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## Are We in Even Better Shape Than the Data Suggest? NAICS vs. SIC Revisited

### Executive Summary

It has been five years since the U.S. Census Bureau converted the inventory and sales data from the Standard Industrial Classification (SIC) basis to the new North American Industry Classification System (NAICS) basis.<sup>1</sup> When the new system was introduced it served to push up the inventory-to-sales ratio for all businesses. The major impact was in the retail sector, where the ratio increased 0.15 on average across the dual reporting period; slight increases were seen in manufacturing while little impact was seen in the wholesale sector. The effects of the change were frequently discussed in the immediate wake of the conversion to NAICS and the release of back data for comparison in 2001. Now, we felt it time to revisit the data in light of our current position in the business cycle and consider what the data suggest for the economy going forward.

### The Loss of Historical Data

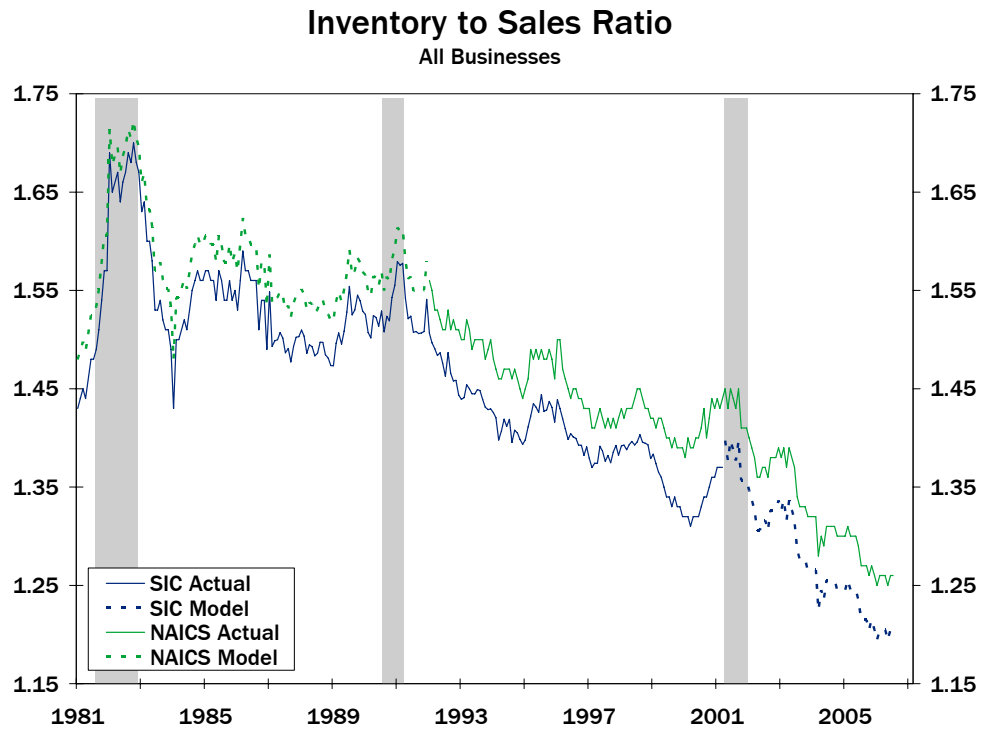
One of the biggest losses of the conversion from SIC to NAICS was the extensive history of the inventory series over multiple business cycles. On an SIC basis we have historical data for inventory and sales from 1981 to 2001. For the manufacturing sector the data spans from 1958 to 2001. This would allow comparisons across some seven business cycles. Whereas on a NAICS basis, the data spans from 1992 to present, only one complete business cycle including a recession and the current expansion.

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<sup>1</sup> The author thanks Rosalyn Wilson and Robert V. Delaney whose 2002 *State of Logistics Report* and presentation 13<sup>th</sup> Annual "State of Logistics Report": *Understanding Inventory-Stay Curious*, brought the author's attention to the conversion again, and provided helpful insights.

To take advantage of the increased historical data presented on a SIC basis we model the SIC data as a function of NAICS data for those periods where SIC data is unavailable, and we model NAICS data as a function of SIC data for those periods where NAICS data is unavailable. The two series are well correlated across the period 1992-2001 where data in both NAICS and SIC forms are available. We believe that the correlation between the series is sufficient to allow us to model the missing data for the purposes of comparison.<sup>2</sup> The modeled as well as historic data on both a SIC and NAICS basis for all businesses is presented in Figure 1; the manufacturing series are presented in Figure 2.

