

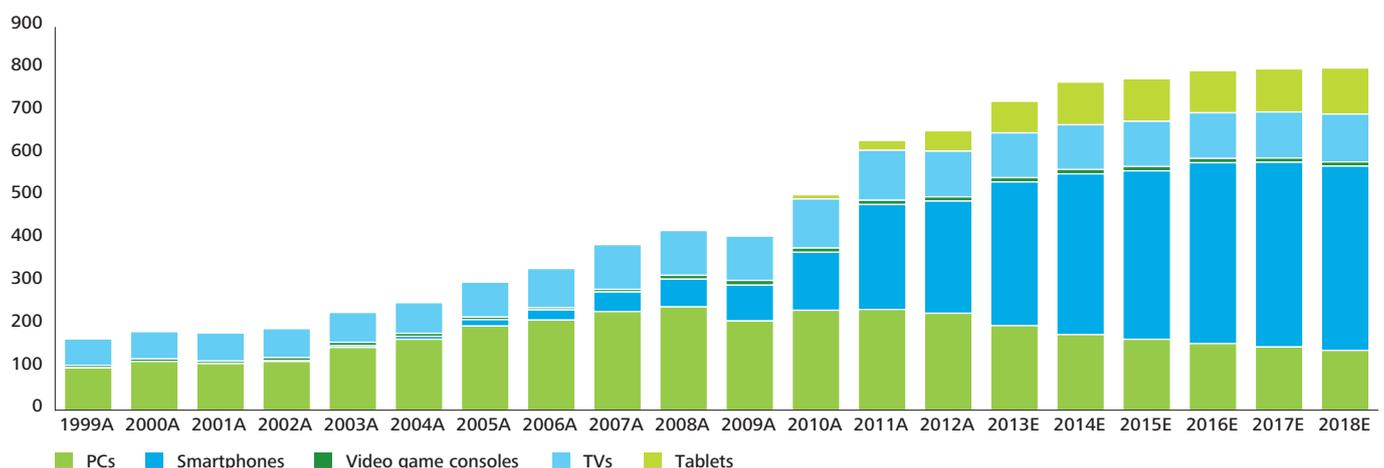
## The \$750 billion converged living room: a plateau approaches

Deloitte predicts that global sales of smartphones, tablets, PCs, TV sets and video game consoles will exceed \$750 billion in 2014, up \$50 billion from 2013 and almost double the 2007 total (see Figure 1)<sup>1</sup>. Combined global sales of these five products have grown remarkably since 2003, with trailing five-year compound annual growth (CAGR) of 6-12 percent per year over a decade (see Figure 2) (although year-over-year growth has fluctuated from a high of 27 percent in 2010 to a low of -3 percent in the recession year of 2009). In contrast, the growth rate for the global semiconductor industry was only 3.1 percent between 2000 and the end of 2012<sup>2</sup>. However a plateau appears likely: sales are expected to continue growing, but at a slower rate than over the past 10 years, with an estimated ceiling of about \$800 billion per year.

These five categories of consumer electronics devices are closely related in that they are currently the five largest by dollar value, are all multi-functional, and each plays a key role in entertainment and media consumption. Also, all five of these devices have benefited from common technology such as processors and screens (except for video game consoles, all of the devices make use of high resolution LCD technology)<sup>3</sup>. In contrast, other large segments such as portable video games devices, eReaders and feature phones tend to focus on a single function and thus have a narrower impact on general media consumption and entertainment.

