
THE DEVIL'S ADVOCATE REPORT

August 31, 2011

Advanced Micro Devices, Inc.

(*SELL*)

Price:	\$6.90	Ticker:	AMD
52-Week Range:	\$5.53-\$9.58	Dividend:	zero
Shares Outstanding:	743 million	Yield:	zero
Market Capitalization:	\$5.1 billion		

Data As of August 31, 2011



*Exclusive Marketers of
The Devil's Advocate Report*

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Investment Thesis

Advanced Micro Devices (AMD) has been a second-source supplier of microprocessors for almost 30 years. Throughout its history, the company has struggled at times to keep up with Intel, its much larger rival, while at other times it has had a slight technological advantage over Intel, given the short and frequent development cycles. At the current time, with its Bulldozer architecture, AMD appears to have a fairly strong product pipeline relative to Intel but any lead is bound to be short-lived in this industry. For example, while AMD's wider gross margin in the second quarter of 2011, and its future shift to 32nm fabrication are positive signs for the company, both can be negated by intensifying competition from substitute products, such as tablets and smartphones, future competition from ARM Holdings in the PC segment, and rapid innovation by Intel, which will soon transition to 22nm fabrication and so-called 3D Tri-Gate transistor technology years before AMD is expected to have similar technology.

Intel and AMD have benefitted greatly from the tremendous growth in PC sales over the past two decades. In 1991, 18.7 million PCs were sold worldwide (including Ataris, Amigas and Commodores) as compared to estimates of 380 million units for the current year, which equates to a 20-fold expansion. However, in terms of stock market performance, AMD has actually declined almost 65% in the past 10 years and is currently trading at levels first reached in 1991. Intel's shares have declined just over 10% in the past 10 years (including dividends) while it first reached its current stock price in 1997 (adjusted for dividends). The poor stock market performance has occurred despite fairly robust revenue growth. AMD generated revenues of \$1.2 billion in 1991, \$3.9 billion in 2001 and should reach \$6.8 billion this year based on consensus estimates. Therefore, it appears that the increasing size of the PC market has not helped AMD's shareholders, since the company's profitability has been uninspiring to say the least, with cumulative losses of \$5.5 billion since 1991.

Over the next few years, it is possible that the traditional PC market will expand at a much slower rate, and may even stagnate or decline, as consumers appear to prefer smartphones and tablets. While most market observers expect PC sales to slow to annual growth rates of around 5-10%, it is entirely possible that last year's introduction of the Apple iPad was a paradigm shift that will have a significant impact on future PC sales. Tablets sales are growing rapidly and Apple should sell over 40 million units in 2011 alone. When taking the competing Android tablets into account, over 60 million tablets may ship in 2011, relative to the expected 380 million PC units, according to IHS iSuppli. Given tablets' growth rates of approximately 200% compared to 2010, it appears obvious that if tablets can sustain such a growth rate for one more year (i.e. if 200 million tablets will be sold in 2012), the additional 140 million units would clearly cannibalize PC sales to a great extent. While it must be considered extremely unlikely that tablets can reach that level in 2012, by 2015 many market observers, such as Gartner and IHS iSuppli, expect tablet sales to approach 300 million units. Market researchers have thus far separated traditional PC sales

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(laptops and desktops) and tablet sales, but assuming that the total market this year is 440 million units (380 million PCs plus 60 million tablets) and that the total market expands by 10% per year, total shipments in 2015 would be 644 million units. However, if 300 million of those units are tablets, only 344 million would be traditional PCs, indicating contraction in this segment over the next five years. In a stagnant PC market, price competition will intensify, which should result in significant margin pressure for both AMD and Intel. Therefore, given that AMD has almost no exposure to tablets, its total addressable market may actually decline over the next few years.

To make matters worse for AMD, Microsoft will make the next version of Windows, which is expected to be launched next year under the name Windows 8, compatible with the ARM architecture. Currently, Windows can only be run on a microprocessor with the x86 architecture, which only Intel and AMD are allowed to produce. Therefore, within a few years, it appears likely that ARM Holdings will take market share from both Intel and AMD in the traditional PC market. ARM's microprocessors are currently dominating the smartphone and tablet markets with a market share of over 90%. Its chips are generally considered to be fast enough, considerably cheaper and very efficient from a power consumption point of view. For example, the iPad (which uses an ARM processor) has a battery life of approximately 10 hours, compared to around 3-4 hours for most laptops using Intel or AMD processors. Consequently, ARM will most likely focus on the low-end laptop market once it is able to enter the market for Windows-based systems. That would put it in direct competition with AMD, which also focuses on this segment, whereas Intel focuses more on the mid to high-end of the market. AMD is forced to compete primarily on value, rather than performance, mainly as a result of Intel's significant manufacturing and R&D advantages. Intel will invest approximately \$7.0 billion this year, whereas AMD will spend just around \$1.5 billion. Not only does Intel spend 4-5x as much on R&D in absolute dollar terms, it also spends considerably less on R&D as a percentage of revenues. Therefore, Intel's scale of operations provides it with a substantial competitive advantage in that it can significantly outspend AMD on R&D and yet realize a much wider net profit margin. This is perhaps the primary reason for Intel's relative outperformance, in terms of revenue growth, net profit margin and stock price, over the past decade.

Assuming that AMD's revenues will be stagnant for the next few years based on the 2010 level, and that its operating expenses and cost of goods sold increase with inflation at around 3% per year, AMD would breakeven in 2012, everything else being equal. In 2013, significant losses would be incurred.

Because of the lower growth rates in the PC industry and competition from tablets and smartphones, coupled with future competition from ARM in the PC market, it is likely that AMD's addressable market will shrink and that pricing pressure will eradicate its existing profitability. With a tangible book value of only \$1.75 per share, the company has significant downside. Consequently, shares of Advanced Micro Devices are recommended for sale or short-sale.

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Company Overview

Based in Sunnyvale, California, Advanced Micro Devices (AMD) is one of the largest suppliers of PC microprocessors and graphics processors worldwide to computing OEMs. The company's main product lines include desktop, notebook and server processors and chipsets, and other consumer electronics. Along with market leader Intel, AMD dominates the PC microprocessor space. Microprocessors are essentially the brain of a computer and AMD produces both single- and multi-core processors, which are compatible with both 32- and 64-bit x86 architecture. Intel and AMD are the only companies licensed to produce these x86-based chips and, in the PC market, the Microsoft Windows operating system does not run on any other architecture at the moment. However, the next version of Windows is expected to also run on the ARM architecture, which is currently the dominating smartphone and tablet architecture.

AMD supplies its chips to the server and workstation market, the embedded products market, the graphic and chipset products market, as well as to consumer electronics where its processors can be found in Microsoft's Xbox 360, the Nintendo Wii and Nintendo GameCube gaming consoles. The company also used to supply memory products until those operations were spun off in October 2006 under the name Spansion Inc. Emerging markets continue to account for a greater percentage of total PC shipment volume and now represent nearly half of all worldwide PC shipments.

AMD's revenues are derived from the following sources:

35% Desktop Microprocessors,
20% Mobile Microprocessors,
24% Graphics Processors,
6% Server Microprocessors, and
14% Chipset and others.

