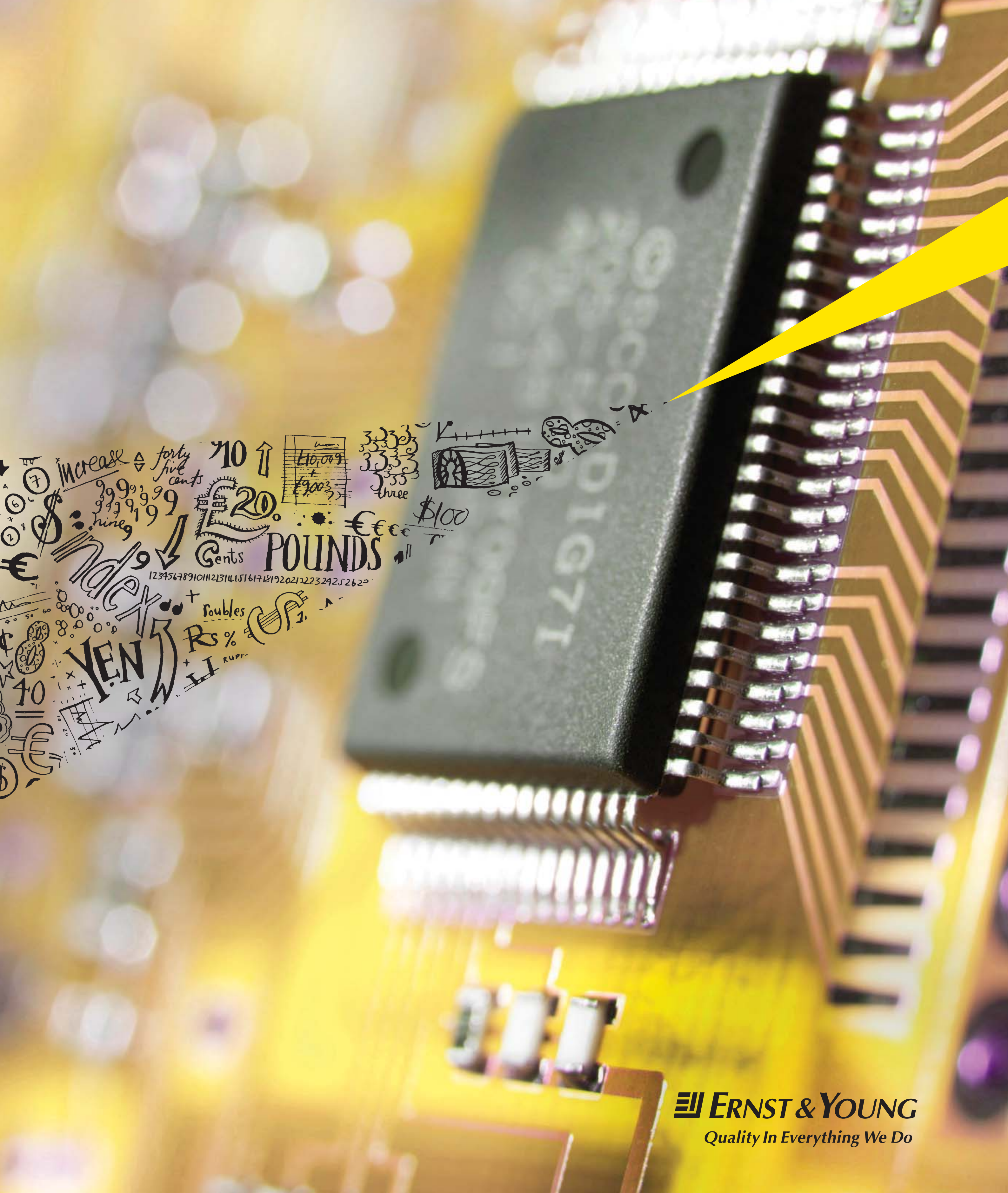
Cash on the chip

US technology companies and working capital management 2011



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Quality In Everything We Do

Foreword

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Cash on the chip is the latest in a series of working capital (WC) management-focused studies based on Ernst & Young research.

The US-based technology industry has changed a great deal since 2002. Substantial strides have been made in improving working capital management. Progress, however, has been uneven. Many WC issues remain, suggesting significant WC benefits are still available for most companies.

Key findings

- Technology companies have made significant progress in reducing WC levels in recent years, with specific actions to transform and drive greater efficiencies out of manufacturing, supply chain and procurement operations. Changes in product mix have also contributed.
- Lessons appear to have been learned from the recession of 2001, as seen by the comparatively reduced impact of the global downturn of 2008 on the industry's WC performance.
- 2010 compared with 2009 saw a limited improvement in WC performance, which can be attributed to higher levels of WC associated with increased sales growth.
- Further analysis, however, shows that WC results over time have been varied among and within segments of the US technology industry.
- Evidence also suggests that many WC issues persist. Supply chains have been growing complicated and vulnerable to business disruptions. It is also getting harder to balance operational excellence with agility. There is a lack of trust between manufacturers and their suppliers. Visibility to the final demand remains poor. There is still some heavy resistance to change at many levels within organizations.
- For each company, we believe that significant opportunity for WC improvement still exists. A high-level comparative exercise (Ernst & Young analysis) indicates that up to US$48 billion is unnecessarily tied up in the WC of the leading 70 US-based technology companies, an amount equivalent to 5% of their sales and 3% of their market capitalization.