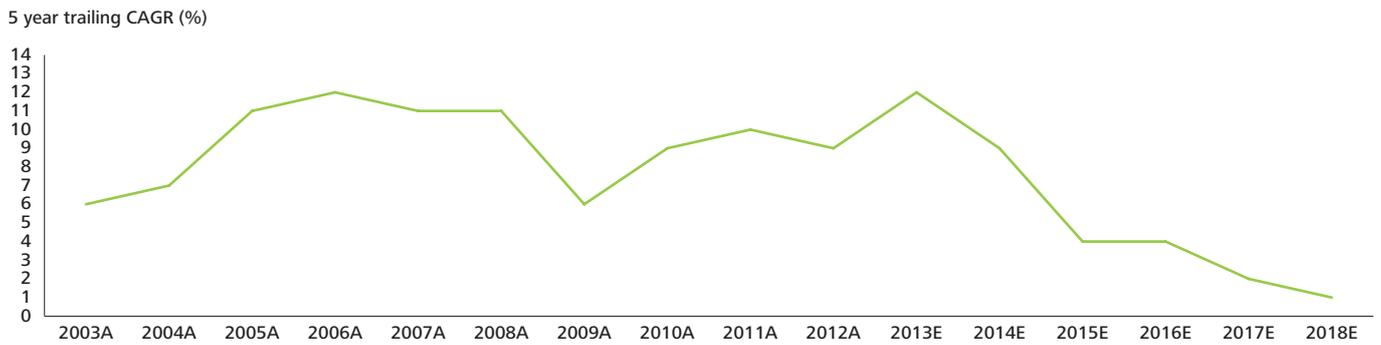
- 1 Deloitte's estimate of device sales and average selling prices for these five categories over the period 2000-2018 is based on actual, forecast and in some cases interpolated data. These were then used to produce annual revenue figures which were then summed. 2000-2012 numbers are actual or interpolated figures. 2013 numbers are based on year-to-date figures up until Q3, combined with industry forecasts and Deloitte estimates. The 2014-2018 estimates are a combination of published industry forecasts and Deloitte estimates. Sources used include, but are not restricted to, IDC, Gartner, Canals, IHS, and DisplaySearch.
- 2 Worldwide Market Billings, 3 Month Moving Averages. 2012 billings were \$291.09B, and 2000 billings were \$201.1B, for a 12 year CAGR of 3.13 percent. Historical Billing Reports. Semiconductor Industry Association, 5 December 2013: [http://www.semiconductors.org/industry\\_statistics/historical\\_billing\\_reports/](http://www.semiconductors.org/industry_statistics/historical_billing_reports/)
- 3 There are important differences between the application processors in PCs, tablets, smartphones and video games consoles. In terms of complexity, manufacturing technology and speed they are much more similar than dissimilar.

**Figure 1: Combined global sales revenues of smartphones, tablets, PCs, TV sets, video game consoles (1999-2018)**



Source: Deloitte, 2013

Figure 2: Five year CAGR (2003-2018) for combined global sales revenues of smartphones, tablets, PCs, TV sets, video game consoles



Source: Deloitte, 2013

The simultaneous growth of these five devices created a virtuous circle over the last decade. For example, to supply the massive volumes of LCD screens required for large, flat HDTVs, manufacturers built plants capable of producing 400 million square meters of screens annually by 2013<sup>4</sup>. This drove prices for laptop screens down, which in turn focused research and development on better, smaller screens; which eventually led to high resolution screens for smartphones and tablets that made those devices much more appealing and useful.

There has also been a virtuous circle with solid state memory: the need for gigabytes of flash memory for each of a billion smartphones and tablets led to new manufacturing capacity and increased production volumes that lowered prices, which helped enable the creation of powerful gaming systems and ultrabooks. Also, massive economies of scale drove down prices for lower-end PCs, tablets and smartphones such that large numbers of less affluent families in emerging and developed markets could afford them. This further increased scale and enabled even less expensive devices, such as the \$100 smartphone. Further, the virtuous circle doesn't merely enable the low-cost smartphone; it makes possible the perennially improving smartphone, as well as the \$100 tablet.

These mutually beneficial forces allowed the five categories to grow at an aggregated average CAGR of 11.8 percent between 2004 and 2014 (estimated), almost four times faster than the underlying semiconductor industry, and almost twice as fast as global GDP, which in constant dollars grew at an annual rate of six percent between 2004-2014 (estimated)<sup>5</sup>. However, this impressive growth rate appears to be reaching a plateau.

