

# **The Ems Market for Tier II & III Providers**

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Technology Forecasters, Inc.**

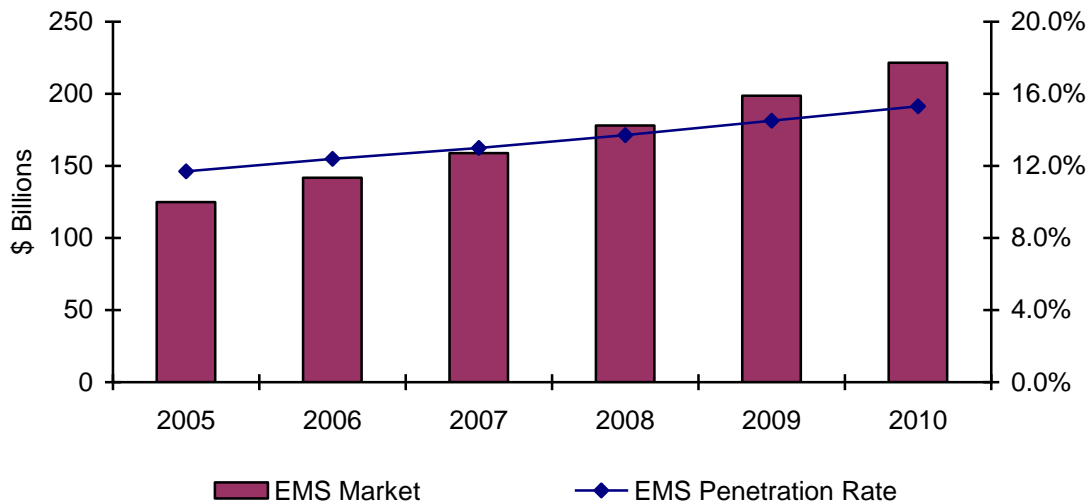
In the global Electronic Manufacturing Services (EMS) market, we constantly hear news of the major ("Big 6") players—Foxconn, Flextronics, Sanmina-SCI, Solectron, Celestica, Jabil—as well as others. But what about the remainder of this market? The portion served by those EMS companies with revenues less than \$250 million totals \$15 billion annually and is distributed among approximately 2,000 global service companies. What does the future hold for these smaller industry participants? Will they survive? Will they be gobbled up by the bigger fish? Can they compete in the mass migration of electronics manufacturing to low-cost regions? With these questions in mind, we chose to investigate this global market for smaller EMS providers.

We conducted analysis on this market and will present background, the outlook for the EMS industry, analysis of interviews with industry participants, and data to support the following conclusions:

- The global electronics COGS will continue to grow.
- Penetration of this market by EMS suppliers will continue to expand.
- There will continue to be a market place for the smaller EMS providers.
- Smaller companies demonstrated greater profitability metrics, while the larger contractors exhibited better cash management performance.
- Smaller EMS contractors are well suited for the high-mix/low-volume production contracts entailing complex technology, unpredictable fluctuating schedules, and numerous engineering changes.
- The industrial, medical, instrumentation, aerospace/defense, and high-end communications segments are typical of these product characteristics.
- Flexibility, relationship management, and level of service are the major advantages of the smaller EMS companies over their larger counterparts.
- Global supply chain management, the temptation to move to low-cost regions, price pressures, and adequate financial resources are the major challenges facing today's smaller EMS contractors.

## **Global EMS Revenue**

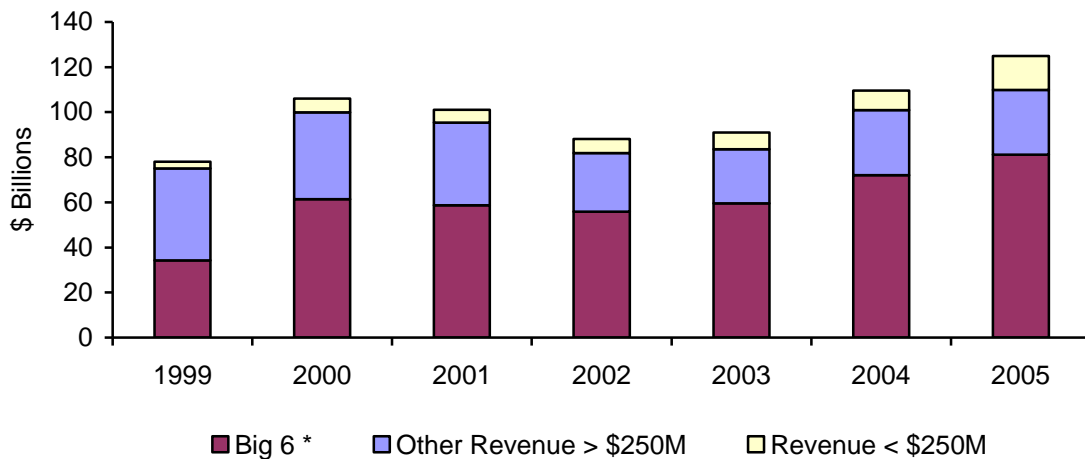
Although still facing many challenges, the worldwide EMS industry is again growing. Based on the increasing acceptance of outsourcing as a viable option for the industry, TFI projects the global market will grow at a 12% annual growth over the next five years to \$222 billion by 2010. Whereas, EMS companies now produce 12% of the world's electronic products, TFI projects this capture rate of electronics Cost of Goods Sold to increase to over 15% by 2010 (Figure 1).



Source: Technology Forecasters, Sept 2006

**Figure 1 - Global EMS Market**

This global EMS revenue is highly concentrated (Figure 2). The aforementioned “Big 6” suppliers account for about 65% of the world’s 2005 EMS revenue. In addition another 30-plus global EMS contractors with annual revenues exceeding \$250 million generated \$29 billion in total revenue. The remaining 12% is distributed among the industry’s smaller providers.



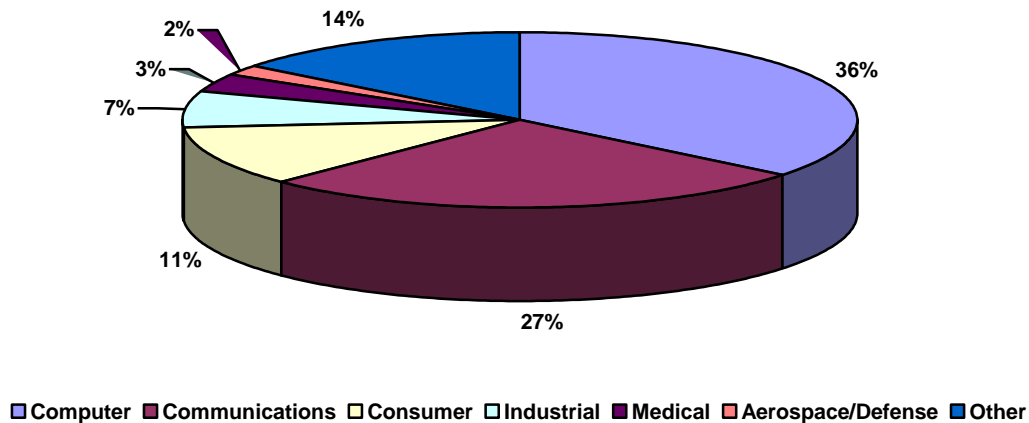
\* Big 6 includes Foxconn, Flextronics, Sanmina-SCI, Solectron, Celestica, Jabil

**Figure 2 - EMS Revenue by Company Size**

### The EMS Profile

What is the profile of these smaller contract manufacturers? How do they differ from their larger competitors? What markets and customers do they serve? What is their level of financial performance? With these questions in mind, we conducted our research and reviewed existing studies to define the current state of the market.

