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New Economy, Who Dis?:
A comparative analysis of technology and economic recovery in the business press

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Abstract

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Recently, terms such as the “fourth industrial revolution”, or the “second machine age”, have been used both in the business press and by academics to describe the current era of technological development. Embedded in these catchphrases is an assumption about the role of technology in the economy, who it serves, and the outcomes it provides. Communication scholars have long studied how the economy and technology are independently framed in the media, but little work has focused on how these terms are framed together. Understanding how the media frames technology’s role in the economy, and how those frames change over time, is necessary to fully analyze the role of technology in today’s society. This paper conducts a comparative frame analysis of the business press in two recent periods heavily influenced by technological development: 1992–1998 and 2010–2016. Results of this frame analysis show that

a positive Growth frame was the most popular frame used in both periods. Overall coverage of technology's role in the economy has dropped significantly since 1992. The 2010–2016 period saw a notable drop in positive Market Disruption frames but an increase in positive Social Recomposition and Employment frames.

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Chapter 1. INTRODUCTION

In April 2012, *The Economist* published an article heralding the beginning of the third industrial revolution, marked by digital manufacturing and disruptive technology. Two years later, Erik Brynjolfsson and Andrew McAfee (2014) from the Sloan School of Management at MIT, published their new book *The Second Machine Age*, which depicts an already upon us future where automation overtakes both physical and cognitive tasks of humans. Finally, the topic of the 2016 World Economic Forum was how to approach the *fourth* industrial revolution. For the World Economic Forum, the third industrial revolution came in the 1990s with the development of the personal computer and massive investment in information technologies. The fourth industrial revolution is characterized by machine learning algorithms and artificial intelligence. Whatever one's choice of periodization, the use and development of new, potentially revolutionary, technologies are currently a hotly debated topic, particularly in the business press. The 1990s were perhaps the last time there was this much excitement around new technologies and their economic potential. This era was widely known as the New Economy, which, like the World Economic Forum's third industrial revolution, promised rapid economic growth with low inflation as a result of new information technologies and the internet. While the 90s were certainly a time of economic growth, the preceding dot com bubble of 2000, and the financial crisis of 2008, have proved these optimistic predictions short-lived, as we currently face a weak economic recovery, following the worst recession since the Great Depression (Baily & Bosworth, 2013).

Are these narratives of technology being a revolutionary force of growth in the economy unique to our current period of economic recovery, or are they a historical constant? For critical media scholars, it is important to begin to understand how certain periods of economic activity

shape the stories that are told about technology. How exactly does the business press narrate the role of technology during times of economic recovery? Current scholarship is divided on these questions, with one side arguing for consistency, and the other for change. For those on the side of consistency, the business press is seen as playing the stable, ideological role of cheerleader for capitalism, using technology as an instrument for increased economic growth and productivity. Those that argue for change recognize failures of the business press to honestly interpret economic conditions, but point to promising organizational, educational, and structural changes in the business press after the dot com bubble and the financial crisis.

To measure the explanation of technology's role in the economy, this paper provides a comparative frame analysis of articles in the business press from two different periods, 1992–1998 and 2010–2016. Three popular journals in the business press are analyzed: *Forbes*, *Fortune*, and *Harvard Business Review*. The comparative method allows for the observation of potential changes over time and helps solidify the narrative of periods of economic recovery. These two economic recoveries are important to study together for several reasons. First, the two crises leading up to the periods of recovery (1987 and 2008) both had roots in asset bubble crashes, which have played a large role in the conversation around the financialization of the US economy over the last 40 years. These advances in financialization have come about in part due to new technologies that increase the speed and reliability of digital stock market transactions. Finally, the business press was reprimanded by journalists and academics as being insufficiently critical of Wall Street during the financial crisis. Some have argued that this reproach has led to critical changes in business press and financial reporting, while others are less convinced. By studying the framing of technology and the economy during these time periods, changes in both the coverage of technology and the economy, as well as business press reform, can be analyzed.

