December 1998
FEDERAL RESERVE BANK OF DALLAS HOUSTON BRANCH

Houston Business
A Perspective on the Houston Economy

Purchasing Managers Provide New Insight Into Houston Economy

This article compares the Houston purchasing managers report and its national counterpart and discusses the use of this new tool to analyze the local economy.

One of the most widely followed data series on the U.S. economy is the *Report on Business,* issued monthly by the National Association of Purchasing Management (NAPM). This report, based on a survey of NAPM membership, provides a detailed look at a number of statistical series related to manufacturing, such as production, inventories and prices paid. The *Report's* most cited single feature is a summary statistic called the Purchasing Managers Index (PMI), which indicates whether the manufacturing sector is expanding or contracting. NAPM recently broadened its coverage of the U.S. economy to include a separate report on U.S. nonmanufacturing activity.

Since January 1995, the Houston affiliate of NAPM has provided similar insights into the workings of the Houston economy, producing a local report that is one of 16 regional reports from around the nation. This monthly survey of 80 or more local companies yields useful and timely information on a number of economic indicators, plus it provides an overall measure of local expansion or contraction. This article compares the Houston report and its national counterpart and discusses the use of this new tool to analyze the local economy.

THE NATIONAL REPORT

Since its inception in 1915, the NAPM has compiled informal and formal reports on U.S. economic conditions. For the first 15 years, the association collected information mostly on price and supply conditions for various commodities, but in 1930 a committee was formed to broaden the

reporting basis. Through the years, a formal structure slowly emerged; today the panel consists of 300 members selected by Standard Industrial Classification code and geographical region to statistically reflect the composition of U.S. manufacturing. Earlier this year, a separate panel began regular reporting on U.S. nonmanufacturing industries.

Data are collected from member companies on a number of manufacturing-related series. Are production, employment, new orders and export orders better, the same or worse? Are prices, inventories and imports higher, the same or lower? The results for the previous month, reported on the first business day of each month, offer a preview of government series that will be reported later. The NAPM's reported series have been thoroughly studied and tested, and they are highly correlated with the published government series released weeks or months later. For example, NAPM industrial production correlates well with the Federal Reserve's Industrial Production Index and NAPM employment with the Bureau of Labor Statistics' manufacturing employment report.

Data are reported to the public as a diffusion index, based on the difference between the percentage of purchasing managers reporting increases or decreases.

$$\textit{Diffusion Index} = (\%\ \textit{Reported Increases} - \%\ \textit{Reported Decreases})/2 + 50$$

If increases and decreases are equal, the index is neutral with a value of 50; more increases than decreases moves the value of the index above 50, indicating expansion; and more decreases than increases puts the value under 50, implying contraction. The break-even value of 50 seems to compare closely with no change being reported in the corresponding government series, except for inventory (which has a break-even value near 42) and employment and prices (with a neutral value of 47).

Five of the reported series are subjectively weighted and combined in the Purchasing Managers Index for manufacturing. The PMI contains production (weighted at .25), new orders (.30), lead times (.15), inventory (.10) and employment (.20). A PMI value above 50 indicates expansion is under way in U.S. manufacturing, and less than 50 indicates contraction. The PMI is sometimes used to draw broader conclusions about the U.S. economy as a whole, as variations in this index can explain about 60 percent of the changes in U.S. gross domestic product. A PMI value below 43.6 is associated with recessionary conditions in the United States.

Table 1
Diffusion Indexes for Houston and U.S. Data

	October 1997		October 1998	
	Houston	U.S.	Houston	U.S.
Production	68.0	59.5	52.5	52.5
Sales (new orders)	69.0	59.5	44.5	46.5
Lead times	69.0	55.0	39.0	50.0
Finished-goods inventories	47.5	44.5	44.5	47.0
Employment	58.0	52.0	48.5	44.5
Prices	57.0	55.0	38.0	35.5
Purchases	62.5	n.a.	31.0	n.a.
Purchased-material inventories	47.5	n.a.	43.5	n.a.
Purchasing Managers Index				
5-weighted series	64.4	55.8	46.5	48.2
8-weighted series	61.3	n.a.	47.2	n.a.

