## Calamos Advisors LLC Commentary



BY JOE WYSOCKI, CFA

### Cloud Computing: The Next Wave of Innovation

If asked, many of us would probably not say we are riding the next wave of technological innovation. But at the same time, most of us have discovered that using popular web-based e-mail systems or social networking sites has changed the way we communicate with friends and family around the world. If that's true for you, chances are you're already riding that wave—whether you know it or not.

By now, many have heard the term "cloud computing," since it's gaining attention in mainstream media, but what is it really? There are many definitions, but for the most part, the "cloud" refers to massive computing power placed around the globe, all connected through a network. It sounds a lot like the basics of the Internet, but a key differentiator is that information can be stored on this "cloud." This can change how we do many things. The business impact is

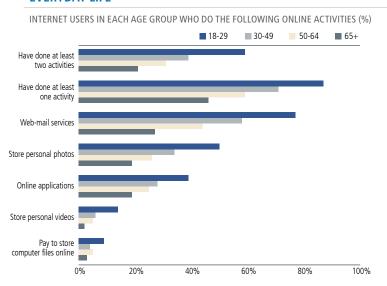
tremendous, but it also has a pretty profound impact on everyday users such as you and me. Furthermore, it is trends such as these that help shape how we position portfolios here at Calamos.

### A Significant Business Impact

It may seem odd, but the wave of the future has similarities to an old and mundane power utility. One of the primary business benefits is the ability to use basic computing power similar to how we use electricity. Large data farms have been built on the back of ever-increasing computing speeds at decreasing prices. With continuously faster broadband connections, anyone can tap into that power at a pretty low cost. From an investment perspective, we look for industries that stand to benefit from this. The infrastructure requires vast amounts of networking equipment as well as storage and servers for the data centers. Software companies that specialize in virtualization, data management and security may also see increased demand for their products.

Treating computing power as a commodity also has enormous implications not only from a cost-savings standpoint but from an operating perspective. The physical hardware costs for individual businesses are greatly reduced, and the cost of maintaining and upgrading the system shifts to data center operators who benefit from economies of scale. Businesses can "rent" computing power and easily expand should they need more computing space. This is

## FIGURE 1. FOR MANY, CLOUD COMPUTING IS ALREADY PART OF EVERYDAY LIFE



Source: John B. Horrigan, "Use of Cloud Computing Applications and Services" Pew Internet & American Life Project April-May 2008 Survey, September 2008, http://www.pewinternet.org/Reports/2008/Use-of-Cloud-Computing-Applications-and-Services.aspx, accessed on May 5, 2010, page 5. N=1,553 Internet users. Margin of error is ±3%.

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particularly appealing for a small start-up business which may find the fixed costs of doing this on its own prohibitive. Further, power costs are reduced as the "cloud" enables the large data farms to be built in cooler climates and next to renewable energy sources that are friendlier to the environment. (Google recently took out a patent for a floating data center which uses power generated from the motion of the waves.) This can also impact industries outside of the technology sector, as demand for power shifts to low-cost areas and possibly drives demand for renewable energy sources and infrastructure.

# The "cloud" has profound implications for everyday users.

There are potential indirect effects as well. By having this information on the "cloud," the data can be used to identify new ways to generate sales, enhance productivity or develop completely new business models. Did you know that Google's spell checking system was developed largely from gathering data from individual searches? Google processes three billion queries a day and tracks misspellings along with the corrections users make, thereby "learning" how to spell check—across multiple languages.

#### **Benefits for Consumers**

Perhaps you're wondering, "what's in it for me?" The "cloud" has profound implications for everyday users. While web e-mail and social networking are already very popular (see Figure 1), another potential game-changing effect is "software as a service" (SaaS). Perhaps the best way to explain SaaS is to compare it to renting movies from a cable or satellite service that allows us to stream movies to our home whenever we wish. This has greatly diminished the need for each of us to own a DVD player, just as it has disrupted the old business model where we could find a movie rental store on virtually every street corner.

Consider another area that is on the verge of changing—video games. People generally buy one of three major video game consoles for a pretty hefty price, and then individual games that are not cheap either. Apply the SaaS concept and a totally new competitive force enters the picture. Similar to the movie example, the game software and hardware are stored on the "cloud." Users simply buy a controller and use a broadband connection to play games. Parents will appreciate not having to buy consoles and kids will appreciate being able to play any game, anytime from anywhere (though parents may not!). Game makers will not have to develop a separate version of each game for each console system. They will likely have better control over distribution since there will be no physical games to trade in at second-hand stores. At the same time, the secondhand stores may have to rethink their business model since their core business could shift overnight.

Still not a believer? Transfer both of these examples to your household computer. If you're anything like me, you have multiple applications to manage your finances, do your taxes, create spreadsheets, view pictures and the like. All of that can be run through the "cloud". By "hosting" these applications on the "cloud", it no longer matters to you how much storage space your computer has, how much processing speed you need or even what type of operating system the computer runs. All that matters is that you have an internet connection that allows you to tap into the "cloud" where you can access the applications and your information. You benefit by having access to the same information anytime, any place, from any computer. In addition, you no longer have to be concerned about updating to the latest version of the application because the "cloud" does that for you. Given this, hardware manufacturers may see consumer preferences shift to lower-priced, higher volume computers. Software companies will have to adjust to a new business model.

### **Investment Implications**

At Calamos, an important element of our investment process involves identifying secular themes that we use as guideposts in portfolio construction. These themes include:

- > Productivity enhancement
- > The world is starved for information
- > People want access to anything, anytime, anywhere
- > The world is flat; the marketplace is global

The "cloud" clearly fits into these themes and has the potential to progress them to the next level.

We also focus our efforts on filtering through individual businesses to identify those with the best growth prospects and which generate strong and sustainable returns on invested capital. As seen in some of the examples above, the "cloud" can have major impacts for both new and existing businesses, so it is important for us to understand the implications and identify the winners and losers.

While there are existing industries that may be positively impacted by the "cloud"—virtualization, security, data management, infrastructure, networking equipment, lower-priced but higher volume computers, renewable energy—experience has also taught us that the leaders of the next generation are probably not even on the radar screen yet. Indeed, one of the most fascinating aspects of the "cloud" is that it has the potential to be a launch pad for the next great businesses of the 21st century.

As with any emerging trend there are uncertainties—you may feel comfortable putting your pictures on the "cloud," but what about your personal finances? But one thing is certain—technology constantly progresses. The "cloud" is a

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natural evolution for an industry that has undergone amazing development in a relatively short period of time. At Calamos, we think this will bring some exciting changes, and we are continuously looking for ways to position investors to benefit.

#### **ABOUT THE AUTHOR**



Joe Wysocki, CFA, is an associate vice president and senior strategy analyst. As a senior member of the Calamos investment team, he is directly involved in the fundamental analysis of companies, and investigates investment opportunities consistent with the firm's long-term philosophy and process.

### Commentary



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