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Inventory performance today: Why is it declining?

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MAPI

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Inventory is often considered by manufacturers to be the most valuable category of assets on their books. However, inventory has its issues: it ties up large amounts of cash and can diminish in value for a host of reasons. So, it has become common practice to minimize inventory as much as possible without hurting customer service levels. While manufacturers have focused on managing inventory, they seem to have reached a point of diminishing returns.

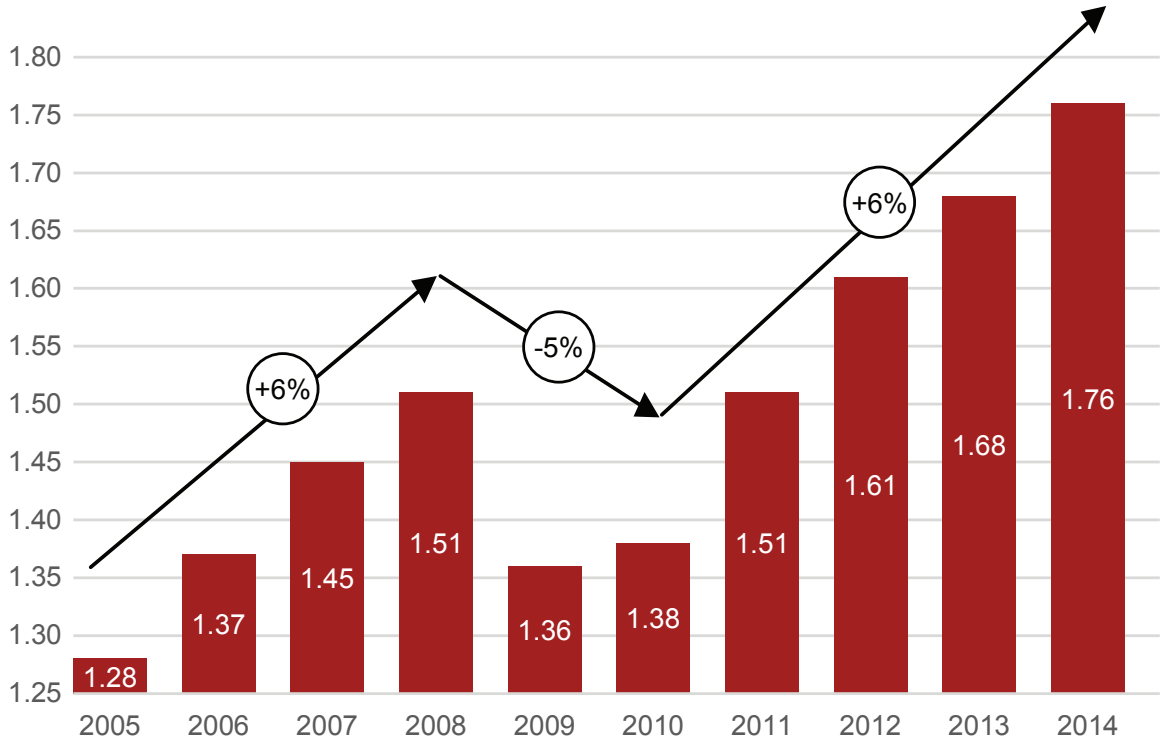
Now manufacturers are looking for new ways to further reduce their inventories. Increasingly, they are turning to advanced information management solutions. With perfect information, the right part would always be at the right place at the right time. There would be no need for inventory. Of course we don't live in a world with perfect information, so how effective are advanced information management solutions at further reducing inventory?

Contradictory trends

A look at macroeconomic data[1] suggests, in fact, that manufacturers are carrying more inventory than previous years. Figure 1 shows that US inventories grew from 2005–08, consistent with the country's GDP growth. Then the Great Recession hit and inventories dropped 10 percent. But, oddly, since the recovery, despite an average annual GDP growth rate of 2.5 percent, US inventories have risen more than 6 percent per year. After five years of anemic recovery, manufacturers are still adding inventory to their books much faster than GDP growth.