The findings of this paper show both continuity and change in how the business press frames technology's role in economic recovery. The most common frame found across both time periods was the positive Growth frame, which despite its consistency showed a degree of intra-frame variation. Significant changes across time periods were a drop in positive Market Disruption frames and an increase in Social Recomposition and Employment frames in the 2010–2016 period. The high level of the positive Growth frame indicates consistency in the mechanistic role of technology in the economy, but the intra-frame shift in the 2010–16 period suggests the current economic recovery has altered the scope of what aspects of the economy technology can change. Technology's market-mediated role in the current economic recovery is more focused on questions of Employment and Social Recomposition than 1992–98, where frames of positive Market Disruption played a greater role. As for how the business press has evolved after both the dot com bubble and the financial crises, the results are again mixed. Despite positive growth being the dominant frame in both time periods, there seems to be some indication that the business press has changed its framing of technology's role in economic recovery. This may be due to either reforms and reorganization within the business press, or a reflection of the different economic conditions of the two recoveries being studied.

Chapter 2. THE FRAMING OF TECHNOLOGY & THE ECONOMY

To understand how the business press talks about technology's role in economic recovery, technology must be defined. There are broad understandings of technology: for example, the United Nations defines technology as, “systematic knowledge for the manufacture of a product for the application of a process or for the rendering of a service” (UNCTAD, 2001). This definition relates to how the media understands technology, particularly regarding its use for the economy.

In the business press, the word ‘technology’ can take on a slightly different meaning depending on the context, sometimes referring to a specific product, like the UN definition, while other times relating to the broader industry of technological development. While business magazine narratives of technology’s role in economic recovery have not been studied directly, relevant literature is available that helps to support and situate this research project. This literature can be broken up into two different camps. The first is the literature that suggests the framing of technology in the business press is positive, uncritical, and does not react to changes in the economy. The second camp shows signs of a more critical business press in the wake of the dot com bubble of 2000 and the financial crisis of 2008, with more nuanced coverage of technology as these technologies mature.

The first camp sees the business press as, to use the popular phrase, a cheerleader for capitalism, and as failing to fulfill its watchdog duty during essentially any of the major economic crises from 1929 through 2008 (Butterick, 2015; Chakravartty & Schiller, 2010; Shaw 2015; Starkman, 2014). In fact, there seems to be evidence that the coverage has become worse. Knowles et al. (2017) conducted a longitudinal qualitative and quantitative content analysis of news reporting on three economic crises: the recession of 1990, the dot com bubble of 2000, and the global financial crisis of 2008. Before each economic crisis there were fewer (in both total and relative terms) articles that warned the public of a potential financial downturn (Knowles et al., 2017). A partial answer to why the business press has continually failed this duty comes from an overreliance on the mechanistic relationship between technology and economic growth in capitalism.

Despite quantitative shifts in automation, financialized capital, or employment, the qualitative relationship between technology and the economy has remained the same throughout

the history of capitalism. Capitalism operates on the continual growth of capital, sometimes more generally known as profit, which is valorized through the labor process. Marketable technological advancements help economies grow by increasing productivity, which can lead to profitable comparative advantages over competitors (Tassey, 2013). This is known as the technical composition of capital. As Smith (2000) writes, “It follows that revolutionizing the instruments of production is not a contingent feature of capital. It is an essential determination of the capital form,” (p. 206). However, it is only a matter of time before competitors match or exceed the previous level of technological advancement, thus eliminating the original advantage. The positive economic tone that the business press associates with technology may be due to an overemphasis on the temporary advantages. When these advantages become blindingly large, as is the case with any bubble, the business press misses the forest in the trees.

An example of this phenomenon can be seen in the IT sector of the 1990s which led to a decade-long economic recovery before the dot com crash of 2000 (Jorgenson, 2001). This was the biggest era of growth for the business press, with more outlets hiring journalists for dedicated technology columns. This was the decade when profitability and productivity from technological advances made in the 60s were finally coming to fruition, (Edmonson, 2009; Malecki, 1997) which led to heightened coverage of technology firms within the business press. “New technology companies were treated in stories as the future of the business world even though few of them made money—and most of them would go out of business or be sold” (Roush, p. 153). Not only did the IT sector have a high stock market valuation before the bubble burst, but the fact that the sector was focused on developing new technologies made it seem less like a bubble and more like a truly New Economy.

