Long Tails Versus Superstars:
The Effect of IT on Product Variety and Sales Concentration Patterns

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Abstract

The Internet and related information technologies are transforming the distribution of product sales across products, and the effects are likely to grow in coming years. Both the Long Tail and the Superstar effect are manifestations of these changes, yet researchers lack consistent metrics or models for integrating and extending their insights and predictions. In this paper, we begin with a taxonomy of the technological and non-technological drivers of both the Long Tails and Superstars and then define and contrast the key metrics for analyzing these phenomena. While significant research has already been done, the core the paper describes a large and promising set of questions forming a research agenda. Important opportunities exist for understanding future changes in product distribution; its impact on supply chains (including cross-channel competition, competition within the Internet channel, implications for the growth of firms, and the balance of power within the supply chain); implications for pricing, promotion and product design; and ultimately potential effects on society more generally. Our approach provides an introduction to some of the relevant research findings and allows us to identify opportunities for cross-pollination of methods and insights from related research topics.

Key words: Long Tail, Superstar, Product Variety, Sales Concentration, Information Technology

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1. Introduction

Improvements in information technology (IT) are changing the way consumers learn about goods and services, as well as the way producers develop, distribute and deliver them. These technological advances are not simply the result of increases in the capacity of digital communications, computing and storage, but also a qualitative transformation in search, recommendation tools and social network technologies.

The implications of this change for business and society are large and will likely grow as technology advances. For instance, significant increases in societal welfare have come from the introduction of new products and services and the concomitant increase in product variety available to consumers (Bresnahan and Gordon 1997). In recent years, IT has played a central role in this increase in the supply and demand of niche products, creating a "Long Tail" in the distribution of product sales.[1] At the same time, many markets can be increasingly described as "Superstar" or "winner-take-all" markets where blockbuster products dominate sales.[2] Such changes in production and consumption patterns across niche and blockbuster products portend profound effects on competition and market structure.

In this paper, we argue that while both the Long Tail, and the Superstar[3] literatures have largely been separate, they can and should be analyzed as part of an integrated research agenda that studies shifts in product variety and concentration patterns caused by information technology. Each of these literatures has made important contributions, and in our view, they are connected by common fundamental drivers, methods, and metrics. We first discuss some of the common technology drivers and describe a unified measurement framework. We then go into more detail on a set of open research questions that can form an agenda for the next decade. Ultimately, a better understanding of how IT can affect product concentration may not only provide guidance to entrepreneurs, managers and policymakers, but could also provide a lens for analyzing related questions like the balkanization of ideas and innovations.

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[1] See, for example, Anderson (2004); Brynjolfsson, Hu and Smith (2003); Brynjolfsson, Hu, Simester (2007); Cachon, Terwiesch, and Xu (2008); Tucker and Zhang (2009); and Oestreich-Singer and Sundararajan (2009).
[2] See, for example, Rosen (1981); Fleder and Hosanagar (2009); Noe and Parker (2005).
[3] While terms "long tail" and "superstar" can be used in various contexts, in this paper, we capitalize the terms Long Tail and Superstar to refer specifically to the contrasting phenomena describing changes in product variety and concentration patterns.

2. Drivers of Product Variety and Concentration

As discussed below, the drivers of these changes in product variety and concentration can be divided along two axes: technological and non-technological drivers and demand- and supply-side effects.

2.1. Technological Drivers

We believe that there are three main demand-side technological drivers of changes in product variety and product concentration: 1) changes in search and database technologies, 2) changes in personalization technologies, and 3) changes in online community and social network technologies.

Search and Database Technologies: Search technologies like Google have transformed how consumers find the products they buy. Consumers' information sources are shifting away from channels such as print and broadcast media advertising and in-store displays toward broader Internet search channels with greater targeting and broader potential selection. As a result, an estimated 57% of all online shoppers use a search engine to begin their shopping research.[4] Moreover, by enabling consumers to specify their desired product features, prices, characteristics or locations, Internet search engines can influence the importance of brands, and potentially increase the relative share of niche products that cater to specific needs. Similarly, search tools at sites like Google Products, eBay, or shopping aggregators like PriceGrabber make it possible for consumers to find obscure products with relatively little effort. In the whole, search engines are becoming more sophisticated in the way they handle queries, which may portend the ability to match consumers even more precisely to products and services with specific or even unique attributes.

