INVESTMENT STRATEGY UPDATE

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CLOUD COMPUTING

Of all the jargon used in the world of technology, perhaps no phrase is currently as pervasive as "Cloud Computing." Among investors, the concept seems to be on everyone's mind, and we have wondered for some time whether it is as well understood as it is well promoted. Our research suggests that Cloud Computing truly is a "new paradigm," but any time those two words get thrown around, our job as investors is to do two things: make sure we don't lose our shirts by overestimating its importance, and make sure we don't miss a great opportunity by underestimating its impact. The following is a summary of our current understanding of this trend and how we see it developing.

Framing the Concept

The computing industry has been evolving for decades but its basic purpose remains the same: process and store data as efficiently as possible. Currently, the dominant architecture for doing so is the "client/server" model, whereby sophisticated personal computers (clients) capable of processing, storing, and displaying data in their own right, link up to more powerful computers (servers) for shared storage or special functionality. Generally, a single server performs a single function, defined by the operating system and the particular application software installed on it. In recent years, this model has been gradually evolving to the new architecture known as Cloud Computing. It's a big concept that is not easily defined, but there are a few characteristics that are so incontrovertibly linked to Cloud Computing that we offer this succinct description: remotely accessed, shared technology services.

The first defining characteristic of the Cloud is that the technology services, whatever they may be, are accessed *remotely*, often by desktop computer, but also by laptop, smart phone, or tablet, thanks to highly robust telecommunications networks. The Internet is hardly a novelty, but it remains a disruptive force, and continues to change the way companies do business.

The second, and perhaps most important, characteristic of Cloud Computing is that it utilizes *shared* technology resources to serve multiple customers. In much the same way that a utility efficiently generates electricity for thousands of homes, so that each customer does not need to operate their own generator, a data center that houses powerful servers and large arrays of data storage devices can provide thousands of customers with the computing resources they need. A critical technology that enables this sharing of resources is called virtualization, which uses overlying "control" software to allow multiple operating systems to function on one server. So instead of needing one physical machine for each function, many "virtual machines" can be hosted by a single server. Utilizing shared resources is a great way to improve efficiency and, thereby, save money.

Finally, the Cloud is all about *services*. These can take the form of technology nuts-and-bolts hardware, such as computing, data management, and networking resources, some combination of which are essentially rented, rather than owned. An example of this "infrastructure as a service" would be a mid-sized business deciding to allow an outside vendor to physically house, monitor, and manage their servers and data storage devices, rather than investing in their own real estate, equipment, and staff. At another level, end-user applications such as e-mail, word processing, and customer relationship management can also be rented, in a manner known as "software as a service." BTR, for instance, completely outsources its e-mail service. Cloud-based services can also take the form of a software platform ("platform as a service") accessed via the Web, on which software developers can create their own customized applications. Examples include Google's App Engine and Microsoft's Azure.

The Benefits and Limitations

For all of the excitement and new terminology, Cloud Computing is not, in and of itself, a new technology. It is merely a way to use existing technology resources more efficiently. In short, it's a cost-cutting strategy. And as such, it succeeds brilliantly. No matter whether you are an individual with a couple of personal computers, a printer, and a wireless home network, or a large corporation with thousands of users and a dedicated information technology (IT) department, managing the tangles of modern technology is not easy. The idea of outsourcing the whole thing is an attractive proposition. Spreading the costs of hardware, software, and people across many companies, rather than having each company build its own set of dedicated resources, increases overall utilization, thereby lowering costs. Add to that the facts that the software is always kept current by the provider and that the service can be accessed from any Internet-capable device, and the attraction is undeniable.

Naturally though, in the real world, things usually aren't that simple. While deployment of a new computer application may be relatively easy via the Cloud, there are a lot of applications already in place, running highly-customized software. Merrill Lynch estimates that less than a third of all software spending is on commercially available software packages. The rest is spent on software designed in-house or by systems integration consultants. That investment is not simply going to be abandoned overnight. In order to move a data processing workload to the Cloud, the Cloud-based application would likely need to be compatible with a company's existing systems, and this is where the Cloud model doesn't perform as well.

In order to minimize costs, Cloud service providers standardize their operations on one kind of technology "stack"; that is, they use only one kind of database and one kind of operating system, etc. As such, a customer may not be able to customize a Cloud-based service to meet its unique needs. Furthermore, even though each Cloud may be standardized, compatibility between Clouds is currently minimal, so the ability to switch providers is likely very limited. And not to be forgotten, as reliable as most networks are, the Internet still becomes a single point of failure for all of a company's outsourced applications, potentially causing major headaches if the connection goes down.