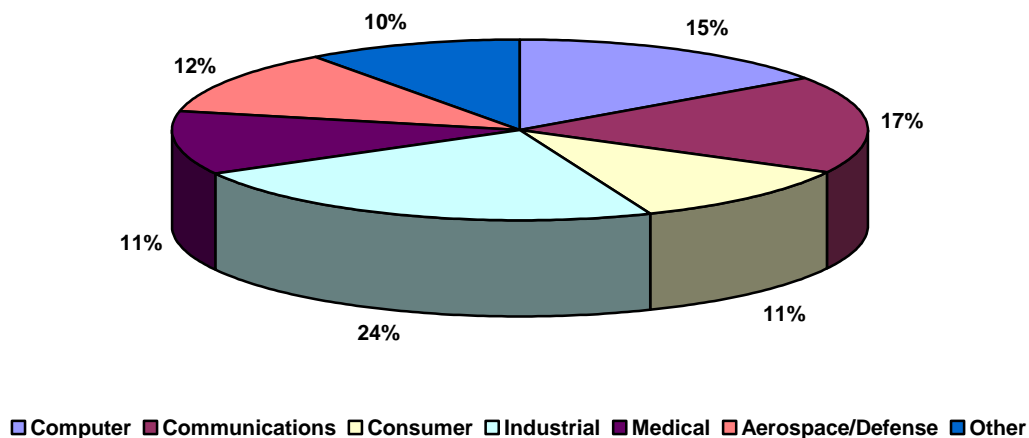
Figure 3 and Figure 4 display the difference in market segments served by the large EMS providers and the smaller companies. Whereas the larger EMS providers derive almost two-thirds of their electronics revenues from the computer and communications segments, the smaller companies serve a much more balanced market.



Source: EB 100/TFI Research

**Figure 3 - Market Distribution—EMS Providers with Revenue More than \$250M**

While the industrial, medical, and aerospace segments represent only about 12% of the revenue for large providers, these segments are the source of almost half of business for the smaller EMS players. This can easily be explained. The larger suppliers are better situated to serve the high-volume, low-mix market for products such as personal computers, printers, cell phones, and consumer electronics. Smaller companies are positioned for the highly specialized, low-volume, high-mix segments and products such as industrial controls, military electronics, medical diagnostic equipment, semiconductor capital equipment, avionics, and X-ray equipment.



Source: EB 100/TFI Research

**Figure 4 - Market Distribution—EMS Providers with Revenue Less than \$250M**

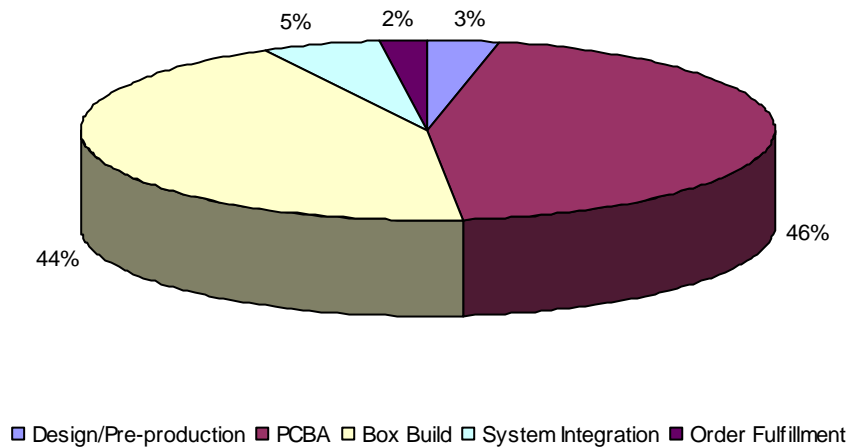
Although far less than the larger companies, the smaller contractors generated 17% of their revenue in the communications segment. Within this category are many sub sectors: networking, wired telephone communications, and the wireless electronics. Undoubtedly, the larger firms gravitate toward serving the high-volume consumer telecom market (cell phones) while the small firms, in most cases, support smaller OEMs and niche players in the communications sector. Also, many Tier I EMS companies have entered into long-term manufacturing agreements with major communications giants such as Nokia, Nortel, Lucent, Cisco, and Motorola.

To enhance business performance, the smaller EMS providers tend to gravitate to low-volume/high-mix customers. These same sectors are not as sensitive to consumer price pressure and they often provide more opportunities for enhanced returns and are frequently less penetrated. The industrial, instrumentation, medical, and aerospace/defense markets appear to be the most advantageous markets. The aforementioned markets are thought by many to be defensible niche areas of growth and profitability and are less susceptible to the movement to low-cost regions because of two inherent traits. First, many

customers prefer a supplier to be in close geographic proximity, and second these types of products have an inherent complexity of the manufacturing process that requires detailed coordination.

**EMS Service Offerings**

Our research found that 46% of the revenue of the smaller EMS players was generated through printed circuit board (PCB) assembly, 44% from box build or sub-assembly level and 7% from final assembly or system integration and order fulfillment services (Figure 5). Design services accounted for the remaining 3% of revenue. In Tier I suppliers, we are seeing a strategic effort to expand the service offering with a “womb-to-tomb” approach with expanded design through order fulfillment activities. The smaller EMS players seem to be following a similar strategy; however, there is a lag in their accomplishments in this area. One possible explanation is the expanding financial resources necessary to provide such a full-service offering.



Source: TFI Research/Analysis

**Figure 5 - Revenue by Service Offering—EMS Companies with Less than \$250M Annual Revenue**

**Relative Financial Performance**

In the 2006 *TFI Annual Productivity Benchmarking* report, the financial results for 43 publicly traded EMS companies were analyzed. Table 1 displays the definitions for the company size categories in this analysis. For this current study, we used this base data to compare the financial results for the companies of various size categories. Table 2 presents a summary of some of the key financial metrics for the size categories. Since there was such a wide range of variability within all performance categories, the median was used to portray relative performance. In general, it is evident that the larger companies show better performance in revenue growth and cash management metrics. The smaller company sample demonstrated slightly better metrics on the profitability and return measurements.

**Table 1 - EMS Size Category Definitions**

Size Category	Annual Revenue Range
1	Greater than \$2B
2	\$500M to \$2B
3	\$100M to \$500M
4	Less than \$100M

**Table 2 - EMS Industry Scorecard**

	<b>EMS Industry Median 43 Companies</b>	<b>CAT 1 Median 9 Companies</b>	<b>CAT 2 Median 6 Companies</b>	<b>CAT 3 Median 14 Companies</b>	<b>CAT 4 Median 14 Companies</b>
Revenue growth (2004 vs. 2005)	6%	10%	17%	1%	(2)%
Net profit percentage	1.3%	1.0%	2.3%	3.4%	1.2%
Return on assets	4.2%	3.5%	2.7%	6.3%	3.5%
Return on invested capital	4.8%	4.8%	3.5%	8.8%	4.0%
Inventory turns	6.6	10.7	7.5	5.4	5.1
Days sales in receivables	47	43	56	49	41
Days payables	58	66	66	57	36
Cash to cash conversion cycle	38	18	44	51	45

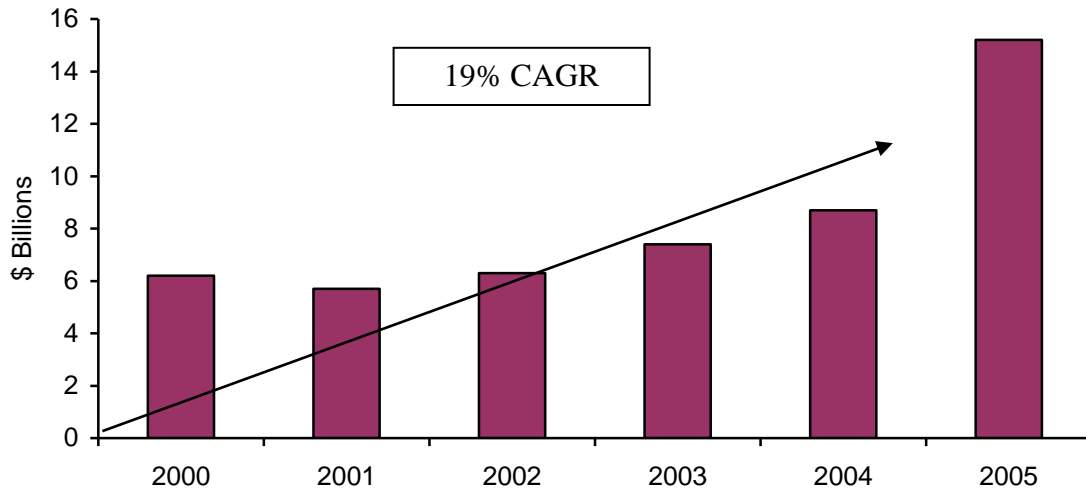
*Technology Forecasters, Inc*

No size group had what would be considered outstanding financial performance. Of the companies in our sample over 25% reported net losses, and of the 43 companies analyzed, only 7 reported a profit rate exceeding 5.0%. For these EMS providers, performance ranged from a 10.3% net profit to a (34.6) % net loss. This overall lack of profitability is again reflected in the Return on Assets and Return on Invested Capital measurements.