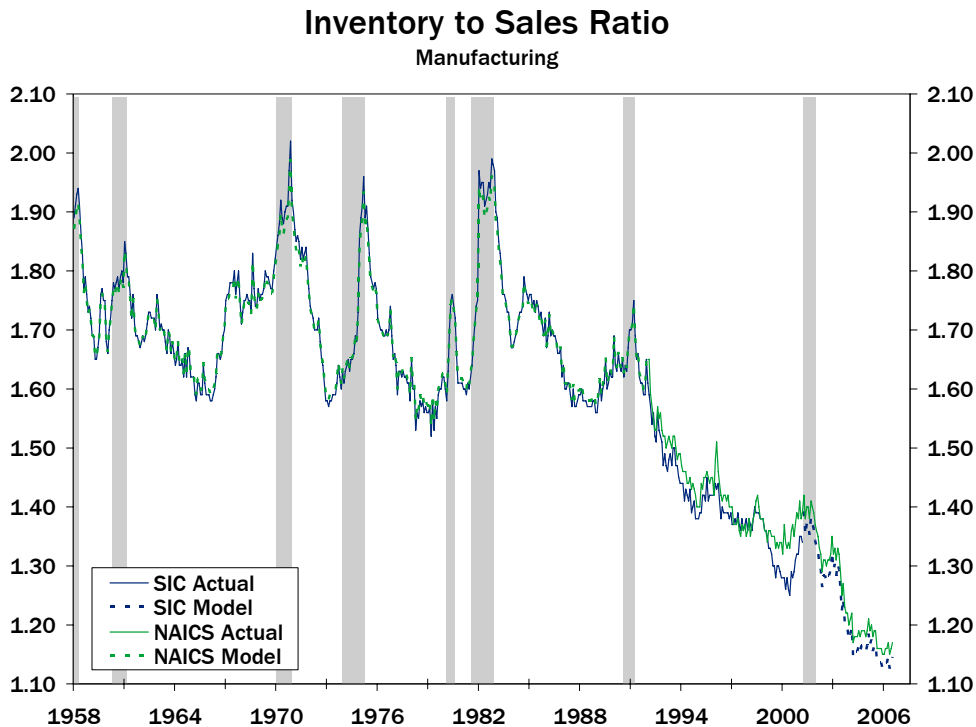
**Figure 1**



Source: U.S. Census Bureau and Wachovia Corporation

<sup>2</sup> Among all businesses the correlation is 0.96 and among manufacturing firms the correlation of NAICS and SIC data is 0.95. In both cases the correlation is statistically different from zero at all standard levels of significance.

Figure 2



Source: U.S. Census Bureau and Wachovia Corporation

Across all businesses, the inventory-to-sales ratio on an NAICS basis is consistently above that of the ratio on a SIC basis. Perhaps the economy is in even better shape than the NAICS data suggest. According to the Wachovia model, on an SIC basis, we are at 1.20 near the all time low of 1.19 for the inventory-to-sales ratio.

### Using the Modeled Inventory-to-Sales Ratios

Using the modeled data we are able to see movements in inventory-to-sales ratios as predictors of business cycle changes, historically. We are now better able to analyze the current trend in the inventory-to-sales ratio in light of past moves during expansionary periods. In Table 1 and Table 2, the relative movements for each business cycle are presented.

**Table 1**

Expansion	Inventory-to-Sales Ratio							
	All Business				Manufacturing			
	SIC		NAICS		SIC		NAICS	
	Peak	Trough	Peak	Trough	Peak	Trough	Peak	Trough
1958-1960	-	-	-	-	1.85	1.65	1.83	1.65
1961-1969	-	-	-	-	2.02	1.58	1.99	1.59
1970-1973	-	-	-	-	1.96	1.57	1.93	1.58
1975-1980	-	-	-	-	1.76	1.52	1.75	1.54
1980-1981	-	-	-	-	1.99	1.59	1.96	1.60
1982-1990	1.58	1.47	1.61	1.52	1.75	1.56	1.74	1.57
1991-2001	1.40	1.31	1.45	1.38	1.39	1.25	1.42	1.32
2001-Present	-	1.19	-	1.25	-	1.13	-	1.15

Source: U.S. Census Bureau and Wachovia Corporation

The strength of better inventory controls and more “real-time” information has significantly reduced the wild swings in inventories and consequently inventory-to-sales ratios in the months prior to recessions. Whereas the manufacturing sector’s inventory-to-sales ratio moved 0.40 points leading into the 1981 recession, it moved only 0.14 points leading into the 2001 recession, according to the Wachovia imputed SIC model. The business cycles prior to 1990, which saw swings in the inventory-to-sales ratio of less than 0.30, were in the relatively short recessions in 1960 and 1980.