Personalization Technologies: Personalization and recommendation technologies go one step beyond search, to predict what consumers may be interested in based on observed actions, and to display these predictions to consumers in the course of their shopping. These technologies can take various forms, from simple "top 10" lists of recommended items other users have selected to sophisticated collaborative filters that infer preferences with little or no active effort by the consumer. Engines that disproportionately help consumers find obscure products that they would not have otherwise known about, should reduce product

[4] Available from http://www.internetretailer.com/2010/06/01/most-consumers-start-their-online-shopping-research-searc, last accessed September 4, 2010.

sales concentration. However, it is also possible that these tools could be tuned so that they lead to disproportionate gains in sales of popular products relative to niche products (Fleder and Hosanagar 2009). The net effect on product concentration will depend on not only the recommendations of the engine, but also on the information sources and decision-making process that consumers would rely on in the absence of a recommender tool. The ultimate outcome is unlikely to be purely a function of technological forces, but may also depend on how tool developers, and the sites that pay them, choose to drive purchase considerations. In turn, this may depend on the nature of product market competition and other factors.

Online Communities and Social Networks: Perhaps the most basic function of digital technologies has been to connect people through reduced communication costs, and the past decade in particular has witnessed an explosion of dedicated online communities and social networking sites. While the monetization of these sites is low relative to search, the potential to influence purchases is significant. For instance, to the extent that demand-side economies of scale are important, and consumers communicate as part of a single interconnected network, these technologies may increase the importance of fads, blockbusters and the Superstar effect. However, if people use the tools to self-segregate into smaller groups, or to learn about and develop idiosyncratic tastes, the net effect of online communities and social networks might be increased balkanization, favoring niche products.

Supply-side drivers: On the supply side, IT-enabled markets may increase producers' incentives to create niche products while also increasing retailers' incentives to stock these products. Considering retailers' incentives, technology changes the cost of stocking products: to make one additional product variety available to all the consumers in the U.S. (or in the world), Internet retailers only need to add the inventory of that product to their centralized warehouses, which in the case of digital products to a central server and product database. Even for physical goods, these costs can be minimized with technology. By forming drop-shipping agreements with book wholesalers, Amazon lowers the cost of stocking an additional book. In addition, a variety of IT systems have reduced the costs to create niche products.

Finally, these technological drivers may create a set of secondary supply-side effects: by creating nationally and globally interconnected markets, as opposed to local markets, technology may creative in-

centives for retailers to disproportionately pursue Superstar products. Conversely, the ability of consumers to locate products that otherwise would not have been stocked in physical stores, may allow producers to pursue different projects, projects that apart of technology would not have been profitable.

2.2. Non-Technological Drivers

In addition to these technological drivers, research must also consider important non-technological factors influencing changes in consumption. For instance, in 1776 Adam Smith noted, "specialization is limited by the extent of the market," suggesting that larger markets — such as those supported by the Internet — could support more niche producers. Conversely, starting with Rosen (1981) and Frank and Cook (1995), a number of papers in the "Superstar" literature have advanced supply-side explanations for why companies may prefer to produce a few Superstar products: economies of scale may allow Superstar products to have higher profitability than niche product do; Superstar products may command price premiums either because of increasing returns to quality or because of the highly skewed distribution of talent, which in turn leads to highly skewed distribution of quality. Likewise, increasing returns to advertising expenditures can increase the profitability of Superstar products (Noe and Parker 2005).

Papers in the "Superstar" literature have also provided a set of non-technological demand-side explanations for why consumers would prefer to consume Superstar products: consumers may want to have social interactions with other consumers, they may use product sales as a signal of (otherwise difficult to obtain) product quality, or they may limit their choice set to economize on cognitive costs.

After reviewing the various drivers of product concentration, it is clear that theory alone cannot predict an inevitable trend in product concentration. Instead, these are primarily empirical questions requiring careful research and models tailored to identifying and quantifying the specific metrics and drivers of interest. In the following sections we will review relevant empirical measures of these phenomena and program of research for the IS community to pursue in addressing these questions.

3. Measures Matter

Given that technological and non-technological factors can drive sales toward either the head or tail of the sales distribution, the next question is "how should the research community measure these shifts?"