This view is supported by previous studies that used framing theory to analyze how the news media reports on technology. Framing theory looks at why specific narratives may emphasize certain aspects and relationships over others (Entman, 1993). Weaver et al. conducted a longitudinal study, from 1999 to 2008, of the media frames relating to nanotechnology and found that 40% used a frame of social and economic progress (Weaver et. al, 2009). In another longitudinal study about the frames and discourses of microcomputers in US magazines from 1974–1997, Kelly (2009) identified a futurism frame that demonstrated a conflicting view of the revolutionary capacities of computers. “Despite the fact that on its face the futurism frame was associated most closely with the idea that computers would produce ‘revolutionary’ change, as presented in these cases, in fact it reinforced existing political and economic institutional processes and power relationships” (p. 46). Further, a study conducted on how German media framed narratives about the internet found that over two-thirds of the articles examined framed the internet positively, with 28.4% of the articles focused on the internet’s positive impact on the economy. “Generally speaking, the internet was framed as a new media technology with positive outcomes in most domains of social, political, and individual life and particularly a great potential for economic progress” (Rössler, 2001, p. 61). These studies suggest that the business press will frame technology positively during periods of economic recovery, highlighting a specific link between technology and economic growth. For this side of the debate, the expected change over time is relatively insignificant, as the business press plays the constant role of affirming market ideology to middle managers and entrepreneurs.

There are, however, some who argue that the business press has positively adapted to the dot com bubble and the financial crisis in ways that might change their economic coverage. Chris Roush, in his book *Profits and Losses: Business Journalism and its Role in Society*, argues that the

business press has learned from its mistakes. Regarding the dot com bubble, Roush recognizes that the business press had failed as a watchdog in a similar fashion to 1929, but is confident that “business journalism is now rebuilding its credibility with society by tackling its coverage in a more aggressive manner. More questions are being asked.” (Roush, 2006, p.164) These claims are supported later in the book by arguing that both the academy and industry have taken steps such as increased funding and training to improve the quality of business journalism (p. 232).

More recent scholarship has pointed to a potential shift in the way economic crisis is covered post-2008 financial crisis. Chapter six of Ibrahim Shaw’s book, *Business Journalism: a critical political economy approach*, is a comparative frame analysis of the Financial Times’s coverage of subprime mortgage lending in the 2008 crisis compared with its coverage of the UK horsemeat scandal in 2013 (Shaw, 2015). The frame analysis found that throughout 2008, the Financial Times focused heavily on a de-escalation scale, refraining from calling the crisis an actual crisis, and instead referring to it as a simple “credit crunch” (p. 101). This indicates not only a failure to warn, but also to accept the crisis as it was unfolding. However, the horsemeat crisis of 2013 involved primarily escalating frames as opposed to de-escalating.

However, although there was more recurrent framing of the big retailers as victims rather than perpetrators of the fraud leading to the horsemeat crisis, there were a few articles that exceptionally pointed fingers of blame at them and even provided critical reflection on some more political economic causes of the crisis within the context of escalation framing (p. 104).

While these two events are not equal in terms of severity or impact, both the greater use of the escalation frame and the broader political economic critique show a potential change in business press behavior.

Finally, the Weaver et al. study mentioned above found that the narrative around certain technologies can change as the technology continues to develop. In the case of nanotechnologies, most of the social and economic progress frame came from the late 1990s and early 2000s, whereas by 2007, the dominant frame shifted to regulatory responsibility (Weaver et al. 2009). These findings may reflect the development of the technology itself, but also the way the press covers it. This study looked at nanotechnology coverage before and after the dot com crash, meaning that some of the change in coverage could have come as a response to the bubble. This camp suggests some level of reform in the business press from both an organizational and content standpoint. They have argued that as the business press continues to mature institutionally, with more educated journalists and increased funding, coverage of technology would be more nuanced and critical in the 2010–16 period, after both the dot com bubble and the financial crisis. For changes in content, this camp suggests a more comprehensive analysis that links technology with political regulation and macroeconomic development.