While AMD used to be a chip designer as well as a semiconductor foundry, it divested the latter operations in 2009, now known as Global Foundries (in which AMD retains a 14% stake). Global Foundries was created by the divestiture of the manufacturing side of AMD but was expanded through its merger with Chartered Semiconductor in January 2010. A specialist investment company created by the Government of Abu Dhabi known as Advanced Technology Investment Company (ATIC) is the largest investor in the company. Currently, Global Foundries manufactures integrated circuits in high volume mostly for semiconductor companies such as AMD, Broadcom, Qualcomm, and ST Microelectronics.

As a result of the divestiture, AMD's total debt has been reduced from \$4.7 billion at the end of 2009 to \$2.2 billion at the end of June 2011. The improvement in its balance sheet is also due to a \$1.25 billion settlement payment that AMD received from Intel in 2009

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because of Intel's prior business practices of rewarding companies that use Intel chips and punishing those that did not. Consequently, one could argue that AMD has been serving a great purpose for consumers and PC makers by maintaining a competitive market for x86 microprocessors and keeping the prices of microprocessors under control.

The table below shows AMD's research and development (R&D) spending for the past three years, compared to its larger rival:

R&D (billions)	2010	2009	2008
Intel	\$6.58	\$5.65	\$5.72
<i>% of Rev.</i>	<i>15%</i>	<i>16%</i>	<i>15%</i>
AMD	\$1.41	\$1.72	\$1.85
<i>% of Rev.</i>	<i>22%</i>	<i>32%</i>	<i>32%</i>

As the table above indicates, Intel spends 3-4x as much on R&D, yet considerably less as a percentage of revenue, which puts AMD in a very difficult position. Intel can outspend AMD to ensure that it dominates the high-margin high-end segment of the market, which leaves AMD primarily to compete in the low-end, low-margin segment. That, coupled with the fact that AMD spends considerably more on R&D as a percentage of revenue, allows Intel to have a profit margin of 23% (consensus estimate for this year) versus 6% for AMD. Perhaps recognizing that it cannot compete successfully with Intel across the board, given the short product cycles and high development costs, AMD has chosen to pursue a dual strategy, positioning itself as the value alternative to Intel's offerings and emphasizing that everyday computing performance results are the result of CPU/GPU (central processing unit/graphics processing unit) interaction rather than processor workload alone, thus promoting its combined "APU" processors, or accelerated processing units.

PC Market

According to research firm International Data Corp (IDC), the growth rate in the PC market slowed in the second quarter of 2011, partly as a result of weakened spending and the growing interest in tablets. Worldwide PC shipments reached 84.4 million units during the quarter, an increase of just 2.6% compared to the year-ago quarter. IDC has lowered its expectations for worldwide PC shipments in 2011, now predicting only 4.2% year-on-year expansion.

The PC market was negatively affected by the decline in netbook demand, which accounted for 12% of PC shipments in the second quarter, compared to 22% in the same period last year, according to IDC. The PC market was also impacted by economic weakness in the U.S. and Europe, while Asia-Pacific was comparatively stable, with PC shipments growing by 12% year-over-year. Worldwide microprocessor shipments during the second quarter were flat compared to last year's second quarter, according to IDC. Shipments grew by just 0.6%. Intel's market share declined during the quarter to 79.3%

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from 80.7%, while AMD gained slightly from 19.0% to 20.4%, also according to IDC. AMD gained share from Intel in the laptops and desktop processor segments, but lost share in server chips. AMD held a 15.2% market share in laptops, an increase from 13.7%, while Intel's market share was 84.4%, down from 86.1% in the corresponding period last year. AMD's share in desktop processors was 28.9%, up from 27.3% in last year's second quarter. Intel's share fell to 70.9% from 72.2%. Intel continued to dominate the server processor market with a 94.5% share, while AMD's share fell to 5.5% from 6.5% a year earlier (and down from almost 30% five years ago).

In addition to the slowing growth of the PC industry, the paradigm shift from desktop computing to the Cloud is another troubling sign for the PC industry. The main reason that Microsoft and Intel (sometimes referred to as "Wintel") were so dominant in their respective markets was because many critical applications could only be run on the PC platform. When some of the apps started to shift away from desktops to the Web or Cloud, it gave non-Wintel device makers a more leveled playing field to compete. Therefore, it is not surprising to see Wintel losing market shares to Apple's Macintosh computers and tablets, in addition to smartphones, which currently have the processing power of a PC from just a few years ago.

Company Background

AMD was founded in 1969 by a group of former Fairchild Semiconductor executives. The company began as a producer of logic chips, then entered the RAM chip business in 1975. That same year, it introduced a reverse-engineered clone of the Intel 8080 microprocessor. In February 1982, AMD signed a contract with Intel, becoming a licensed second-source manufacturer of 8086 and 8088 processors. The underlying reason was that IBM wanted to use the Intel 8088 in its IBM PC, but according to its policy at the time, it required at least two sources for its chips. AMD later produced the Am286 under the same arrangement, but Intel canceled the agreement in 1986 and refused to convey technical details of the i386 part. AMD challenged Intel's decision to cancel the agreement and was successful in arbitration, but Intel disputed that decision. A long legal dispute ensued, ending in 1994 when the Supreme Court of California ruled in favor of AMD. Subsequent legal disputes centered on whether AMD had legal rights to use derivatives of Intel's microcode. In the face of uncertainty, AMD was forced to develop reversed-engineered versions of Intel code.

In 1991, AMD released the Am386, its clone of the Intel 386 processor. Later, the Am486 was used by a number of large original equipment manufacturers, including Compaq. Another Am486-based product, the Am5x86, continued AMD's success as a low-price alternative. However, as product cycles shortened in the PC industry, the process of reverse engineering Intel's products became an ever less viable strategy. To that end, AMD began developing in-house processors, beginning with the K5, which was launched in 1996.

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In 1996, AMD acquired a company known as NexGen specifically for the rights to its Nx series of x86-compatible processors. AMD provided the NexGen design team significant resources to rework the Nx686. The result was the K6 processor, introduced in 1997. The K7 was AMD's seventh generation x86 processor, making its debut in 1999 under the brand name Athlon. Unlike previous AMD processors, it could not be used on the same motherboards as Intels' due to licensing issues. In October 2001, the Athlon XP was released, followed by the Athlon XP with 512KB L2 Cache on February 10, 2003.

The K8 was a major revision of the K7 architecture, with the most notable features being the addition of a 64-bit extension to the x86 instruction set (officially called AMD64), the incorporation of an on-chip memory controller, and the implementation of an extremely high performance point-to-point interconnect called HyperTransport, as part of the Direct Connect Architecture. The technology was initially launched as the Opteron server-oriented processor. Shortly thereafter it was incorporated into a product for desktop PCs, branded Athlon 64.

AMD released the first dual core Opteron, an x86-based server CPU, in April 2005. The first desktop-based dual core processor family—the Athlon 64 X2—launched a month later. The next AMD microprocessor architecture, known as K10, became the successor to the K8 micro-architecture. The first processors released on this architecture were introduced in September 2007 consisting of nine quad-core Third Generation Opteron processors. This was followed by the Phenom processor for desktop. K10 processors came in dual-core, triple-core, and quad-core versions with all cores on a single die.