Figure 1: US inventory growth

US Manufacturing and Trade Inventories ($Trillions)[2, 3]



Sources: Inventories and sales are from US Census Bureau, May 2015; CPI is from U.S. Bureau of Labor Statistics, July 2015

[1] Inventories and sales are from US Census Bureau, May 2015; CPI is from U.S. Bureau of Labor Statistics, July 2015

[2] Manufacturing and trade inventories for each year is obtained by average monthly inventories, and monthly inventories is adjusted for seasonal variations but not for price changes

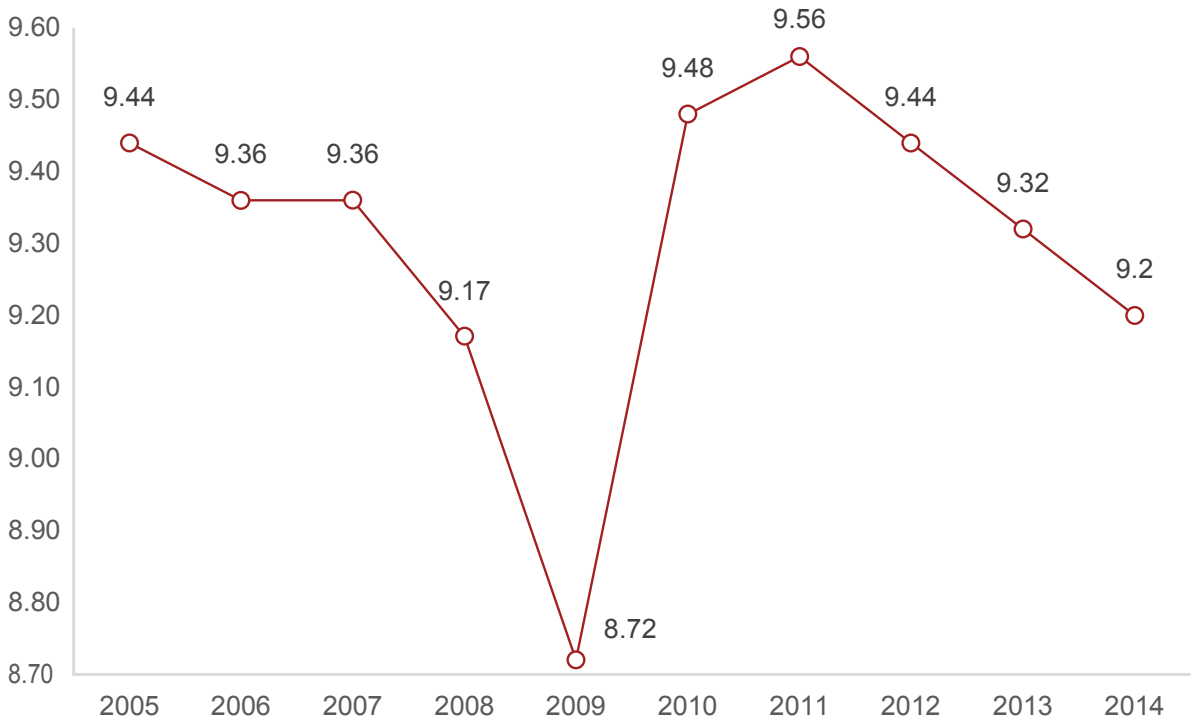
[3] If CPI is used to adjust price changes, the inventories CAGR is 2% from 2005 to 2008, and 4% from 2010 to 2014

Contradictory trends

Another measure of inventory performance is turns. An increase in inventory turns indicates the supply chain is getting more efficient at moving goods from suppliers to customers. In the US, inventory turns have declined steadily since 2011, from a peak of 9.56 turns to 9.20 turns (Figure 2). Also, US inventory turns in 2014 were lower than they were at their peak before the Great Recession hit. Despite 10 years of investment in new information management technologies, inventory turns have declined steadily and are near a 10-year low, with the exception of 2009 and the depth of the recession.

Figure 2: US inventory turns

US inventory turns[4]



Source: Inventories and sales are from US Census Bureau, May 2015

[4] Manufacturing and trade inventories for each year is obtained by average monthly inventories, and monthly inventories is adjusted for seasonal variations but not for price changes