Chapter 3. METHODS

The time periods for the comparative analysis were chosen for multiple reasons. The main reason is that both periods were those of economic recovery. More specifically, both periods represent recoveries from economic crises that involved the financial sector. The first period concerns the recovery from the 1987 stock market crash, when many people were critical of computerized stock trading (Suttles, 2011). The second period is in the immediate wake of the great recession caused by the financial crisis of 2008, as well as the dot com bubble of 2000. Despite involving more than just the stock market, developments in trading mortgages via credit default swaps, and technological advances of high frequency trading, were seen as the core of the financial crisis

(Brogaard et. al, 2016). Even if overall economic growth has been slower in the 2010–16 period than 1992–1998, both periods involve sustained, if minor, growth after a recessionary period. Since both crises preceding each period were seen as being induced to some degree by new technologies, there is the opportunity to measure the influence of these crises on the narrative of technology and the economy.

Another reason for comparing these periods is to see if narratives of technology's effect on the economy in business magazines were influenced by the dot com bubble of 2000, and the financial crisis of 2008. Aside from their inception in the early 1900s, the biggest era of business magazine development came in the 1990s, with the rise of the internet and stock market growth (Kjaer, 2007). The business magazine form allowed for more dedicated coverage about the economy, which satisfied a new consumer demand for understanding how the economy functioned (Roush, 2006). This era became known as the New Economy, where new technologies were believed to drive economic growth and productivity while keeping inflation down (Smith, 2000). Revisiting this relationship between technology and economy in 2010 allows us to see how these narratives have held up, particularly in the wake of the dot com bubble and the financial crisis, where the business press was critiqued for not fulfilling its watchdog function.

The literature that looks specifically at how the media reports on the economy indicates that it follows real economic trends fairly well (Nadeau et al., 1999) which might help explain why, as economic recovery and growth occur, the business press becomes blind to macroeconomic trends that might indicate a bubble. The prediction of economic crises requires a delicate balance of micro- and macro-level investigation, because becoming too focused on either end tends to foster the misinterpretation of causal factors. Since we know the media generally reports on technology in an instrumental (Feenberg, 2001), and positivist sense in relation to the economy

(Weaver et. al, 2009; Kelly, 2009), one could assume that this relationship becomes increasingly positive as economic recovery and growth strengthen. By directly studying this relationship over this specific time period, both the question of how the business press explains technology's role in economic recovery, and how it has changed after a period of two economic crises, can be addressed.

One potential complicating factor in the comparison of the two selected periods is the effect of the dot com crash in 2000 on technology reporting in the media. The information age aspect of the New Economy led the business press to develop technology-specific sections of their papers and magazines, which were supported by advertising revenue from companies in the technology sector. After the dot com crash, when many of these companies failed, advertising revenue dried up and many of the technology sections in the news disappeared with it (Roush, 2006). Technology-based news reporting has made a comeback since the early 2000s, but the dot com crash significantly affected both the total number of articles written about technology and the outlets that supplied them. This factor can help explain why there are more articles in the 1992–98 period than that of 2010–16.

This study examines news articles during two periods, 192–1998 and 2010–2016, from three business magazines, *Forbes*, *Fortune*, and *Harvard Business Review* (n=139). The business magazines as a category within the US business press began in the early 1900s. All three of the selected business magazines began in this initial period; *Forbes* was first published in 1917, *Harvard Business Review* in 1922, and *Fortune* in 1930, just months after Black Tuesday. The business magazine form allowed for more dedicated coverage of the economy which satisfied a new consumer demand for understanding how it functioned (Roush, 2006). These specific business magazines were chosen based on the availability and completeness of their archives, as well as

their high levels of circulation: Forbes (928,464), Harvard Business Review (278,241), and Fortune (851,579).¹