In January 2009 AMD released a new processor line dubbed Phenom II, a refresh of the original Phenom built using the 45 nm process. Along with this came a new platform codename "Dragon" which utilized a new Phenom II processor, an ATI R770 GPU from the R700 GPU family, as well as a 790 GX/FX chipset from the AMD 700 chipset series. This came in a dual-core, triple-core and quad-core variants, all using the same die with cores disabled for the triple-core and dual-core versions.

In 2006, AMD acquired ATI Technologies for \$4.3 billion in cash and 58 million shares of its stock for a total purchase price of \$5.4 billion (which is more than the current market capitalization of the company). After the merger, an initiative codenamed Fusion was announced with the intent to merge a CPU and GPU on entry level chips. Some of the processing originally done on the CPU (e.g. Floating Point Unit operations) were to be moved to the GPU, which is better optimized for such calculations. This is referred to by AMD as an Accelerated Processing Unit (APU).

Currently, AMD is transitioning to a modular design methodology named "M-SPACE", with two new processor cores, codenamed "Bulldozer" and "Bobcat"; Bulldozer is to be released late in the third quarter of 2011, whereas Bobcat was released in late 2010. Both cores were built from the ground up, with the Bulldozer core focused on 10 watt to 100

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watt products, while the Bobcat core is focused on 1 watt to 10 watt products. Bulldozer is organized in modules, each consisting of two integer cores capable of processing integers and one floating point unit (FPU). Each module will be seen by the OS as two cores and all of AMD's new 2011, 32 nm high-end desktop and server parts will be built on the Bulldozer microarchitecture, including Zambezi and Orochi for the desktop and Interlagos and Valencia for the server market.

The Llano processor was the second APU released, targeted at the mainstream market, incorporating a CPU and GPU on the same die. Llano is, however, not based on the new Bulldozer core and will be similar to the older Phenom II "Deneb" processor, serving as AMD's high-end processor until the release of the new 32 nm parts. A notebook computer with Llano can run 10 hours, according to AMD, which represents a significant improvement compared to the prior generation.

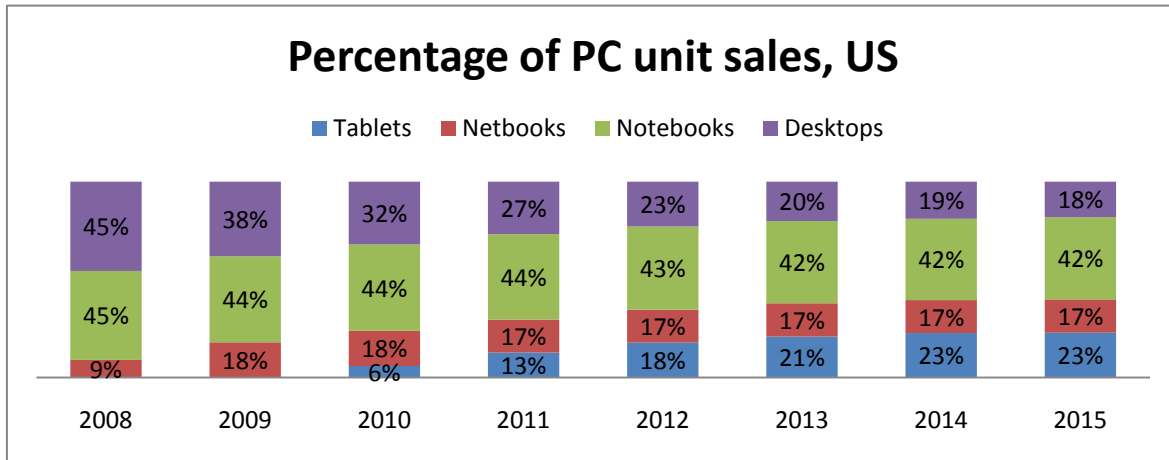
In addition, AMD has recently introduced an AMD A8 series to take on the Intel Core i7 and Core i5 processors, an AMD A6 series to take on the Core i3, as well as the AMD A4 series and two E-Series chips, including the Sabrine and Brazos platforms.

While AMD has a strong pipeline, given the short product cycles, it is likely that Intel will soon regain its dominance as that company has announced that it expects chips based on its 22nm Tri-gate '3D' process node to ship in 2012. AMD's competing products appear to be approximately two years behind, based on statements from the company.

Historical Prices of Microprocessors and PCs

There is a significant shift under way in the PC market. While desktops used to account for the vast majority of sales, laptop sales began to exceed desktop sales in 2008 and this trend has continued as the market embraces smaller devices such as netbooks and tablets. Netbooks are just smaller versions of laptops with fewer features than full size, high-end, laptops. In fact, the success of the Apple iPad, coupled with the expected onslaught of Android-powered tablet devices, could lead to a computer revolution similar to what the laptop did for the computer industry more than a decade ago, as the chart below illustrates:

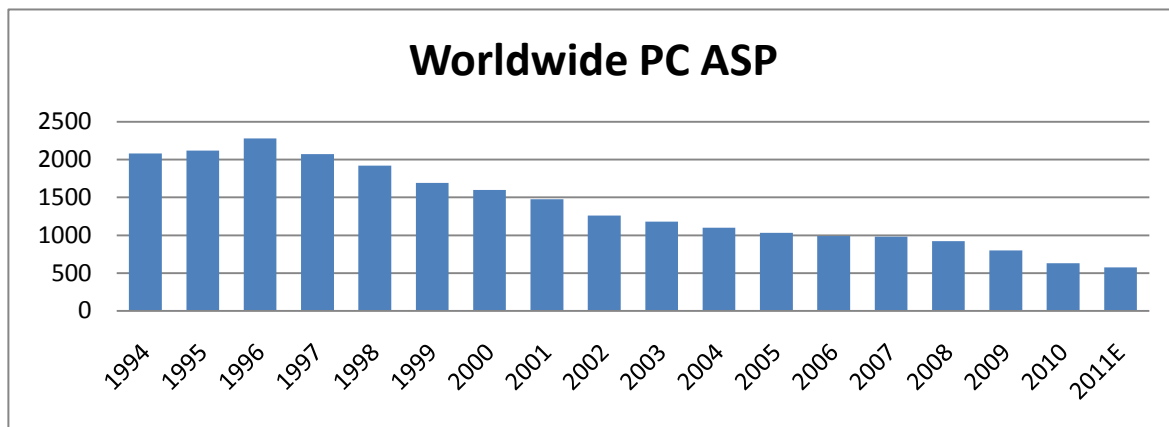
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(Source: Forrester Research)

In 2008, desktop unit sales were almost identical to laptop sales, while sales of the lower-end laptops known as netbooks were 9% of the total. Over the past few years, though, mid and high-end laptops sales have remained at around 44% of the market while desktop sales have declined to an estimated 27% of the market this year, with netbooks and tablets accounting for the difference. The latter two categories are expected to continue to grow much faster than the rest of the market, which should continue to pressure ASPs (average selling prices) over time since netbooks and tablets are generally more inexpensive compared to desktops and notebooks.