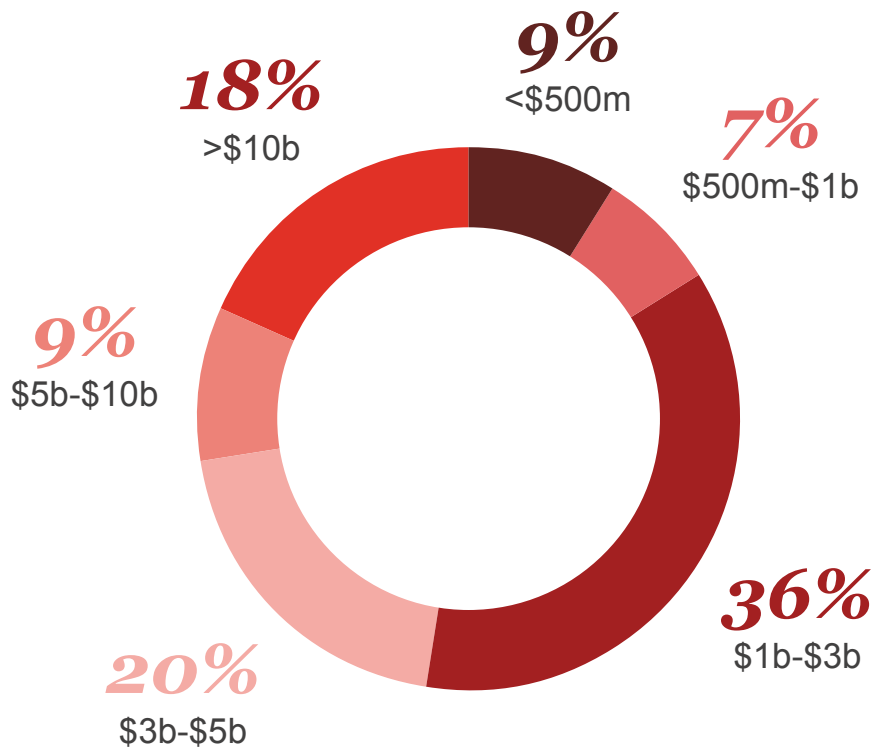
Making sense of the contradictions

This paper looks at some possible explanations for a seeming decline in inventory performance, using survey results combined with research and analysis. The survey was conducted by PwC in collaboration with the Manufacturers Alliance for Productivity and Innovation (MAPI) to determine if US manufacturers are using advanced inventory data management strategies and, if so, whether they are reaping the benefits.

Companies with effective ERP and supply chain visibility systems enjoy higher margin growth than their peers.

