

## Technology Economics: Rubin's Law and Why Your IT Spending is About to Hit the Wall

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February 3, 2012  
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Technology Intensity - Patent US 7,996,249 B2 Howard Rubin

During the short history of what we now call “technology economics” which spans 50 years, it has always been clear that demand for computing is increasing and that upwards expense pressure is a fact of life in what many have called the information age.

Equally clear and apparent – especially in the past 3-4 years – has been the desire (maybe a demand) by businesses to drive down IT total expense or at constrain its growth in times of revenue and market pressure.

Moore's Law has been an ally in helping CIO's manage the dynamics of upward demand and downward cost pressure.

In short, Moore's Law hypothesizes that *the number of transistors that can be placed inexpensively on an integrated circuit doubles approximately every two years.* Fundamentally this translates to more computing power per dollar. And, based on analyses of computing costs and power available in the market place this enables CIO's to reduce costs of their “run the business” processing on a continuing basis – assuming a reasonable refresh rate to keep up with technology advances.

In “supply and demand” terms, this phenomenon has enabled firms to offset growth in demand for IT capacity of up to about 18% per year. Such growth rates will probably now be known as the “good old days”!

Between 2006 and 2010 demand for processing cycles (MIPS, Servers, and the like) has slowly approached an 18% annual growth rate in the big banks. Storage by the way has hit 45% per year – the advent of BIG DATA is here – and although the unit cost of storage is still dropping, storage cost pools around the financial industry are expanding out of control. Moore's Law just isn't enough and the growth phenomenon is now exacerbated by market conditions.

In their efforts to protect revenue, grow new revenue sources, enter emerging markets, become more global, increase automation to lower operating expense, and even support new channels (social networking) and devices (Bring Your Own Device), financial services companies are now experiencing core platform growth rates exceeding 20% a year. It feels sort of like a triple-witching-hour or a perfect storm –

BIG DATA, demand, and falling/uncertain revenue have all converged to drive a new era and behaviors in technology economic dynamics

“Rubin’s Law” is now apparent: The geometric growth rate of computing demand -- technology intensity in the context of business and our personal lives - will drive computing costs past the point at which Moore’s Law will keep the costs manageable.

Put another way, computing demand is doubling every 5 years and Moore’s Law won’t save you – companies can no longer “surf” Moore’s Law. Therefore, discontinuous/disruptive technology and innovative approaches are critical to the new economics we are about to encounter.

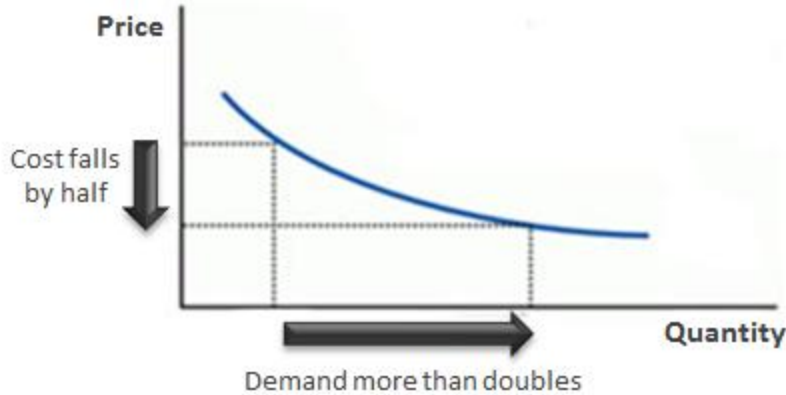
Taking a step back, you will likely ask, “How can this be true?”

The answer involves yet another “law” – actually a paradox observed in the late 1800’s, “Jevons Paradox” which states *Technological progress that increases the efficiency with which a resource is used, tends to increase (rather than decrease) the rate of consumption of that resource.*

William Stanley Jevons’ developed this hypothesis in 1865, based on his observations of coal consumption vis-à-vis technology the technology improvements designed to improve the efficiency of coal usage. It was his argument that these improvements alone could not be relied on to reduce consumption, rather they would lead to increased consumption - and he was right. Today we talk about elastic computing; in 1865 Jevons focused on “elastic coal” – well at least the demand was elastic.