As a result of technological innovation as well as economies of scale in PC manufacturing, the average selling price (ASP) of a PC has declined sharply over the past two decades. The average PC was priced at more than \$2,000 in the mid-1990s, as compared to approximately \$600 at the current time. Gartner expects the ASP to decline to \$575 in 2012, or approximately 5% year-over-year. In comparison, ASPs declined 5.8% and 14.5% in 2008 and 2009, respectively, as the chart below indicates:

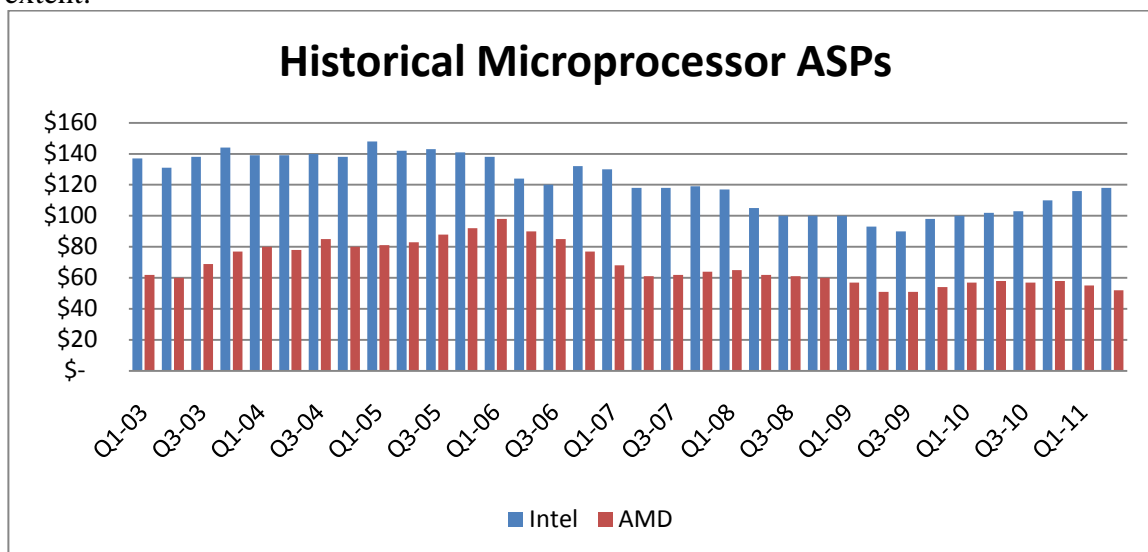


Source: IDC

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It should be noted that average PC selling prices also benefitted from the initial transition away from desktops and towards laptops, which were historically more expensive. Also, while the table above represents averages, the ASP for Windows desktop PCs selling at U.S. retail was \$515 in the first quarter of this year, a decline compared to \$527 a year earlier, while Windows notebook ASP was \$505, down from \$526, according to NPD. By comparison, the ASP for Apple's Macintosh increased from \$1,366 to \$1,403 for desktops and from \$1,340 to \$1,448 for laptops during the same time period, clearly skewing the overall figures. It is important to note that AMD derives all of its microprocessor revenues from the PC segment, rather than Macs.

While the selling price of the average PC has declined by over 50% since 2003, it is interesting to note that the average price of microprocessors has not declined to the same extent:



Source: Company reports

In fact, both Intel and AMD report ASPs that are approximately 10%-15% below the levels achieved in 2003. Consequently, a \$60 AMD processor accounted for around 5% of the cost of the \$1,180 average PC selling price in 2003, whereas today, the average AMD processor cost of \$50 represents approximately 10% of the \$510 average purchase price of a new Windows PC. In reality, AMD's processors probably account for a greater percentage of the price of a new PC given that the company tends to focus mainly on low to mid-priced PCs, as compared to Intel, which is more focused on the high-end (which is evident in its ASP of \$117).

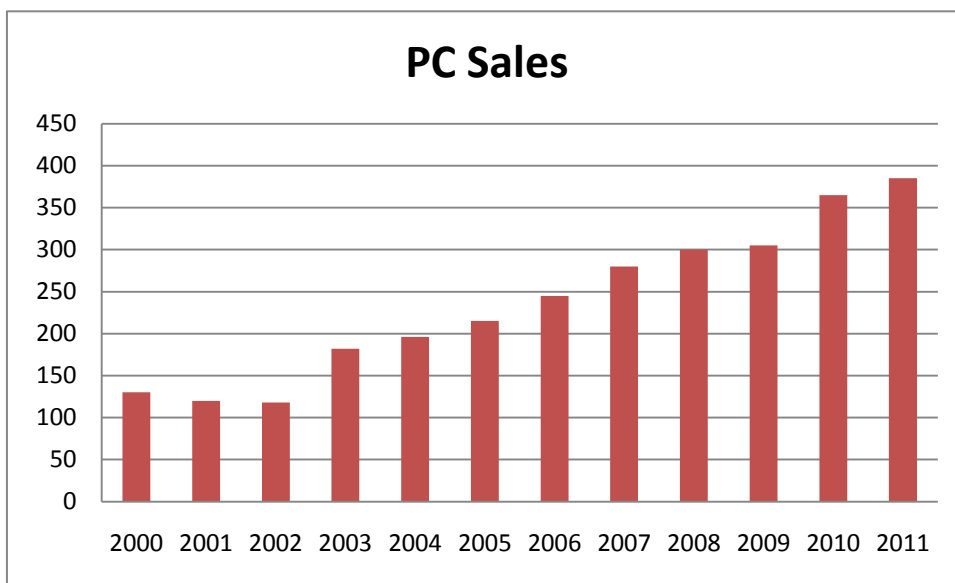
Using the blended average microprocessor cost (assuming an 80% market share for Intel and 20% for AMD, in terms of units), the average microprocessor currently costs \$104 and accounts for 20% of the price of a new PC (using the blended average price for a Windows

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desktop and a Windows laptop of around \$510), versus \$153 and 13% in 2003. Given the approximately \$55 average selling price of a Seagate hard drive and the average price of the Windows operating system, which is also around \$55, it appears reasonable to assume that if the PC ASP decline will continue, all of the components, primarily the aforementioned, must become cheaper as well. In other words, margin pressure should increase as manufacturers need to reduce prices to compete better with tablets.

Interestingly, so far it appears that smartphone manufacturers, such as Motorola and Samsung, have been more successful at producing tablets than PC manufacturers such as Hewlett Packard and Dell. Consequently, if a PC manufacturer such as Hewlett Packard loses a sale because its netbook PC is deemed to be too expensive, odds are that the particular consumer will buy a cheaper tablet instead; a tablet produced by a different manufacturer. Therefore, the PC makers' incentive will be to continue to produce more inexpensive PCs to avoid losing sales. An x86-based processor is considerably more expensive to manufacture compared to the alternatives. For example, an ARM system-on-a-chip, which is used in tablets and smartphones, cost approximately \$25, which can be compared to an Intel motherboard and a relatively inexpensive Intel CPU, which could cost a total of \$200-\$300.

Given that Windows 8 will be compatible with ARM processors, it is reasonable to expect that a meaningful percentage of at least the low-end laptop market will switch to inexpensive, low-powered ARM processors, thereby enhancing battery life and lowering cost. Since AMD has benefitted from a tripling in PC unit sales since 2003, as the chart below indicates, a stagnation in unit sales (or even a decline in x86 PC sales), coupled with continued price declines will almost certainly be disastrous for AMD's profitability:



(Units in millions)

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While AMD can make up for some of the declining PC revenues by expanding its server revenues, a segment in which it currently holds a market share of merely 6% (down from almost 30% in 2006), it is unlikely that even a substantial improvement in market share would be sufficient to offset declining PC revenues.

