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Globalization – The Tail Gets Longer

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August 31, 2005

Paper for the October Adhesive and Sealant Council Meeting

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Consolidation and globalization have been the “trend words” in the ASC industries for many years. There are constant references to the ASC industries as “fragmented” and needing/benefiting from consolidation.

The unstated but assumed process for globalization is that illustrated in figure 1. Globalization will proceed via firm consolidation in order to achieve the “critical mass” to effectively compete in a global market place. But what is globalization really? One can find in excess of 1000 definitions and references in different contexts of the word on the internet. Let’s review just a few that have particular relevance to our industry.

1. Increasing economic integration and interdependence of countries.

2. Increased flow of goods, services, money, and ideas across national borders and subsequent integration of the global economy.

3. Processes leading to the integration of economic, cultural and social systems across geographical boundaries.

4. A process of creating a product or service that will be successful in many countries without modification.

What is interesting is that none of the definitions imply economic consolidation; overwhelmingly the use is of “integration”. While consolidation can be one form of integration, the two processes can operate on independent paths.

Van wishard of world trends research is an expert in trend analysis. In his recent book[1] Wishard examines what is really happening in the world today. His contention is that we are passing through a rare historic moment when a civilization progresses from a familiar world view to a new broader outlook. In his book he defines Globalization. It “is far more than integration of economics and finance. The essence of globalization is the individuals expanding awareness of other people’s cultures and religions as a result of technological advances in communications and travel”.

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Globalization means awareness of others needs and these may be totally different than yours or mine. In fact I believe we like it that way and really do not want to see “homogenization” become “globalization”.

Therefore the business challenge is to satisfy an increasingly disparate or “fragmented” customer requirement. The strategic question is what the best way to serve this global requirement.

As a model for this problem I would like to suggest one of the most fragmented “markets” in the world and that is the global internet. The internet as we know it today was conceived during the height of the cold war. It was a response to concerns over a soviet nuclear attack disabling the Telephone network in the U.S. due to its dependence on highly concentrated “switching centers”. As a result of this effort

four computers were linked together at the University of California at Los Angeles, Santa Barbara, Stanford and the University of Utah. This first network was the ARPANET, and in addition to demonstrating a more robust method of linking communications it allowed University scientists to share scarce and expensive computing power.

What a change from then to now. The internet has grown into a global communication and information highway. Bill Cheswick[2] of Lucent technologies has created a map of the internet which is shown in Figure 2. On the surface this looks like the most chaotic system in the world without any form of organization. In his research examining the structure of the internet Barabasi[3] expected to find a typical bell curve distribution of nodes and corresponding links. (The nodes and links of figure 2). The expectation is shown in figure 3. Instead of the "normal distribution" it was found that the connectivity of the internet followed a plot shown in figure 4.Figure 4 is an example of a "power law distribution". This power law was detected in further research on topology of the internet by computer scientists and brothers Michalis, Petros and Christos Faloustos[4] and is shown in figure 5.

The consequences of this discovery and subsequent investigations into the application of power laws in the natural and business world lead to a explosion of research which has lead to a whole field of science known as "Chaos theory"[5] "small world theory"[6] and fractal science[7]. The essence of these disciplines is the realization that power laws govern many phenomena in our world rather than the "Normal distribution" of which we are so familiar from quality systems and statistics.

In the world of competition and the corporation Barbasi[3] has made case that the market is a directed network; companies, firms, corporations, financial institutions, governments, and all potential economic players are the nodes. Links quantify various interactions between these institutions, involving purchases and sales, joint research and marketing projects, and so forth. The map of the internet is a good "visual" for a market like ours which is fragmented.

In his widely read and referred to book on competitive strategy Porter[8] devoted a significant amount of discussion to "Fragmented" industries. As a preamble to this discussion he stressed that an industry must be viewed as an interrelated system and that this fact applies to fragmented industries as well. In illustrating fragmented industries he lists many examples (of which adhesives and sealants is one). The common areas where fragmented industries are found are;

- Services
- Retailing
- Distribution
- Wood and metal fabrication
- Agricultural products
- "creative businesses"

There is significant discussion devoted to how to compete in this type of environment. Porter's assertion that industries must be viewed as interrelated and Barbasi's contention that markets are connected networks are very similar concepts. Yet no one has tackled the implications of a "fragmented" industry competing in a global environment and there is not an extensive literature on the subject.