The study uses framing theory (Goffman, 1986; Entman, 1993) to identify how technology's role in economic recovery is framed. Kelly (2009) and Rössler (2001) have previously used frame analysis to identify mediated narratives of technology, while Kozinets (2007) coded four fields of technology ideology through consumer interviews. Frame analysis has also been successfully used to show how the business press reports on economic crisis (Shaw, 2015). To create a frame is “the process of culling a few elements of perceived reality and assembling a narrative that highlights connections among them to promote a particular interpretation” (Entman, 2007, p. 164). The frames used in this paper are influenced by the previously cited scholarship. However, new frames have been created by the author to better address specificity and applicability to the research questions. The four frames used in this analysis are: Growth, Market Disruption, Social Recomposition, and Employment.

The Growth frame is used to track technology's relationship to economic growth. This frame addresses the profits of a specific company, and broader economic growth if that growth is explained as being caused by technology. In some cases, this frame was used when articles evoked Moore's Law as a deterministic conclusion for why new technologies will fuel economic growth. In others, managerial decisions to adopt new technologies in the workplace led to greater productivity and rising company profits. This frame was selected based on the literature that suggests technology is positively associated with economic growth. The Market Disruption frame shares some similarities to the Growth frame, but is distinct in several ways. Market Disruption highlights how technology changes the way in which business is conducted and structured. A

¹ Bloomberg Businessweek was not chosen for this study, despite having the highest circulation of any business magazine due to the incompleteness of its archive when it was bought out by Bloomberg L.P in 2009.

reorganization of labor markets, new modes of communication, or mergers and acquisitions, all fall under this frame. The similarities between the Growth frame come about because these are all changes that firms make to maximize profit, but the frame is distinct because the focus is not on the assumed profits to come, but the changes themselves that new technologies require. The forms that these changes take on allow for more specific analysis of technology's role in the economy, beyond looking at growth alone.

The Social Recomposition frame was added to observe the revolutionary change framing of technology identified by Kelly (2009). While still market mediated, technology's effect on the economy influences aspects of our lives such as family values, education, communication, leisure, and personal identity. This frame highlights how our lives might be restructured due to the introduction of new technologies in the marketplace. The framing of how technology affects the indirectly market-mediated aspects of our lives offers valuable insight into how the business press views technology's ability to change the role of the economy in our lives. One of the more directly market-mediated ways in which this occurs is through employment, which is the final frame analyzed. The Employment frame is concerned with both the qualitative and quantitative shifts in employment that might arise from increases in technology. This frame covers the highly-contested topic of automation that is central to many debates around technology's role in the economy.

Figure 1 defines each frame identified in the sample and provides indicators for how they were coded. Each frame is coded with a dominant tone of positive, neutral, or negative, and each article was coded to have multiple frames and tones. Observing how tone changes along with frames allows for a more precise analysis of what the frames mean, and how narratives of technology and the economy have changed over time. The neutral tone indicates that the frame was either displayed as both positive and negative, or that the frame was truly neutral in tone. For

frames such as employment, a positive tone indicates job creation and a negative tone indicates job loss. A neutral tone for employment would indicate that technology affects employment opportunities to some degree, but that it will not result in a net increase or decrease in employment.

Table 1. Frame Definitions

Frame	Definition	Indicators
<i>Growth</i>	Technological development in general, or a specific type of technology, leads to economic growth. Technological innovation is the driver of capital expansion.	GDP, Profit, Revenue, Productivity, Economic growth, Recovery, Recession, Increased goods circulation
<i>Market Disruption</i>	Technology constantly causes existing markets to become unstable through innovation. New firms that capitalize on the productive capacities of technology will supplant old firms, or create new markets.	Disruption, Thorstein Veblen, Creative Destruction, Innovation, Markets, Competition, Joseph Schumpeter, Business Reorganization,
<i>Social Recomposition</i>	Technology's effect on the economy will require changes in life outside of just the economic. By creating new markets and products, technology will change the way we communicate, learn, and live. This includes technology's ability to develop products that were once non-market mediated, and bring them into the market.	Education, Geography, Communication, Globalization, Emotional Labor, Social Reproduction, Politics
<i>Employment</i>	Technology's biggest effect on the economy will be what type of work people do and how many jobs are available.	Job Loss/growth, Work, Labor, Unemployment, Automation, Job Satisfaction, Nature of Work

