

Don't Settle for Less: Resale Values from Retired IT Assets – First Annual Update

The first annual update to data collection and analysis of the secondary market for refurbished desktop computers and laptops

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May 9, 2008

Executive Summary

In May, 2007, Cascade analyzed resale values and trends for more than 60,000 desktop and laptop computers it tested, cleaned, repaired and/or refurbished for resale and reuse over the past four years. This report adds data from an additional year from about 20,000 more devices and examines changes in the marketplace during that time.

More than 85% of Cascade's resold equipment is generated by Fortune 1000 companies with 3-4 year refresh cycles. The data revealed that resale prices for these items dropped at an average monthly rate of 2.02%; far below the commonly cited monthly depreciation rate of 6-10%, but a 7% faster monthly decline compared to the findings from last year's research. Overall, prices paid for the average retired desktop computer fell during the past year, primarily due to a greater mix of older equipment sold in the secondary market. This paper also demonstrates how a company with a consistent three year refresh of its equipment actually saw the resale price of its laptops rise over time. The information presented in this White Paper offers useful benchmarking data for enterprises embarking on IT asset retirement management and helps to establish the value to be gained through active planning in responsible IT asset disposition.

Keywords:

IT Asset Disposition (ITAD), IT Asset Management (ITAM), IT Asset Retirement (ITAR), Investment Recovery, Refurbishing, Resale Values

Resale values for used computer equipment decline every year. It is the obvious result of supply and demand as well as the availability of more recent equipment on the market placing downward price pressure on the resale value of older equipment.

Computer manufacturers also experience price pressures on the sale of their new equipment. Prior to 2000, the typical consumer desktop PC fetched a retail price of about \$1,000. Now, cutting edge computers targeted for home use are selling for less than half that price.

Several industry research groups (Gartner, Aberdeen and International Data Corporation) contend the value of used computer equipment declines at a rate of 6 to 10% per month. Given a compound depreciation rate of 6% a month, these groups

assert you would find your computer to be worth half its value if you wait one year to sell it.

Cascade Asset Management (Cascade) sells thousands of computing devices each month on the open market through both the direct sale of equipment to end users as well as a variety of channels including value added resellers and retailers around the world. As a result, we can provide actual data from equipment we collect and process for our customers. When examining sales data on some of the most common items handled over the years, we are able to define specific benchmarks for the used computer resale market which can help corporations and institutions maximize the value of their equipment through its retirement.

Last year, Cascade published a White Paper (“Don’t Settle for Less”, May 8, 2007) to compare the declarations of these industry groups with its own resale data. Information was evaluated on 53,382 desktop computers and 9,938 laptop computers Cascade received from its customers and resold, in whole, for reuse during the period from the 4th Quarter of 2003 through the 1st Quarter of 2007. Our actual resale data indicated an average monthly resale price reduction of just below 2% per month, far less than the range reported by other industry groups.

Cascade continues to process desktop and laptop equipment. The current edition includes resale data from the 2nd Quarter of 2007 through the 1st Quarter of 2008. A total of 79,960 desktop and laptop computers were evaluated from October, 2003 to March, 2008.

Data Collection Methodology

Cascade’s customer base consists of Fortune 1000 companies from throughout North America with three to five year refresh cycles (contributing more than 85% of all resellable items), as well as government institutions, municipalities, and small and medium sized businesses located near our Wisconsin and Indiana processing facilities.

Cascade collects a wide range of information technology assets, including personal computers and peripherals, as well as many other consumer electronics. The company sorts, inventories and triages equipment to process for refurbishing and reuse or demanufacturing and recycling. Trained A+ technicians electronically remove all data from storage devices using a software overwrite tool. Each unit undergoes an inspection for cosmetic and operational deficiencies. Simple repairs and cleaning are performed on equipment to ensure resold items meet minimum quality requirements for performance and condition. Items are resold by Cascade staff through resale channels including:

- § Direct sale through on-line store to employees of customers;
- § On-line auctions, such as eBay;
- § Direct sale to businesses, schools and institutions in the United States and abroad; and,
- § Direct sale to domestic and international resellers and retailers.