Does our industry follow a power law model in its competitive dynamics? And if it does what are the implications for moving forward in this increasingly global environment? We test this hypothesis using sales (as already suggested by Barbasi and Porter) as a proxy for the linking transaction for this "network". Figure 6 shows a plot of the sales rank for 35 companies in the adhesive and sealant industry for which reliable sales data could be obtained. This list includes many of the companies that are members of this organization. As seen from this plot the curve is the same shape as the internet nodes and links plot shown in figure 5. If one plots then the log-log version of this data a straight line is obtained as shown in figure 7.

What about other industries? What kind of distribution or fragmentation pattern do they follow? Does this relate to financial performance of ability to compete in a global environment and create value? To gain insight into these questions several "industries" were evaluated for their tendency to follow power laws or not. Industry classifications and data were taken from value line[9]. In choosing the industries to evaluate some hypothesis was required as to which industries might follow a fragmentation pattern and which may not. Intuitively it would seem that "creative" industries in the definition of Porter would be those such as computer software, computer hardware, and other types of information technology. Those which would be consolidated and probably not follow a power law model would be those with high capital barriers to entry and therefore depend more on volume of business than developing new, different and better products. It would be very difficult for example to start a niche railroad to compete with CSX. The following industries were examined as representative of the two categories.

TABLE 1;

Consolidated Industries	**Creative Industries**
Railroads	Computer software
Auto manufacturing	Computer hardware
Integrated steel	Information services
Chemical basic	Wireless networking
Chemical specialty	
Paper	
Cement	

As an example of how the data were examined figure 8 shows a rank plot of the ASC industries, computer software, integrated steel and basic chemicals. The ASC industries and computer software show very similar rank plots with many companies competing in the smaller firm size area.

In order to better and more efficiently quantify an industries tendency to follow a power law fragmentation the industry data was tested for "skewness". This is a statistical measure of how equally distributed about a median data really are. Figure 9 illustrates the concept of this measurement. For this study the coefficient of software skewness[10] was used to characterize the data. For industries that follow "power law" structure (or "fragmented") one would expect to find a high positive skew. For those that do not a slightly positive, neutral or negative skew would be anticipated. We therefore use the software coefficient of skewness as an indication of "fragmentation".

The results for this measurement for the various industries in table 1 are shown in table 2.

Table 2: Skewness Test for industry Fragmentation

Consolidated Industries	Skewness	Global	Creative Industries	Skewness	Global
Railroads	-.01	No	Computer software	3.92	Yes
Auto manufacturing	-.84	Yes	Computer hardware	3.23	Yes
Integrated steel	1.65	Yes	Information services	3.52	Yes
Chemical basic	1.21	Yes	Wireless networking	1.21	No
Chemical specialty	1.06	Yes	ASC industries	2.74	Yes
Paper	1.76	No			
Cement	.65	No			

From table 2 we conclude that certainly the “consolidated industries” are much less skewed than the “creative” industries. A judgment of the globality of each is added to show whether there might be any correlation between globality and skewness. From this small sample there are as many “global” industries that are fragmented as there are global industries that are “consolidated”. Therefore we hypothesize that consolidation is not necessary for globalization and that is more dependent on the competitive dynamics of the particular industry and market. A comment about the wireless networking industry; It is considered by Financial analysts as a “start-up industry” and therefore shows a low skew, one would expect as this industry advances that skewness would increase as firms find their niche and market base.

We postulate then that a particular industry must globalize within its most efficient overall structure, which could be “completely consolidated” (0 to negative skew; e. g. automotive producers), a hybrid situation (modest positive skew), or “fragmented” (high positive skew). In fact the processes of consolidation and globalization are totally separate.

For an industry that must satisfy a wide range of customer needs that may depend on disparate technologies, distribution systems or some combination of disparities a power law structure is probably the best way to meet that market need. In fact we might expect that if one tries to operate outside of the most robust structure for a particular industry that there could be negative financial consequences.

Figure 10 show a plot of the coefficient of skew vs. return on total capital for the industries considered. It seems that the “consolidated” industries earn a higher return the closer they are to a normal distribution in firm size about a mean. When these competing firms fragment to much they quickly lose competitive advantage. The “creative industries seem to fare much better when there is a significant amount of “fragmentation”. This can be interpreted as due to the fact that “ideas” can be more easily commercialized in these industries and have immediate impact. It seems that there needs to be more differentiated ideas in the wireless network area.