Figure 3: Survey respondents

Company revenues



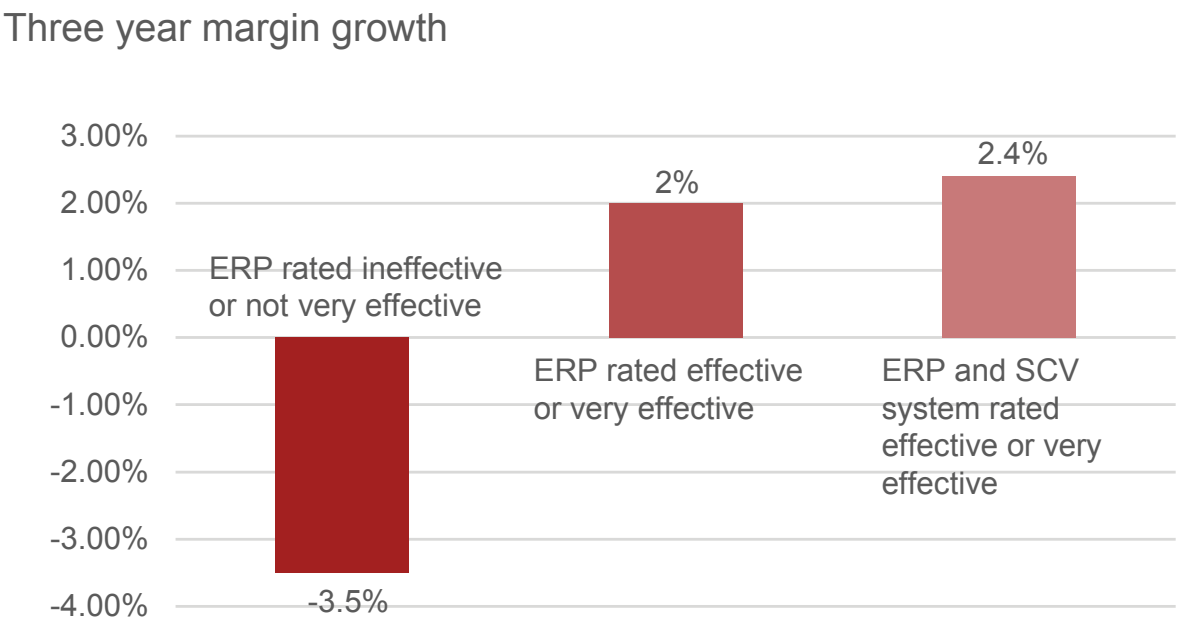
Median company revenue: $3.2 billion

Source: PwC and MAPI survey

Making sense of the contradictions

Of the 75 total respondents in our survey, 28 of them, representing 20 companies, said their ERP system was either not very effective or ineffective at enabling agility, responsiveness, and operating flexibility. On the other hand, 47 respondents, representing 17 companies, characterized their ERP systems as either effective or very effective. Of this second group, 29 respondents (13 companies) said their supply chain visibility (SCV) systems were effective or very effective at replacing inventory and costs with actionable and timely data. When we looked at margin growth for these three groups of companies, we found a correlation with their responses (Figure 4). Companies with ineffective ERP systems experienced an average annual margin erosion of 3.5 percent, while companies with effective ERP systems experienced average annual margin growth of 2.0 percent. Companies in the third category, with effective ERP systems and effective SCV systems, had even higher margins.

Figure 4: The value of effective ERP and SCV systems



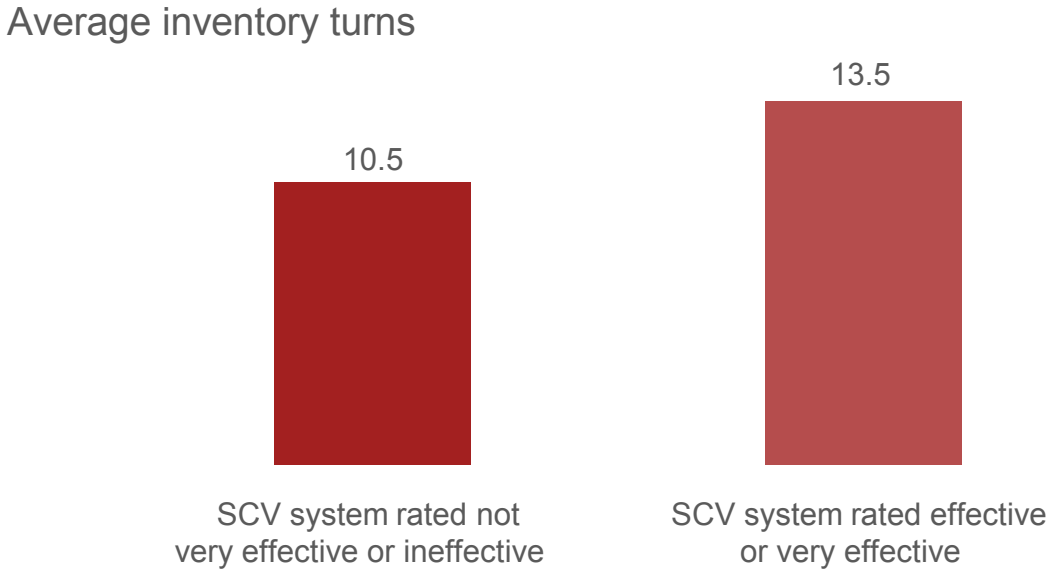
Source: PwC analysis

Making sense of the contradictions

We conducted a similar analysis using inventory turns (Figure 5). Of the 75 total respondents, 25 (9 companies) said their supply chain system was not very effective or ineffective at replacing inventory and costs with actionable and timely data. On the positive side, 36 respondents (19 companies) said their SVC system was effective or very effective. When we compared the inventory turns of these two groups of companies, we found the effective SVC system companies outperformed the ineffective ones by 30 percent, or 13.5 turns versus 10.5 turns.

In both of these analyses, we see a correlation between business results—better margin growth and higher inventory turns—and effective systems. This is not surprising: a common, single instance ERP enables a company to standardize management, share data, and leverage scale much more easily than a mixed ERP environment.