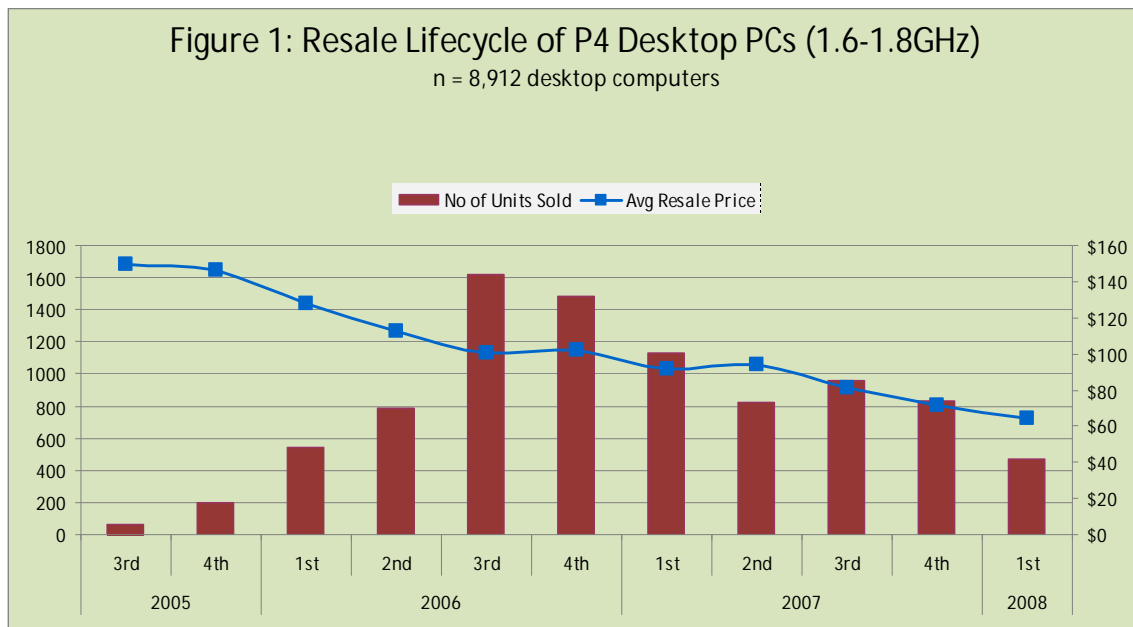
Cascade only resells functioning equipment that is not obsolete (generally, less than five years old.) All items are sold with a 30 day warranty and include technical support. The

resale values earned by Cascade typically track closely with the Orion Blue Book resale prices for refurbished equipment and often yield 20% - 50% greater values than when firms manage their own sale of used equipment through bidding programs.

The data used in this report were extracted from all resale activity for desktop computers and laptop computers resold by Cascade from October, 2003 through the March, 2008. Cascade retains comprehensive information on the configuration of each item it resells, including manufacturer, processor speed, memory size, chipsets, etc. For the purpose of this analysis, we reviewed processor type and speed and the price paid to Cascade for each item. Cascade shares a portion of this resale price with its customers. This “rebate” revenue sharing model is typical in the IT asset retirement industry.

The Resale Lifecycle of Computers

The typical resale lifecycle for computers can be described by analyzing two variables—the average resale price of a particular type of computing device sold during a given period (we evaluated sales on a quarterly basis) and the number of units sold during that period. Over time, resale values decline, as is expected. In addition, the typical quantity of a given generation of a computing device turned into Cascade for processing follows a bell curve. We find a few customers who refresh equipment earlier in its lifecycle and some others wait years later to turn over the same generation of IT equipment, with the bulk of users turning in their devices in the middle of the resale lifecycle.