A peak at the Future – The music industry

There is no more global business than American music and entertainment. Every country in which I have traveled (and it is quite a few) plays, enjoys and indeed demands American Rock music, Pop, and movies. It is a huge success story for American creativity and truly qualifies as one of those "creative" industries to which Porter[8] refers. The music and entertainment industry however is undergoing a radical change[11]. For too long the tyranny of lowest common denominator fare, brain-dead summer blockbusters and manufactured pop. Why? Economics. Many of our assumptions about popular taste are actually artifacts of poor supply-and-demand matching- a market response to inefficient distribution. The main problem is that we live in the physical world and, until recently, most of our entertainment media did too. Figure 11 demonstrates this with only a fraction of the entertainment titles physically available. Hit driven economics is a creation of an age without enough room to carry everything for everybody. This is the world of scarcity. With online distribution and retail we are entering the world of abundance and the differences are profound. The market that lies outside the reach of the physical retailer is big and getting bigger.

Most successful businesses on the Internet are about aggregating the long tail. Niches are where the economic success will be in the future. What this means is pulling consumers down the long tail with lower prices. Figure 12 illustrates this as the bit player advantage[11.]

Now it is impossible to email a drum of adhesive to the customer so this analogy can only be taken so far. However if we look at figure 12 and change the word titles to formulas, and then consider this on a global basis, I believe that fragmentation brings more value to the customer. There are many companies out there that have excellent technology in this industry, and as we become more comfortable and capable in doing industrial business over the internet the ability to extract value from the long tail of the industry will increase and not decrease. As the industry continues to globalize and foreign small companies enter the mix the industry may globalize through additional fragmentation and not consolidation.

Long tail businesses can treat customers as individuals, offering mass customization as an alternative to mass-market fare. This is especially applicable to our industry where varying customer processes, rapid dislocation of manufacturing sites, and changing end-use requirements demand mass customization.

Conclusions

1. Globalization in the Adhesive and Sealant industry may proceed more effectively through "fragmentation" rather than consolidation. (See figure 13).

2. "Fragmentation" (for some industries) presents a higher rate of return on capital.

3. "Fragmentation" is a more robust industry structure in which to provide value to the customer on a global basis given the trend to mass customization.

4. Both Large and small firms play an important role in "creative" industry dynamics.

Future Work

The role of mergers and acquisitions in creating value in globalization is currently being examined in order to identify specific strategies for firms along the "power chain" to exploit so that appropriate tactics for growth are identified.

This will be the subject of a upcoming publication.