Figure 5: The benefit of effective SCV systems

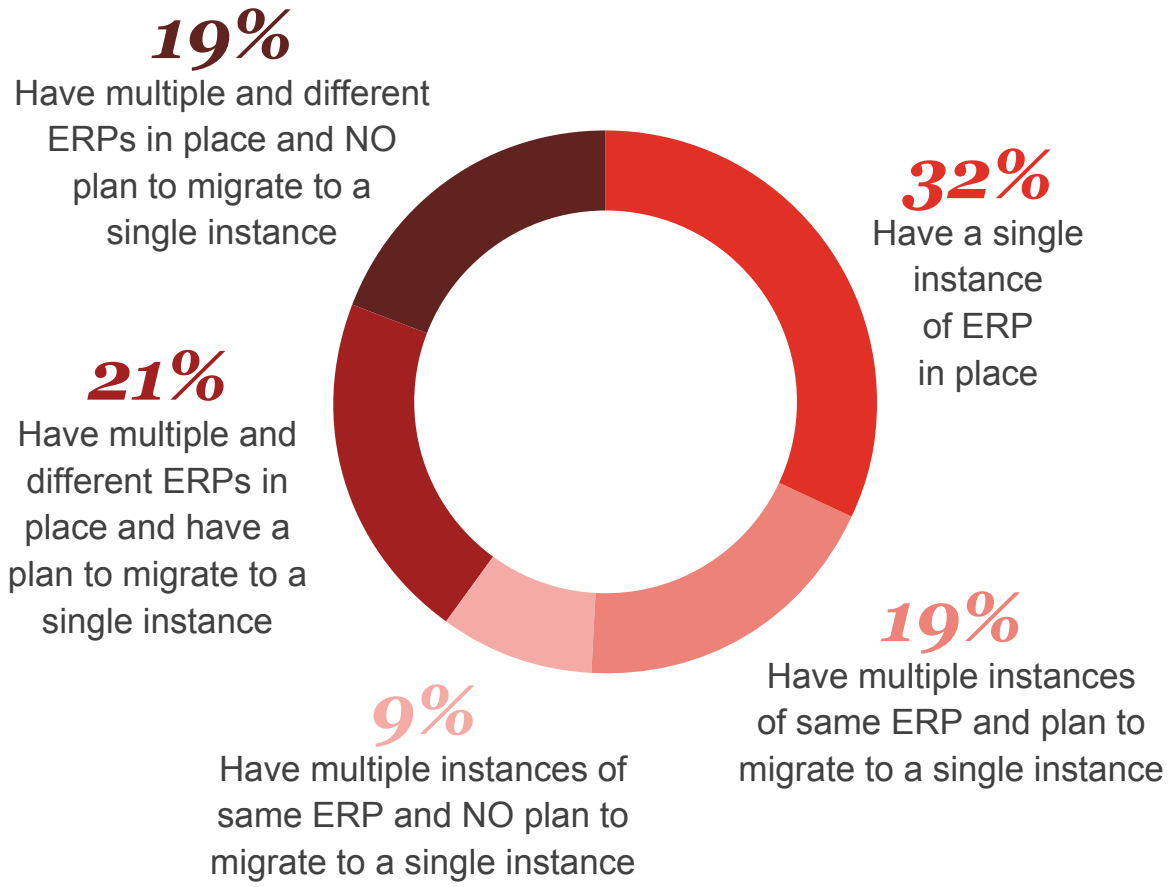


Source: PwC analysis

Making sense of the contradictions

A third of respondents (Figure 6) are already using a single instance of the same ERP platform. Another 20 percent are using different instances of the same ERP platform, but have plans to migrate to a single instance in the next three years. Consistent with this migration to a single instance, many respondents are spending a large proportion of their IT budget on ERP implementation, upgrades, and maintenance.