The Cash-to-Cash Conversion Cycle is calculated by adding the days in receivables and the days in inventory and subtracting from this the day's payables. In cash management we see a distinctly better performance metric in inventory turns for the larger EMS providers. Of course, this is directly related to these larger firms having a greater portion of their business in support of the high-volume/low-mix electronics markets such as computer systems and consumer telecommunications. We also noted an advantage in days in receivables for the larger companies. Likewise, the larger EMS providers have a longer accounts payable cycle—larger size companies can often dictate more favorable payment terms in their contracts. Taking these factors into consideration, the cash-to-cash conversion cycle for the larger EMS players is distinctly better.

### **EMS Market Growth**

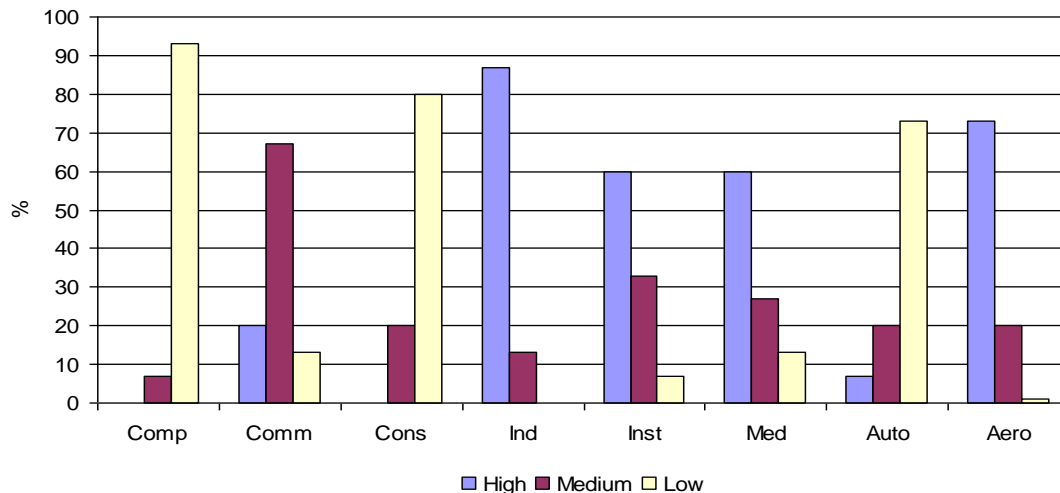
Even considering the significant depressed electronics market in 2001 through 2003, the overall EMS market has had a 3.3% annual growth rate since 2000. Looking further at the data we found a somewhat enlightening trend. During this same period, EMS companies reporting annual revenues below \$250 million reported annual growth of 19% (see Figure 6) from \$6.2 billion in 2000 to \$15.2 billion in 2005. These smaller companies' revenues were less affected by the aforementioned 2001–2003 market slump, undoubtedly due to the smaller companies being less dependent on the volatile telecommunications and computer market segments. During this period, although down, the industrial, medical, and aerospace/defense markets proved not to be as volatile.



**Figure 6 - EMS Revenue for Smaller EMS Companies**

#### Attractiveness of Market Segments

To supplement our market and financial analysis, we interviewed executives with 15 smaller EMS providers to get their perspective on the current market. In our interaction with these EMS participants, we questioned which segments were attractive targets for their market engagement. We asked survey participants to rate the attractiveness of eight key electronics segments to the smaller EMS contractors. Results are displayed in Figure 7.



**Figure 7 - Attractiveness of Sectors to Smaller EMS Contractors**

Mirroring our findings in the actual revenue distribution, the industrial, medical, aerospace/defense, and instrumentation sectors were identified as most desirable. The attractiveness of these segments was typified by their production being of a more high-mix, low-volume nature, the products themselves being somewhat more complex and containing significant intellectual property, and the production of these items being less susceptible to the lure of the low-cost manufacturing regions of the world.

For the communications sector, the opinions were mixed. Many felt the area offered opportunities for the smaller market participants if they focused on the higher end and emerging technology. The high-volume and consumer-type products should be left for the major Tier I suppliers.

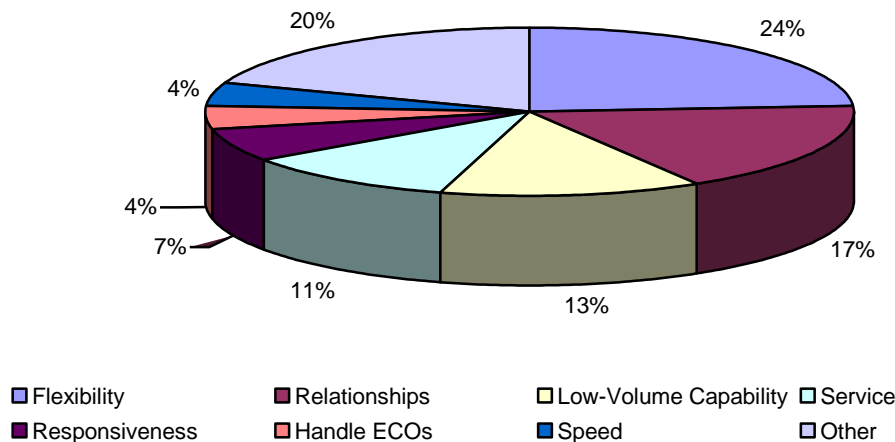
The conscientious opinion was that the computer and consumer segments were not attractive—no survey response rated them highly attractive. This is mainly due to the high-volume, price-sensitive nature of products in this arena. Likewise these are

logical targets for the Tier I EMS companies. For the most part, the computer products are commodity-type products in high volume requiring a low-cost model, best suited for offshore production.

The automotive sector was also thought to be less desirable. Very few of the participating executives felt automotive was highly attractive. This was attributed again to cost pressures and the reputed difficulty in dealing with the automotive industry OEMs.

**Advantages of Using Smaller EMS Providers**

Keeping in mind these critical factors for OEMs, we asked the surveyed executives what advantages they offer customers over their larger counterparts. Greater flexibility and a higher level of custom service were the two most-cited factors (Figure 8). They also indicated they feel they develop a better working relationship with smaller OEMs and have a better understanding of their business needs.

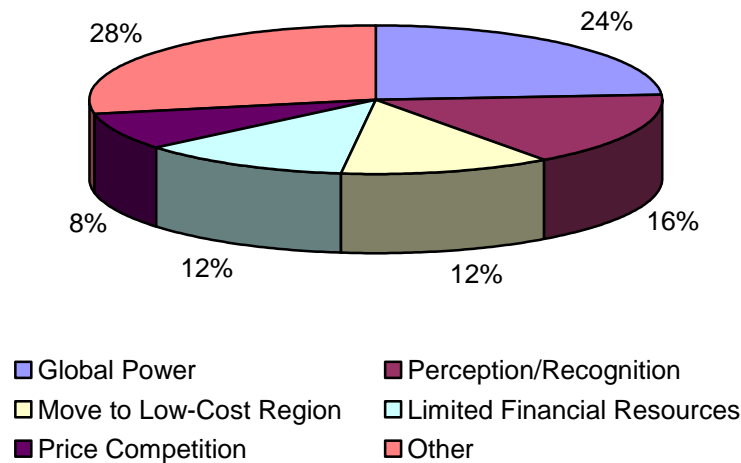


**Figure 8 - EMS Perspective on Advantages of Dealing with a Small Supplier**

Another advantage noted is that the smaller companies are often more suited to serve the sectors that offer higher margin opportunities. Smaller providers are more suited on serving these smaller sectors that require high-mix/low-volume production with many engineering changes.

**Challenges for the Smaller EMS Suppliers**

We asked the smaller companies what they felt were the major challenges they faced in competing for business in the EMS market. Figure 9 displays the results of these answers. The worldwide power of the larger players, including global purchasing power and facilities in low-cost regions was the most significant challenge noted. In contrast to the big EMS providers who buy billions of dollars of electronics annually, the small players are at a distinct disadvantage in negotiating the lowest prices or securing allocations on scarce components. Our surveyed executives also felt they lacked the name recognition and prestige of the larger players, which could have a detrimental impact on their ability to engage with new customers. In addition, financial issues, in the form of price competition and the lack of the financial resources to pursue new opportunities were also noted.