Finally, and perhaps most importantly, the concept of shared resources really does mean that one company's data are stored, processed, and transmitted side by side with another's. Though done in the name of cost cutting, the very notion must give senior managers the willies. As IBM's Vice President of Strategy recently pointed out, members of Generation Y may be comfortable sharing their most intimate details on Facebook, but he's yet to meet an enterprise that feels the same way. In a survey of IT professionals, Forrester Research found that where there is an unwillingness to adopt Cloud Computing, the biggest reason is security.

A Happy Medium

As with most new concepts, it will take time for Cloud Computing to become the game-changer it is expected to be. At a recent technology industry conference we attended, the Cloud was arguably the most talked about single issue, so we know that corporate management is contemplating what it means. For those companies large enough to manage their own data centers, continuing deployment of virtualization technology inside their security firewall to create a "private" Cloud seems to be the logical way to move forward.

For smaller companies that can't afford dedicated IT personnel, let alone their own data center, outsourcing applications to a truly "public" Cloud may make sense, particularly if the privacy hurdle can be overcome. As Cloud-based service offerings proliferate, larger corporations may find that outsourcing certain applications (like email) to the public Cloud makes sense, while they keep more mission-critical applications (like databases) safely in-house. We believe that this "hybrid" approach is the most likely endgame for Cloud Computing.

Winners and Losers

The companies with the most to win in this case are those that are already driving the adoption of Cloud Computing by making technology resource utilization more efficient: those focused on virtualization, data management, and storage networking. Any company that can provide a robust data security solution for the public Cloud, so that sensitive personal and corporate data are not threatened, will also benefit enormously. Another group of winners is likely to include the companies whose products manage the ever-increasing traffic on telecommunications networks. And, generally speaking, the companies that can provide a data center manager with a one-stop-shop for all computing, storage, and networking needs should take market share from competitors that can't. In short, this is the group that sells the picks and shovels to the gold miners.

Ultimately, the biggest cost of the decentralized and highly customized client/server computing architecture is personnel. Therefore, IT department employees may have the most to lose from Cloud Computing. This, however, is not an investable theme. The companies with the most to lose longer-term may be the big systems integration consultants, as the demand for customized systems drops. Of course, a vendor that cannot supply either a high-quality unified data center solution, or at least a best-of-breed solution for a single application, will either have to build or acquire some of these capabilities, or, indeed, contemplate its status

as a going concern. We believe the recent merger and acquisition activity in the technology sector reflects this.

Financial Market Comment

So far this year, the stock market has been largely confined to a trading range of plus or minus 7%. Despite the recent rally back into positive territory, the continuing commentary from most investors and the media is overwhelmingly bearish. Pessimism reigns, but our review of the underlying data indicates a fairly well-balanced outlook.

On the one hand, major financial crises have always been followed by extended periods of deleveraging and very sluggish growth. And thus far, this cycle has been no exception. Economic progress to date has been meager, with employment and housing lagging quite badly. Additionally, deflation fears are ramping up, and there is a general concern that if the economy weakens further, the Federal Reserve Board will be forced to expand its program of quantitative easing, injecting more money into the economy by purchasing Treasuries.

On the other hand, the global economic outlook remains favorable and a much-feared double-dip U.S. recession seems unlikely. Growth may be agonizingly slow, but the recession is over. Furthermore, U.S. corporations are in excellent financial condition and seem well equipped to compete in the expanding global arena. And with corporate earnings continuing to grow, stock market valuations seem relatively attractive. Given the high level of pessimism and the substantial amount of buying power on the sidelines, we think that even a slight hint of further fundamental improvement could lead to sharply higher stock prices.

Additionally, and with the "past performance is no guarantee of future results" caveat, we offer the following: Historically, U.S. mid-term elections have been associated with significantly-positive subsequent stock market performance. According to a recent study by The Leuthold Group, reviewing the seventeen mid-term elections since 1942, the stock market has *never* been down over the subsequent 200 days. In fact, the average gain during those 200-day periods was an astounding 18%.

On the fixed income side, we consider bond market investments to be quite unattractive at this point in time. So, while investors continue to pour money into very low-yielding, seemingly safe bond funds, we envision a major trap down the road, when interest rates inevitably rise to more normal levels. The bottom line is that we find it difficult to believe that stocks won't handily outperform bonds and cash in the months and years ahead.

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