Figure 6: Common or different ERP platforms



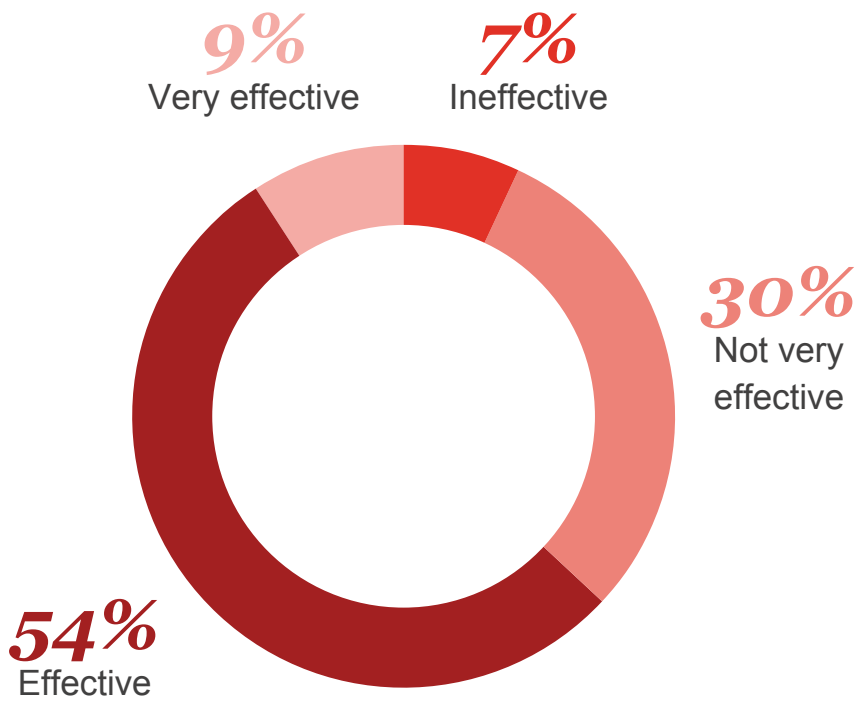
Source: PwC and MAPI survey

Making sense of the contradictions

At least for this group of respondents, these investments are delivering more effective ERP management capabilities (Figure 7).

However, even with effective systems, companies are experiencing inventory growth and supply chain issues. Why? The answer lies in faulty or incomplete data. Just over 50 percent of survey respondents expressed dissatisfaction with the quality of their data. One respondent, who rated his company's ERP system as effective, said: "It's hard to evaluate suppliers, hard to understand the impact of changes, impossible to compare metrics." Another respondent captured the sentiment of several others when he said, "there are often many exceptions to data, so the normal process is to download it into an Excel spreadsheet and continue manipulating it there." Companies cannot realize the full potential of advanced systems when work is still done offline on spreadsheets.

Figure 7: Effectiveness of ERP systems



Source: PwC and MAPI survey

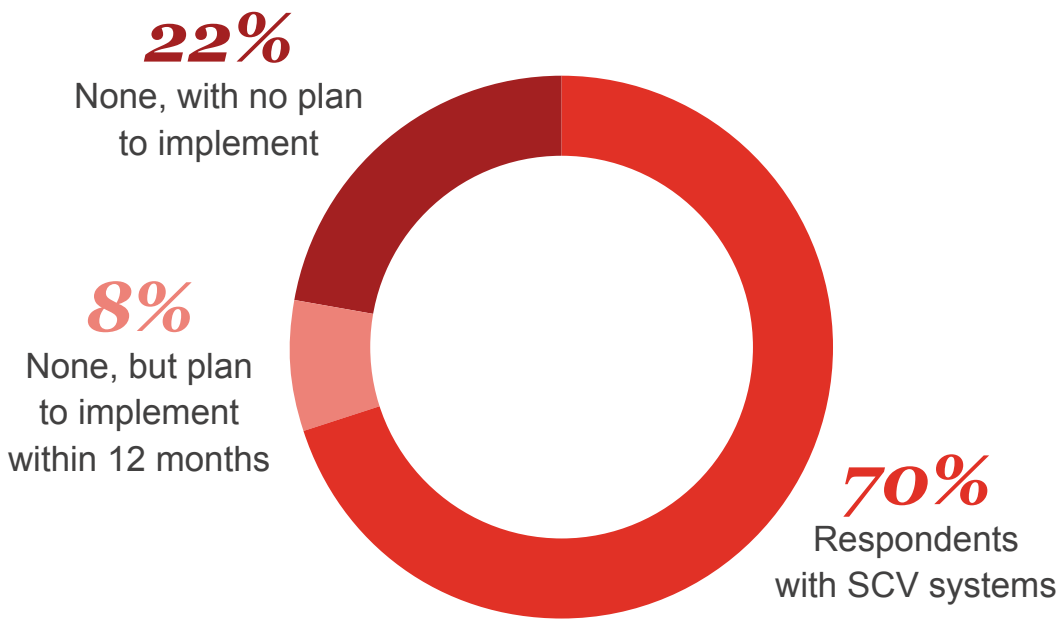
Making sense of the contradictions

The next step

In an effort to improve supply chain management, many companies are embracing SCV systems. These systems enable companies to track and manage raw materials, work-in-process, and finished goods across the extended supply chain. When fully implemented, they provide extensive demand, planning, supply, and inventory information throughout the supply chain, enabling users to optimally balance customer service levels with costs to serve. SCV is a powerful complement to a well-functioning ERP system.

Seventy percent of survey respondents reported having an SCV system, and another eight percent have plans to implement one within the next 12 months (Figure 8).