Introduction

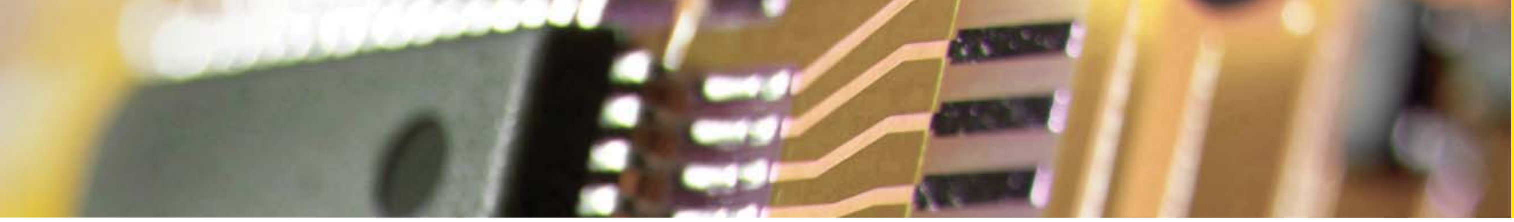
All industries evolve. However, few experience change at the scope, scale and pace of the US technology industry. The nearly incessant evolution of high-tech products and services, so essential to the industry, tends to be mirrored through continuous reconfigurations of associated financial, operating and geographic footprints.

The technology industry has one of the most complex supply chain structures of any industry.

Organizations are now more global, portfolios of offerings have been expanded, operating models are more efficient and financial positions remain strong. A critical element of this transformation has been a stronger focus on return on capital invested, as well as on cash and WC management.

Progress has been achieved, for example, by driving greater cash and cost efficiencies out of manufacturing, supply chains and procurement operations. Collaboration has been increased across the extended enterprise. Terms have been renegotiated. Yet many issues remain. Supply chains are increasingly complex — balancing cash, cost and service levels is a constant challenge, and visibility of final demand remains poor.

In this context, we continue to see further opportunity for improvement in many areas of WC.



Fast-evolving business models

The recession of 2001 caught most members of the technology industry by surprise. Sales growth was assumed to be a near constant. Business models focused on R&D and production, and much less so on subtle or overt signals from customers or the economy at-large. Consequently, the industry missed the signs that a recession had arrived, further exacerbating already bloated inventories all along the value chain. The inward focus of most companies made the technology crash of 2001 more severe than it might have been otherwise.

Driven by these experiences, technology companies have since been consciously transforming from a forecast-driven push mode to a more of a demand-driven pull system. Within this transformation, original equipment manufacturers (OEMs) have been moving contracting to third parties as a growing part of their operations, including original design manufacturing services (ODMs) and electronics manufacturing services (EMS) providers. Outsourced manufacturing and design are now estimated at 25% of total production.

Some of the specific actions being taken by industry members include:

- Simplifying and consolidating manufacturing (for example, through more focused plants, increased outsourcing and by pursuing make-to-order and configure-to-order strategies)
- Reconfiguring, relocating and consolidating supply chains according to different strategies and solutions deployed for different products or market segments
- Leveraging, centralizing and consolidating procurement
- Streamlining and standardizing business and IT processes
- Expanding the use of and refining the practice of vendor-managed inventories (VMI)
- Improving billing and cash collections
- Negotiating more favorable terms from customers and suppliers
- Improving operational coordination between supply, planning, manufacturing and logistics functions and processes

HP: shifting focus from products to customers

Optimization of production, inventory and other business practices that affect WC can be enhanced through greater customer intimacy. In this regard, a growing number of leading technology companies are reorienting their business models.

HP*, for example, is shifting from a focus on products to a focus on customers. Once operating 35 different product-based supply chains, the company is now organized into a mere five, each focusing on a distinct customer segment. These include "no touch," "low touch," "configure-to-order," "high volume," and "solutions and services."

Product standardization has thus been increased and customization reduced. The number of direct and indirect suppliers has been more than halved, and procurement processes have been streamlined. The company has also increased the proportion of centralized commodities from 60% to over 85%, and supply contracts have been standardized. Progress has also been achieved in improving operational coordination between supply, planning, manufacturing and logistics functions, and processes and business and IT processes have been simplified — all of which contribute to enhanced WC performance.

*Source: December 2010, HP Supply Chain conference

- Collaborating much more closely with channels of distribution and suppliers, enabling enhanced demand and supply visibility, improved forecasting accuracy, optimized production planning, lower levels of inventory and better supply chain reliability
- Sharing leading practices within the organizations and across the various supply chain partners
- Tracking and monitoring working capital metrics, and linking compensation to these metrics

Lessons learned

Such changes have led to manufacturing, supply and distribution chains that today are significantly leaner, more responsive and agile. The lessons of 2001 (when huge write-offs of excess and obsolete inventories, as well as much higher levels of provisions for bad debt were recorded) appear to have paid off, as evidenced by the comparatively limited impact of the global recession of 2008.

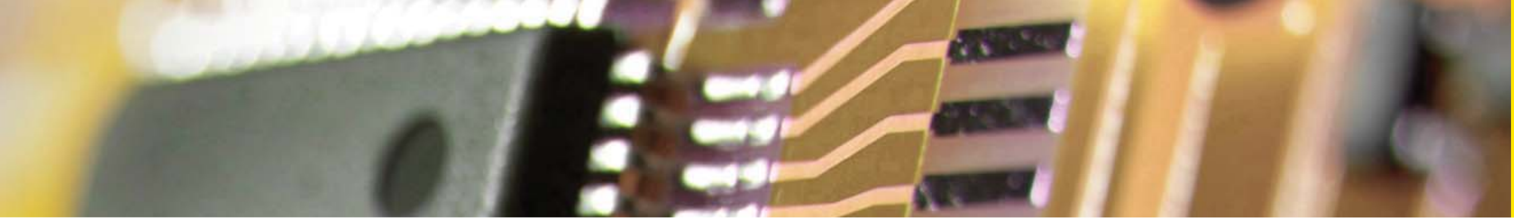
For the industry as a whole, C2C* was down by 6% in 2008 compared with 2007, and then by 3% in 2009 compared with 2008. Each segment but one reported a decrease in C2C between 2007 and 2009 (semiconductor components saw a marginal increase).