NOTE: Neither Houston nor U.S. values in this table are seasonally adjusted; n.a. indicates "not available."

THE HOUSTON NAPM SURVEY

The Houston NAPM survey bears many similarities to the national report, but it is not strictly comparable. The local NAPM affiliate collects data on eight statistical series (listed in Table 1), six of which overlap the national report. Two local series are different: an abbreviated version (compared with the U.S. report) of information on purchases by the firm, and a series that asks about purchased-material inventories (in addition to the question on finished-goods inventories). Table 1 shows diffusion index values for each series, computed for both Houston and the United States for October 1997 and October 1998—the latest figures available. The U.S. values of this index reveal significant cooling off over the past 12 months, but the corresponding decline in Houston values over the same period is much sharper. The NAPM–Houston index hovers near neutral with regard to Houston employment, but it is pointing to continued decline ahead as both sales and lead times are shrinking rapidly and excess capacity is developing.

The NAPM diffusion indexes reported in Table 1 are not seasonally adjusted for either the United States or Houston. The U.S. indexes are typically reported by NAPM in seasonally adjusted form; however, the unadjusted numbers can be calculated easily from the *Report on*

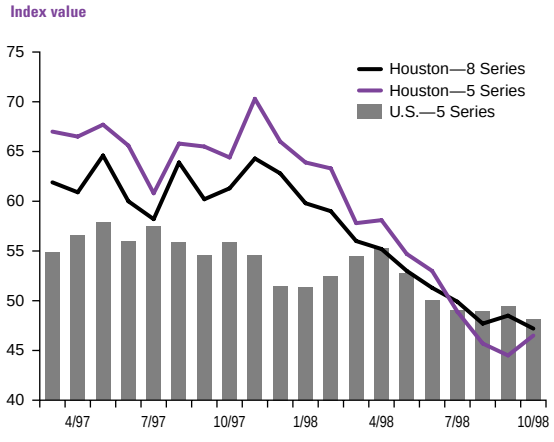
Business. The Houston report is just concluding its fourth year of data, and the time series remains too short to do any seasonal adjustment. Therefore, any comparisons between the two series have to be made without adjustment.

What ultimately makes the U.S. and Houston data different and noncomparable is coverage. The national NAPM index divides its data into two panels, one for manufacturing and (recently) another for nonmanufacturing. In contrast, the Houston index mixes manufacturing and nonmanufacturing, with reports from oil and natural gas, engineering and construction, business services, health care and distribution in addition to manufacturing. The local survey attempts to broadly reflect Houston's overall industrial mix. About 22 percent of contributors to the survey, for example, do not carry a physical inventory. The index is still weighted heavily, however, to goods production, and—given the strong correlation between Houston's oil and gas, manufacturing and many business services—one might be tempted to think of these series as having properties not unlike those exhibited by the NAPM index on manufacturing. Great care should be taken in drawing any such conclusions, however.

It is also tempting to look to the U.S. index as a guide to help interpret the Houston data, but such comparisons are mostly speculative. The Houston index is too immature to test its properties against other reported series, to decide if it better reflects local mining and manufacturing or the broader economic picture, or to determine if the break-even point for an individual series is 50 or somewhere else. In two or three more years enough data will have accumulated to definitively answer some of the questions, but at present we are dealing with an evolving product.

This is not to say that Houston NAPM data are not extremely valuable right now. For several of these series we will never see corresponding data series from government or other sources that specifically cover Houston, such as inventories or new orders, and we will never really know how well they correlate with reality. The NAPM report is all we have, so we must trust that the strong correlation results for the nation carry over to Houston. For now, seasonal adjustment problems can be worked around with 12-month comparisons or with enough patience to let trends become apparent over several months. If the line between expansion and contraction is blurry, we can still determine the overall direction of the economy as evidence accumulates from one month to the next. All qualifications aside, Table 1 unequivocally documents how, over the last 12 months, Houston's economy has gone from red hot to medium cool.

Figure 1
Purchasing Managers Index, Houston and U.S. Compared



NOTE: Neither Houston nor U.S. index values are seasonally adjusted.