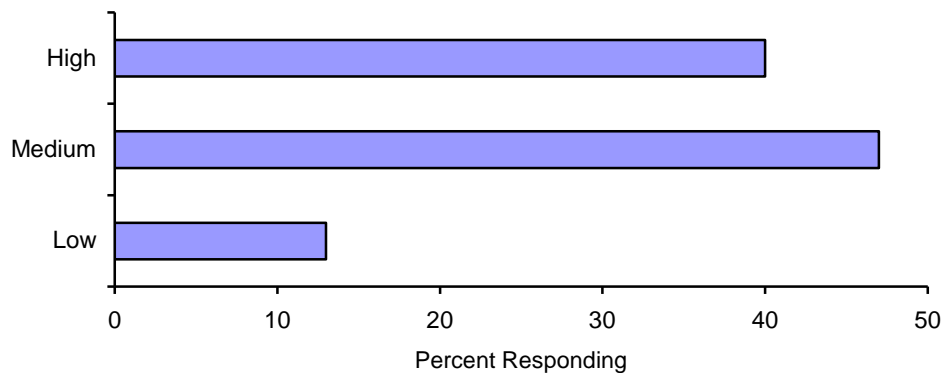


**Figure 9 - Challenges Facing Smaller EMS Providers**

### The Impact of Low-cost Regions

The growing temptation of OEMs to move electronic production to low-cost regions is emerging as a significant challenge. The “China Syndrome” presents an increasing challenge for the small and mid-tier EMS suppliers. By the year 2010, over half of global EMS production will be in Asia. Many smaller EMS manufacturers feel that, although a major market exists in China, they are not able to effectively compete with the large Tier I players in this geography. The slowing domestic market and Chinese competition could limit the growth opportunities for many smaller EMS participants.

We asked the EMS companies what was the impact on their business of the OEMs desire to move to low-cost regions (LCR). The responses indicated this was a medium to high challenge based on the individual company (Figure 10).



**Figure 10 - What Impact is the OEM Desire for Low-Cost Regions Having on Your Business?**

How are the contractors responding to this geographic shift of electronic manufacturing? Many indicated a move into Asia, either through expansion or alliances, to offer their customers a low-cost market solution. However, many smaller EMS providers are recognizing this challenge by redefining their marketing strategy focusing on segments that are not as susceptible to the allure of low-cost regions.

But maybe the OEMs are becoming smarter in their outsourcing decisions related to low-cost regions. Small domestic EMS providers that help their customers truly understand the total cost of ownership may be able to counter this “rush to judgment”.

Initially it was difficult for a lower tier EMS provider to win business with many OEMs that were “following the herd” in outsourcing offshore strictly based on pricing criteria....Many OEMs have had negative experiences with the drawbacks of outsourcing product that did not “fit” the offshore model—or becoming a “small fish in a very big pond” when placing lower value business with Tier I EMS providers.



Many of the OEMs have begun re-evaluating their outsourcing model in favor of smaller, capable domestic EMS providers that can provide competitive pricing in the U.S. This is especially true with OEMs that can accurately track their total cost of product acquisition, such as accounting for inventory costs, IP costs, transit times as it impacts inventory, and lost sales opportunities. Many have discovered that, even with a slightly higher price, lower tier EMS provider can actually provide outsourced product at a lower overall cost of acquisition.

As an interesting note: in a study in 2005, Technology Forecasters discovered one of the advantages Chinese EMS providers had over their Western counterparts, was their willingness to accept small-lot, low-volume/high-mix, production contracts. As the smaller tier offshore organizations expand, this could be a significant factor in their growth in the global market.

### **Strategies for Small EMS Providers**

For any EMS provider to attain an acceptable level of customer satisfaction, they must maintain a focus on delivering a quality product, in a timely manner, and at a competitive price. Flexibility, responsiveness, communication, global supply chain management and customer service are factors in selection and retention of an EMS supplier. For every member of the supply chain, clear communication about needs and requirements is critical. Only through open and honest dialog can we gain the benefit of understanding the technical and business issues facing each of us in the current global market. We must all develop a higher level of trust, communication, and cooperation.

As this EMS market expands, smaller EMS companies should consider the following strategies to position themselves for this market expansion.

- Identify your niche market.
- Demonstrate agility, flexibility, and responsiveness.
- Ensure that your marketing and selling strategies address the customers' needs.
- Emphasize experience with similar products to your target markets.
- Execute a system of regularly surveying your clientele.
- Counter the OEMs pursuit for low-cost regions with strategic actions.
- Enhance the financial metrics by concentration on cash management techniques.

From our analysis, we firmly believe there is a future in the EMS industry for small, niche-specific contractors. The industrial, medical, aerospace/defense, instrumentation, and high-end communications segments will offer the most opportunities to these companies. Traditional strengths of the smaller EMS contractors are focus, agility, and flexibility. These factors allow greater attention for every customer regardless of their size. However, these opportunities are not without major challenges such as participating on a global basis and having the financial resources to contend.



**TECHNOLOGY FORECASTERS INC.**

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**IPC Printed Circuits Expo, APEX and the Designers Summit  
Los Angeles, CA  
February 21, 2007**

**Charles W. Wade**



**TECHNOLOGY FORECASTERS INC.**

**Technology Forecasters, Inc.**  
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- A market analysis and strategy consultancy for
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- Numerous industry contacts who respect TFI as objective 3rd party
- Consultants with extensive experience with OEMs, EMS, ODM, and supply chain members

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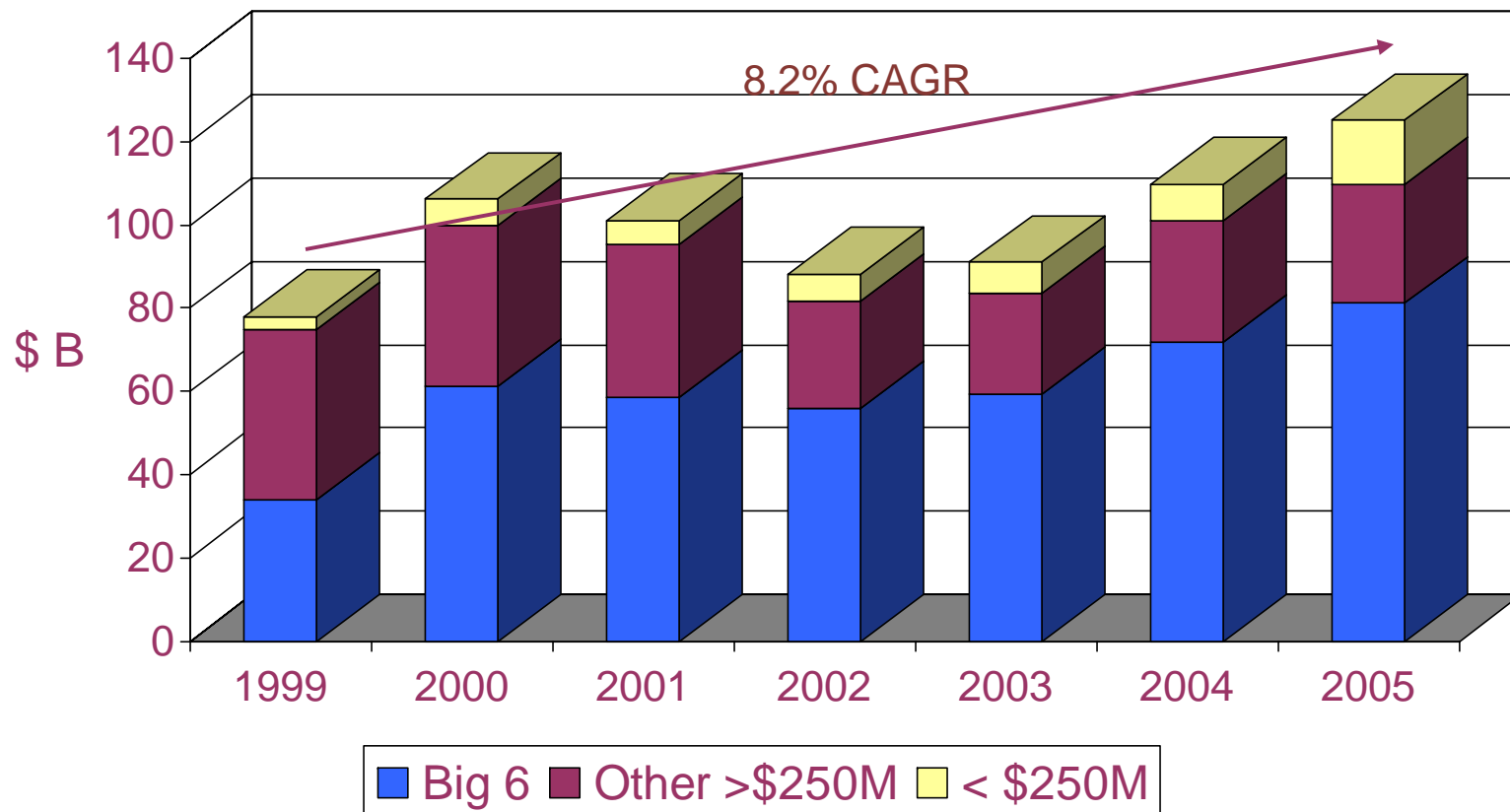
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# Technology Forecasters Study