Had the last quarter of each year been considered rather than the full year, C2C would have declined by 12% between Q4 2007 and Q4 2009.

Still, in a few cases, rapid changes in demand may have resulted in temporary, lagging WC performance variations as lead times in customer orders may be less or more than the lead time required to procure components. When demand for technology products started to recover in Q3 2009, for example, the industry's supply base acted to expand manufacturing capacity. This resulted in the elongation of lead times for certain components over the latter part of 2009 and throughout 2010.

* C2C (cash-to-cash) = DSO plus DIO minus DPO (expressed as a number of days of sales, unless stated otherwise)

For a more detailed explanation of this and other metrics in the study, see "Glossary" on page 16.



Review of working capital performance

Since 2002, technology companies have reduced their WC levels by 27% as measured by cash-to-cash (C2C). Improvement was evident in six of the seven segments reviewed over this period, with only the communications equipment segment showing an increase in C2C. Some of the more noteworthy shifts include:

- **Diversified technology.** This segment reported, by far, the largest reduction in WC levels, with a drop in C2C of 34%. This strong showing was partly driven by the positive impact of the change in the product sales mix, with software and services now contributing for 53% of overall sales versus 44% in 2002.
- **Computer equipment.** C2C for the segment improved by three days, reaching a negative figure of four days in 2010 compared with a negative figure of one day in 2002. Performance, however, has been varied among companies. Apple and EMC, for example, reported lower C2C, while Dell saw an increase on the back of a gradual change in its business model toward enterprise solutions.
- **Communications equipment.** This was the only segment reporting a weaker WC performance, with C2C rising by 10%. This deterioration came primarily from higher levels of receivables (DSO), owing to the impact of ongoing consolidation of the customer base and increasing sales into higher credit risk segments of the market. Also, there were financial difficulties among a very significant customer base for this segment (government entities). Changes in the sales mix also played a part. Progress in inventory (DIO) was mitigated by a reduction in levels of payables (DPO).

It is also worth noting that cash levels (when considered in the broader context of cash and WC management) are currently elevated across the industry. In 2010, cash levels accounted for about 30% of total assets and sales – equivalent to 112 days of sales. Although this overall ratio has remained almost unchanged since 2002, there are large variations among segments, with communications equipment and computer equipment showing significant increases in cash, and software reporting a significant decrease.

Progress in WC has been uneven among technology segments and companies.

Table 1: Change in WC performance across the industry, 2002–10

Top 70 US	2010	2002	Change
DSO	56.4	61.7	-9%
DIO	20.8	24.7	-16%
DPO	38.9	34.2	14%
C2C	**38.3**	**52.2**	**-27%**

	C2C		
Segment	**2010**	**2002**	**Change**
Diversified technology	55.6	83.7	-34%
Computer equipment	-4.1	-1.0	nm
Semiconductor components	51.0	56.0	-9%
Distribution	41.7	44.9	-7%
Software	51.0	52.5	-3%
EMS	38.0	39.3	-3%
Communications equipment	50.8	46.1	10%
Top 70 US	**38.3**	**52.2**	**-27%**

Source: Ernst & Young analysis, based on publicly available financial statements

Importance of deferred revenues

Deferred revenues are a key element of the industry's business model. Carried on the balance sheet, they relate to amounts received or billed in advance for products, services and fixed-price support contracts. For support contracts, revenue is deferred and recognized on a pro-rated basis over the period during which the services are to be performed, typically between one and three years. Advanced services revenue is recognized upon delivery or completion of specific duties.

Technology segments differ in terms of the level and the nature of deferred revenues. For the industry as a whole, current deferred revenues on the balance sheet amounted to 7.7% of sales in 2010, ranging from a high of 21% for software down to nonexistent for distribution and EMS.

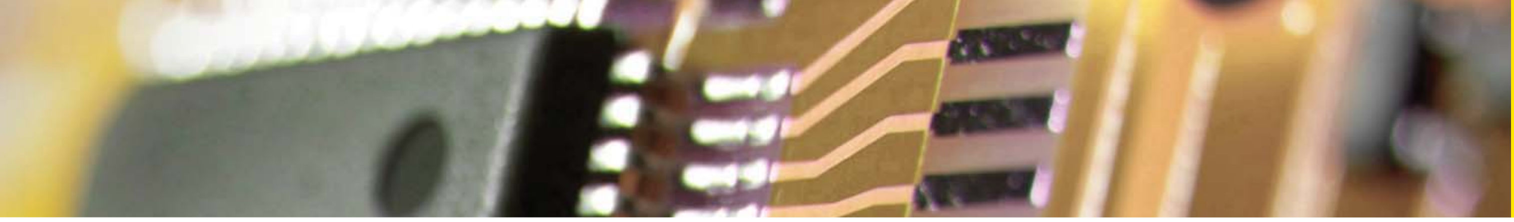
Levels of deferred revenues have been rising steadily in recent years (they averaged 5.4% in 2002), as the proportion of services and software in total sales have been increasing for most segments. Computer equipment registered the largest increase, followed by communications equipment, diversified technology and software.

Had current deferred revenues been included in the WC performance calculation, C2C would have dropped from 32 days in 2002 to 10 days in 2010, equivalent to a decrease of 70%.