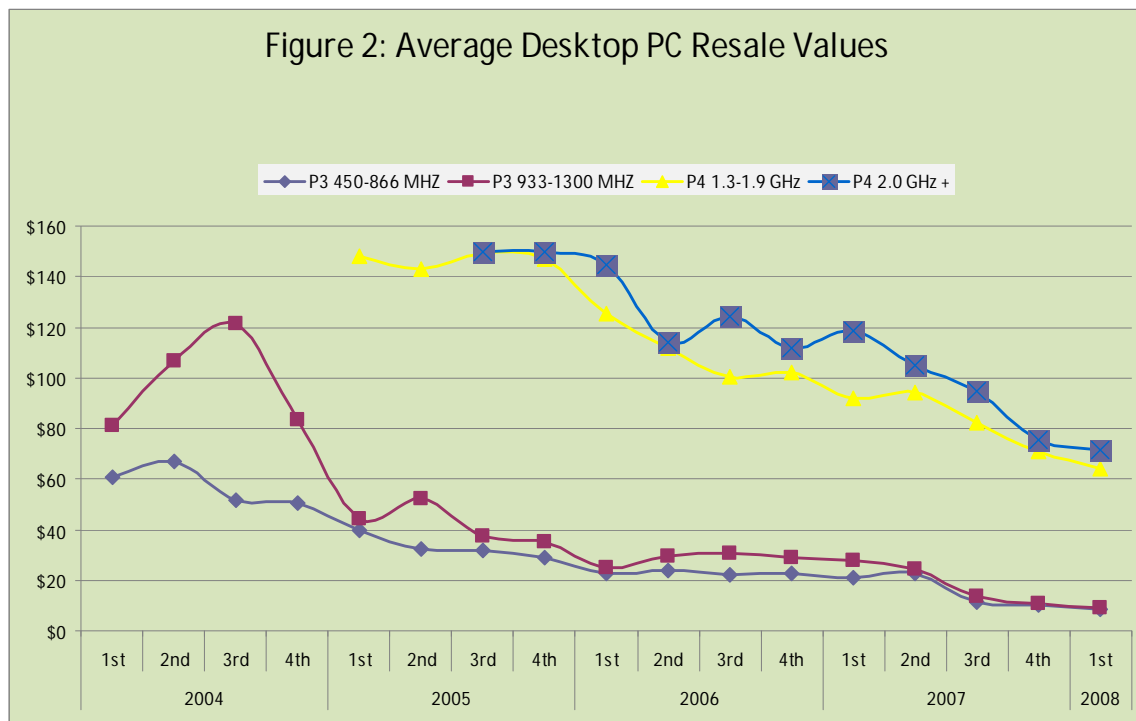
One example of these trends can be observed in the resale lifecycle of Pentium 4 (1.6 GHz – 1.8 GHz) desktop computers processed and resold by Cascade. These units first trickled into Cascade’s processing centers in the second quarter of 2004 (typically as damaged units needing to be replaced) and started to arrive in more significant numbers by the first quarter of 2006. Figure 1 charts the receipt of this generation of PC. The number of units resold peaked by the third quarter of 2006 and continues to decline as newer models are entering the resale market. Over the course of the 21 months

between the summer of 2006 and the winter of 2008, the average resale price Cascade was paid for its P4 1.6 – 1.8 GHz computers dropped from \$100 to \$65 each; a decrease of about 35% or about 2.4% per month.

Looking more carefully at the drops in price over certain periods, we find that the greatest value decrease for these desktops occurred in the first year Cascade began processing them; a 3.2% monthly decline. With many of these P4's purchased in 2002, those companies following a three year refresh cycle for this generation of computers realized a 33% better return on their investment through resale recovery than if they held onto that unit for an additional year. The total life cycle cost for extending the refresh cycle for computers from three to four years is really even higher, as maintenance and service costs increase to support an older installed base.