Figure 8: SCV systems

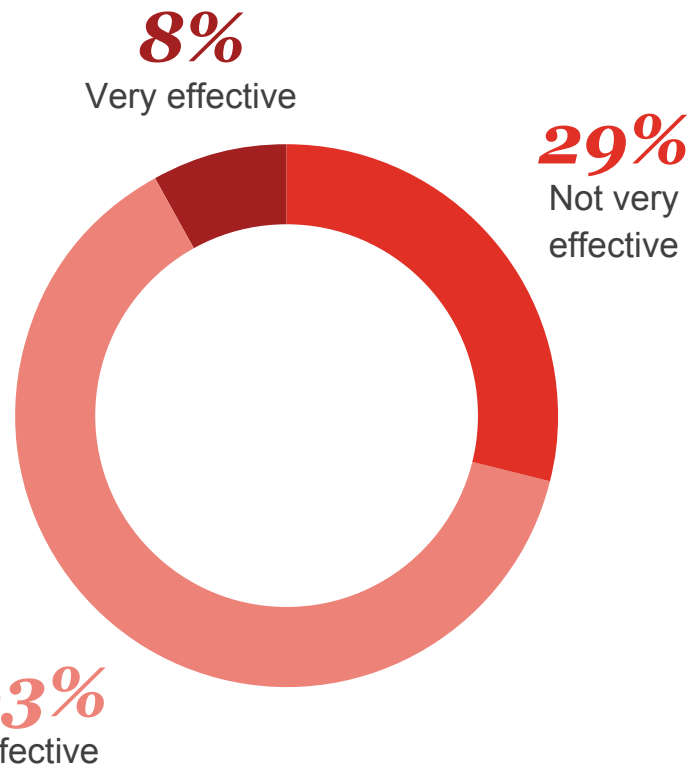


Source: PwC and MAPI survey

Making sense of the contradictions

More than two-thirds of respondents reported their SCV systems were effective or very effective (Figure 9). However, a closer assessment of these systems reveals a disconnect between the promise and the reality.

Figure 9: Effectiveness of SCV systems



Source: PwC and MAPI survey

Making sense of the contradictions

One problem stems from the uncertainty of supplier deliveries and customer demand (Figure 10). While SCV systems are intended to link customer demand to production schedules and supplier orders and deliveries, respondents continue to cite problems with forecast accuracy. It appears that system technology can help, but companies still need to have good communications and coordination with their suppliers and customers.

Figure 10: Factors driving SCV

How significant of an impact do these factors have on driving SCV?	None	Not Very Significant	Moderate	Significant	Very Significant
Longer lead times					
Lead time variability					
Increased number of suppliers					
Unpredictable customer demand					
Increasing channel complexity					
Supplier delivery performance					
Forecast accuracy					
Number of tiers in supply chain					

Source: PwC and MAPI survey

Underscoring this point, respondents also commented on the factors that drive their ability to maintain optimal inventory levels (Figure 11). The three most significant factors cited were lack of discipline in operating processes and practices, a high degree of product complexity or number of stock keeping units (SKUs), and poor forecasts from marketing or sales. Again, information systems do not drive these factors, management discipline does.

Figure 11: Factors driving optimal inventory levels

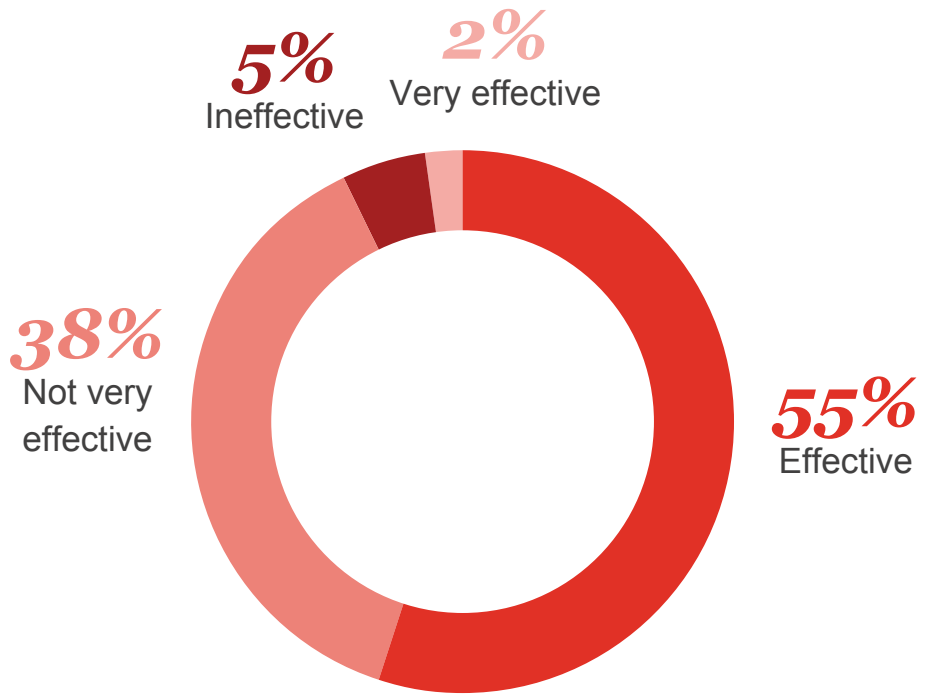
How significant of an impact do these factors have on your company's ability to maintain optimal inventory levels?	None	Not Very Significant	Moderate	Significant	Very Significant
Lack of discipline in operating processes and practices					
Limited insight into how to act on available data					
Limited quality of master data					
Reliance on cycle counting					
Use of vendor managed inventory					
Clear organization of warehouse tied to usage					
Use of super-markets close to operations					
Separation of materials management from operations and assembly					
High degree of product complexity or number of SKUs					
Poor ability to predict or keep delivery dates					
Poor forecasts from marketing or sales					
Poor ability to plan and meet supply commitments					