Shift to software and services

A shift to software and services played a big role behind the strong WC results reported by diversified technology companies, a proportion that has risen from 61% of sales to 80% for IBM and from 22% of sales to 33% for HP between 2002 and 2010.

There are also examples of companies in other segments where software and services represent a much bigger proportion of sales, reaching, for example, 19% of sales in 2010 for Dell against a negligible figure in 2002. For EMC and Cisco, comparable figures for 2010 were 36% and 20% versus 22% and 17%, respectively in 2002.



Fundamental drivers

Receivables (DSO)

Since 2002, levels of receivables (DSO) have been reduced by 9%, or 5.3 days. Three out of seven segments — diversified technology, semiconductor components and EMS — reported a reduction in levels of receivables.

In contrast, distribution, computer equipment and communications equipment posted a significant deterioration in receivables performance, partly due to changes in products sales mix and in OEM channel programs, as well as a combination of acquisitions and development of solutions and services to enterprises.

For the distribution and computer equipment segments, this deterioration has been more than counterbalanced by a corresponding increase in levels of payables. The differential between receivables and payables (DSO-DPO) for these segments was cut by five days and three days, respectively, since 2002. For these segments, the increase in DSO for 2010 would have been much lower had the last quarter of the year been used as a basis for calculation, reflecting the acceleration in sales throughout the year. Q4 2010 DSO as compared to Q4 2002 shows an increase of 11% for each segment (instead of 23% for distribution and 21% for computer equipment).

A feature that may have influenced receivables performance across the industry in recent years has been the rising proportion of total revenues derived from service and support payments as opposed to transactions. For software and services, such annuity payments now account for up to 70% of revenues. Outsourcing, business process services and financing businesses also feature a relatively higher share of annuity content. By comparison, transactional revenues are principally composed of equipment sales, consulting, systems integration and one-time software licence charges.

A further contributing factor behind the receivables performance has been the changes in the revenue mix by region and country, together with the related impact of local payment terms practices. In 2010, 60% of total sales made by the US technology companies in this report were realized outside the US, up from 50% in 2002.

Each WC component contributed to the industry's improved WC performance, but with varying degrees.

Table 2: Change in receivables performance, 2002-10

	DSO		
Segment	**2010**	**2002**	**Change**
Diversified technology	75.0	94.5	-21%
Semiconductor components	36.7	40.8	-10%
EMS	51.3	55.4	-7%
Software	63.3	62.7	1%
Communications equipment	46.6	40.8	14%
Computer equipment	45.1	37.3	21%
Distribution	57.4	46.6	23%
Top 70 US	**56.4**	**61.7**	**-9%**

Source: Ernst & Young analysis, based on publicly available financial statements

Inventory (DIO)

Since 2002, levels of inventories (DIO) have been reduced by 16%, or 3.9 days. Four out of seven segments reported reduced levels of inventory, with diversified technology showing the largest fall, followed by communications equipment. In contrast, EMS and, to a lesser extent, distribution saw increases in DIO. Software, meanwhile, reported a large percentage drop in DIO, but from a relatively low level.

The divergence in inventory performance between segments can be partly explained by the expanded use of VMI arrangements. With suppliers increasingly holding more inventory on behalf of customers, there has been a shift of inventory toward upstream suppliers. The extent varies according to the segment's or company's relative influence within the value chain.

For EMS, the adoption of lean practices by OEMs has led, in some cases, to increased levels of inventory as companies assumed greater supply chain responsibilities. Changes in product mix also may have contributed to increased DIO.

Texas Instruments, for example, has indicated that about 30% of its distributors' revenues, accounting for 30% of total sales, result from VMI. The aim is to reach a figure of 50% over time. A significant percentage of OEM customers are also managed on a consignment basis. Adding the two, such arrangements now represent about two-thirds of the group's total sales.

Another feature that may have influenced inventory performance across segments and companies in recent years has been the change in the products sales mix with the increasing contribution of software and services that carry negligible levels of inventory to total revenues.

Payables (DPO)

Since 2002, levels of payables (DPO) have risen by 14%, or 4.7 days. Four out of seven segments – distribution, computer equipment, EMS, and semiconductor components – reported higher levels of payables.

Overall progress in payables was driven by a stronger focus on procurement and sourcing, as well as by success made in expanding payment terms. Changes in sales product may have also played a part.

Note that for distribution and computer equipment, improvement in DPO would have been much lower (28% and 13%, respectively) had the last quarter of the year been used as a basis for calculation rather than the full year.

Table 3: Change in inventory performance, 2002–10

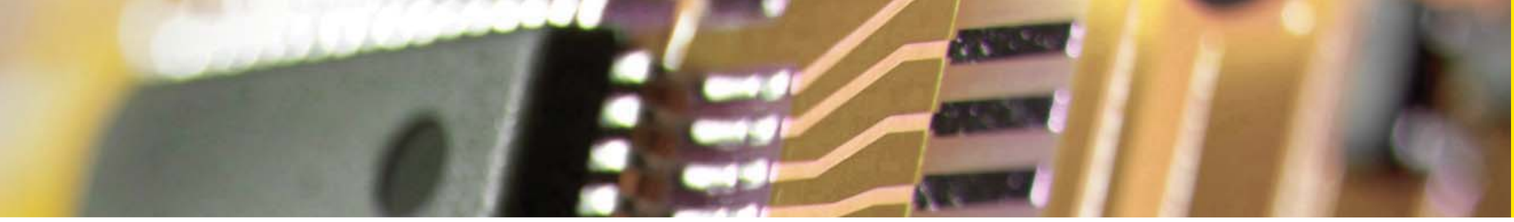
	DIO		
Segment	**2010**	**2002**	**Change**
Software	3.8	6.3	-40%
Diversified technology	14.8	23.4	-37%
Communications equipment	17.5	21.0	-17%
Semiconductor components	39.6	39.8	0%
Computer equipment	11.1	11.0	1%
Distribution	36.9	35.4	4%
EMS	50.7	40.0	27%
Top 70 US	**20.8**	**24.7**	**-16%**