A review of the literature suggests that the Long Tail can be defined and measured in at least three different ways, which can lead to confusion since these metrics can lead to seemingly contradictory outcomes:

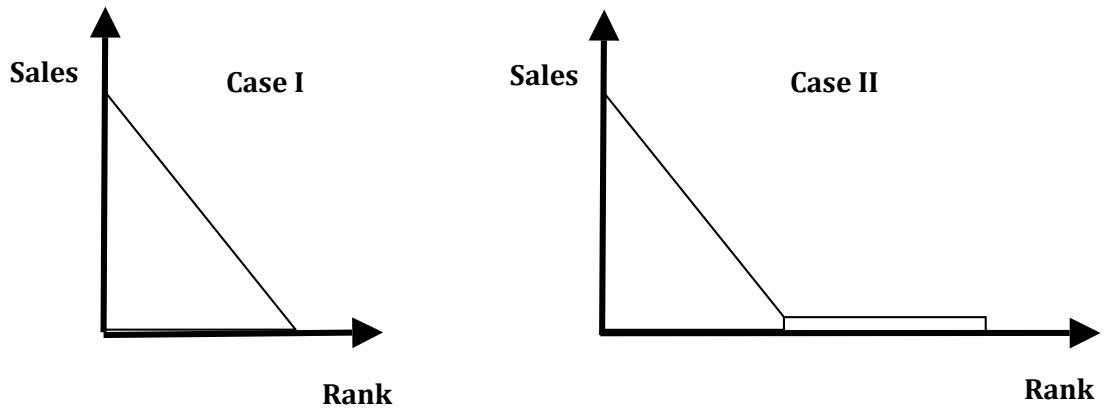
- The *Absolute Long Tail* measures changes in the absolute number of products sold, typically making comparisons across channels, time periods or categories. The measure of sales above an absolute cut-off of 100,000 titles, the typical size of large bricks-and-mortar bookstore, is an example of an absolute measure used in Brynjolfsson, Hu, and Smith (2003).
- The *Relative Long Tail* focuses on the relative share of sales above or below a certain rank. The Gini Coefficient (e.g. Brynjolfsson, Hu and Simester 2007) is an example of this metric and the classic Pareto Principle, that 20% of the products often generate 80% of the sales is an application of it.
- Finally, because the ordinal rank to cardinal sales relationship often follows a Power Law distribution, the exponent (i.e. the *slope of the log-linear relationship*) provides an indication of the relative importance of the head versus the tail of the sales distribution.

Each of these metrics has strengths and weaknesses, and they are not interchangeable. A weakness of the absolute metric is that is not always intuitive to apply it across different markets. The Long Tail phenomenon might be important for understanding changes in competition among camera retailers, even though they have orders of magnitude fewer SKUs than, say, booksellers do. This makes it appealing to apply a relative metric, which is scale invariant, and thus can be used to compare different markets.

However, the relative metric will not always give the same results as the absolute metric, even when applied to the same situation. For instance, suppose a retailer introduces a large number of new niche products, each of which has very low sales. By the *absolute metric*, the Long Tail has grown longer: consumers have more choice, and on an absolute basis the number of sales above a certain rank cutoff may increase even if the sales of any individual product is relatively low. However, it's quite possible that sales will now be *more* concentrated when viewed by the *relative metric*: the top X% of products SKUs may well account for larger share of overall sales than before, which seems to suggest that the Long Tail is now less important. Figure 1 provides a simple illustration of this. Fortunately, the relative metric is consistent with the absolute metric when the number of products does not change. In this case, a Lorenz

Curve, or Gini Coefficient can be used to illustrate the general importance of the tail, or various rank percentiles (e.g. 20%) can be compared.

Figure 1: Increasing the Number Of Available Products Can *Increase* Sales Concentration



Case I: 100 products are available and the top 50% of products account for 75% of total sales.

Case II: Add a "longer tail" of 100 niche products with minimal sales, while leaving the sales of existing products unchanged. Now 200 products are available, and the top 50% of products account for 95% of total sales.

The third frequently used metric is the slope of the log-linear relationship between rank and sales. This exploits the fact that many sales distributions can be characterized by a power law (see, for example, Huberman 2001 with respect to web site visits and other online metrics). Of course, this metric is not particularly useful when this is not the case. For instance, Brynjolfsson, Hu and Smith (2009) provide evidence that the sales-rank slope is not constant, but changes over different parts of the distribution.