**Table 2**

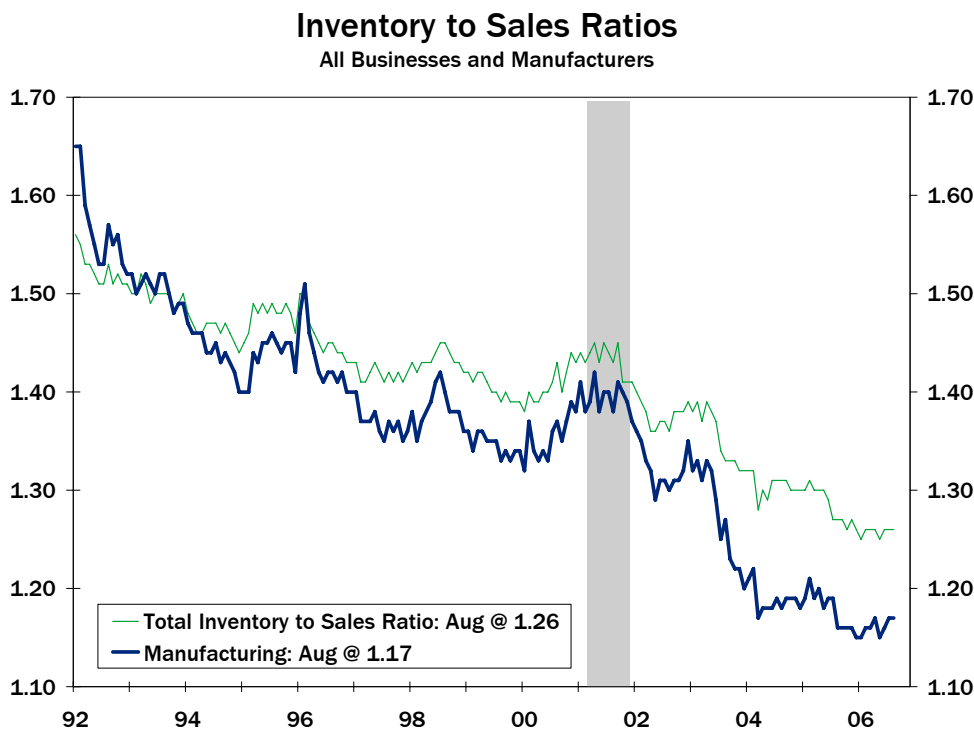
Expansion	Inventory-to-Sales Ratio			
	All Business		Manufacturing	
	SIC	NAICS	SIC	NAICS
	Peak to Trough	Peak to Trough	Peak to Trough	Peak to Trough
1958-1960	-	-	0.20	0.18
1961-1969	-	-	0.44	0.40
1970-1973	-	-	0.39	0.35
1975-1980	-	-	0.24	0.21
1980-1981	-	-	0.40	0.36
1982-1990	0.09	0.09	0.21	0.17
1991-2001	0.09	0.07	0.14	0.07
2001-Present	-	-	-	-

Source: U.S. Census Bureau and Wachovia Corporation

**Stalled Trend**

It appears the long-term downward trend in inventory-to-sales ratios, which we discussed at length in our piece *Inventories-Trend Dominates the Cycle*,<sup>3</sup> has, at least temporarily, stalled in the manufacturing sector and across all businesses, as well. The manufacturing inventory-to-sales ratio has sat at its all time low on a NAICS basis of 1.17 for two months, and has not moved significantly downward since first hitting 1.16 in August 2005. The ratio for all businesses has stood at 1.26 for three straight months and has oscillated between 1.25 and 1.27 since first entering the range in July 2005, again on a NAICS basis.

**Figure 3**



Source: U.S. Census Bureau

The downward trend in inventory-to-sales ratios stalled during much of the late 1990s expansion, only to resume again after the 2001 recession as the economy again gained strength and the cyclical nature of an expansion helped a return to the downward trend. A stall and slight upward move in late 2002 did not indicate the imminent onset of a

<sup>3</sup> September 26, 2006. Available at <http://www.wachovia.com/economics>, or from the author upon request.

recession and we have the same view of the current stall. While a stall may be a sign of a late phase of the business cycle it does not necessarily indicate that a recession is probable in the near term. The recent stall could also represent the fact that advances in technology and supply chain management techniques have run their course for the time being. Even with just-in-time inventory management some inventories will remain either as work in process or finished goods even if inputs are tightly managed. The next move in inventory-to-sales ratios will be downward if a technological advance for supply chain management precedes an end to the business cycle. However if the end of the cycle comes first then we will likely see a temporary move upwards. A move upwards, if it occurs, will be more reminiscent of those preceding the 2001 recession than those that preceded recessions in decades past.

### **Discussion**

While the long-term downward trend in the inventory-to-sales ratio appears to have stalled, we remain at or near all time lows for the ratio. The wild swings that used to be indicative of coming recessions are not likely to be repeated in the near term. Strong inventory and supply chain management has led to quicker responses from companies as they react to changes in the sales environment, they are better able to avoid large moves in inventory volumes.

Our forecast remains, that with below trend growth through the second half of the year, inventory investment will moderate from the levels seen in the second quarter. As a result, we anticipate that inventory investment will detract between 0.1 and 0.3 percentage points from GDP growth in both the third and fourth quarters of the year.

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