Source: Ernst & Young analysis, based on publicly available financial statements

Table 4: Change in payables performance, 2002–10

	DPO		
Segment	**2010**	**2002**	**Change**
Distribution	52.6	37.1	42%
Computer equipment	60.3	49.4	22%
EMS	64.0	56.0	14%
Semiconductor components	25.3	24.6	3%
Diversified technology	34.2	34.2	0%
Software	16.1	16.5	-2%
Communications equipment	13.2	15.6	-15%
Top 70 US	**38.9**	**34.2**	**14%**

Source: Ernst & Young analysis, based on publicly available financial statements



Moderate WC improvement in 2010

2010 saw a limited improvement in WC performance, which can be attributed to higher levels of WC requirements associated with increased sales growth.

It is worth noting that using the last quarter of the year rather than the full year would have shown an increase of 2% in C2C, partly reflecting weaker than expected seasonal sales growth in Q4, as well as the impact of inventory replenishment initiatives. Had current deferred revenues been considered, C2C would have also increased by almost one day (from 9.6 days to 10.4 days).

In 2010, only three out of seven segments and 40% of the companies analyzed managed to report a year-on-year improved WC performance. Leading performers reported a drop of 30% in C2C, while laggards saw an increase of 11%. Several large companies reported well-below-average WC progress, significantly influencing overall changes.

More specifically, the headline performance analysis shows a reduction in receivables, partly offset by swelling inventories — and no change in payables.

DSO was down 2% year-on-year. However, using the last quarter of the year as a basis for comparison rather than the full year would have shown an increase of 2% in DSO, primarily due to higher sales levels. Every segment but two (diversified technology and distribution) reported a year-on-year improved receivables performance. Forty-three percent of companies reported a year-on-year reduction in DSO.

In contrast, DIO was up 3% year-on-year. Using the last quarter of the year as a basis for comparison rather than the full year would have shown a much bigger deterioration, with DIO up 8%, inflated by higher levels of production, in conjunction with build-up of inventories to replenish levels and reduce lead times. Only two segments (computer equipment and diversified technology) saw a year-on-year drop in DIO. Close to two-thirds of companies analyzed reported a year-on-year deterioration in inventory performance.

DPO remained unchanged year-on-year. Again, using the last quarter of the year as a basis rather than the full year would have shown a much bigger increase of 4% in DPO, due to higher levels of production and capital spending. Three out of seven segments (software, communications equipment and computer equipment) saw a year-on-year improvement in payables performance. Half of companies analyzed reported a year-on-year reduction in DPO.

Current deferred revenues dropped from 8.1% in 2009 to 7.7% in 2010. Three out of five segments that carry deferred revenues reported a year-on-year fall.

Impressive year for sales

WC results were achieved in the context of a much better year in 2010 than expected in terms of sales growth (above 20% for the companies analyzed). Demand for technology products has been progressing steadily during 2010.

However, this situation, compounded by a period of underinvestment and supply chains being much leaner, led to severe supply constraints and extended lead times across the industry during 2009–2010. Most companies now consider that for a majority of products, average lead times exiting 2010 are nearing normal levels. For some companies, seasonal sales patterns have also been unusual, with revenues showing little growth in Q4 compared with Q3 (as supply and inventories were adjusted to end demand after several quarters of significant growth and extended component lead times).

Table 5: Change in WC performance metrics across the industry

Global	2010	2009	Change
DSO	56.4	57.8	-2%
DIO	20.8	20.1	3%
DPO	38.9	38.9	0%
C2C	**38.3**	**39.1**	**-2%**

	C2C		
Segment	**2010**	**2009**	**Change**
Computer equipment	-4.1	-0.2	nm
Semiconductor components	51.0	51.6	-1%
Software	51.0	51.4	-1%
Communications equipment	50.8	50.2	1%
Diversified technology	55.6	53.3	4%
Distribution	41.7	38.7	8%
EMS	38.0	32.1	18%
Top 70 US	**38.3**	**39.1**	**-2%**

Source: Ernst & Young analysis, based on publicly available financial statements

Opportunities going forward

Variations in WC performance between US technology companies and within each segment point to significant potential for improvement. The reality is that only half of the companies analyzed showed an improvement in C2C since 2002. This suggests large variations in the direction and degree of focus and improvement company by company. Leading performers reported a drop of 42% in C2C, while laggards saw an increase of 43%. Several large companies reported well-above average WC progress, significantly influencing overall changes.

The size of the disparities in performance between companies within each segment also points to fundamental differences in management focus on cash and process efficiency.

A high-level analysis suggests that the leading 70 US technology companies have between US$22 billion and US$48 billion of cash still unnecessarily tied up in WC processes, equivalent to between 2.5% and 5.4% of sales.