Each of these metrics has its uses, but as with many academic fields, progress can be hampered when different researchers use different, and potentially conflicting, metrics. Reference to the above taxonomy can help assure researchers are speaking the same language when they contribute new theory or empirical results. Emphasizing this point, we note that the papers concluding that the Long Tail is important or is growing have typically used an absolute metric — sales of products above a certain sales rank[5]

[5] Note that a metric like sales of the *bottom* 100 products (e.g. Tan and Netessine, 2010) is *not* the same as the absolute metric such as sales beyond the top 100 products. While the latter metric reflects changes in product variety, the former metric cannot be used in this way.

— to measure its size, while papers finding reduced importance of the Long Tail are more often based on the concentration of sales or sales above a certain proportion of products. There may not be a single best measure, and it is quite possible that different measures should be used in different settings. For example, the absolute measure adopted by Brynjolfsson, Hu, and Smith (2003, 2009) may be more appropriate for measuring the consumer surplus gain from the Long Tail, while the relative measure adopted by Elberse and Oberholzer-Gee (2008) and Chellappa et al. (2007) may be more appropriate for analyzing producer incentives for targeting a particular area of the curve.

4. Toward a Long Tail and Superstar Research Agenda

As discussed in sections 2 and 3, both the Long Tail and Superstar effects can be seen as the two sides of a common set of questions about product variety and concentration. That said, the research literature on the Long Tail thus far is more developed and provides a useful lens for highlighting key research opportunities. Fortunately, most of our research suggestions can also be applied to questions about the Superstar effect, or more generally, an integrated view of both phenomena.

Following the drivers and metrics discussed above, we have identified four major areas of inquiry for future research in the Long Tail: the nature of the Long Tail phenomenon, its impact on supply chains, its impact on pricing and other marketing strategies, and its impact on society.

4.1. The Existence of Long Tail and Superstar Outcomes in Different Environments

As noted above, a particularly salient research question surrounding increasing product variety is whether this is an important long-term shift or a passing fad. The mere fact that Internet markets can supply more product variety than traditional markets can does not necessarily mean that they will. It is possible that consumers like to consume the same products that their friends are consuming and, as argued in the literature, that this characteristic will lead to Superstar effects in some product markets.

In this regard, it would be useful for the literature to measure how the Long Tail varies across product categories. Given differences in tastes and consumption patterns across product categories, it is possible that Long Tail markets will be more likely to develop in some product markets than in others. For example, Elberse (2008) argues that music and movies are more likely to be enjoyed in a social context and

thus have natural characteristics that will lead to "winner-take-all" outcomes. Is this true, and if so, what other product categories will experience similar outcomes? Much of the current research studies information goods (e.g., books, music, movies), thus future research could look into non-information categories.

Similarly, Brynjolfsson, Hu, and Smith (2006) predicted that many Long Tail markets would exhibit important secondary effects that would lengthen the tail over time. It will be important for future research to analyze both changes in the Long Tail over time (i.e., Brynjolfsson, Hu, and Smith 2009).

As noted above, sites like Amazon include recommendation engines, which help consumers find products in the Long Tail, as well as prominent links to lists of top sellers in each product category, which tend to increase winner-take-all effects. What's more, it is possible that both types of tools are effective at the same time, which in principle could increase the relative size of both the head and the tail of the sales distribution at the expense of the middle. Finally, both producers and retailers may have self-interested motivations to drive sales toward the head or the tail of the sales distribution and may act on these motivations by tuning their recommendation and search engines to ensure these outcomes. In light of the contrasting effects discussed above, it would be interesting for future research to study the effect of each technology on consumers' shopping behaviors in terms of how they search for information, evaluate alternatives, and make purchase decisions. How will these technologies affect the concentration pattern of consumers' purchases, in isolation and in tandem? How will the relative importance of tools and technologies like these vary across product categories, consumers, and over time, as the tools evolve?

4.2. The Impact of the Long Tail on Supply Chains

How should supply chain participants respond to the opportunities and challenges afforded by increased product variety available in Internet markets? At the producer level, Long Tail markets afford producers an opportunity to sell products online that would not be commercially viable in traditional brick-and-mortar markets (Brynjolfsson, Hu, and Smith 2006). Should producers focus their efforts on niche products with a small number of sales, or should they continue to focus on hit products with large sales (but with *ex ante* risky outcomes)?