Figure 1: Assummed Process of Globalization

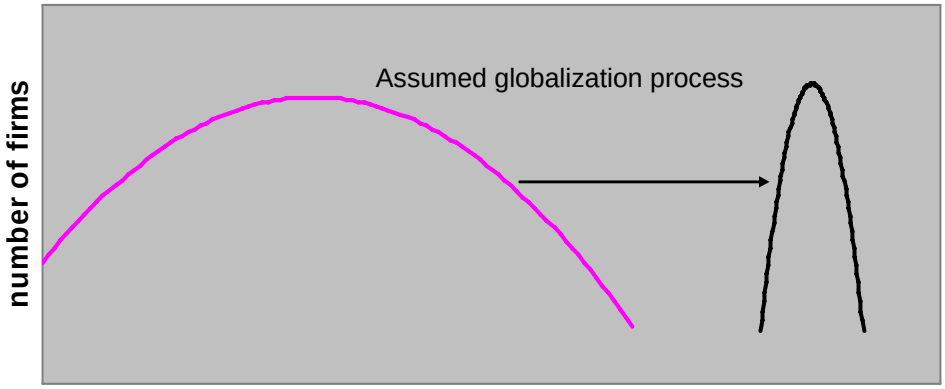


Figure 2: Map of the Internet

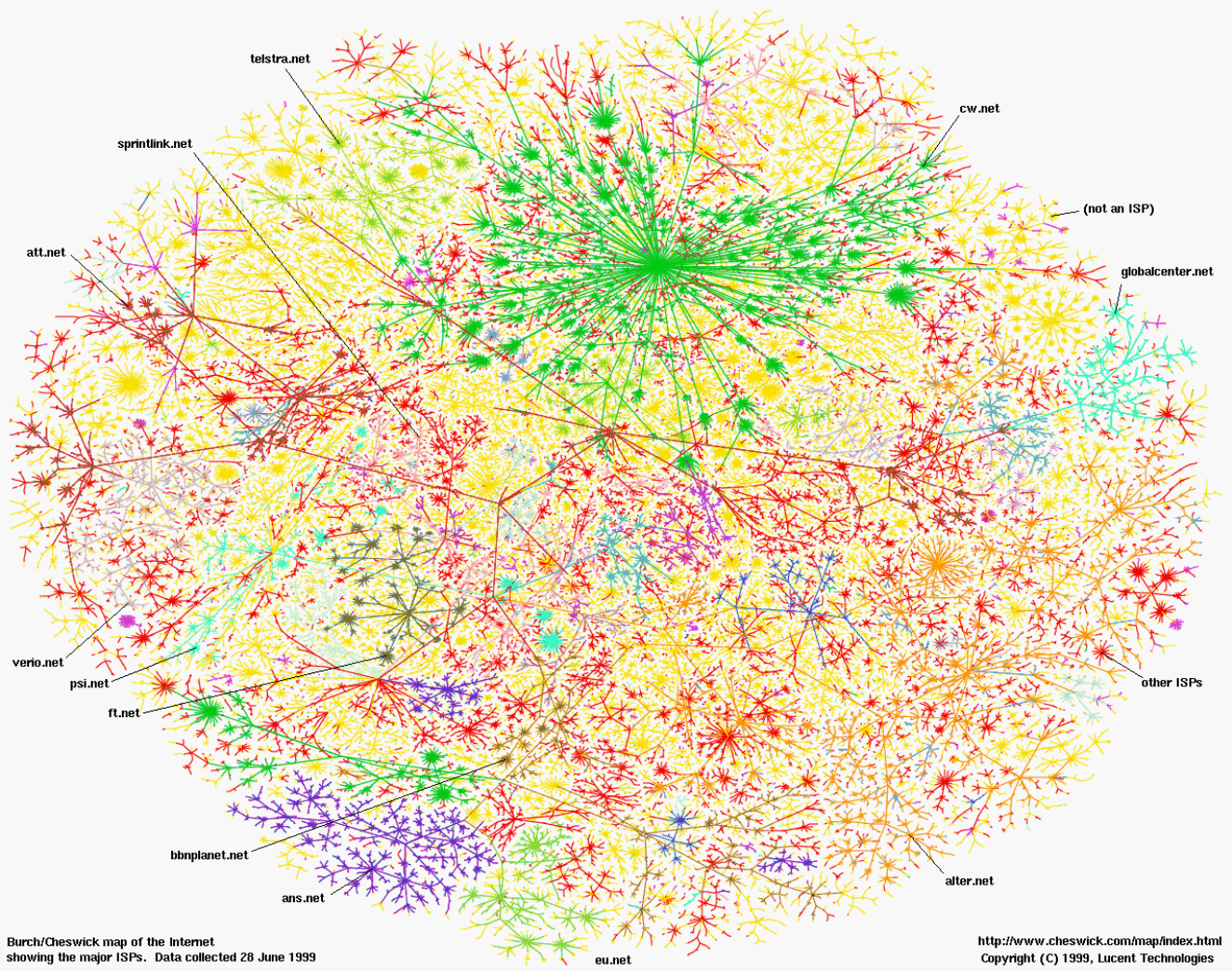


Figure 3: Expected Nodes and Links Internet Distribution

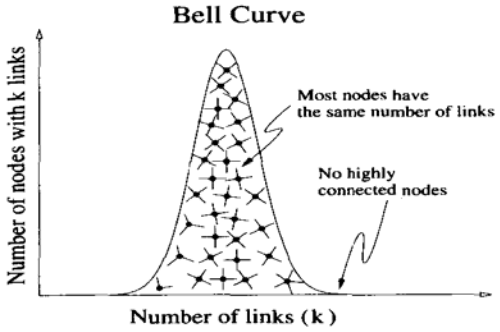


Figure 4: Internet Nodes and Links Actual

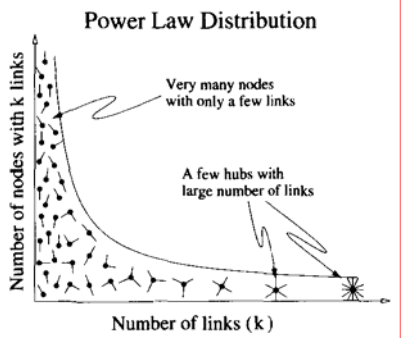
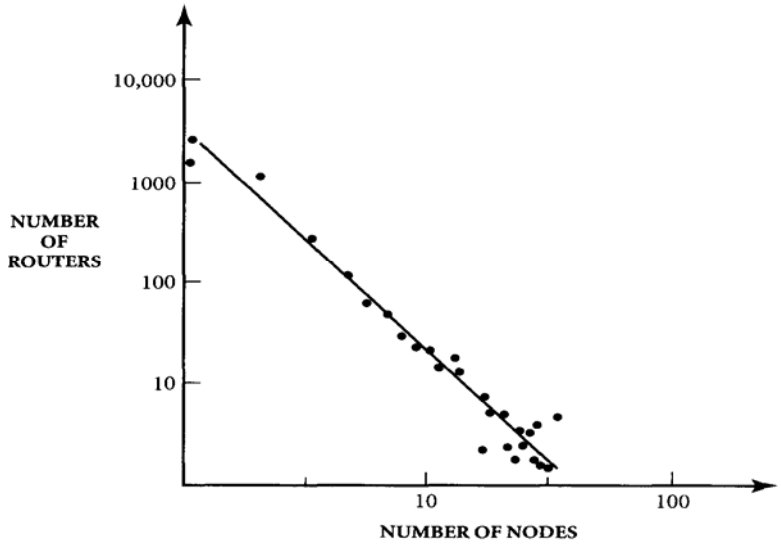