The articles were obtained through archival database searches of each publication in question, using the search terms “economy AND technology.” Articles were read and coded by the author. The original sample size of articles containing the two search terms was 139 across both time periods (85 in 1992–98, and 54 in 2010–16). However, certain articles were excluded from the coding process if they did not meet certain criteria. For an article to be coded it needed to make claims about the relationship between technology and the economy; if the two concepts were talked about without connection, the article was not included. There needed to be some demonstration of cause and effect, whether implicit or explicit, about how technology interacts with the economy, within at least one of the selected frames. Other examples of articles that were excluded were letters to the editor or reader response articles, or articles that discussed the economic development of technology firms without talking about technology’s role in this development. After these articles were removed from the sample, the revised sample size was $n=72$ (46 in 1992–98, and 26 in 2010–16). Figure 2 shows the number of articles selected for each business magazine and for each period.

Table 2. Articles by publication and year

	1992–1998	2010–2016
Forbes	22	10
Fortune	12	8
Harvard Business Review	12	8

The identification and collection of these frames and tones, through both qualitative and quantitative methods, allows multiple research questions to be asked.

RQ1: What is the most common frame and tone, within each period, that business magazines employ to talk about technology’s role in the economy?

RQ2: How have the frames and tones used in business magazines to talk about technology's role in the economy changed over the two periods studied?

RQ1 is answered using descriptive statistics to determine the most commonly used frames and tones for each period. The frequency for each frame and tone is reported, along with the total number of instances. A qualitative analysis of the dominant frame was conducted to assess any potential intra-frame changes throughout the two periods. RQ1 adds a comparative approach to previous research that has addressed narratives about technology and the economy. Knowing the most common frame and tone for each period provides an opportunity learn more about dominant narratives in the business press, and can motivate future research on the framing and ideology of technology's role in the economy. RQ2 also used a combination of descriptive statistics and qualitative analysis. The descriptive statistics show the percent change, as well as the total number change, in frames used across both periods. The qualitative analysis for RQ2 provides textual analysis of articles from the sample that exemplify the quantitative changes in framing and tone across time periods. RQ2 demonstrates how frames of technology's role in the economy have changed between two different periods of economic recovery. This provides a way to see what effects, if any, the dot com bubble and the financial crises had on framing in the business press, as well as what one might expect to find in the future.

Chapter 4. FINDINGS

4.1 RQ1

Figure 3 shows that the most common frame used to address technology's role in the economy in both periods was the Growth frame, with 41 total instances in 1992–998, and 22 instances in 2010–2016. In both time periods, the positive tone was most commonly associated with the Growth

frame. This example from 1996 demonstrates the commonly held connection between the use of technology for economic growth. “The information economy presents such opportunity in spades. Propelled by the declining prices and soaring performance of silicon chips, and by new blasts of high-speed connections, our age *is* the golden age, ripe for joyful creation and huge harvests,” (Internet Blur, Forbes, 1996). Taking the real trends seen in the economy, such as declining prices and increased performance of technology, the author expands these claims to the broader information economy. The focus on the 1990s being a specific era, an information economy era, is another feature of many of the stories from this period. This highlights the way that technology, through economic growth, played a cohesive role in the creation of the collective identity known as the New Economy, or information economy.

This assumption of positive economic growth and technology manifests in the 2010–16 period as well. One of the similarities is the reliance on the costs of technology decreasing over time, thus permitting accessible investment from all corners of the economy.

Another opportunity is provided by information technology. Compared with the U.S., Spanish rates of investment in IT have been abysmally low and haven't paid off in productivity improvements. Funds are scarce these days, but with developments such as cloud computing, the initial cash outlays required are no longer quite so daunting[...]restructuring of the Southern European economies will not happen until firms become more international, more innovative, more high tech, and bigger (Reinventing Spain's Economy, Fortune 2012).

