIVE SUMMARY

Pi-C is down from **105.48** in the third quarter of 2011 to **102.18** (3.23%↓) in the fourth quarter of 2011. Major contributors to this change are:

- Pi-C Economic that changed from 102.02 to 84.34 (17.33%↓)
- Pi-C Stability that changed from 105.86 to 104.21 (1.56%↓)
- Pi-C Social that changed from 106.13 to 106.10 (0.03%↓)

Overall the industry did not experience any significant changes, and the drop from 105.48 in the last quarter to 102.18 in the fourth quarter of 2011 is mainly due to the seasonal effects on Pi-C Economic dimension. Furthermore, the slight drop in Pi-C Stability dimension contributes to the decrease in the Pi-C. The seasonal drop in the economic dimension reflects the improving trend as it is compared to the economic status in the last year. Overall the Pi-C was improved by 4.63 compared to the last year, since all the dimensions show signs of improvement. This demonstrates that the industry experiences the seasonal degradation in its health of the construction industry compared to the last quarter, but the overall health trend of the construction industry is steadily improving since 2009.
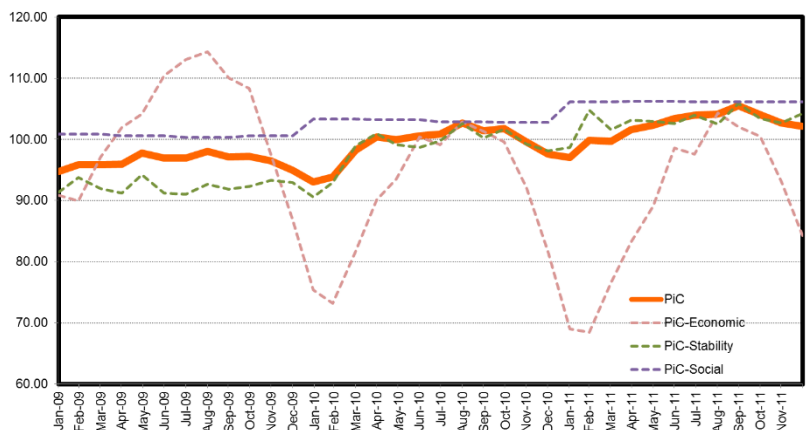

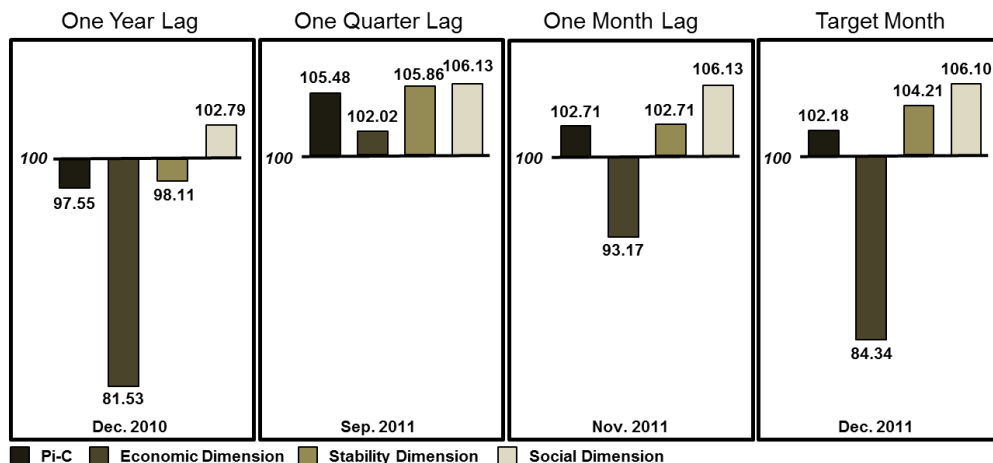Figure 1. Pi-C phase one including three dimensions (Jan.-2009 ~ Dec.-2011)

Figure 2. Comparison of Pi-C index

About the Pi-C Initiative

This report is part of *Purdue Index for Construction (Pi-C),* the ongoing research project as a platform to open the discourse on application of analytics and data-driven decision making in the construction industry. Pi-C aims to track health of the U.S. construction industry and provides a gateway for data driven policy making and strategy development. Furthermore, Pi-C enables users to observe trajectories of the U.S. construction industry referring to the status of the industry in terms of different health factors. This report is published quarterly to discuss dynamics of the industry through the framework of Pi-C including general discussions about different trends.