At the retailer level, changes in the Long Tail markets can affect competition. The economic literature shows that consumers benefit from the introduction of new products and new product varieties (Hausman 1981). Thus, consumers will be naturally attracted to companies that offer a large selection of niche (and popular) products, and provide IT-enabled tools that help consumers discover these niche products. There is some anecdotal evidence that firms are consciously pursuing such a Long Tail strategy in order to gain a significant competitive advantage when competing with their competitors and to grow their market shares (Mendelson and Meza 2001). All told, firm strategies associated with Long Tail markets may impact competition and strategy in four main areas: cross-channel competition, competition between Internet retailers, firm growth, and power within the supply chain.

4.2.1. The Impact of the Long Tail on Cross-channel Competition

Internet retailers typically offer a large selection of niche products and provide IT-enabled search and recommendation tools to help consumers discover niche products, while brick-and-mortar retailers typically only stock popular products and do not provide IT-enabled tools. Thus, an Internet retailer may be able to gain an advantage over its brick-and-mortar counterparts by pursuing a Long Tail strategy.

We are not aware of any paper that has made this point through the use of an analytical model. However, Brynjolfsson, Hu, and Rahman (2009) represent an empirical approach to this question, finding that as the number of local brick-and-mortar stores increases, Internet consumers' demand for popular products drops significantly, but their demand for niche products does not change much. However, they have only studied one product category — clothing — where products do not have unique identifiers. Future research is needed in other product categories such as books, music, and DVDs. The competition between Internet retailers and brick-and-mortar retailers could be stronger in these categories, because unique identifiers should make it easier to identify an exact offline substitute for an online product. Technology may even increase competition here as a variety of mobile applications (e.g., RedLaser on Apple's iOS platform) allow consumers to scan bar codes in brick-and-mortar stores and compare prices with online retailers. Given the central role of such cross-channel competition, and the growing availability of data, there are enormous opportunities for further research.

4.2.2. The Impact of the Long Tail on Competition among Internet Retailers

Researchers could also study how Internet retailers could use the availability of niche products as a strategic tool in its competition with other Internet retailers. Some Internet retailers like Amazon and Zappos offer a huge selection of niche products, while others provide a more targeted selection. To what extent can the availability of niche products drive consumers' choice of which Internet retailer to buy from? To what extent can the availability of niche products help an Internet retailer gain a competitive advantage? And what are the strategic, technological, cost or other drivers that lead firms to choose different strategies with respect to their Long Tail approach?

Furthermore, low search and switching costs on the Internet may intensify price competition among Internet retailers. It would be interesting for future research to study whether an Internet retailer can adopt a Long Tail strategy to move consumers from shopping solely on price toward looking for niche products that fit their tastes well. Such a strategy could lead to higher levels of differentiation among Internet retailers and, in turn, potentially higher profitability.

4.2.3. The Long Tail and the Growth of Firms

Long tail strategies may also affect the growth of firms. Even before the term "The Long Tail" was coined by Anderson (2004), a number of Internet companies had successfully pursued management strategies seemingly based on a Long Tail concept. For instance, Jeff Bezos, the founder and CEO of Amazon, has long observed that there were more than 3 million book titles in print worldwide, while the largest physical superstores carry only about 175,000 titles (Mendelson and Meza 2001). Recognizing the inherent advantages of Internet retailers in providing greater product variety, he decided to choose books as its first product category when he founded Amazon in July 1995, and the company provided a large selection of books online along with tools that enabled consumers to search for books. Likewise, Steve Barnhart, the CEO of Orbitz, commented that niche products present a great growth opportunity for travel companies (Joyce 2008).

It is reasonable to expect that the impact of the Long Tail phenomenon on managerial practices and firm growth will only grow as Internet commerce accounts for a larger proportion of total consumer commerce in the future.

4.2.4. The Long Tail and the Balance of Power within the Supply Chain

Finally, researchers could analyze whether Long Tail distribution and promotion channels will impact the balance of power within the supply chain. For example, consider the context of music where historically a concentrated set of large music labels have controlled the industry, leaving artists (with the exception of a few Superstars) with little power over their creative product. It is possible to view this structure as arising from the ability of the record labels to control access to a small number of promotion (e.g., radio) and distribution (e.g., brick-and-mortar record store) channels (see for example Meier 2000). Does the Long Tail reduce the scarcity of access to distribution and promotional channels and thus weaken the control publishers have had over these important resources, or will publishers continue to be able to exercise strong control over most creative artists as they have historically?