- *“A Niche for All”: A Review of the EMS Market for Providers with Annual Revenue Below \$250 Million*
- Interviews with executives of 16 Tier II & III EMS providers conducted to discuss key issues and trends in outsourcing related to smaller firms
- Financial data updated to reflect Technology Forecasters EMS/ODM 2006 Forecast Update, and 2006 Annual Benchmarking of EMS and ODM Companies

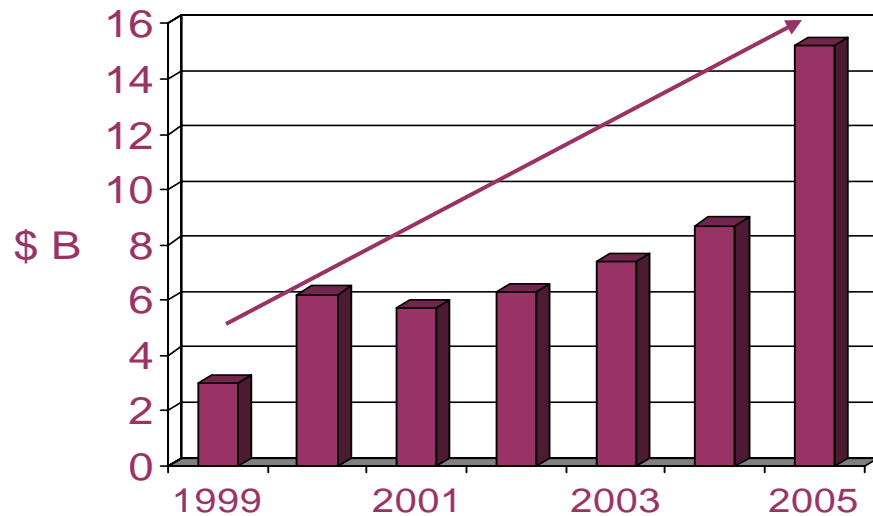
# The global EMS market is stratified



“Big 6” – Foxconn, Flextronics, Sanmina-SCI, Solelectron, Celestica, Jabil

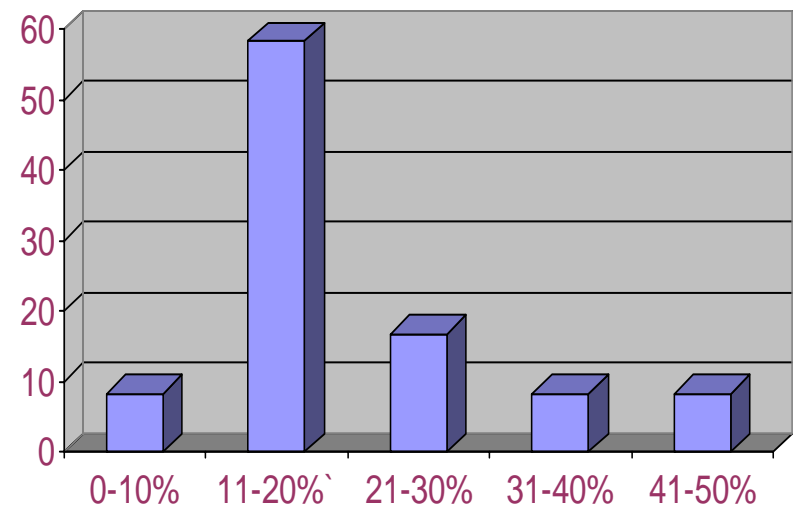
# There is a place for the smaller EMS contractors!

Revenue  
EMS Providers <\$250M



31% CAGR

Interviewed EMS Companies  
Projected 3-Year Growth



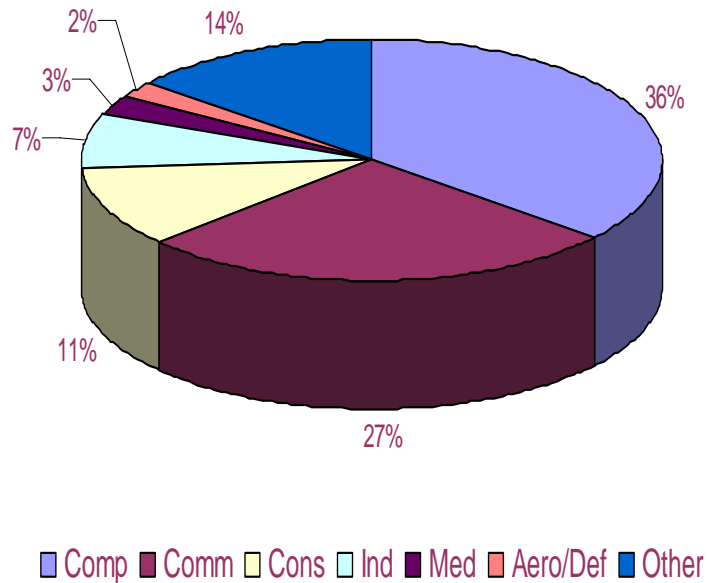
Average 22%

## Unique products provide a profitable niche for smaller EMS providers

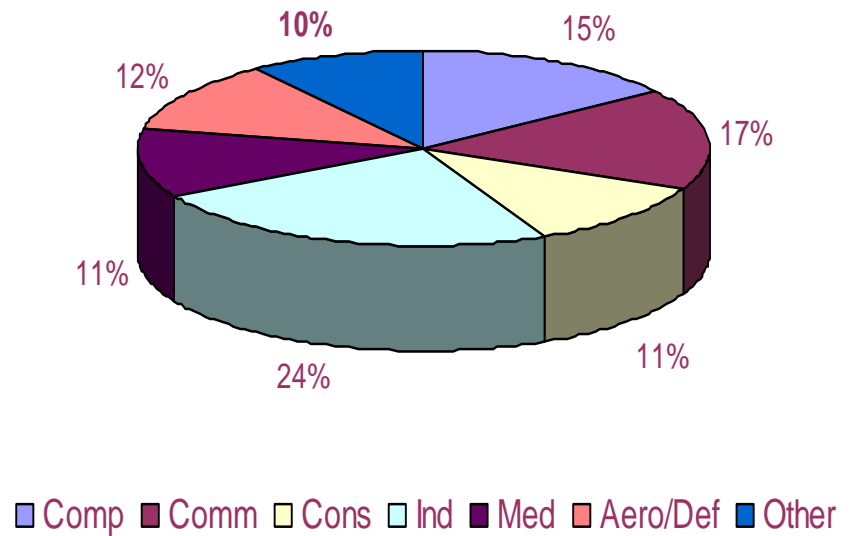
- Products with low-mid volume/high-mix
  - Target segments are less margin sensitive
  - Often a need for domestic or local supplier
  - Products technically complex with high IP content
  - Frequently a necessity for specialized processes and certifications
  - Production encounters a high level of engineering change
-