Loss in Value During the IT Asset Retirement Lifecycle

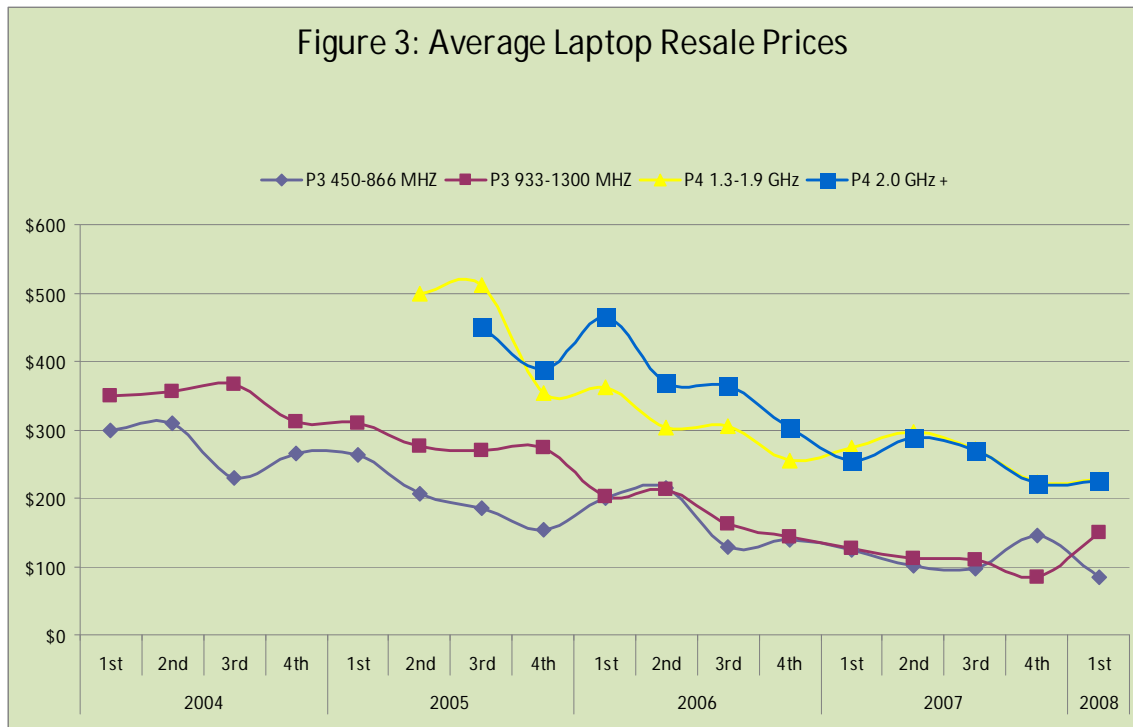
When analyzing other generations of desktop and laptop computers, we discovered similar price declines and resale lifecycles. Figure 2 illustrates the price drops in four generations of desktop computers. In general, we find prices received for desktops plateau toward the end of their resale lifecycle, with more significant price drops realized earlier in its resale lifecycle. We believe the peak in the resale values of the P3 933 MHz machines is due to a relatively small sample size of equipment being sold, thus we commanded higher prices by channeling these items through retail markets.



We also find some seasonality in our resale of equipment with sales dipping in the first quarter of every year and inching up or flattening during the 2nd and 3rd quarter.. These

market prices mimic the values retailers see for new equipment as the first quarter is typically the worst period for revenue for consumer electronics.

The laptop market is similar to the desktop market, though resale values are much higher. Figure 3 plots Cascade’s resale value of four generations of laptops. One difference from the desktop market is that seasonality is less predictable based on this group of equipment. There was also a change in our findings from a year ago, whereby resale prices continued to decline. Over the past year, laptop values for all categories have actually remained flat. We believe there is a strong shift in demand in the market towards more laptop computers. In addition, it is less costly to ship laptops to buyers. Since Cascade buyers cover freight and must absorb rising fuel costs, laptops earn a preference over bulkier desktops.



Resale Prices Not Falling as Fast as Expected – for Now

When analyzing the average resale prices of more than 80,000 desktops and laptops sold over a four and a half year period, we find price drops lower than what has come to be expected. As noted earlier, several market research groups indicated that resale values of used equipment typically depreciate at a rate of 6-10% per month, or 52-72% per year. Table 1 provides the depreciation rates for items during their first year being handled by Cascade, as well as during the second and third years, if they have been around that long. On average, we find the resale price on reusable equipment drops about 25% during the first year. For some of the newer laptops, prices are dropping faster than in the past.

Last year’s data revealed an average monthly price drop for these systems at 1.88%. When data from the past twelve months is included, the average price drop increased by

7% to 2.02% per month. This price drop is mainly due to a falloff in desktop values in the past three quarters.

While we found the loss in value from waiting to retire and resell a surplus computer is not as dramatic as earlier reported, the loss in value is still significant. When a company considers the total cost of ownership (TCO) of its personal computers, the potential recovery value from the final disposition of those items plays an important role. Even more significant savings in TCO are realized when shortening the refresh cycle of computers due to reduced support costs for maintenance and service during extended periods of use past warranty.