4.3. The Impact of the Long Tail on Pricing and Other Marketing Strategies

How might niche products made available through the Internet channel (i.e., place, one of marketing's "4Ps"), impact the other "4 Ps" of marketing practice: price, promotion, and product?

4.3.1. Pricing

Pricing in the context of the Long Tail presents a variety of fertile areas for future research. First, it is not obvious how companies should price niche products. Should they charge a price premium for niche products that fit consumer tastes well, or should they cut the price for niche products to stimulate consumers' exploration of products that may have lower qualities and higher uncertainties?

Likewise, should companies adopt a uniform pricing for all their products? Without conducting in-depth research, Apple initially adopted a uniform pricing strategy for the music in its iTunes store. More recently, Apple, along with other music retailers, has shifted toward a more flexible tiered pricing scheme. Under this new scheme, most songs will still sell for 99 cents; a certain number of new hit songs will sell for $1.29; and many older songs will go for 69 cents. A researcher could utilize data from such a

natural experiment to understand how consumer demand responds to price changes and how this effect is different across popular products and niche products. Such an analysis could shed light on whether niche songs should be sold at a higher or lower price than hit songs and whether a tiered pricing scheme has led to higher or lower profits for music retailers and music labels.

Moreover, the answers to these and related questions will likely vary across product categories, as consumers likely place high values on niche products in categories they need while placing low values on niche products in categories that they may not necessarily need. For instance, online booksellers typically offer bestsellers at substantial discounts, while more obscure books are often sold at smaller or even zero discounts.

Second, the above scenario assumes that consumption of product A is independent from product B. But in reality, the demand functions for different products could be correlated. A consumer may initially want to buy a popular product, but could end up buying a niche product to go with the popular product, either because of the retailer's recommendation or because of the retailer's free shipping hurdle. The reverse can also happen: a consumer may be attracted to a retailer because they offer niche products, and may end up buying a popular product in addition to the niche products. In other words, the demand for niche products could have a spillover effect on the demand for popular products, and vice-versa. An executive at Amazon told us that even when obscure products are not profitable standing-alone, the company benefits from keeping them in stock so that customers are confident of finding what they look for at Amazon. This increases customer loyalty and reduces incentives for visiting competing retailers. Given this strategic consideration and the ones outlined above, it is important to know how Internet retailer's should price their popular products and niche products, in the presence of such spillover effects?

4.3.2. Promotion

As with pricing, there are a variety of ways Long Tail markets could impact promotion. Historically, companies needed to access scarce and expensive promotional channels such as radio and television to reach an audience. Today companies can connect to potential consumers via a variety of social media channels, such as MySpace, Facebook, and Twitter. In such environments, producers can broadcast in-

formation on its products to a set of consumers who are connected to the company. Anecdotal evidence suggests that such promotions in social media can significantly impact product sales (e.g., Vincent 2007).

In this regard, social media has clearly given niche products and producers of those products a new channel to connect to consumers. Given that traditional media are often saturated by the promotions of popular products, it is possible that promotion via social media can skew sales toward niche products, driving the Long Tail phenomenon. On the other hand, the effect of promotions via social media depends critically on the number of consumers who are connected to the company and its products. Since more consumers are likely to be connected to Superstar products than to niche products via social media, it is also possible that social media will expand the gap between Superstar products and niche products. More research is needed to understand how social media will drive these competing effects.[6]

4.3.3. Product

Finally, product design itself might be affected by increased product variety. For instance, incentives for the creation of new niche products will be increased if these products have successful channels for distributions and sales. This may cause existing producers to shift production toward Long Tail products or may cause new producers to pursue these markets.