Between 2006 and 2012, annual PC industry sales oscillated within a narrow band of \$210-\$240 billion. But in 2013, sales declined by 12 percent to under \$200 billion, and many analysts forecast an additional four percent decline in 2014<sup>6</sup>. A constant decline in average selling prices (ASPs) means that while PC unit shipments may shrink by less than five percent annually over the next five years; revenues may fall at a faster rate.

The market for TV sets has also been shrinking since peaking at over 115 billion dollars in 2011: 3D technology, integrated connectivity, and voice and gesture control have not enticed consumers to upgrade their TV sets more frequently or at a higher price. Television set ASPs have been declining slowly since 2007; however, that erosion might be slowed or even reversed over the next five years by demand for Ultra High Definition (UHD) 4K TV sets, which are likely to command premium prices. Yet even with this possible boost, TV set sales in 2018 are expected to rise by less than \$10 billion over the 2014 forecast of \$105 billion.

New video game consoles were introduced in late 2013. Although early combined sales figures in markets where the new devices have been released have been higher than for prior generations of consoles<sup>7</sup>, the console business, at around \$10 billion per year, is unlikely to make much of a difference on the more than \$750 billion base.

These trends suggest that smartphones and tablets need to be the main engines for growth in the connected living room market.

Sales of smartphones should continue to grow, in units and revenues, but the rate of growth is likely to decline. Globally, feature phones are now a minority of sales: the steepest part of the growth curve for transition to smartphones has already occurred. The smartphone upgrade cycle is lengthening: while some people still line up to be the first to own the latest phone, the average consumer is happy with their current phone for longer than in 2008 and 2009, when each new model was a dramatic improvement over the previous model. Between 2007 and 2013, the handset upgrade cycle lengthened by over 25 percent, from less than 19 months to more than 24 months<sup>8</sup>.

The majority of smartphone sales over the next five years are likely to be in the developing world. These price-sensitive buyers are already having an impact on ASPs: in late 2013 the decline in smartphone ASPs dragged down overall mobile phone ASPs by four percent. While smartphone sales in 2014 are expected to rise to about \$375 billion, a 12 percent year-on-year increase, smartphone sales in 2018 are only expected to rise to \$430 billion, a 15 percent increase over four years.

4 This is equivalent in area to 80,000 football pitches, or the entire land area of Vienna, Austria or Denver, US. Such a screen, assuming a 16:9 aspect ratio, would be about 27 km by 16 km with a diagonal of 32 km. The average viewing distance is three times the diagonal, so this hypothetical screen would be viewable from about 100 km up, which is the recognized definition of outer space. See: Kármán line, Wikipedia, 2013: [http://en.wikipedia.org/wiki/K%C3%A1rm%C3%A1n\\_line](http://en.wikipedia.org/wiki/K%C3%A1rm%C3%A1n_line)

5 Report for Selected Country Groups and Subjects, World Economic Outlook Database, International Monetary Fund, October 2013: <http://www.imf.org/external/pubs/ft/weo/2013/02/weodata/weorept.aspx?pr.x=78&pr>

6 For a view on PC shipments, see: IDC Forecasts PC Shipments to Fall by Double Digits in 2013; Volumes Are Expected To Stabilize Above 300 Million Units per Year, But With No Significant Recovery, IDC, 2 December, 2013: <http://www.idc.com/getdoc.jsp?containerId=prUS24466513>

7 "...both systems sold more units in November than their predecessors did in the first three to four months following their launches." Edward S. Williams, BMO Research Today, December 13, 2013

8 People Are Taking Longer To Upgrade Their Smartphones, And That Spells Trouble For The Mobile Industry, Business Insider, 6 September 2013: <http://www.businessinsider.com/the-smartphone-upgrade-cycle-gets-longer-2013-9>

In 2014, tablet sales are expected to reach 285 million units and surpass \$100 billion. Falling ASPs are being driven by the growing share of compact tablets (8.5 inches or smaller), which are typically lower-priced. ASPs of classic format tablets (nine inches or larger) are declining. Overall tablet ASPs fell 10 percent in 2013, and if that price decline continues then annual tablet sales are likely to remain near the \$100 billion level through 2018.