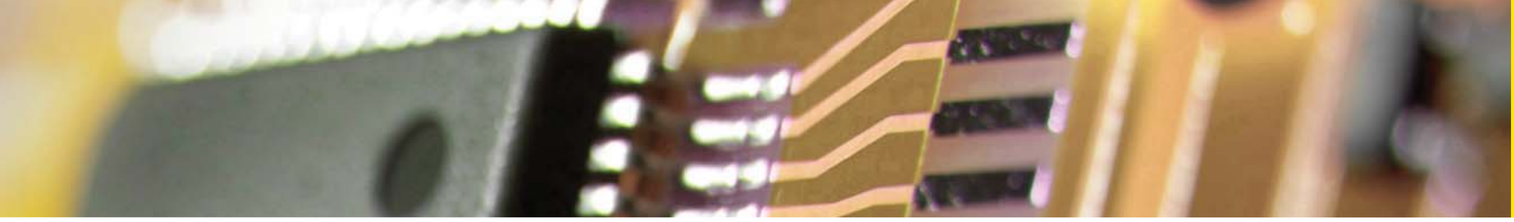
This is calculated by comparing the performance of the WC components of each company with that of the average (low estimate) and the upper quartile (high estimate) of its segment peer group. Even at the top end of each range, our experience across many projects, industries and geographies shows that a dedicated focus on WC management can frequently release results at or above this level.

For the industry as a whole, the range of cash opportunity is lower than in both 2009 and 2002, when it was between 2.6% and 5.9% of sales and between 2.8% and 6.0% of sales, respectively.

Table 6: WC cash opportunity, 2010

	Cash opportunity					
	Value (US$b)		% WC scope		% sales	
	Average	Upper quartile	Average	Upper quartile	Average	Upper quartile
Communications equipment	3.4	5.0	28%	41%	5.8%	8.6%
Computer equipment	4.0	9.8	7%	16%	2.1%	5.1%
Distribution	3.0	7.0	6%	15%	2.5%	5.9%
Diversified IT	7.3	13.6	9%	18%	3.2%	6.0%
EMS	0.4	1.4	2%	6%	0.7%	2.6%
Semiconductor components	2.3	6.8	7%	21%	2.1%	6.0%
Software	1.5	4.2	5%	15%	1.2%	3.2%
Top 70 US	**21.8**	**47.7**	**8%**	**17%**	**2.5%**	**5.4%**

Source: Ernst & Young analysis, based on publicly available financial statements



What drives variations in WC performance across industry segments and among companies?

Much of these WC performance variations are due to the specific nature of each segment as well as to the chosen strategy of each company. Each segment — and within it, each company — is part of a complex value chain. Differences in manufacturing, distribution, sourcing or the nature of the customer base can have a profound impact. Factors that influence WC performance by segment include:

- **Differing exposure to direct sales and distribution channels.** Technology products and services are primary sold either directly through a sales force or indirectly through channels such as distributors, value-added resellers, OEMs, providers of electronics manufacturing services and original design manufacturers, independent software vendors and systems integrators.
- **Varying proportions of international sales.** In 2010, 60% of the total aggregate sales made by the US technology companies included in the survey were realized outside the US. Asia (including Japan) now accounts for more than 30% of overall sales, just ahead of Europe. The proportion of international sales varies widely across the industry's segments, ranging from half of total sales for distribution and software to 85% for semiconductor components — with diversified technology companies together realizing two-thirds of their sales outside the US.
- **Differing types of inventory.** For a technology company, inventory consists of raw materials, work in progress, manufactured finished goods, distributor inventory and deferred cost of sales, and service-related spares. Distributor inventory represents a substantial proportion of the total, as vendor management inventory (VMI) arrangements are becoming more common across the industry.
- **Choice of production strategies.** The industry has been moving away from a traditional forecast-driven push to a demand-driven pull system, with numerous variations on this theme.

  Make-to-order is probably the most effective strategy for customized products, which are manufactured and shipped according to specific requirements. Configure-to-order is better suited to a model where products require many variations. Both practices provide the opportunity to reduce inventory. For basic products selling in high volume, make-to-stock can be used to keep manufacturing costs down and serve customer demands quickly, but this also results in higher levels of inventory.

  For semiconductors, for example, make-to-order typically accounts for 75 to 80% of total production, with the rest coming from configure-to-order. For computer makers, make-to-order represents 40 to 50% of the production and configure-to-order 30 to 40%, with the remainder make-to-stock.

  Some companies have also chosen to pursue an asset-light manufacturing strategy, significantly increasing the proportion of production that is outsourced. Such a strategy aims to reduce fixed assets, increase return on invested capital, improve operational flexibility and reduce business risks. However, it may also result in longer and more variable lead times, excess safety stocks, greater exposure to waste, higher logistic costs and loss of control.
- **Mix and type of spend.** In general, technology companies purchase materials, supplies and product subassemblies from a large number of vendors. Contract manufacturers, original design manufacturers and electronics manufacturing services providers around the world are also relied upon to optimize costs, reduce capital investment, and manage manufacturing lead times and component supply more effectively. Some products are purchased from third-party OEMs and resold under a new brand. The assembly and testing required for the majority of manufactured components are performed either internally or through third parties.
- **Different levels of exposure to software and services.** Sales levels of software and services vary widely across segments, but also within each segment, with companies opting for different strategies. Note that with software and services, billing practices become even more important, revenue recognition can be complex, extended customer acceptance need to be carefully considered, unbilled balances can be substantial, and managing bundled products can prove difficult.

Essential steps

Technology companies need to take a look at their operations to determine the value being lost to inefficient WC management. Leaders, especially those in the upper quartiles, need to remain vigilant to prevent performance entropy. Others, especially those in the lower quartiles, should begin a systematic program to recover lost ground.

For example, hidden within the industry's overall WC performance metrics is a long recognized and yet stubbornly persistent problem: CEOs need to hit their quarterly numbers. In accord, the industry incentivizes the sales force to maximize "this" quarter's revenues. To hit the numbers, a seller will offer all manner of discounts for early buys. Customers know this and game the system with alacrity, timing their orders to obtain the best deals.