Figure 5: Power Law Pattern of the Internet



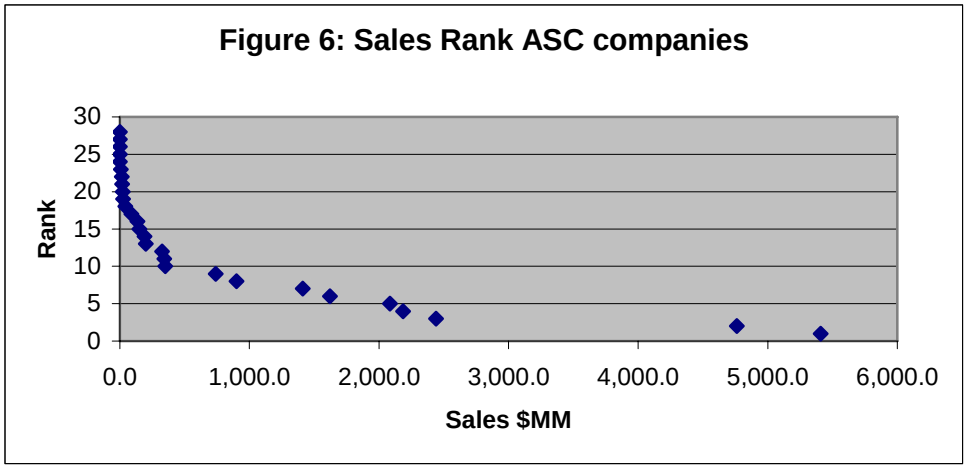


Figure 6: Sales Rank ASC companies
Rank
30
25
20
15
10
5
0
0.0
1,000.0
2,000.0
3,000.0
4,000.0
5,000.0
6,000.0
Sales $MM

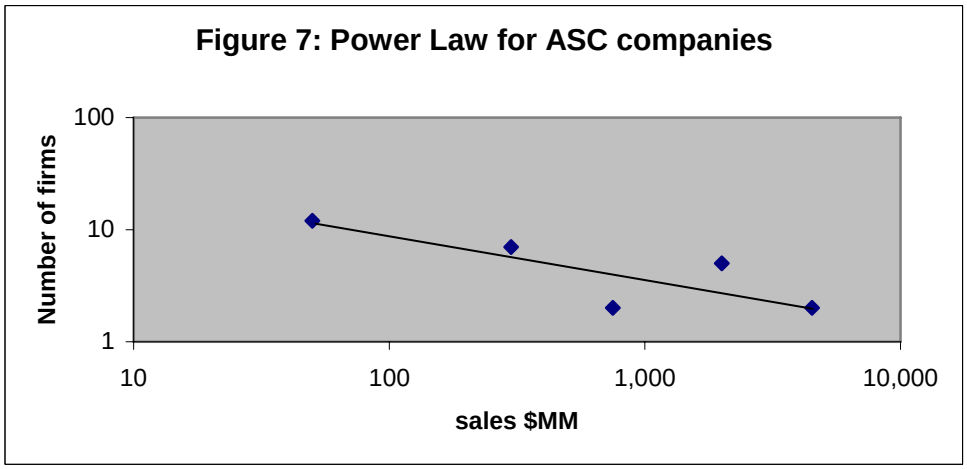


Figure 7: Power Law for ASC companies
Number of firms
100
10
1
10
100
1,000
10,000
sales $MM