Another product design question involves bundling or unbundling products, especially information goods (see e.g. Bakos and Brynjolfsson, 1999, 2000). This question may be particularly salient in the context of music where traditionally an album was built around two or three hit songs, with other songs filling the remaining space on the album. These albums can be viewed as a bundled good, where the shift toward digital markets for an increased variety of singles driving the industry toward unbunbled content. Such unbundling may be particularly dramatic for services like Rhapsody that allow subscribing consumers to listen to all the songs in the catalog, or services like eMusic that allow subscribers to download a certain number of songs from a catalog after paying a monthly fee. These subscription plans can be viewed as an aggregation mechanism, similar to bundling. Finally, even in cases where physical products

[6] While we suggest to study how firms' promotional activities in social media affect concentration patterns, Dewan and Ramaprasad (2007) study how users' activities in social media affect concentration patterns.

are being sold, the practice of offering free shipping discounts on large orders would almost certainly encourage consumers to bundle several items into one order, a form of product bundling.

In this context, the existing literature on Long Tails and Superstars has mostly studied stand-alone products. It would be interesting to study how such bundling and subscription practices can shift the balance of power toward either Long Tail or Superstar products. How would a uniform bundling or subscription strategy (such as CD albums, Rhapsody subscriptions) alter consumers' consumption patterns? How would a customized bundling or subscription strategy (such as eMusic or Netflix subscriptions) change consumers' consumption patterns?[7] How should information goods producers bundle (or unbundle) niche content? And should niche content be sold with other similar content, or in broader bundles of "sampler" content?

4.4. The Impact of the Long Tail on Society

It is also important to understand how changes in product variety and concentration patterns affect society as a whole. What are the implications on social welfare as firms develop, distribute, and deliver more niche products to consumers, and as consumption patterns swing toward niche (or popular) products because of advances in technologies? How much will consumers gain in terms of consumer surplus? How much will firms gain in the form of producer surplus? Moreover, consumer surplus gains may not be evenly distributed across different types of consumers, just as producer surplus may not be equally distributed across different types of firms. Technologies also introduce new players into the supply chain. For instance, many niche products in IT-enabled markets are provided by small niche retailers who are affiliates of large marketplace operators such as Amazon and eBay (Bailey et al. 2009). How profitable are these businesses to small niche retailers and large marketplace operators respectively?

Long Tail consumption patterns of products and information could also lead to either a global village of citizens who are well informed about both products and policies, or to fractured communications between balkanized groups of consumers. An optimistic view, is that the increased information available online will allow consumers to become better informed than they could before. For example, consumers

[7] Goh and Bockstedt (2008) and Elberse (2010) show that customized bundling may shift sales to Superstar songs.

interested in a particular bill before the U.S. Congress can browse the details of that bill on government websites and explore commentary on both sides of the issues in a much more detailed way than could be covered in a typical newspaper. This could lead to a better-informed global village of citizens, and potentially better outcomes for society. On the other hand, the Internet has led to the creation of sites catering exclusively to extreme views on either end of the political spectrum (e.g. Sunstein 2002). As the Internet allows consumers to filter contents based on tastes, interests, and political viewpoints, it is possible that consumers who are fed an exclusive diet of news tilted toward a particular political viewpoint might be less able to understand and engage in a healthy debate with individuals holding a different viewpoint. This view of a balkanized online world could have a negative impact on society, even as the individual involved report higher satisfaction with their chosen news source (Van Alstyne and Brynjolfsson 2005). Again, while both potential outcomes have been discussed in the literature, there has been little empirical research into the actual outcomes as consumers get used to consuming niche products or niche information contents online, or how these outcomes might differ across information categories such as traditional news, public health information and consumer product information.

It is important to note that the Long Tail literature and the Cyberbalkans literature mentioned above study topics that are inherently connected. At first glance, the Cyberbalkans/Global Village literature appears to focus on different constructs (information and interests) from the Long Tail/Superstar literature (consumer purchases). However, information and interests clearly affect purchases, and purchases can also affect information and interests. For instance, the consumption of wine can lead to knowledge of wine properties and even an evolution of new wine preferences. Just as sales and tastes are naturally intertwined and affect each other, the Long Tail/Superstar literature (relating to sales) and the Cyberbalkans/global village literature (relating to tastes and interests) are inherently intertwined.

On a more fundamental level, the IT drivers affecting these trends may have commonalities, as may the research methods employed. While the research literatures have largely evolved separately, joining the theory and methods that have been developed can lead to new insights and enhance the overall vigor of the research. Factors that are prominent drivers in one literature could be studied as drivers in another

literature. For instance, network structure can drive the Cyberbalkans/Global Village literature; it can also drive the Long Tail/Superstar literature. An example of this would be that the position of a musician's MySpace page within MySpace network could affect the flow of information and attention, which in turn affects the sales of the musician's music. In addition, factors driving the Long Tail/Superstar literature could drive the Cyberbalkans/Global Village literature. An example of this would be that the limit of shelf-space could affect product sales, truncating the tail. The limit of shelf-space can also shape consumer interests toward a Global Village.