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#### Bottom Line

The living room's digital upgrade is nearing completion; peak disruption may have passed with no clear winner, except for the consumer, whose need for entertainment and media is now better served than ever at the hardware level.

In 2000 there were few connected devices. A few homes had PCs connected via a dial-up connection. There were video games consoles but they weren't connected; there were mobile phones, but not smartphones; there were books, but they were made of paper; there were televisions, but they were only used to watch TV shows and DVDs. Now, in 2014, the living room in developed markets is almost completely digital.

Over the period from 2000-2014 we have had a period of extreme turbulence, with nearly all aspects of the living room going digital and getting connected. Sometimes this led to profound changes in usage, such as watching TV with a second screen in our hands or on our laps. The music industry and video rental industries were transformed, probably permanently. On the other hand, alongside these profound changes, other behaviors haven't changed. Minutes of traditional TV viewing have remained about the same, even with the number of people paying for traditional TV growing over the same time frame worldwide.

It is important to note that the five categories discussed here are not facing a drop in sales, but merely a slowing of growth. Also, our prediction only extends to 2018: there may well be new developments that could cause the market for any or all of these devices to grow rapidly again after that date.

Further, as happened with tablets in 2010, a new category could emerge that generates annual sales of \$50 or \$100 billion, which would be big enough to move the needle.

The converged living room doesn't seem likely to have room for another "Next Big Thing", but moving outside offers an interesting possibility in smart glasses. Based on our 2014 prediction, first-year sales of these devices at \$2 billion appear to be less than half the first-year sales for tablet computers, so they seem unlikely to be big enough in dollar terms. Also outside the living room, 3D printers, also known as additive manufacturing, might make "every home a factory<sup>9</sup>." That sounds like a promising new category except that the most optimistic analyst forecasts say 3D printers will sell only \$5.7 billion by 2017<sup>10</sup>.

To put the likelihood of another disruptive technology into context, since the 1970s there have only been three consumer device categories (PCs, smartphones and tablets) that generated over \$100 billion in annual sales<sup>11</sup>.

Hyper-growth of hardware sales in the last decade likely absorbed a significant share of the consumer wallet. However, as that growth slows, sales of software, services and content might accelerate. For example, slowing sales growth for flat screen TVs could free up money for multiple video services; lower growth in video games consoles might be offset by higher sales of video gaming titles.

With smartphones, a lengthening refresh cycle might reduce the need for carriers to subsidize phones in markets where that is common, and carriers may even want to encourage consumers to keep their phones for longer through innovative pricing plans. And in markets where phone purchases are not subsidized, it might allow consumers to spend more on data plans.

9 3-D Printers Make Every Home a Factory, Discover, February 2013: <http://discovermagazine.com/2013/jan-feb/19-3-d-printers-make-every-home-a-factory>

10 Gartner Estimates Home 3D Printer Shipments Will Grow 49% This Year, TechCrunch, 3 October 2013: <http://techcrunch.com/2013/10/03/gartner-estimates-home-3d-printer-shipments-will-grow-49-this-year/>

11 For devices launched after 1970. For devices launched after 1970.

One interesting effect could be a deceleration in research and development costs for hardware manufacturers, as many consumers might refuse to pay for incremental technology improvements such as 100 megapixel cameras when 50 megapixels is good enough. At the same time, in a world of increasingly commoditized technology, spending on advertising might rise to stimulate demand and improve differentiation.

It is unclear what the implications might be for chip design: will device manufacturers respond to a plateau in growth by offering a new processor only every second generation, or will they try to claim a bigger piece of the same size pie by attempting to differentiate through even faster new processors?

The past decade has been especially challenging for those developing apps, content or software for devices. Sales growth was accompanied by an explosion in formats, aspect ratios, resolutions and operating systems, with developers forced to create a new version for every combination and permutation, or pick and choose likely winners. A plateau might provide a much needed respite for them, while helping to create a more stable environment with less fragmentation.

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