Table 1: Resale Value Depreciation of Used IT Assets

Item Description	1st year price drop		2nd year price drop		3rd year price drop	
	annual rate	monthly avg	annual rate	monthly avg	annual rate	monthly avg.
Laptops						
P3 450-866 MHz	12%	0.96%	24%	1.92%	37%	2.96%
P3 933-1300 MHz	12%	0.96%	34%	2.72%	38%	3.04%
P4 1.3 - 1.9 GHz	39%	3.12%	2%	0.16%	N/A	N/A
P4 2 GHz +	19%	1.52%	26%	2.08%	N/A	N/A
Desktops						
P3 450-866	35%	2.80%	42%	3.36%	9%	0.72%
P3 933-1300	46%	3.68%	43%	3.44%	(10%)	(0.08%)
P4 1300-1900	15%	1.20%	27%	2.16%	30%	2.40%
P4 2000 and Up	17%	1.36%	24%	1.92%	N/A	N/A

Average Monthly Price Drop 2.02%

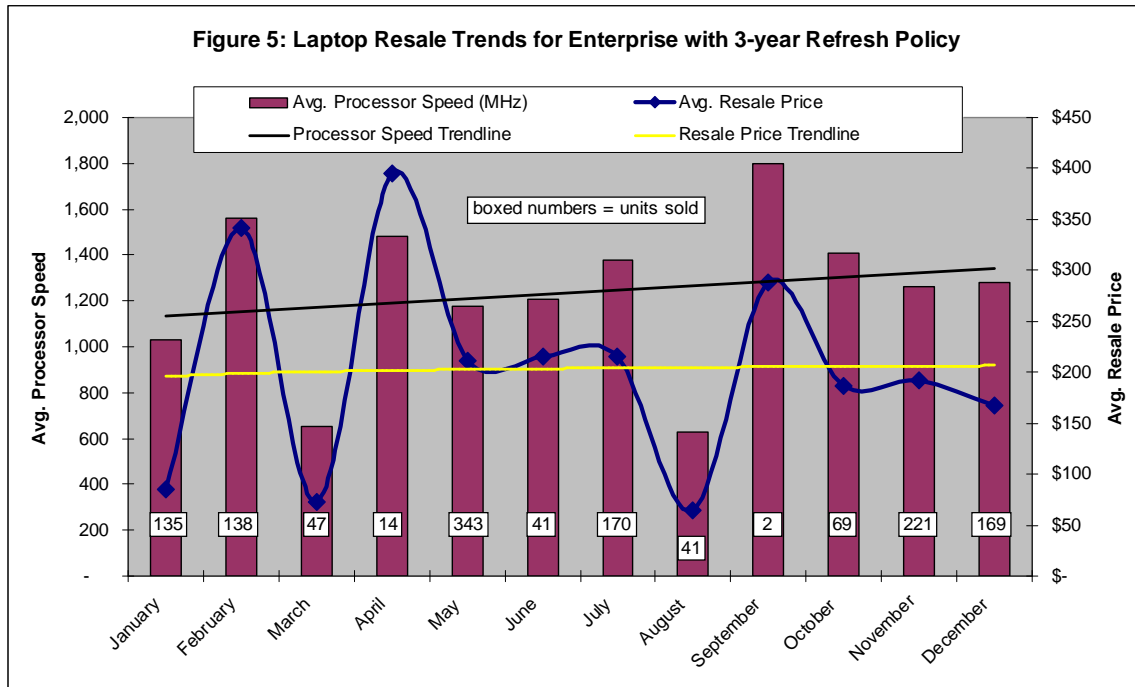
* Rates derived from the average quarterly resale price paid to Cascade for any computer meeting the processor type and speed range

A Standard Refresh Policy Yields Stable Resale Prices

Some companies using Cascade have developed IT Asset Management (ITAM) policies that include standardized refresh periods with new equipment rolled out across the enterprise on a regular (monthly) basis. One such customer, with an established 3 year refresh cycle for its laptops, realized consistent resale values for its retired equipment. As it deployed the newest laptops into its environment, it turned over three year old equipment to Cascade for processing and reselling every month. Figure 5 illustrates how this company's consistent laptop refresh policy yielded resale recovery values at a slightly increasing rate over the course of the year, aided by the fact that the average processor speed for their retired laptops increased by about 24%.

One implication of this finding is that companies can more accurately predict the value of their retired assets during disposal if they follow a consistent refresh plan. This type of

information is useful in return on investment calculations and when explaining the total cost of ownership of computer purchases.