THE PMI FOR HOUSTON

A PMI is also reported for Houston as a summary measure of the eight reported series (*Figure 1*). All eight series are included in the index, with four weighted at .083 (purchases, prices paid, lead times and purchased-material inventories) and four weighted at .167 (sales, production, employment and finished-goods inventories). The U.S. index shows significant slowing since April or May, even without seasonal adjustment. The U.S. PMI is a weighted sum of only five series, and it is possible to reweight the Houston index to include only these five series. This recomputed five-series Houston PMI, also shown in Figure 1, looks like the eight-series index—only more volatile. The two Houston series, however, seem to tell much the same story of growing local weakness.

—Robert W. Gilmer
Douglas R. Miller

NOTE: Douglas R. Miller, C.P.M., is president of Texor Services Inc., a materials management consulting firm, and chairman of the NAPM–Houston Business Survey Committee. For information on obtaining a monthly subscription to *NAPM–Houston Business Report*, contact him at (713) 988-7306.

Vibrant retail and auto sales and soaring housing starts continue to belie a slowdown in Houston's economy. The slowdown is not a mirage, however, as many Houston companies are struggling with a worldwide oil glut, local employment growth has slipped to a 1.5 percent annual rate over the past six months, and preliminary figures show the Houston Purchasing Managers Index falling to 46.7 in November. Further weakness probably lies ahead, both for oil markets and the Houston economy.

RETAIL AND AUTO SALES

Retailers are well positioned to have an excellent holiday season. Furniture stores have recorded double-digit increases over the past 12 months, helped by a strong housing market. One specialty store said the Christmas season began early, keeping the gift-wrapping department busy through November. One high-end retailer reported some growing reluctance to spend freely, but said business was still very good.

Auto and truck sales were up 21 percent from last October, and a record year is all but guaranteed for local dealers. Falling interest rates, rebates and lower sticker prices all make autos more affordable, with a tight job market and rising income fueling sales.

DRILLING AND OIL SERVICES

The number of working rigs has plummeted in the last four to six weeks. Domestic drilling fell by 50 rigs, and drilling outside the United States and Canada fell by 34 rigs. The loss of international activity is particularly important to U.S. oil service companies, as these wells are intensive users of services. This international activity is now at the lowest level since 1975, when Baker Hughes began counting these rigs. Weakness in oil-directed drilling continues to pull the domestic rig count downward, and U.S. oil-directed drilling has also hit the lowest levels ever recorded for the 50-plus years that Baker Hughes has measured this activity. Natural gas-directed drilling is still holding up comparatively well, with offshore activity the strongest component.

Oil producers show signs of pulling back sharply. As a result, service companies report backlogs have shrunk, and in some cases large, planned projects are being canceled. Some service companies are offering to take equity stakes in specific projects rather than being paid in cash.

CHEMICALS

Petrochemical and bulk plastic prices generally stabilized in October, after months of steady decline. Ethylene even saw a significant inventory draw, although this was initially driven by hurricane-related shutdowns and then extended by high levels of outages associated with routine maintenance. The fundamentals remain weak for the industry, however, with low prices, low profits, inability to export and additional capacity coming on line soon from new construction.

REAL ESTATE

Credit conditions have eased for real estate since the last Beige Book, but some local projects are still unable to obtain financing. Some projects that saw their deals fall through in recent weeks have found alternate sources of credit, but others will simply not find financing now because lending standards have tightened significantly.

Local housing starts continue to soar, as builders have a backlog of homes sold over the summer but still unbuilt. The market's pace has been so strong for the past 24 months that builders have not had an inventory of built-but-unsold homes. Housing sales, in contrast to starts, were off significantly in both September (–17 percent) and October (–6 percent) compared with the same months last year. Slower economic conditions, a normal seasonal slowdown and a depleted inventory of homes all play into these slower sales, and we will have to wait a few months to sort out which factor is most important.

For more information, contact Bill Gilmer at (713) 652-1546 or bill.gilmer@dal.frb.org.

For a copy of this publication, write to Bill Gilmer, Houston Branch,
Federal Reserve Bank of Dallas, P.O. Box 2578, Houston, TX 77252.

This publication is available on the Internet at www.dallasfed.org.