Figure 8: Sales Rank for various industries

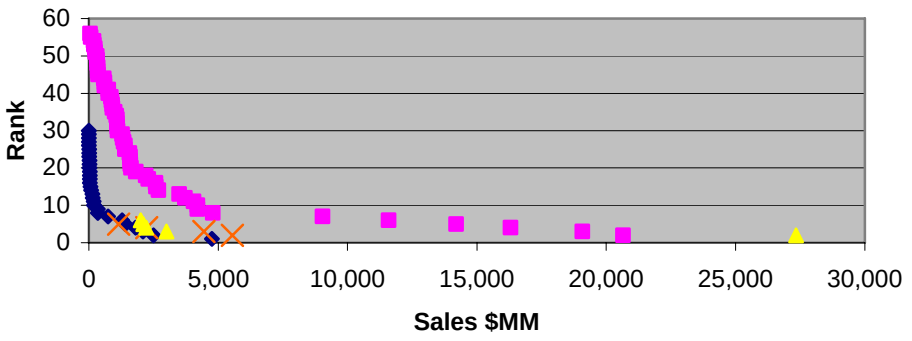
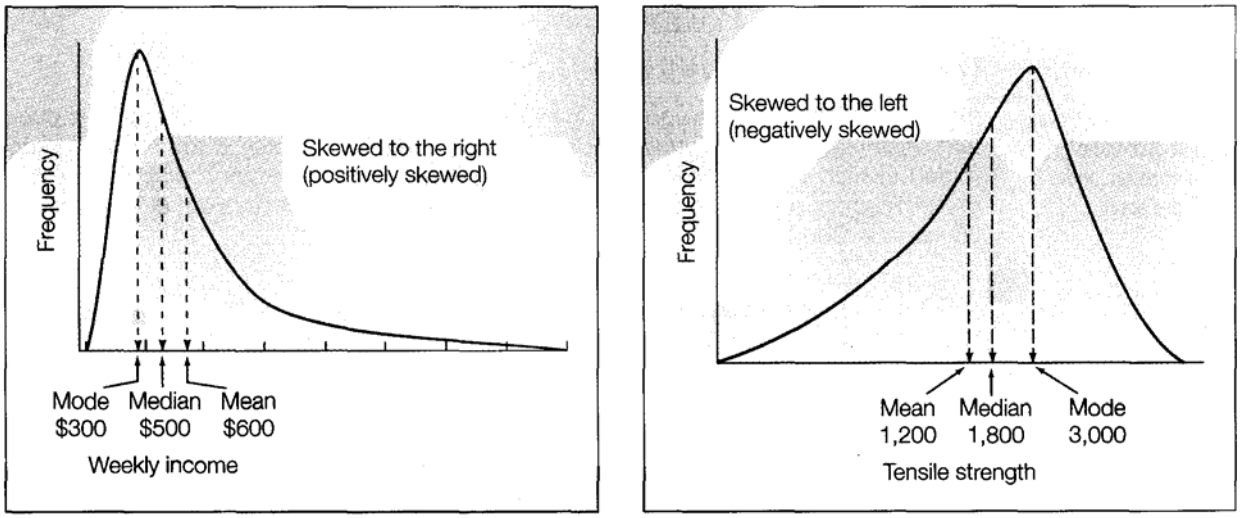