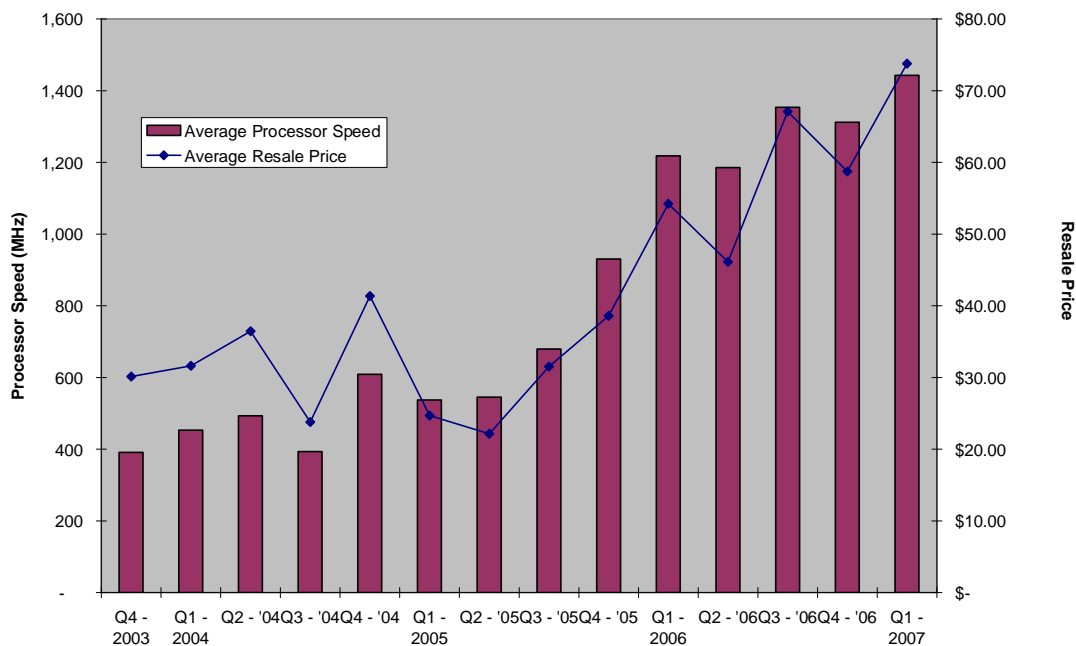


Do Resale Values Correlate to Processor Speed?

One of the more interesting findings in our data mining back in 2007 was the tracking of