# Small EMS providers serve a much more diverse market

## Large EMS Suppliers



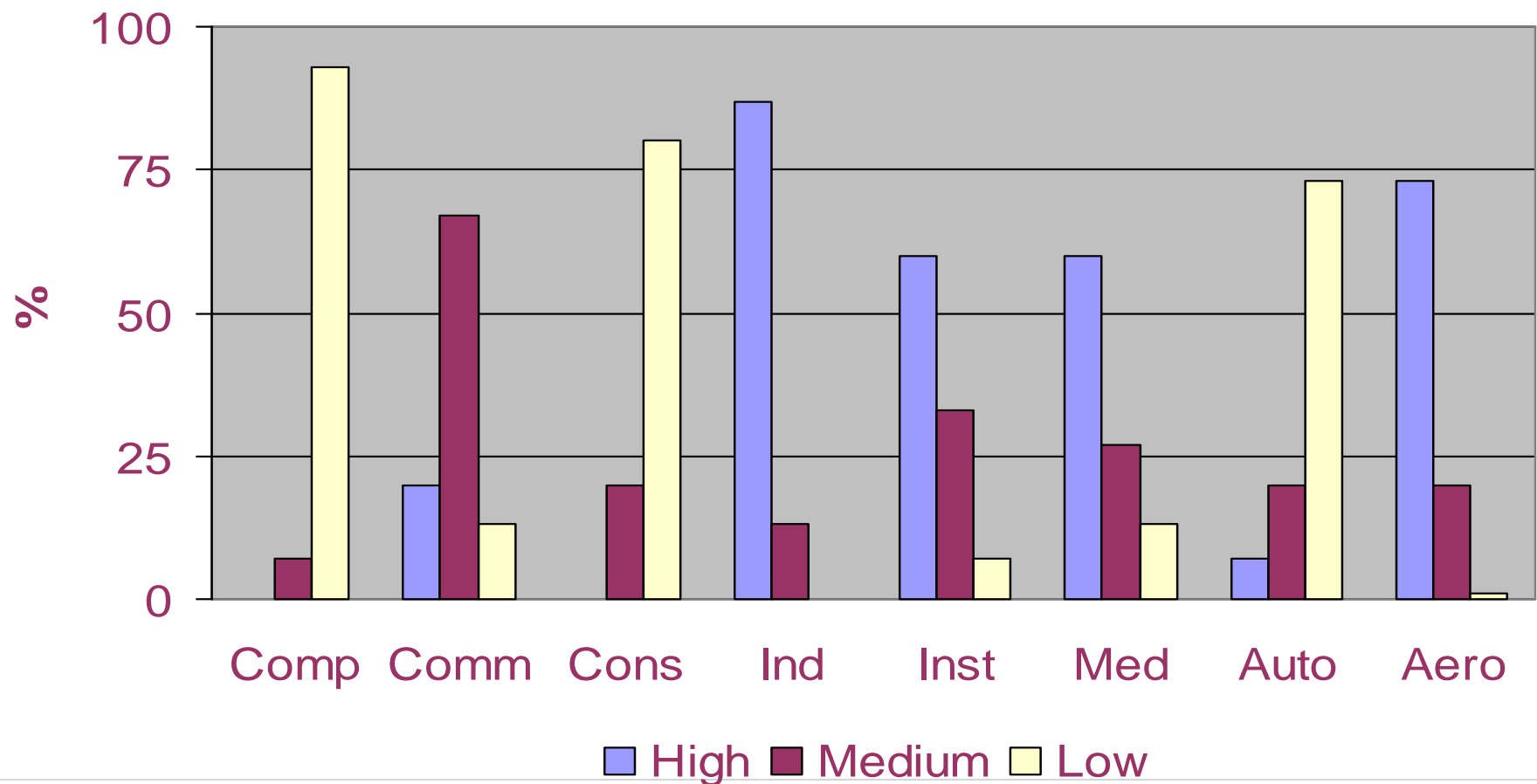
## Small EMS Suppliers



Source: *EB* Top 100 CM/TFI analysis



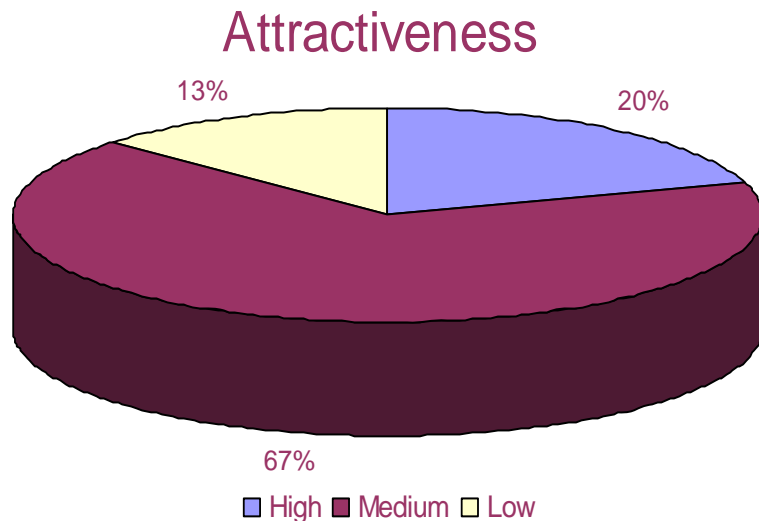
## Industrial, aerospace/defense, medical & instrumentation are most attractive for smaller players



For these segments TAM growth is average, but  
EMS penetration is lower

Segment	2005-2010 TAM CAGR	2005 EMS Penetration	2010 EMS Penetration
Industrial	6.2%	6.9%	7.6%
Medical	7.9%	11.2%	14.1%
Instrumentation	5.1%	6.8%	7.5%
Aerospace/Defense	7.0%	3.1%	3.6%
<b>Total Electronics</b>	<b>6.3%</b>	<b>11.7%</b>	<b>15.3%</b>

# The communications market was a mixed picture

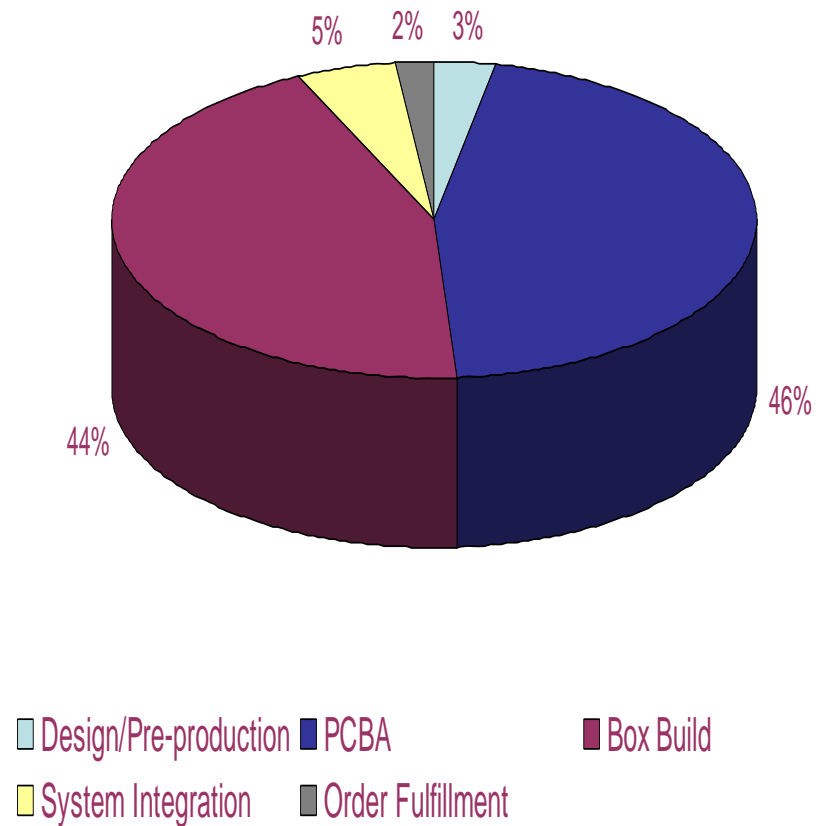
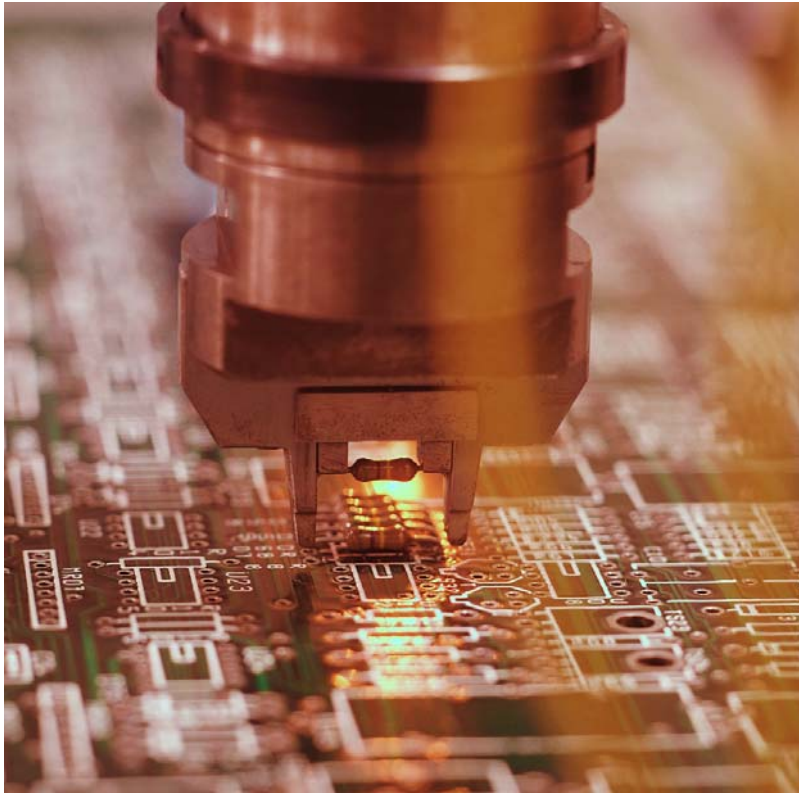