Figure 9: Distribution Skew Measurement



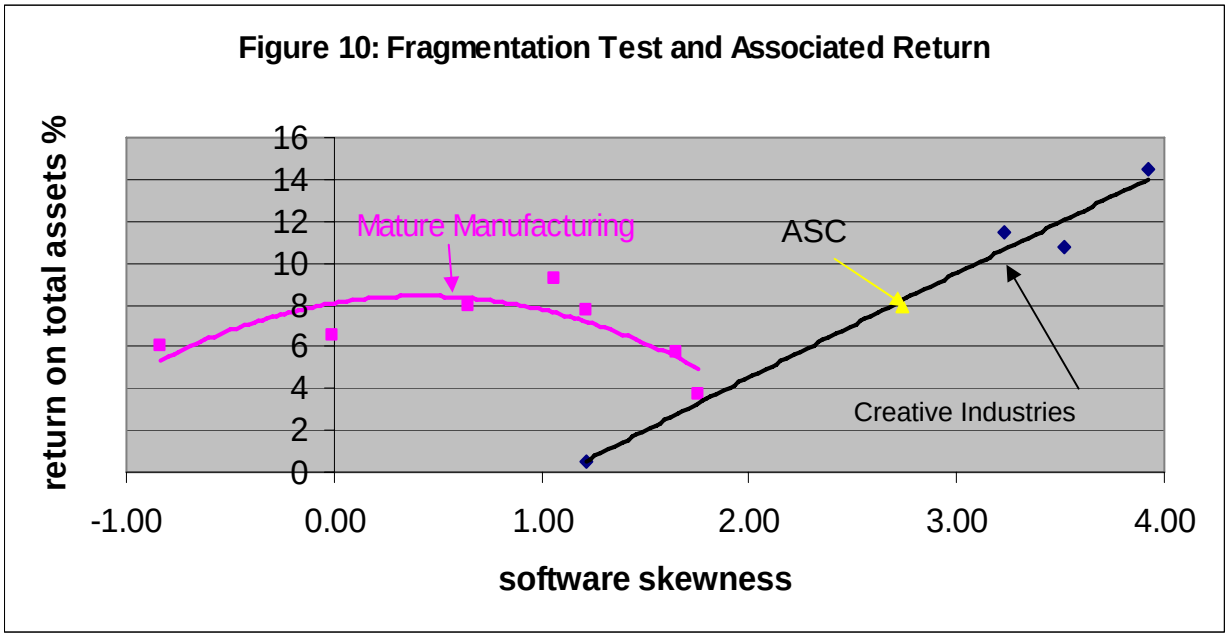


Figure 11: The long tail of the music Industry

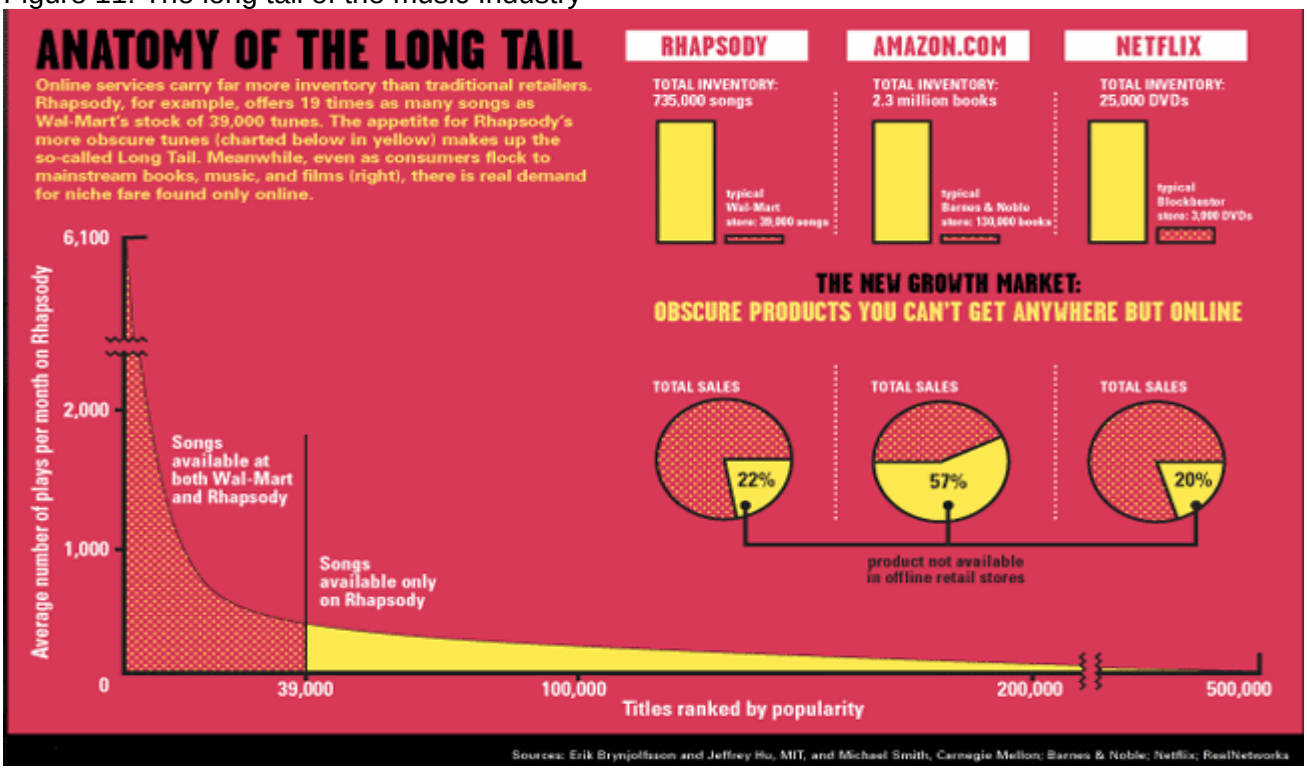