Figure 6: Desktop Processor Speed Effect on Resale Prices

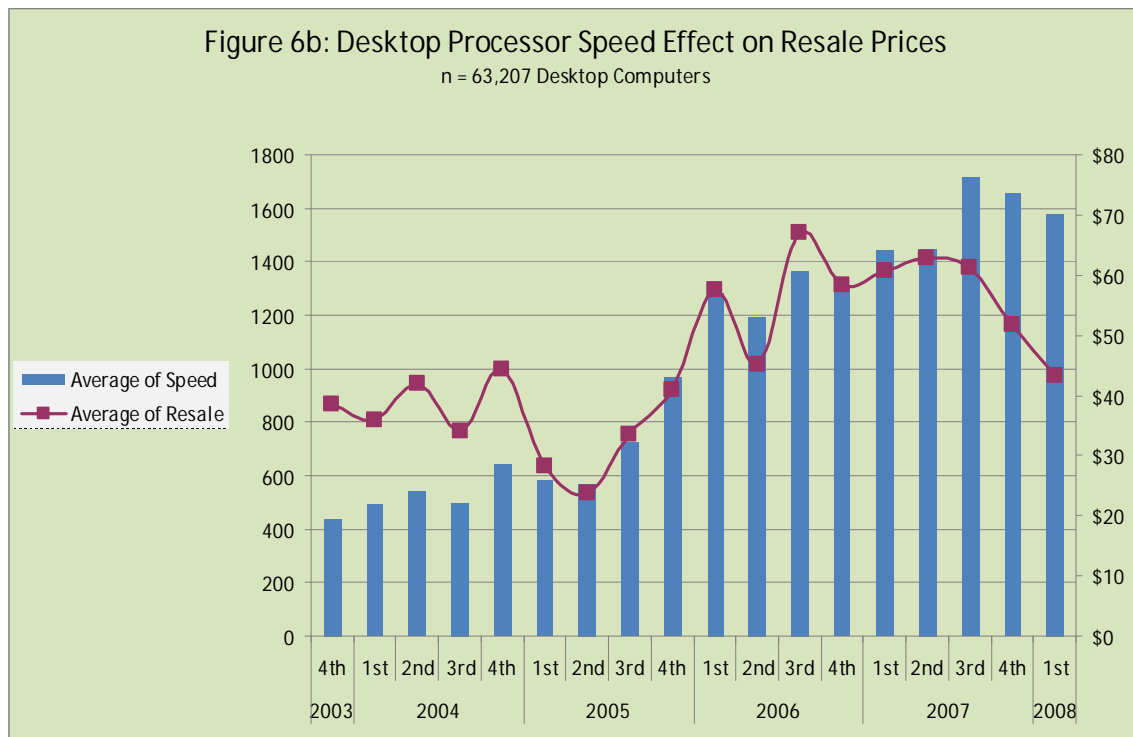
n = 53,382 desktop computers



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the average processor speed of resold computers compared to their resale price. Based on our initial set of data, we discovered a strong correlation of processor speed in desktops to resale value. Figure 6 illustrates how desktop resale values track very closely to processor speeds over time. As processor speeds increase in retired desktops, so goes their resale price. In fact, we found the resale price paid for desktops averaged \$0.05/MHz, with a confidence rate of 95% that variation was less than plus/minus \$0.001/MHz over the course of more than 3 years. The data provided here represent all desktops generated from all sources handled by Cascade, with the average age of equipment a little over four years.

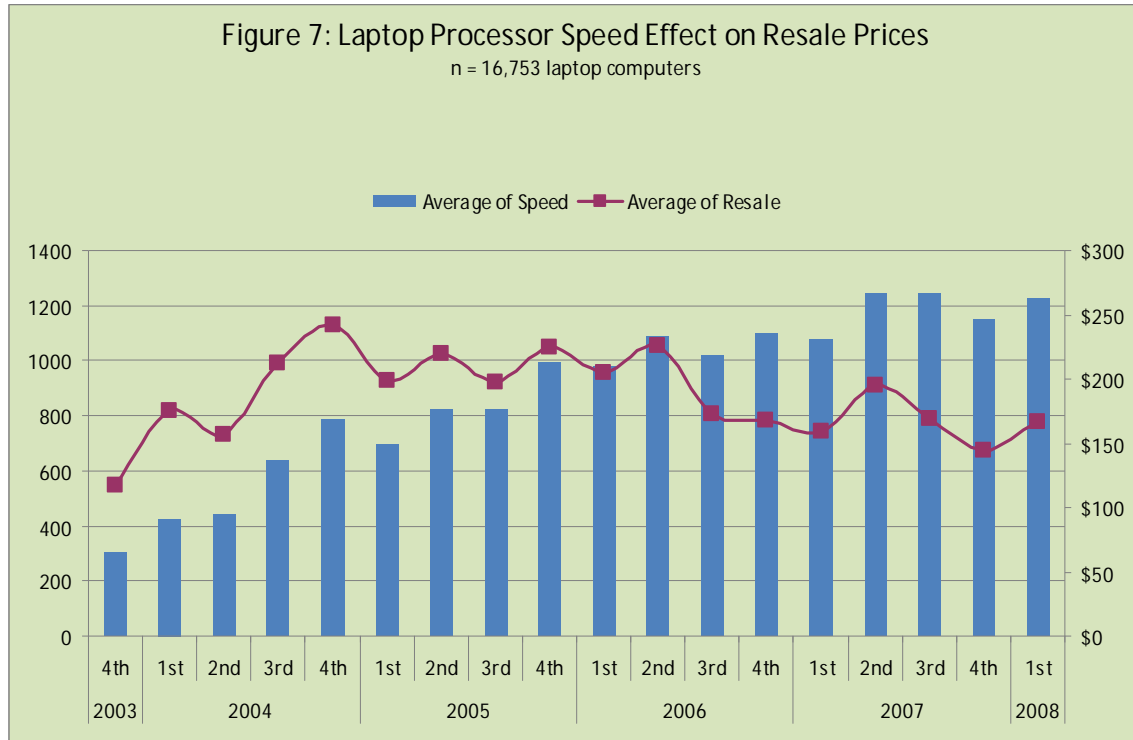
With the addition of another year's worth of data, the relationship no longer existed. Figure 6b updates the 2007 graph with resale data through the first quarter of 2008.