Lapdocks

Recently, Motorola introduced a product that may ultimately become a credible competitor to traditional laptops - the so-called "Lapdock". The lapdock is basically a dummy laptop with a screen and a keyboard and a slot to connect the smartphone directly to the laptop. It then uses the smartphone as the brains to operate. Motorola introduced this concept with its high-end Atrix smartphone but is in the process of expanding it to all of its new smartphones as well as introducing additional lapdocks, including docking stations for PC screens and TVs.



If this concept is successful, and if other smartphone manufacturers such as Samsung and HTC develop similar products, traditional laptop sales could be negatively affected. With over 400 million smartphones expected to be sold this year, if only 10% of customers purchase a lapdock with their smartphones in lieu of a regular laptop, sales of laptops would decline by 40 million units, or approximately 17%. Since smartphones are equipped with increasingly powerful processors, faster data connections and high-capacity memory cards, a smartphone-lapdock combination may become an increasingly attractive alternative to tablets and laptops, particularly since Google is now in the process of acquiring Motorola and may use its significant resources to promote the product. Also, with more content such as videos, pictures and documents stored in the Cloud, the lack of a traditional hard drive is not necessarily an impediment.

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Competition From Tablets and ARM Holdings

The technology industry in general is characterized by short product lifecycles and technology displacement. For example, the personal computer, to a very large extent, displaced the mainframe computer; digital photography displaced, or is in the process of displacing, chemical photography, and the cellular telephone is gradually in the process of displacing landline telephony. Many similar displacements can be identified and the most recent example is the rise of the tablet computer, such as the iPad, which is displacing personal computers (primarily laptops).

Laptop computers overtook desktops in 2008 in terms of unit sales, and tablets and netbooks (small laptops) could achieve a 50% market share by 2015. Clearly, the trend calls for smaller, lighter and more mobile devices. The speed at which this is transpiring is highlighted by the fact that desktops accounted for 50% of PC sales in early 2008 but are expected to decline to 27% this year and to just 18% in 2015, as outlined above.

The tablet is a computer designed to do the main functions for which most consumers use a computer, which is to write emails, shop online, download cursory bits of information, and perhaps view cursory bits of online entertainment. Due to its smaller size, lower weight and comparatively easy user interface, these devices have become the most rapidly adopted new technology in history. Since the tablet industry is expected to expand rapidly over the next few years, it will have major implications for companies such as AMD and Intel, among others. The main concern for AMD is that tablets do not use its processors (which are based on the x86 technology, and are currently using too much power for inclusion in tablets), but rather the much cheaper and power efficient ARM chips.

When the iPad first went on sale in April of 2010, it exemplified the continuation of the trend towards lighter, cheaper, more user-friendly devices that had been in effect for decades. It is doubtful that a device such as the iPad would have been possible even a few years ago because of the reduced size of today's components, the power efficiency of the hardware, availability of WiFi and 3G/4G networks, the price of LCD screens, existence of Cloud-based storage, etc. From this point onward, such devices should be improved greatly every year, which is more than one can say about PCs, which have suffered from a dearth of innovation lately.

What makes the iPad unique is not only its small size and powerful hardware. Microsoft has promoted tablets for nearly a decade, including some that are fairly small and light. However, compared to the Windows-based tablets, the iPad has a far better battery life, at approximately 10 hours versus around half as long, and the iPad operating system provides a close to "instant-on" experience, while Windows-based systems can take a minute or more to start up. Apple has spent substantial amounts on efficient battery technology and lower power consumption components. For example, replacing hard drives with flash drives was necessary to conserve power and improve speed. Still, Apple could not find a

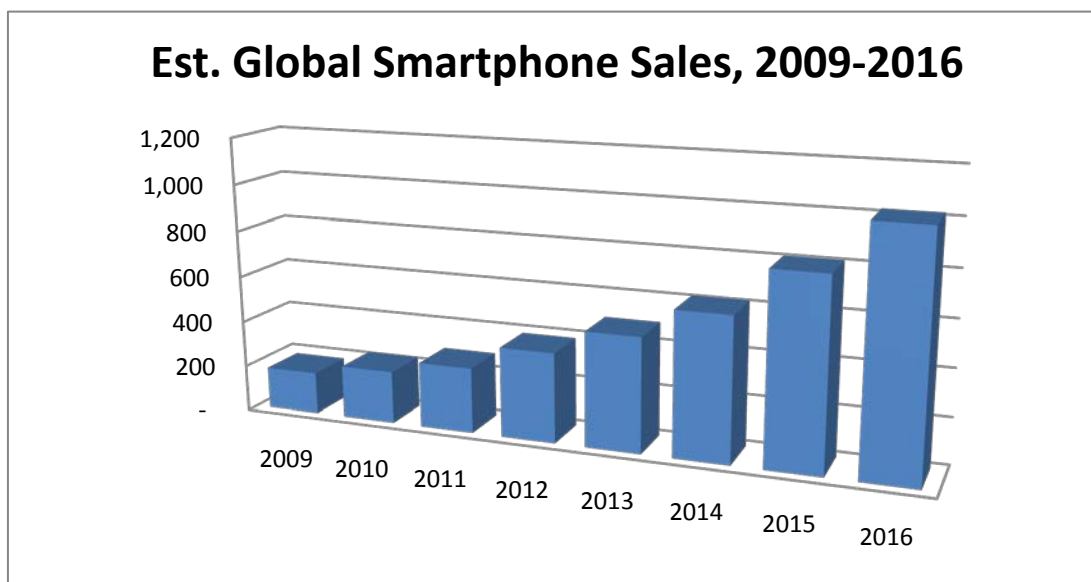
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processor that was efficient enough and, therefore, it had to design its own (known as A4, which was based on the ARM architecture) for the first time in company history. That is now replaced with an A5 processor. Consequently, AMD's chips have currently a limited addressable market in the tablet segment as Microsoft Windows' tablet market share is close to zero and appears poised to remain that way, at least until Windows 8 is released.

The iPad has secured a sufficiently large market share fast enough to disrupt the low-end notebook/netbook market, and force the PC manufacturers to aggressively develop rival tablet devices. In fact, the iPad has attained the fastest adoption rate of any new technology in history. It took five years for DVD players to reach the unit sales pace that the iPad reached in just its first quarter, according to Bernstein Research. At this rate, the iPad will surpass gaming hardware and the cellular phone to become the 4th largest consumer electronics category, with estimated sales of approximately \$25 billion in the U.S. this year, according to Bernstein Research. TVs, smart phones and notebook PCs are presently the three largest categories in terms of revenues. Impressively, with 3.3 million units sold in its first quarter of availability (the second quarter of 2010), the iPad immediately surpassed Macintosh computers in terms of unit sales. This should be compared to the iPhone, which sold one million units in the same timeframe after launch, while the now ubiquitous DVD player sold just 350,000 units in its first four months of availability. Since then, iPad sales have grown to 9.25 million in the second quarter of 2011, or 183% y-o-y, more than twice the 3.95 million Macs the company sold during the same quarter. Consequently, there is no doubt that the iPad is a runaway success of unprecedented magnitude, and one that has a significantly negative impact on traditional PC sales.

While smartphone sales presently account for approximately 27% of overall mobile phone sales, the predicted growth rates over the next few years are staggering. The chart below shows a projected trajectory from around 468 million units in the current year, according to Gartner, to over 1 billion units in 2016:

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Source: Telecom Trends International, Inc.