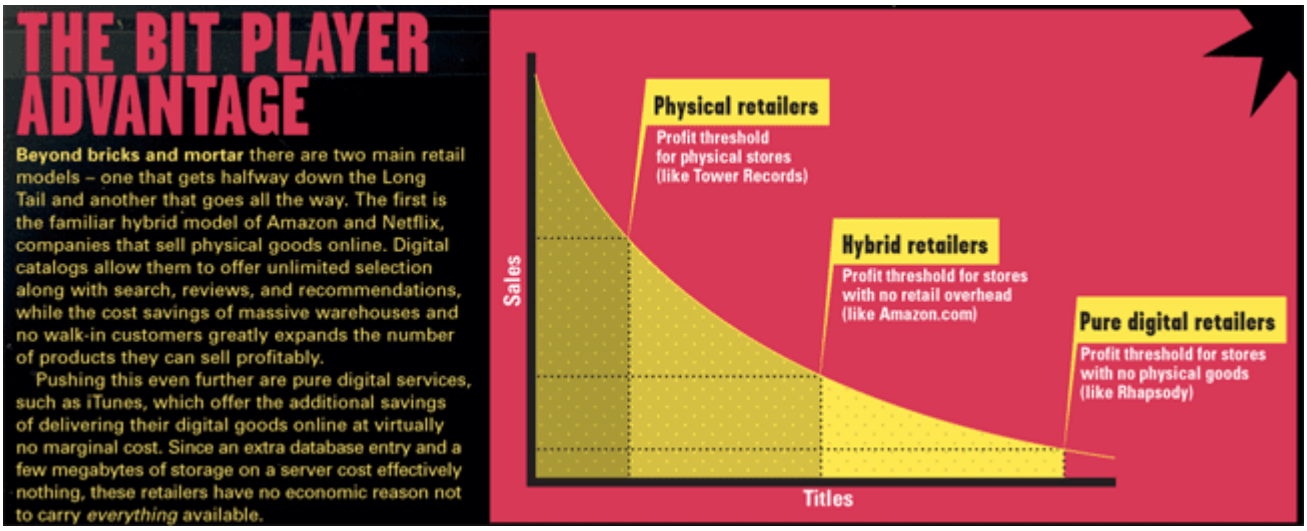
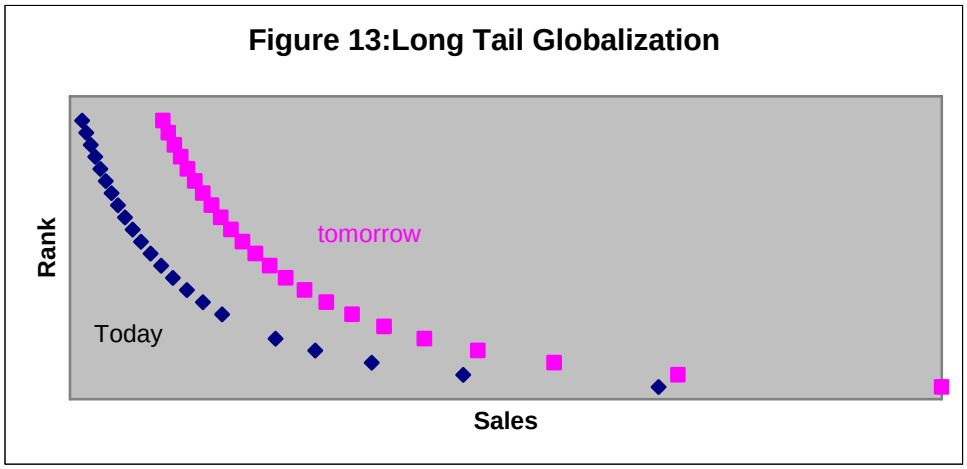


Figure 12: The economic advantage of the bit player





ENDNOTES

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