This does not need to be the case. A handful of steps are available to lessen the impact of the quarterly sales spikes. For example, companies could shift sales targets from quarterly to monthly. Commission incentives could be altered to deliver greater reward to sales occurring earlier in quarter. Or, for the purpose of sales commissions, companies could even shift their quarter-ends so as to disrupt the cycle. Such actions could go a long way toward smoothing demand patterns and preserving margins.

Size gets in the way

Certain segments of the technology industry feature a few dominant players, all serviced by numerous far smaller and somewhat obsequious suppliers. While this is common in many industries, it is important that companies both large and small are aware of how this relationship can get in the way of effective WC strategies.

Consider forecasting. Today, when a large company says it needs X delivered by Y, suppliers scramble — no questions asked. Because the large company always gets what it wants whenever it wants, it often fails to notice any flaws in the system. But in reality, the larger entity is paying for its failure to provide clearer insight into demand. Smaller suppliers, feeling the need to be ready at all times, will carry larger than necessary inventories. And, when orders suddenly spike, suppliers are forced to produce, often in less-than-optimized production runs. The result is higher costs within the system.

Similarly, look at commercial terms. When the downturn of 2008 arrived, the most dominant companies in the value chain began extending their own payment terms, in many cases significantly. In the short term, working capital, at least for the dominant companies, is preserved. However, for others in the supply chain, such pain can quickly translate into financial distress. The resulting cost cutting and loss of focus can lead to lapses in quality or even failure to deliver.

This is not to point fingers. Rather, the goal is to remind all that closer collaboration across a value chain can lead to greater optimization, lower costs and less WC tied up unnecessarily in safety stocks or inefficient production runs. Smaller, less dominant companies, needing clearer windows into downstream demand, should speak up. Larger, more dominant companies should listen and where possible, respond. And all should seek opportunities for eliminating systemic inefficiencies and other drains on WC.

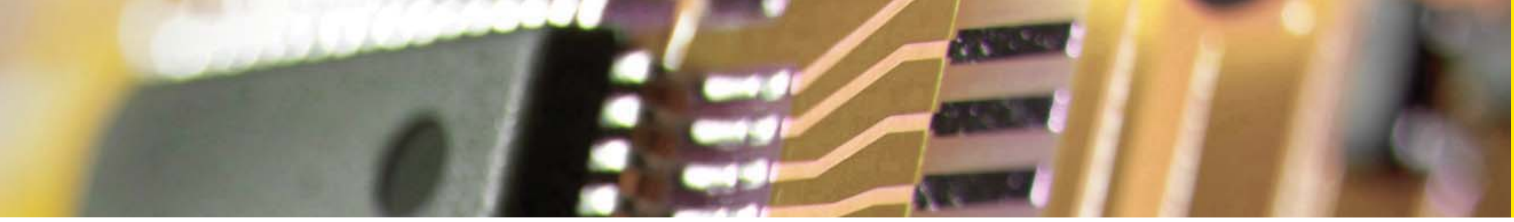
The battle over WC is fought daily

Companies tend to focus more closely on WC in the lean times. But, when matters improve, focus is diffused and inefficiency returns. Given the quick turnaround for the technology industries, that risk is particularly strong today.

Today, technology executives' focus is on ramping up production and replenishing inventories to serve growing sales. In addition, cash is plenty, accounting for about 30% of the total assets and sales of our industry sample.

There is now a danger that corporate attention will once again move away from balance sheet and WC management in particular, shifting instead toward driving revenues and the bottom line, pursuing acquisitions and returning cash to shareholders.

However, companies that allow their focus to shift in this way not only risk damaging their business performance, but they could also undermine the close business relationships and trust that they have spent many years building with customers and suppliers.



Conclusion

The industry as a whole has done well in terms of WC performance. But variations in performance demonstrate that for many, opportunities for improvement are vast. Meanwhile, amid a strengthening economy and in the presence of holding so much cash on the balance sheet, even those with impressive WC credentials are at risk of losing focus.

Companies who will excel in WC management will be those that continue to apply lean manufacturing and supply chain practices, constantly adapting structures to a rapidly evolving market. Leaders will also strive to obtain and enable increased visibility into demand through such steps as adopting common technologies to share real-time and accurate information.

Such insight can then fuel efforts to improve operational coordination between supply, planning, manufacturing, logistics and distribution functions and processes — and not merely internally, but throughout the extended enterprise. Leaders in turn will translate improvements in the above frameworks into greater optimization of payables, receivables and inventories, at all times balancing cash, cost and service levels while maintaining agility.

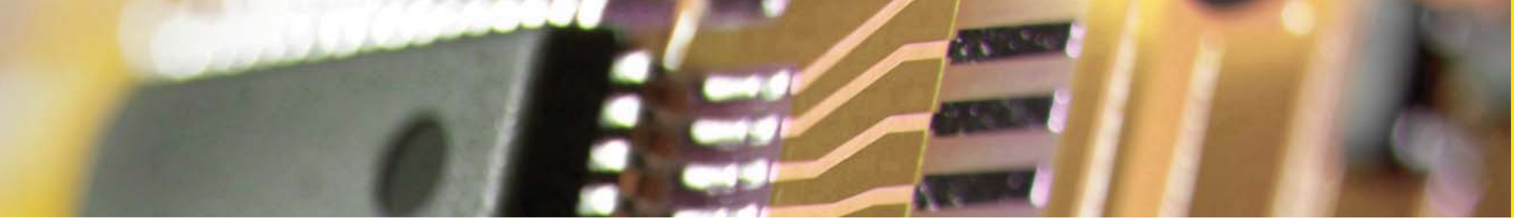
Staying on task will require management focus — a task made even more challenging amid so much cash on the balance sheet and an accelerating recovery. But with so much value at stake, no one company can afford to overlook its opportunities to enhance working capital management.