Overall mobile phone sales are on track to reach approximately 1.5 billion units this year, (first quarter shipments were 372 million units, as reported by IDC), while smartphones at around 468 million units (101 million units shipped in the first quarter) only account for 27% of the total, although that segment is growing at 85% per year compared to just a 19% growth rate for the overall market.

Compared to the PC industry, which ships approximately 380 million units per year, Apple's iPad sales were almost insignificant with just 14.8 million units sold in 2010. Longer term, however, it will most certainly make an impact. IHS iSuppli has boosted its 2011 iPad forecast by over 20% in the past six months to as many as 44.2 million units, which represents a tripling year-over-year. IHS iSuppli also estimates that, in total, 60 million tablets (including those from other manufacturers) are expected to ship this year, a figure that will expand to 275 million by 2015. Apple is still expected to have a 44% market share in 2015. Gartner Inc. is even more optimistic, forecasting 294 million tablets sold in 2015 with Apple holding a 47% market share.

Assuming 380 million PCs shipped this year and 60 million tablets, for a total PC/Tablet market of 448 million units, and a 10% industry-wide growth rate, 644 million PCs will be shipped in 2015. Accordingly, 294 million tablets would account for close to half of the market four years hence. If so, traditional PC sales would be just 350 million units, or a slight decline from current levels. The following table attempts to calculate the potential cannibalization of PC sales:

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	2010	2011	2012	2013	2014	2015
iPad Shipments (000)	14,766	47,964	68,670	86,765	109,627	138,497
Android, Other (000)	2,844	21,816	39,541	64,190	100,954	155,596
Total (000)	17,610	69,780	108,211	150,954	210,581	294,093
Windows-based tablets	2%	1%	1%	1%	1%	1%
Cannibalization:						
Netbook	80%	70%	70%	68%	68%	66%
Notebook	20%	25%	24%	24%	22%	22%
High-end Laptops	0%	5%	6%	8%	10%	12%
	100%	100%	100%	100%	100%	100%

(Gartner Inc. and Horizon Research Group's estimates)

Consequently, if Gartner is correct, that there will be almost no Windows-based tablets through 2015 and given that AMD's processors are almost exclusively aimed at Windows, rather than Android or iOS, it appears that the entire cannibalization that is caused by tablets will affect Windows-based systems, and ultimately AMD and Intel, which are the only microprocessor suppliers to Windows PCs.

Alternatively, if tablets reach just a 30-35% market share of the total PC market within 3-4 years, and if ARM-based processors capture a 20% market share in Windows 8 PC systems, x86 microprocessor demand could fall to approximately half of the overall PC/Tablet market. By comparison, approximately 95% of new PCs used x86-based microprocessors in 2010.

To date, the vast majority of tablets shipped since Apple reinvented the category with its iPad use chips based on the ARM architecture. AMD and Intel have yet to experience any success in this market with their x86-based processors. However, AMD also has a new chip designed for tablets, a Fusion Z-Series and code-named "Desna." The Z-01 has 1.0GHz clock speed, two Bobcat cores, Radeon HD6250 graphics, with 80 GPU cores and 5.9-Watt TDP. Desna chips are set to support DirectX 11 graphics, Adobe Flash Player video acceleration, and smooth streaming of HD video. Hardware graphics acceleration for Internet Explorer 9, Microsoft Office 10, and Windows 7 visual effects are included, too, indicating that this chip is targeting the Windows operating system. Given Desna's 6W power rating, as compared to Apple's A5, Texas Instruments's OMAP 4, NVIDIA's Tegra 2 and Intel's Atom chips, which all have power envelopes significantly below that level, it is unlikely that Desna will have a meaningful impact in the tablet segment.

The x86 architecture AMD uses on the CPU side has drawbacks that have caused tablet makers to overwhelmingly choose ARM chips for their devices—higher power draws and overheating issues, relatively short battery life, and slower boot times being principle x86 features that device makers find unappealing. That being said, AMD has been getting its

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thermals down to tablet-type ranges with its latest embedded APUs, primarily intended for laptops. Consequently, it is possible that AMD will compete better with Intel in the low end of the laptop market but, unfortunately for AMD, this is the segment that should be the most affected by tablet sales as well as future competition from ARM-based systems.

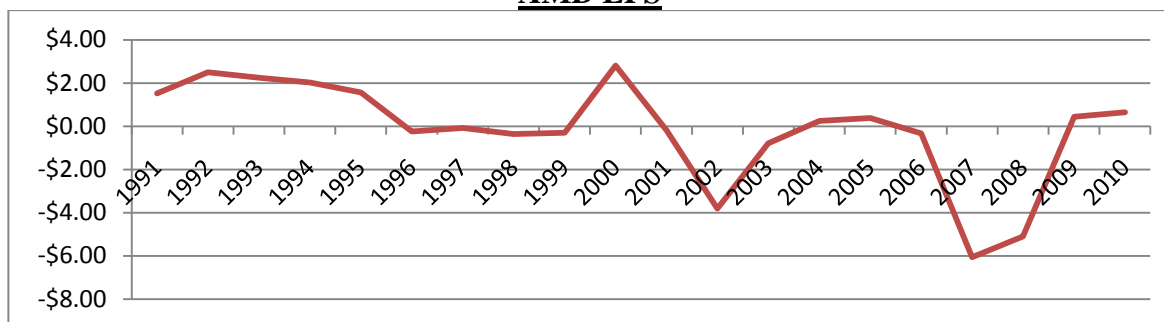
Valuation

AMD is currently trading at a relatively modest valuation of 11x consensus 2011 earnings and 8x the 2012 estimate. Wall Street also expects 4-6% revenue growth over the next two years. Given the increased competition from tablets and ARM-based Windows systems, which we have discussed above, such forecasts appear to be aggressive.

Historical Valuation

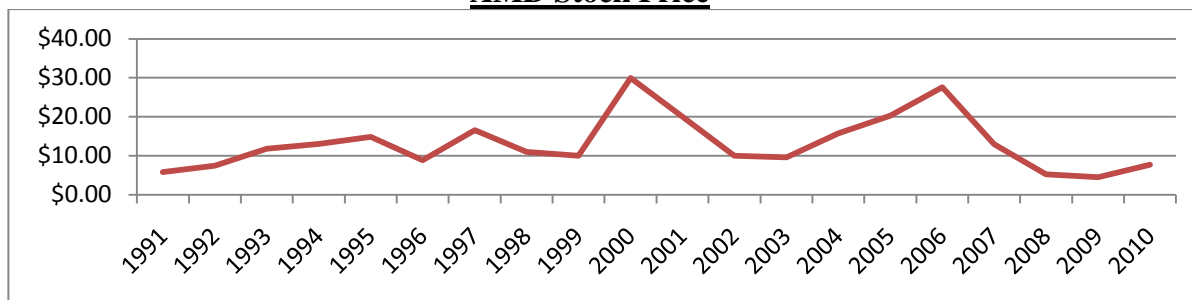
While PC sales have expanded 20-fold over the past 20 years, AMD has only been able to grow its revenues 430% over the period, which indicates that the prices it charges for its microprocessors have declined over time. During that period, the company's earnings have fluctuated wildly, partly because of write-offs, the sale of operations and other non-recurring activities. Unadjusted for such activities, the reported EPS have been as follows:

AMD EPS



Therefore, despite a relatively steady 400% increase in sales, the company has struggled to remain profitable and its share price has reflected this since AMD is currently trading not far from a 20-year low:

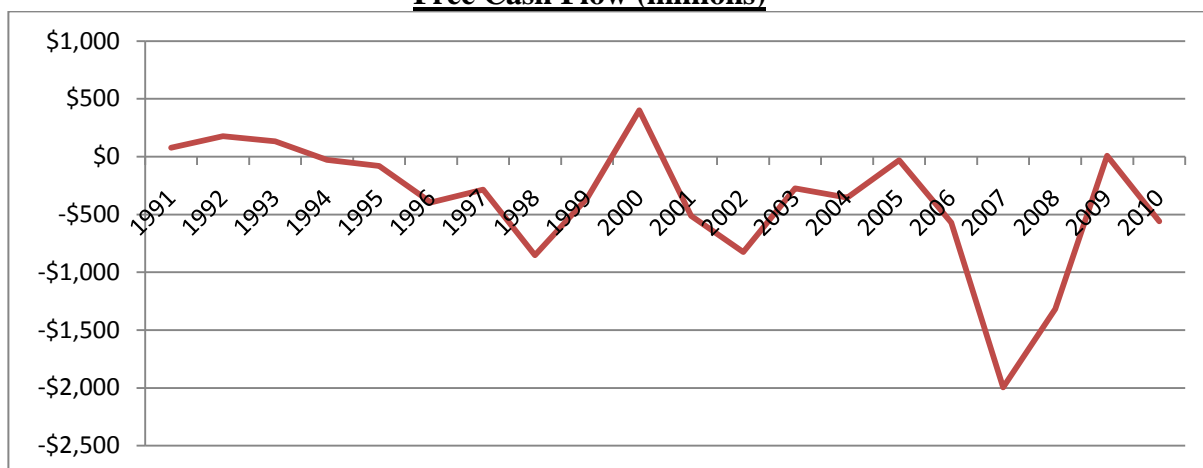
AMD Stock Price



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One of the contributing factors to the negative stock price development is the fact that AMD has been unable to generate healthy levels of free cash flow, on a steady basis, since the early 1990s, as the table below indicates:

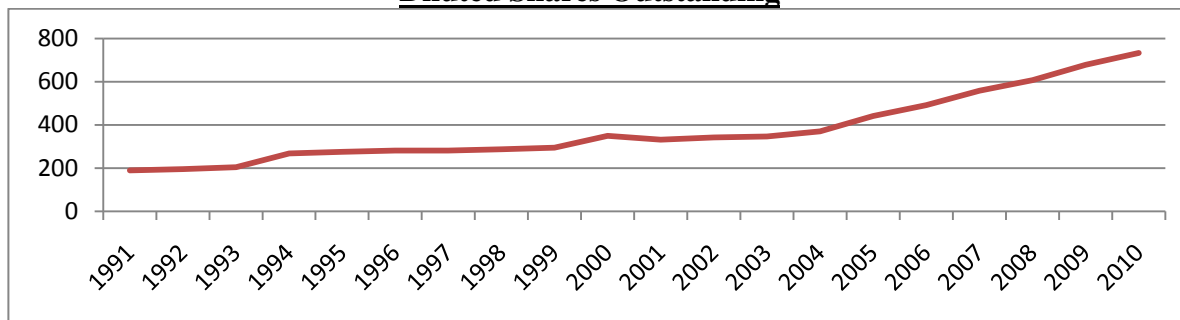
Free Cash Flow (millions)



In fact, over the 20-year period, the company has generated a cumulative free cash flow loss of \$7.6 billion, which should be compared to a cumulative reported net loss of \$5.5 billion, and the only free cash flow positive year in the past decade was 2009, when it generated just \$7 million. Yet, Wall Street forecasts that AMD will generate over \$500 million per year in free cash flow from here on, which would be unprecedented. Given the deteriorating fundamentals, this appears highly unlikely and the company appears to be poised to fall short of these forecasts.

Historically, AMD's losses have been covered mainly by the issuance of new shares, which has caused its share count to increase 4-fold during the period:

Diluted Shares Outstanding



(in millions)

Despite the issuance of shares, AMD's shareholder's equity was actually lower at the end of 2010 compared to the end of 1992.

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Since AMD has reported losses in 10 out of the 20 most recent years, it is of limited use to calculate the average P/E multiple at which the company has traded. However, AMD's historical average Price/Book ratio is 2.1x while its Enterprise Value to Sales ratio has been 2.9x. Currently, the company trades at 3.1x its most recent book value of \$1.6 billion and at an EV/Sales ratio of 0.80x.

Comparative Valuation

Compared to Intel, which has 8x the revenues of AMD, 28x the earnings and close to 22x the market capitalization, AMD is valued as follows:

Company	Symbol	Price	EV/Sales	P/E	P/Book	Market Cap
Advanced Micro	AMD	\$7.00	0.80x	8.5x	3.1x	\$5.2 Billion
Intel	INTC	\$20.80	1.74x	8.0x	2.13x	\$109.0 Billion

(Based on Consensus 2012 EPS. Sales represents current year's estimate.)

However, compared to AMD, Intel is a much more profitable company, and has been so for over two decades:

	2010	2009	2008	2007	2006
Intel					
Gross Margin	65%	56%	55%	52%	51%
Net Profit Margin	26%	12%	14%	18%	14%
AMD					
Gross Margin	46%	42%	40%	38%	49%
Net Profit Margin	7%	5%	-53%	-56%	-3%

Based on its much steadier historical profitability, it appears Intel warrants a significantly higher valuation compared to AMD, but both companies appear to be facing deteriorating fundamentals in the PC industry at the current time.

Because of AMD's long history of volatile earnings and billions of dollars in cumulative losses, it is perhaps most appropriate to compare AMD's valuation to that of the airline industry, which has a comparable history of erratic earnings and huge cumulative losses. On average, the major airlines in the US trade at 0.28x sales and 6.9x next year's earnings:

Company	Symbol	Price	EV/Sales	P/E	Market Cap
United Continental	UAL	\$18.00	0.26x	3.6x	\$6.0 Billion
American	AMR	\$3.25	0.20x	NA	\$1.1 Billion
Delta	DAL	\$7.05	0.42x	3.9x	\$6.0 Billion
US Airways	LCC	\$5.26	0.19x	9.9x	\$0.9 Billion
Southwest	LUV	\$8.20	0.35x	10.4x	\$6.6 Billion
			0.28x	6.9x	

(Based on 2012 EPS. Sales represents current year's estimate.)

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Therefore, compared to the airlines, AMD 's enterprise value of 0.80x this year's revenues represents a substantial premium, while its P/E of 8.5x next year's earnings is more similar. However, AMD's earnings estimates do not appear to be realistic. The existence of a succession of years in which investors anticipated and produced estimates of year-forward earnings, and the positive optionality that they imply, can be the only reason that, over the preceding 20 years, AMD has raised substantial amounts in new share offerings and 'earned' a cumulative loss of \$5.5 billion. Moreover, the prospective competitive environment holds, if anything, a greater secular and technological threat to the viability of AMD than any prior era. Based upon the company's historical record of returns on capital, one should be more inclined to project negative, not positive, earnings.