*“There is opportunity in the communications market as long as the smaller EMS provider remains focused at the high end of the market where electronic content is greater, IP is important, and the requirement for quality and service is high.”*

# Computer, consumer, and automotive are less desirable

- *“Computer products are commodity type products in high volume requiring a low-cost model; best suited for off-shore production.”*
  - *“The mainstream consumer markets have become “commodities” - Lower Tier EMS providers cannot compete.”*
  - *“Automotive is entirely too price sensitive; the relationships are more master/slave.”*
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## Services offerings of smaller EMS contractors is varied

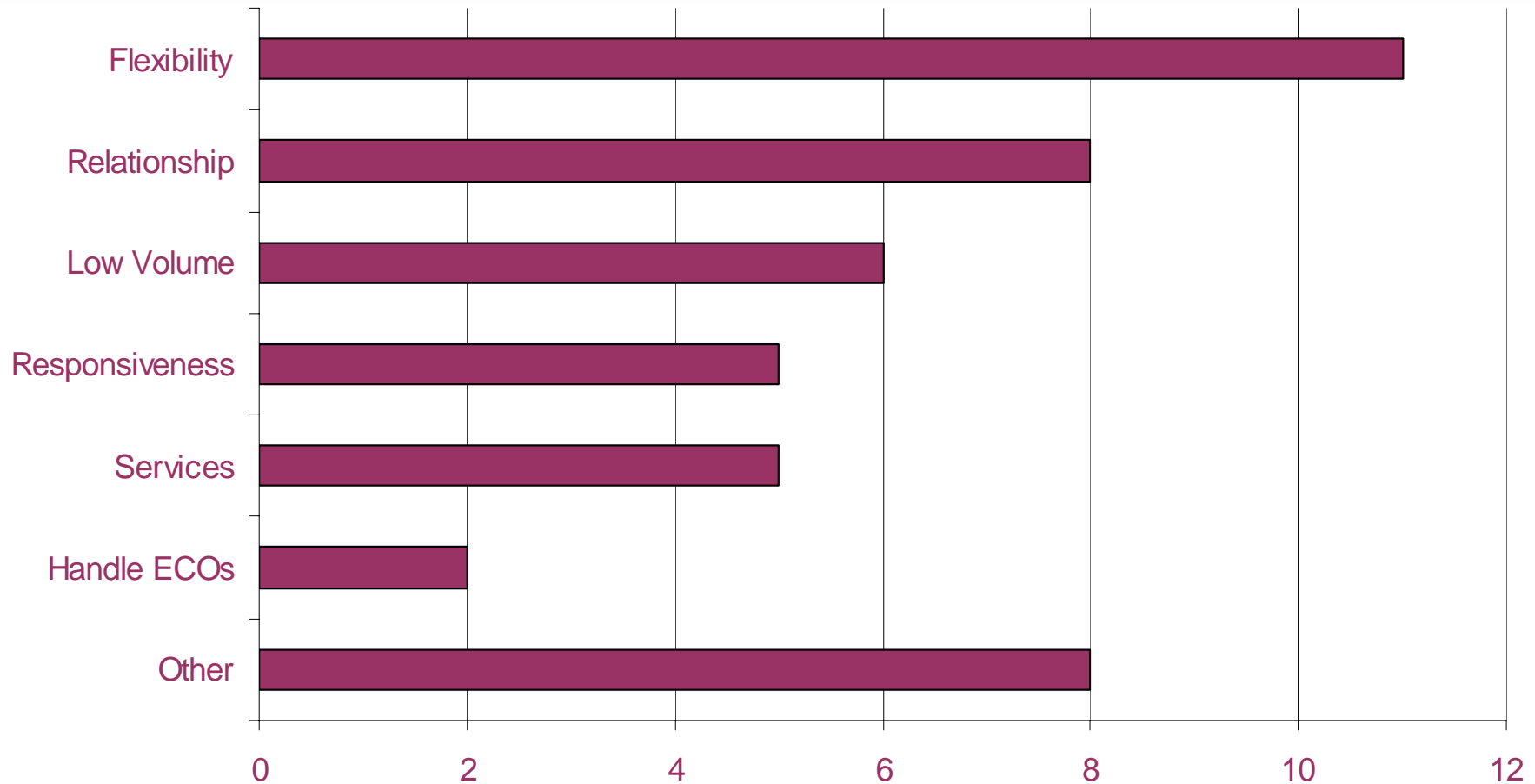


## Larger firms better at cash management; smaller ones more profitable

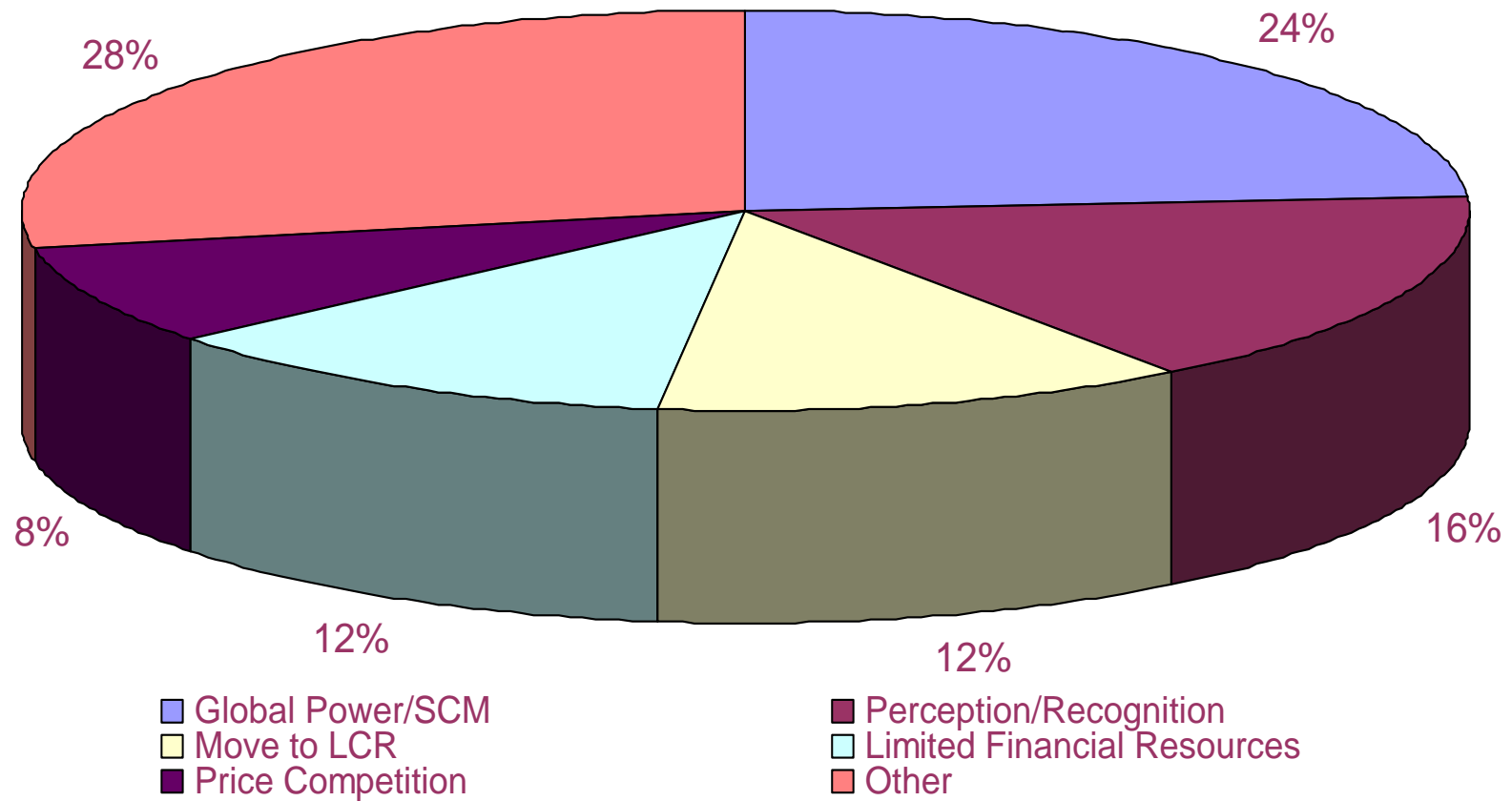
Metric (Number in sample)	Industry (43)	Cat 1 (9)	Cat 2 (6)	Cat 3 (14)	Cat 4 (14)
Net Profit Percentage	1.3%	1.0%	2.3%	3.4%	1.2%
Return on Assets	4.2%	3.5%	2.7%	6.3%	3.5%
Return on Invested Capital	4.8%	4.8%	3.5%	8.8%	4.0%
Inventory Turns	6.6	10.7	7.5	5.4	5.1
Days sales in receivables	47	43	56	49	41
Days payables	58	66	66	57	36
Cash to cash conversion Cycle	38	18	44	51	45