Viewing these two literatures in parallel has another benefit — tools used in one literature can be used in the other literature. And given that the methods and tools used thus far in these literatures have relatively little overlap, viewing them as part of the same phenomenon may suggest some immediate possibilities for cross-pollination. For instance, network measures, widely used in the Cyberbalkans/Global Village literature, may be used in the Long Tail/Superstar literature. As one example, consider how the similarity measures used in Cyberbalkans literature — Euclidean distance across multiple dimensions where each word provides one component of the vector — may be used in the Long Tail/Superstar literature. The Long Tail/Superstar literature only measures the share of sales, with each product being treated as a different identity as long as it had a different SKU number. Thus, whether products are similar or not does not make a difference — adding one book about politics to a bookstore filled with economics would be treated in the same way as adding a 9th edition of a book about economics when the 8th edition was already in stock. Instead, researchers could use similarity measures to create a more fundamental estimate of underlying market variety. As a specific example, one could classify a book based on its actual content — the words between the covers — and compare its distance to a new book. Such a distance metric translates readily into product space, and could enrich our understanding of true product variety and how true product variety affects the distribution patterns of consumers' purchases.

5. Discussion

IT-enabled markets may increase producers' incentives to produce niche products while also increasing retailers' incentives to stock these products. At the same time, search tools, recommender sys-

tems, online communities, and social networks are all changing the level of information and interest consumers have regarding niche (or popular) products, portending even bigger changes in coming years. The effects on consumer choices, retailer strategies, producer profits, and societal welfare are likely to be substantial. However, despite a growing research literature, the implications of these changes remain poorly understood. The goal of this paper has been to highlight the relevant literature driving our understanding of these phenomena, and to identify a research agenda to better understand their impact.

To start, there are widely differing measures of product variety and concentration patterns used in the literature, creating seemingly contradictory results even when none may exist, thus hampering the creation of a cumulative research tradition. In addition, the implications of these measures affect each segment of the "value chain" from producers, to retailers, to consumers, to society. At the most basic level, both producers and retailers face uncertainty about how to approach the Long Tail and Superstar effect. Are Long Tail markets a passing fad that will quickly recede toward Superstar and winner-take-all outcomes, as some predictions in the literature would suggest? Or is the Long Tail here to stay, giving producers profitable niches in which to focus their efforts? At the retailer level, should Long Tail markets impact retailer's strategies such that retailers should focus on particular niche markets, or will the broader selection retailers such as Amazon and iTunes continue to see "winner-take-all" outcomes in this space? Further down the value chain, how will consumers respond to the new variety of products available in markets, the new search and recommendation tools available online, and the new promotional channels offered through social networks? Finally, will Long Tail consumption patterns of products and information cause fractured communication between balkanized groups of consumers, or will the resulting outcome look more like a global village of citizens who are better informed about both products and policies than they could be in traditional "head heavy" communication environments?

Integrating these under-discussed literatures into a common research agenda is important because each of these areas has made important contributions to the information systems field, and it seems likely that the importance of these topics, both in the real world and in the research literature, will increase in

the coming years. Each of these transformative trends is enabled and driven by IT. As IT becomes more powerful, the economic and societal importance of these trends will increase as well.

What's more, integrating methods across these literatures takes advantage of the fact that the same data and technology trends that allow managers to track micro-niche products in exquisite detail, that allow executives to leverage small advantages into dominating global blockbusters, that bring together diverse peoples in unprecedented communities, and that filter out and control all but the most preferred communications, are also transforming the research enterprise itself. Specifically in the coming decade, IS researchers will gain access to nanodata including literally trillions of Google search queries, email and instant messages, web clickstreams, RFID and other real-time data feeds, and myriad other fine-grained data. That will make it possible to understand the market and social micro-structure that undergird the Long Tail in the context of the Superstar effect, the Global Village and Cyberbalkanization. As a result, we are optimistic about prospects for research in this area to not only clarify and resolve these key questions, but also to provide practical, well-grounded advice to managers and policymakers.

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