There is less of an association between technology and an information economy era in this example, but the recommendation for Spanish firms to invest in new technologies in 2012 is the same as it was in 1996. The lower price point of IT investment provided by cloud computing plays the same role as the drop in price of silicon chips. Both developments allow more market actors to

invest in productivity-enhancing technologies, which should lead to temporary profits for early adopters, and more importantly, macro-level growth of the economy on a national and international scale.

Despite overwhelming popularity of the positive Growth frame in both periods, there was a noticeable shift in the type of positive Growth that was displayed. The 1992–98 period had a higher use of macroeconomic growth indicators such as GDP, economic growth, and circulation of goods. The 2010–2016 period made fewer claims that addressed the broader, macro-level economy and more claims addressing economic growth as it related to the individual firm, using growth indicators such as: productivity, and profit. A further investigation of this intra-frame discrepancy is discussed below.

Table 3. Occurrence and change in frames over time

	1992–1998 (n=46)	2010–2016 (n=26)	Percent Difference
Growth	89.10% (41)	84.60%(22)	-4.50%
positive	58.70% (27)	53.80% (14)	-4.90%
neutral	28.30% (13)	30.70% (8)	+2.50%
negative	2.20% (1)	0%	-2.20%
Market Disruption	80.40% (37)	69.20% (18)	-11.20%
positive	43.50% (20)	30.70% (8)	-12.80%
neutral	37% (17)	38.50% (10)	+1.50%
negative	0%	0%	0%
Social Recomposition	54.30% (25)	50.0% (13)	-4.30%
positive	30.40% (14)	38.50% (10)	+8.10%
neutral	23.90% (11)	11.50% (3)	-12.40%
negative	0%	0%	0%
Employment	30.40% (14)	42.30% (11)	+11.90%
positive	8.70% (5)	15.40% (4)	+6.70%
neutral	17.40% (8)	23.10% (6)	+5.70%
negative	2.20% (1)	3.80% (1)	+1.60%

The 1990s was a period of exuberance in many ways, one of which was expressed through expectations for technology to change the economy on a macro level. Discussions about the impact of technology were generally very broad, with subsequent market disruption acting as a force that would increase overall economic growth. Below are two examples from 1992–1998 that demonstrate a positive Growth frame on a macro scale.

Changing technology is driving the next wave of economic growth. To take advantage of that growth, we will have to apply not only new technology but also new thinking. First and foremost will be our ability to understand the shift in the economy. (The Coming of Knowledge based Business, Harvard Business Review, 1994)

We are on the verge of an extraordinary economic boom that will not only benefit the U.S. but will also bring much of the rest of the world along with it. We are approaching the intersection of two trends. One of these is a technology trend—the information age. The other is political and social in nature. (Chip-er Economy, Forbes, 1994)

In these examples, economic growth as a result of technological innovation is almost taken for granted, with little discussion about the specific types of growth that will occur. As Figure 3 shows, when the specifics about the economy are addressed, they are generally handled through the positive Market Disruption frame, which highlights the profit-creating changes that technology will induce.

Articles from 2010–16, while retaining either a neutral or positive Growth frame, focus on very different aspects of growth. Instead of broad generalizations, the positive tone is kept to specific aspects of economic growth.

More generally, competition is simply getting tougher[...]It's a world in which corporations, though fighting ever harder, keep less of the global economy's output—seemingly the recipe for a declining role in world affairs. There are transaction costs—friction—and consolidating transactions inside companies is the most efficient way of handling them. Now, as technology shrinks those costs, many companies are unbundling themselves, outsourcing functions to others, crowdsourcing R&D, and exchanging employees for contractors. (The 21st Century Corporation, Fortune, 2015)

But whereas the outlook for revenue growth is good, the profits picture looks less promising[...]As we've seen, many companies' profit margins are being squeezed. Hospitality, transport, and health care have all experienced price declines in recent years because of the emergence of new platforms and tech-driven competitors. In this

era of tech disruption, companies need to be willing to disrupt themselves before others do it to them. (The Future and How to Survive it, Harvard Business Review, 2015)

None of these claims amount to doomsday prophecies of technological innovation being the end of economic growth, but there is a noted increase in detail around how those gains might be distributed, and where specifically those gains lie. As globalized competition intensifies, profit margins for companies are squeezed, while general economic growth continues to some extent. The idea that information communication technologies might ultimately spread profit margins around the globe, as opposed to only increasing them for US firms, was mostly either ignored or assumed to not have negative consequences in the 1992–1998 period.