* In this report, Pi-C indicates the trajectory of the health status compared to a reference time chosen as December 2013.

Definition of the five dimensions:

Reflecting the multi-dimensional nature of the dynamics within the construction industry, Pi-C defines health of the industry based on five dimensions, as follows:

- **Economic:** Current economic status of the industry
- **Stability:** Stability and resilience of the industry to absorb external and internal shocks
- **Social:** Social health and well-being of the individuals involved in the industry
- **Development:** Level of advancement and expertise in the state of the art of the industry
- **Quality:** Perception of public and owners about the industry and its output

* Only three out of five dimensions of health are reported in the current version of Pi-C, i.e., economic, stability and social.

II. PURDUE INDEX FOR CONSTRUCTION FOURTH QUARTER 2011 (ECONOMIC, STABILITY, SOCIAL)

Pi-C Economic

The Pi-C Economic index dropped 17.68 in the fourth quarter to 84.34, which is yet higher than the fourth quarter of 2010. Since Pi-C Economic index has Construction Spending (DOC) as a sole component, the drop in the fourth quarter this year is attributed to the reduction in the construction spending in the U.S which is a seasonal trend.
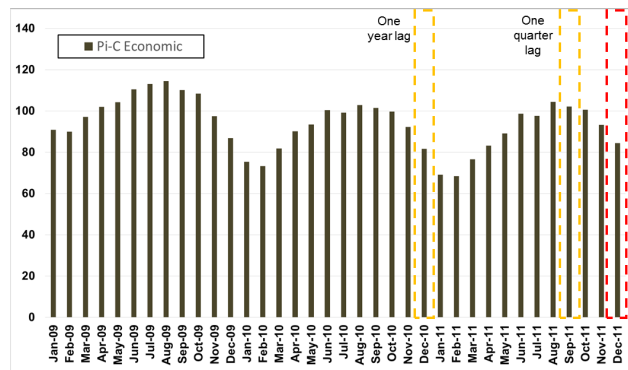

Figure 3. Pi-C Economic index during the last 3 years

Sub-index (Pi-C Economic)
- Construction Spending (DOC)

The downward trend caused by seasonal effects is the result of Total Construction Spending (DOC) sub-index that fell from 75,388 (million dollars) in the third quarter to 62,319 (million dollars) in the fourth quarter. As it is shown in Table 1, major changes are observed in residential, commercial, healthcare, public safety, water supply, and manufacturing areas. Residential and public safety show slow but steady growth, while commercial shows a significant improvement, similar to manufacturing although with minor abruptions. Water supply projects experienced reduction in the construction spending.

Construction Spending (DOC)	2010	2011			
Millions of dollars	DEC	SEP	OCT	NOV	DEC
Residential	238,921	245,041	251,994	255,822	257,142
Lodging	10,358	8,981	8,952	9,391	10,009
Office	35,526	35,011	34,951	34,744	35,135
Commercial	37,717	44,564	44,687	45,495	45,695
Health care	39,776	40,595	38,744	40,101	40,859
Educational	82,044	86,626	86,133	84,785	85,576
Religious	5,157	4,272	4,020	3,901	4,110
Public safety	9,541	10,168	10,234	10,533	10,700
Amusement and recreation	16,157	16,028	16,070	16,565	16,691
Transportation	37,535	34,709	34,159	34,088	35,602
Communication	17,562	17,989	17,259	16,500	17,897
Power	90,604	75,283	77,165	79,664	84,351
Highway and street	81,019	80,308	80,760	82,823	82,350
Sewage and waste disposal	24,156	22,027	22,347	22,900	23,816
Water supply	15,104	14,240	14,608	14,333	13,293
Conservation and development	6,814	6,848	7,555	6,567	6,359
Manufacturing	31,905	47,605	46,096	45,836	51,031