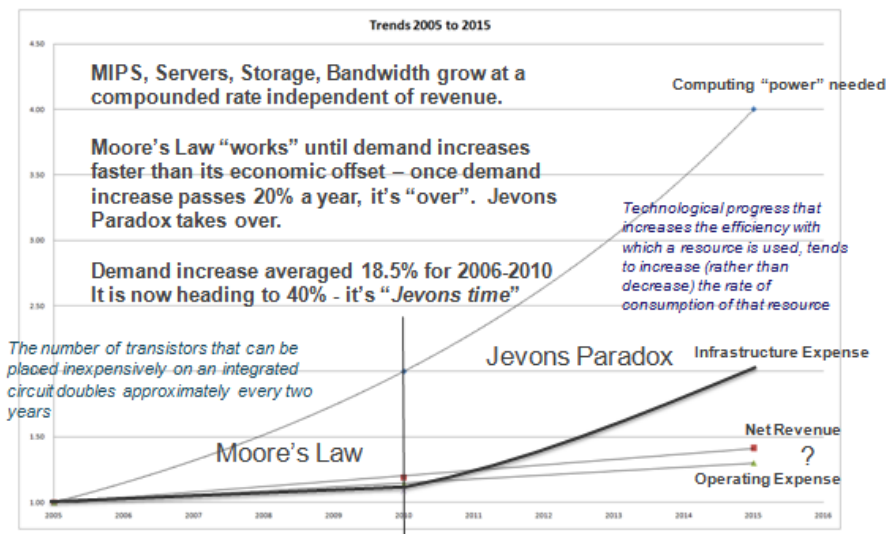


**Improved coal burning efficiency powered the industrial revolution, leading to even greater coal consumption.**



The Jevons Paradox demonstrated that as fuel efficiency improved, the consumption of coal increased by more than double the original consumption level.

So the aforementioned growth in demand (passing the 20% mark per year) is actually fueled in part by the inherent efficiencies created by Moore's Law. Through 2010 we were in the Moore's Law zone of managing IT costs downward.....now we are a new world governed by the effects noted by Jevons.



The financial results reported in the financial services sector and almost half of those companies in the S&P 500 cast a long shadow on the future of IT spending. With some of the worlds foremost global banking institutions having FY2011 revenue decreases of 9% to 26% overall and premier investment banks showing 4<sup>th</sup> quarter results with revenues off 30% or more, IT spending will definitely show up on the corporate radarscope. With such a precipitous revenue decrease, firms which have been accustomed to IT spending in the range of 8-12% of revenue will see this ratio move up into the mid-teens or higher. Though not a good measure of IT efficiency or effectiveness it will certainly be noticed.

CIO's and IT leadership needed to be prepared for this and get ahead of it, if it isn't too late.

The technology economy of 2012 and beyond is going to be characterized by a continuing increase in technology intensity for the enterprise --- independent of revenue patterns:

- it will be characterized by continuing upward pressure on expenses as demand exceeds any Moore's Law offset as the Jevons effect take over
- it will be characterized by a need for revamped technology management models
- it will be characterized by the need for shifts to disruptive and discontinuous technology options (enter the "cloud" and the "commons")
- it will be characterized by the need for urgent change to provide enterprises with both the computer power they need and the economic elasticity that is requisite to master the technology economics (and dynamics) of the rapidly evolving technology economy

Perhaps we will remember 2012 as the technology economic "tipping point". A tipping point at which technology intensity growth is now a reflection of its true potential. And hopefully we will also remember it as the year that business leaders, policy makers, and the world at large begins to embrace the new economics of realities of a technology driven economy.