What happened? Upon a closer look at the data, it becomes obvious why resale values for desktops dropped at Cascade during the past three quarters. First, as the graph shows, the average processor speed during this period also declined. This reflects the fact that Cascade processed significant quantities of Pentium 3 computers generated by customers cleaning out their older stock of equipment. These P3 processors typically came with 1 GHz clock speeds. While the processor speed for a large number of desktops was at about 60% of the speed of the typical P4 desktop sold, the price Cascade earns for P3's is about 20% of the price paid for P4's. As a result, the average price during this period is depressed.

The change in prices is less of a reflection of external market conditions than it is an indication of the mix of desktop computers sourced by Cascade from its customers. This changing mix of equipment may indicate that with a slowing economy, companies are holding onto their more valuable equipment for longer periods and are only parting with

the oldest stock. This is similar to what occurred in 2003 as companies minimized IT spending due to the tight economy.



On the other hand, laptop resale values have never kept pace with the increase in processor speeds. For the 4 ½ year period shown in Figure 7, laptop processor speeds increased by 400%, though resale values for laptops remained relatively flat. Unlike desktop computers, laptop resale values never did grow in proportion to the growth in processor speeds. We believe the difference in depreciation activity may be because:

- § Laptops are significantly more valuable on the secondary market and are in strong demand, while the demand for desktops is waning;
- § It costs less to ship laptops, and as fuel prices increase, the impact of freight on laptops is less severe than for desktops; and
- § Cascade customers tend to retire laptops sooner in their life, thereby keeping resale values for these items relatively higher than for older desktops.

Final Analysis of Data and Opportunities to Positively Impact Retirement Decisions

This report provides several methods to evaluate a large number of resale transactions of used IT equipment from typical corporate and institutional IT users. The findings point to several important conclusions:

1. The depreciation rate for used IT equipment over the past several years (based on the population represented in this report), is just over 2% per month; far lower than what some industry experts say;

2. Companies with a regular and active refresh cycle can expect to be paid similar values for their retired IT assets over time;
3. While desktop PC resale prices were once fairly predictable and consistent (using a value per MHz), this is no longer the case. Other factors in the recent past have dramatically impacted the resale value of desktop computers; and,
4. Laptop resale values have remained quite consistent over time, and external factors indicate this trend should continue at least into the near term.

With an understanding of these conclusions, and based on lessons Cascade has learned when maximizing recovery values on surplus IT assets, firms should adopt the following set of best practices to optimize their asset retirement program.

1. Shorten your refresh cycle—you are more likely to save money from increased resale recovery and lower service costs on older equipment by reducing the period of service of IT assets by a year or more. You will also gain greater functionality from newer hardware;
2. Once you are ready to release your old IT assets, remove them from your environment right away and get them processed for resale. They just lose money and cost you storage space if you sit on them;
3. Keep the equipment in good and complete condition. Prices on laptops drop significantly if we can't include A/C adaptors or swappable drives. Try to keep any accessories with their original equipment to maximize their resale value; and,
4. Trust Cascade's verified security programs for sanitizing your hard drives. We run the most advanced wiping program to ensure your data are never exposed to the outside world. If you let us resell your hard drive, you'll make more money.

About the Authors

Neil Peters-Michaud is co-founder and CEO of Cascade Asset Management. He earned a Master's in Business Administration from the University of Wisconsin in 1999 and a Bachelor's of Science from the UW in 1993. He was appointed by the Governor to the Wisconsin Legislative Council on Recycling. Some of his recent awards include: the Forward Under 40 award for outstanding alumni and an Honorable Mention for Wisconsin's Small Business Person of the Year in 2008. Neil has been involved in electronics recycling since 1994 and has authored numerous papers and presentations on topics such as IT investment recovery, data security and environmental, health and safety impacts of electronics recycling. Neil grew up in Silicon Valley and immersed himself in the IT industry through positions with several prominent electronics manufacturers.

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About the Company

Cascade Asset Management was established in 1999 to provide comprehensive Safe & Sound® IT Asset Retirement solutions for businesses and institutions throughout North America. The company performs on site de-installation and logistics, inventory management, electronic data wiping, testing and refurbishing for resale, lease return processing, demanufacturing for recycling, shredding of electronic media, and management of hazardous and recyclable fractions. The company is ISO 14001 Registered and is a 2006 IAER Certified Electronics Recycler. The company has won



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numerous awards for business performance and environmental leadership. In the past three years, the company has grown by more than 300%. More information on Cascade is available at www.cascade-assets.com.