Source: PwC and MAPI survey

Making sense of the contradictions

The management discipline that most strongly addresses these factors is integrated materials management (IMM), commonly known as sales, inventory, and operations planning (SIOP). This discipline is focused on synchronizing sales forecasts with delivery commitments and material supplies and involves all of a company's key functional stakeholders. While SCV systems can greatly enhance IMM, they cannot replace disciplined review and approval by critical management stakeholders.

Figure 12: Sales, inventory, and operations planning (SIOP) effectiveness



Source: PwC and MAPI survey

Making sense of the contradictions

The road ahead

A core mission of information management systems is to get the right information to the right place at the right time in order to improve effectiveness. To that end, many companies have invested a great deal of time and money implementing ERP and SCV systems. Together these two information management platforms can provide manufacturers with a great deal of detailed information including orders, material availability, lead times, stock quantities, and locations.

Additionally, many manufacturers are adding mobile, cloud, and analytics technology to further boost supply chain management effectiveness. An intelligent integration of these information systems enables manufacturers to do a better job of synchronizing supplier deliveries with production schedules and customer orders, resulting in improved customer service and less overall inventory.

Making sense of the contradictions

But, as our research highlights, there is a lot of room for improvement. Companies need to focus on getting more from what they have and building additional capabilities. Below are some suggestions on important areas to focus on in moving ahead:

Even with the best technology in the world, it still comes back to management discipline

1. ***Data integrity and quality***
   Even the best of systems and the most sophisticated analytics rely on accurate and complete data. Businesses have to develop a common supply chain and operating data structure that facilitates communication among key stakeholders and enables effective management.

2. ***Supplier management***
   Our work with suppliers indicates that more than 70 percent of supplier delivery issues stem from frequent changes to products, orders, and schedules. A stable production schedule can greatly enhance supplier reliability.

3. ***Demand forecasting***
   Probably the single largest gap in forecast accuracy stems from vague or overly optimistic data about customer demand and the business development pipeline. Tools to improve demand management, principally pipeline and opportunity tracking, are within the control of a company's sales function.

4. ***Integrated materials management***
   The single biggest driver of excess inventory and unreliable delivery performance is inadequate material management practices. To make this task easier and more effective requires buy-in and coordination across key functions in the organization.

Appendix: Methodology

This paper is based on findings from a survey of 75 respondents from 37 US manufacturers. The survey included questions about the respondent's ERP system, data governance structure, and supply chain management system. Respondents represented a cross-section of US manufacturing sectors, including industrial products, technology, automotive, and medical products. Participating companies ranged in size from $500M to $90B in revenues with median revenues of $3.2B.

PwC utilized US Census Bureau data to analyze macro trends in manufacturing inventory levels, inventory and financial analysis of survey respondents, and additional data from US manufacturers regarding inventory management practices and performance.

Contacts

Mark Thut
Principal, Advisory Services
+1 (248) 705-9917
mark.j.thut@pwc.com

Stephen Pillsbury
Principal, Advisory Services
+1 (312) 298-2257
steve.pillsbury@pwc.com

Cam Mackey
Senior Vice President,
Operations & Partnerships
MAPI—Manufacturers Alliance for
Productivity & Innovation
+1 (703) 647-5137
cmackey@mapi.net

www.pwc.com

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