■ Increasing Trend
■ Decreasing Trend

Table 1. Breakdown of Construction Spending

Pi-C Stability

The Pi-C Stability index consists of Competitiveness, Construction Backlog Indicators, Employment, and Diversity of the Industry. Pi-C Stability index in the fourth quarter experienced the loss of 1.65 from the third quarter in 2011, but gained a noticeable 6.10 points over the fourth quarter of 2010.
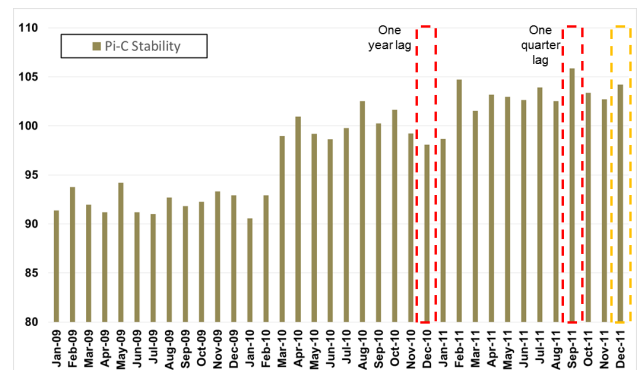

Figure 4. Pi-C Stability index during the last 3 years

Sub-index (Pi-C Stability)
- Competitiveness

In the fourth quarter of 2011, Competitiveness sub-index remains optimistic at 0.98 (with the maximum of 1.0) without any change throughout the year. It is important to note that the construction market keeps a good balance among U.S. contractors for awarding construction projects.

- Construction Backlog Indicators

In the fourth quarter of 2011, Construction Backlog Indicator dropped 0.26 from 8.08 in the third of 2011 to 7.82. However, there was the improvement of 0.77 from the fourth quarter of 2010, 7.05.

- Employment

Employment sub-index slightly dropped by 0.06 to 1.00 in the fourth quarter of 2011. But, the index of the fourth quarter is higher than the fourth quarter of 2010 by 0.11.

- Diversity of the Industry

The Diversity of the industry in the fourth quarter of 2011 slightly increases 0.02 from the last quarter registering 0.87. Compared to last year, the Diversity of the industry remains constant at 0.87.

Pi-C Social

Pi-C Social index is composed of Safety and Level of Salaries. In the fourth quarter of 2011, Pi-C Social index fell slightly from 106.13 in the last quarter to 106.10. Compared to the last year, Pi-C Social dimension gained 3.31 points over 102.79, the fourth quarter of 2010.
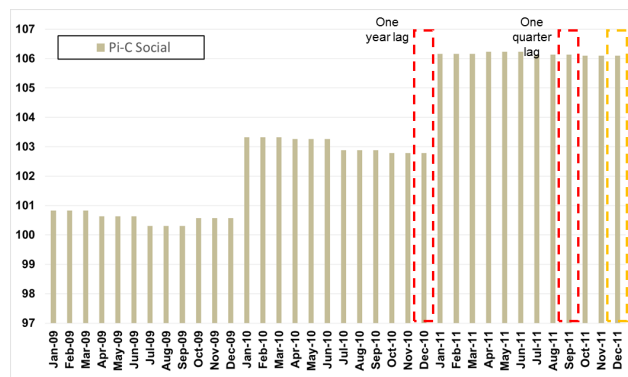

Figure 5 Pi-C Stability index during the last 3 years

Sub-index (Pi-C Social)

- Safety

Safety sub-index is further composed of two indices, Fatality index and Non-Fatality index.

Since Fatality BLS data is reported yearly, Fatality and Non-Fatality index remained at 0.38 and 0.97, respectively throughout the year 2011. Compared to the fourth quarter of 2010, 0.37 of Fatality index and 0.92 of Non-Fatality index, the safety sub-index improved 0.01 and 0.05, respectively.

- Level of Salaries

Level of Salaries remains at 0.97 throughout the last year, 2011. Also, compared to the fourth quarter of 2010, no change was observed in the level of salaries.

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Overview of the index methodology

Pi-C is developed based on the framework of composite indices and includes three dimensions, each of which is comprised of its relevant sub-indices as below.

- **Pi-C Economic:** Construction Spending (DOC)
- **Pi-C Stability:** Competitiveness, Construction Backlog Indicators, Employment, Diversity of the Industry
- **Social:** Safety and Level of Salaries

In this report, Pi-C is measured under the assumption that each dimension has equal contribution to the health of the construction industry. In other words, the loadings of each dimension are equal in the calculation of the overall Pi-C.