Cat 1 – Greater than \$2B/Cat 2 - \$500M to \$2B/Cat 3 - \$100M to \$500M/Cat 4 – Less than \$100

## There are distinct advantages of working with smaller EMS providers



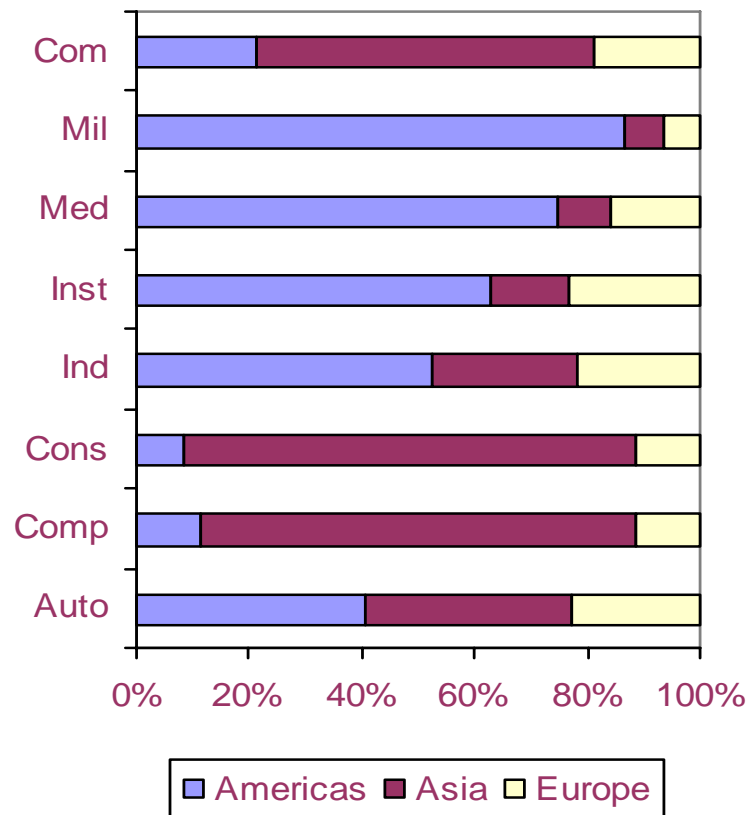
## Smaller EMS companies face many challenges



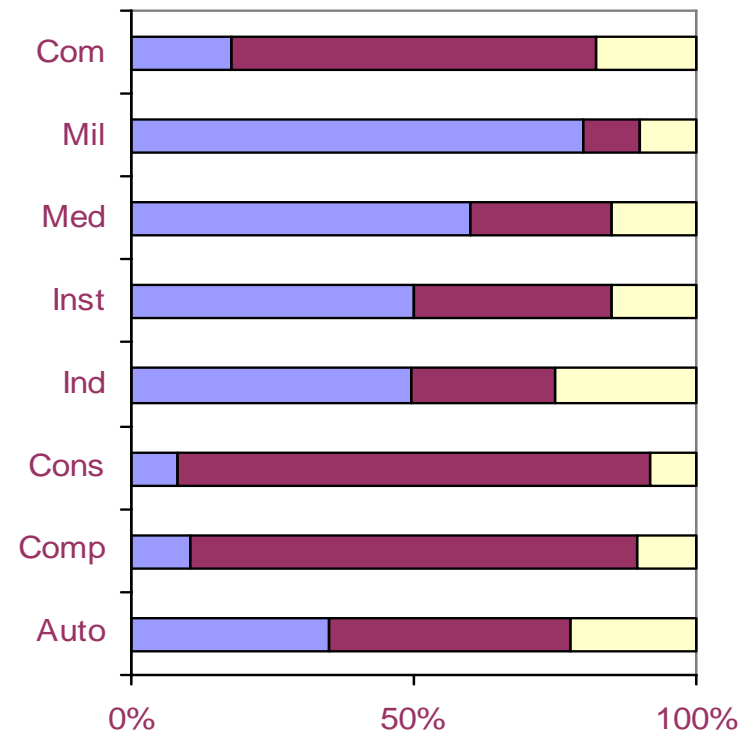


# The Outsourcing Market by Region

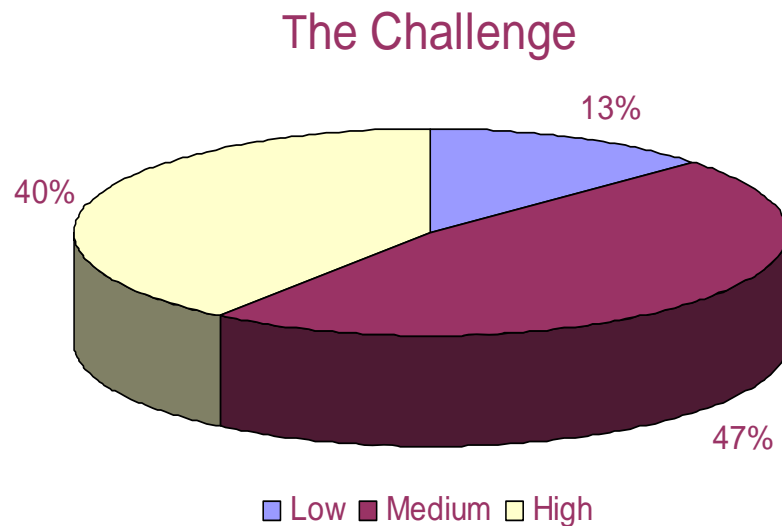
2005



2010



# The OEMs desire for Low Cost Regions is a major challenge



- Smaller EMS Strategies

- If you can't beat 'em, join 'em!
- “China Proof” the targets
- Educate OEMs in evaluating total cost

# EMS Recommendations

- Identify and target your niche market
  - Evaluate your internal capabilities that are suitable for serving target OEMs
  - Set strategies to meet customer's future needs
  - Emphasize experience with similar products
  - Counter OEMs pursuit of low cost regions
  - Improve cash management techniques
-

## OEM Recommendations

- Determine processes that can be outsourced
  - Refine the selection criteria for EMS partners
  - Evaluate on total product cost when making your outsourcing decision
  - Consider the advantages of working with a smaller EMS provider
  - Provide market information and demand forecast with your suppliers
-

# Resources from Technology Forecasters

- Quarterly Forum for Electronics Manufacturing Outsourcing and Supply Chain
- Outsourcing Navigator Workshop
- Reports
  - *2006 EMS/ODM 5-Year Forecast Update*
  - *Annual Benchmarking of EMS and ODM Companies - 2006*
  - *EMS/ODM Report Card and Buyers' Guide*
  - *"A Niche For All": A Review of the EMS Market for Providers with Annual Revenue Below \$250 Million*
  - *Manufacturing Migration: Which Geographies are Winning/Losing and Why?*



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*From the entire team at*  
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**Thank you!**



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