How Ernst & Young can help

To support companies in gaining greater control over their cash flows and addressing WC opportunities and challenges, Ernst & Young helps identify, evaluate and prioritize realizable improvements in WC derived from process improvements, elevated compliance levels or changes to commercial terms. We also help companies to implement these WC and cash flow improvements and realize the resulting benefits.

To help organizations make the transition to a cash-focused culture, we also help them implement the relevant metrics and identify areas for improvement in cash flow forecasting practices. We can then assist in implementing processes to improve forecasting as well as frameworks to sustain improvements.

WC improvement initiatives are often self-funding. In addition to increased levels of cash, significant cost benefits may also arise from process optimization through potentially reduced transactional and operational costs, lower levels of bad and doubtful debts, and inventory obsolescence.



Study methodology

This report relies on publicly available information to develop views on the WC performance of the 70 largest technology companies, by sales, headquartered in the US.

In addition to analysis of the industry overall, this work isolates the performance of seven specific segments. The specific companies and segmentations include:

Communications equipment (11): Adtran, Inc., ARRIS Group, Inc., Brocade Communications Systems, Inc., Ciena Corporation, Cisco Systems, Inc., JDS Uniphase Corporation, Juniper Networks, Inc., Netgear, Inc., Powerwave Technologies, Inc., Skyworks Solutions, Inc., Tellabs, Inc.

Computer equipment (9): Apple, Inc., Dell, Inc., EMC Corporation, Imation Corporation, Lexmark International, Inc., NCR Corporation, Network Appliance, Inc., Seagate Technology Plc, Western Digital Corporation

Distribution (7): Anixter International, Inc., Arrow Electronics, Inc., Avnet, Inc., Ingram Micro, Inc., ScanSource, Inc., SYNNEX Corporation, Tech Data Corporation

Diversified technology (2): Hewlett Packard Corporation, International Business Machines Corporation

(These two companies are being considered separately, as they are of similar size, operate across several segments and they feature similar WC business models.)

EMS (5): Benchmark Electronics, Inc., Flextronics International Ltd., Jabil Circuit, Inc., Plexus Corporation, Sanmina-SCI Corporation

Semiconductor components (20): Advanced Micro Devices, Inc., Altera Corporation, Analog Devices, Inc., Atmel Corporation, Broadcom Corporation, Cypress Semiconductor Corporation, Fairchild Semiconductor Corporation, Freescale Semiconductor Holdings Ltd., Intel Corporation, International Rectifier Corporation, Linear Technology Corporation, LSI Corporation, Maxim Integrated Products, Inc., Microchip Technology, Inc., Micron Technology Corporation, National Semiconductor Corporation, Nvidia Corporation, ON Semiconductor Corporation, Texas Instruments, Inc., Xilinx, Inc.

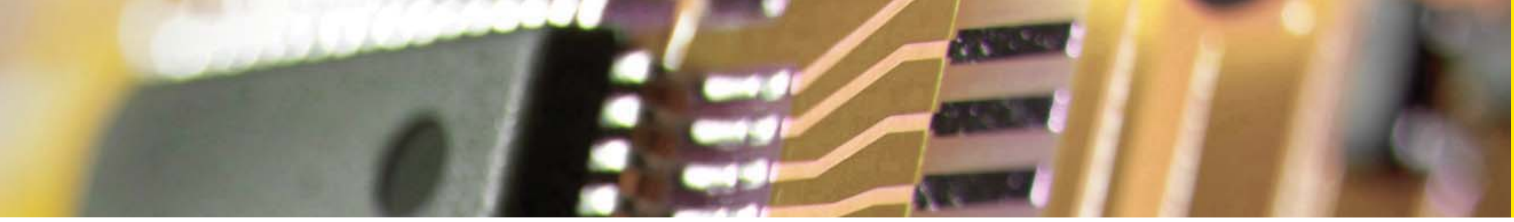
Software/IT services (16): Adobe Systems, Inc., Autodesk, Inc., Avid Technology, Inc., BMC Software, Inc., Cadence Design Systems, Inc., CSG Systems International, Inc., Intuit, Inc., McAfee, Inc., Microsoft Corporation, Oracle Corporation, Parametric Technology Corporation, Progress Software Corporation, Symantec Corporation, Tibco Software, Inc., Unisys Corporation, VMWare, Inc.

Note: Although a number of traditional technology companies are now becoming diversified technology companies, for the sake of comparison with prior studies, these have been held to their traditional segments. In a few cases, when 2002 data were not available, they have been replaced by the next release of data.

[2] Headquartered in Singapore

Glossary

- **DSO (days sales outstanding):** year-end trade receivables net of provisions, including VAT, and adding back securitized and current financial receivables, divided by full-year pro forma sales, and multiplied by 365 (expressed as a number of days of sales, unless stated otherwise)
- **DIO (days inventory outstanding):** year-end inventories net of provisions, divided by full-year pro forma sales, and multiplied by 365 (expressed as a number of days of sales, unless stated otherwise)
- **DPO (days payable outstanding):** year-end trade payables, including VAT, and adding back trade-accrued expenses, divided by full-year pro forma sales, and multiplied by 365 (expressed as a number of days of sales, unless stated otherwise)
- **C2C (cash-to-cash):** equals DSO, plus DIO, minus DPO (expressed as a number of days of sales, unless stated otherwise)
- **Pro forma sales:** reported sales net of VAT and adjusted for acquisitions and disposals when this information is available



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