If there will be no earnings, then a P/E based valuation, comparative or otherwise, is invalid. One might then default to the EV/sales methodology, one approach to which was reviewed via comparison with the airline industry. Alternatively, one might reference the net asset value of the company. The book value is \$2.21 per share, of which \$0.46 is attributable to goodwill and acquisition-related intangible assets. If the assets cannot produce earnings, then the goodwill does not, arguably, have value. Consequently, tangible book value would be the relevant factor, and this is only \$1.75 per share, versus a share price of approximately \$7.00. AMD trades at 4.0x this measure. In the absence of a premium for optionality related either to the company's possibility of persistent future earnings or the capitalization of its patents or other intangible assets, of which there needs to be \$5.25 per share of value (\$7.00 share price - \$1.75 tangible book value), or \$3.90 billion of market value, the shares have much to lose.

Scenario Analysis

Assuming that AMD's revenues will remain steady over the next few years (at 2010 levels) and that its cost of goods sold and operating expenses will increase by 3% per year, in line with inflation, the company's profitability would soon be eradicated:

	2010	2011	2012	2013
Revenues	\$6,494	\$6,494	\$6,494	\$6,494
Cost of Goods Sold	\$3,533	\$3,639	\$3,748	\$3,861
Gross Profit	\$2,961	\$2,855	\$2,746	\$2,633
Operating Expenses	\$2,400	\$2,472	\$2,546	\$2,623
Operating Earnings	\$561	\$383	\$200	\$11
Net Income	\$335	\$146	\$0	-\$151

(in millions)

Holding revenues steady is not as farfetched as it may appear. For example, if ASPs decline by 10%, AMD needs to sell 11% additional units to generate the same level of revenues. Even such a level of growth in the PC industry may be unattainable given the threats from tablets and smartphones.

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While it could be argued that AMD will at some point become an attractive takeover target, particularly given its attractive patent portfolio and graphics division, but unfortunately its license to produce x86-based microprocessors is not transferable. Consequently, it is unlikely that AMD would receive a meaningful takeover premium.

Investment Summary

From a performance standpoint, the PC industry is rapidly approaching a level at which further improvements in processing power may have a diminishing impact on the retail consumer, as well as low-level enterprise segments. Most users require only a certain amount of processing power to run basic productivity and online applications and for these applications, as the currently exist, the vast majority of users will not perceive any significant performance improvements by switching to a cutting-edge processor.

Other companies such as ARM Holdings, Texas Instruments, Qualcomm and NVIDIA currently dominate the microprocessor market for smartphones and tablets, whereas AMD has almost no exposure to these fast-growing markets. The reason for that is that such devices require chips with minimal power consumption, which has never been a significant consideration for PC chips and, therefore, AMD and Intel have struggled to make any inroads in these markets.

Because of the rapid growth in tablet sales, which has a negative impact on laptop sales, it is likely that computer manufacturers will apply pressure to bring down the price of components. This will become more pressing as laptop PCs and so-called netbooks all experience increasing competitive pressure from tablets and even smartphones as those devices are displacing, or one might say cannibalizing, sales of traditional PCs. During the past few years, average selling prices for PCs have declined at a considerably greater pace than the average selling price for microprocessors. However, since Windows 8 will be compatible with the ARM architecture, PC manufacturers soon have access to considerably cheaper microprocessors from companies such as NVIDIA, Texas Instruments and Qualcomm, etc., and that should result in a meaningful contraction in AMD's profit margins.

During the past 20 years, PC sales have expanded 20-fold. While that should have provided AMD with a substantial tailwind, the company's stock price is virtually unchanged compared to 1991 and it has recorded net losses of \$5.5 billion over the period. Since it now appears that growth rates in the PC industry is stagnating, or even declining, AMD's future prospects appear bleak. Consequently, shares of Advanced Micro Devices are recommended for sale or short-sale.

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Advanced Micro Devices, Inc.
Condensed Consolidated Balance Sheets
(Unaudited)

	July 2, 2011	December 25, 2010
(In millions, except par value amounts)		
ASSETS		
Current assets:		
Cash and cash equivalents	\$ 554	\$ 606
Marketable securities	1,307	1,183
Total cash and cash equivalents and marketable securities	1,861	1,789
Accounts receivable, net	759	968
Inventories, net	642	632
Prepaid expenses and other current assets	176	205
Total current assets	3,438	3,594
Property, plant and equipment, net	686	700
Investment in GLOBALFOUNDRIES	486	—
Acquisition related intangible assets, net	19	37
Goodwill	323	323
Other assets	272	310
Total assets	\$ 5,224	\$ 4,964
LIABILITIES AND STOCKHOLDERS' EQUITY		
Current liabilities:		
Accounts payable	\$ 455	\$ 376
Accounts payable to GLOBALFOUNDRIES	117	205
Accrued liabilities	575	698
Deferred income on shipments to distributors	132	143
Other short-term obligations	—	229
Current portion of long-term debt and capital lease obligations	4	4
Other current liabilities	29	19
Total current liabilities	1,312	1,674
Long-term debt and capital lease obligations, less current portion	2,195	2,188
Other long-term liabilities	76	82
Accumulated loss in excess of investment in GLOBALFOUNDRIES	—	7
Commitments and contingencies (see Note 10)		
Stockholders' equity:		
Capital stock:		
Common stock	7	7
Additional paid-in capital	6,637	6,575
Treasury stock, at cost (8 shares on July 2, 2011 and December 25, 2010)	(106)	(102)
Accumulated deficit	(4,897)	(5,468)
Accumulated other comprehensive income	—	1
Total stockholders' equity	1,641	1,013
Total liabilities and stockholders' equity	\$ 5,224	\$ 4,964

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Advanced Micro Devices, Inc.
Condensed Consolidated Statements of Operations
(Unaudited)

	<u>Quarter Ended</u>		<u>Six Months Ended</u>	
	<u>July 2, 2011</u>	<u>June 26, 2010</u>	<u>July 2, 2011</u>	<u>June 26, 2010</u>
	(In millions, except per share amounts)			
Net revenue	\$1,574	\$1,653	\$3,187	\$3,227
Cost of sales	854	915	1,776	1,748
Gross margin	720	738	1,411	1,479
Research and development	367	371	734	694
Marketing, general and administrative	239	229	500	448
Amortization of acquired intangible assets	9	17	18	34
Restructuring reversals	—	(4)	—	(4)
Operating income	105	125	159	307
Interest income	2	3	5	6
Interest expense	(47)	(55)	(95)	(104)
Other income (expense), net	4	(1)	15	303
Income before equity income (loss) and dilution gain in investee and income taxes	64	72	84	512
Provision (benefit) for income taxes	3	(5)	5	(5)
Equity income (loss) and dilution gain in investee, net	—	(120)	492	(303)
Net income (loss)	<u>\$ 61</u>	<u>\$ (43)</u>	<u>\$ 571</u>	<u>\$ 214</u>
Net income (loss) per share				
Basic	\$ 0.08	\$ (0.06)	\$ 0.79	\$ 0.30
Diluted	\$ 0.08	\$ (0.06)	\$ 0.76	\$ 0.29
Shares used in per share calculation				
Basic	724	709	722	708
Diluted	743	709	766	732