If the 1992–98 period is characterized by the unanimous growth of the New Economy era, 2010–16 is seen as an era of “winner takes all” disruption. As Geoff Colvin notes, “As technology remakes the economy, businesses that can ‘self-disrupt,’ may hold the key to longevity,” (Lead a Revolution from Within, Fortune, 2016). For many firms in the 2010–16 period, disruption is characterized as an external threat to their success, with the usual suspect being a tech startup. In an act of Schumpeterian creative destruction, the startup harnesses new technology to create a cheaper and more efficient business model than that of an existing firm, eventually driving it out of business. Calls for self-disruption are calls for firms to make the necessary technological and organizational changes, before the invisible hand of the market does it for them.

One of the forms that these changes take in the 2010–16 period is the emergence of the platform company. A platform company is one that offers a service that allows it to collect proprietary data about its customers, which it will then use to direct its consumers to other products it produces or profits from (Srnicek, 2017). Since platform companies such as Facebook or Uber attempt to provide as many services as possible, thus keeping their consumers on their platform,

this form of organization can lead to high concentrations of market power in just a few firms. Alan Murray explains a further aspect of the platform company within the positive Growth frame. “[...]technology made it easier to transact with workers, suppliers, and customers. If the 20th-century corporation had lost its logic, the article asked, what would take its place? Uber is the emergence of an answer. It’s a big company and growing larger every day. But more than that, it is supporting, shaping, and creating a new marketplace. It is, truly, a synthesis of firm and market,” (Uber-nomics, Fortune, 2015). The platform becomes the marketplace for an exchange of products produced by the firm, as well as a source of extraction for products produced by the consumer: their data. Aside from the slower growth of the economy in the 2010–16 recovery, compared to 1992–98, this shift in firm organization and marketplace activity can also explain the intra-frame difference in positive Growth between time periods. As firms become their own marketplaces, through the vertical integration of proprietary consumer data, it becomes harder for the business press to make general claims on the outcome of technology’s influence on economic recovery. As the data show, the overall framing of these changes in the business press is still positive, but the focus has changed from economic benefit for all, to economic benefit for some.

The economic trend that best reflects the shift in framing across time periods is the separation of labor productivity from median family income and corporate profits from wage levels, a trend that began in the early 1970s and materialized in the 80s. Systemic overproduction and globalized competition led to a reduction in the total distribution of profits for US firms, which ended the parallel rise in wages with productivity that had been seen since World War II (Brenner 2006; Chakravartty & Schiller, 2010). Brynjolfsson and McAfee call this the Great Decoupling, the title of an interview conducted with *Harvard Business Review* in 2015, an article included in this dataset. “The two halves of the cycle of prosperity are no longer married: Economic

abundance, as exemplified as GDP and productivity, has remained on an upward trajectory, but the income and job prospects for typical workers have faltered.” (The Great Decoupling, Harvard Business Review, 2015). Mapping this economic trend onto business press framing of technology’s role in economic recovery helps explain some of the observed shifts. The decoupling of profits and wage growth that expanded throughout the time periods observed are somewhat reflected in the changes to the Growth frame. Despite staying positive in tone, the shift from macro-level to micro-level analysis can be seen as an attempt to rationalize and positively frame these changes in the economy.

4.2 RQ2

While perhaps the largest change between the two periods is that of the total difference in articles written (46 in 1992–1998, and 26 in 2010–2016), Figure 3 still shows a noticeable difference between frames and tone for each time period. The biggest percent change across time periods was the positive Market Disruption frame, which dropped from 43.5% of all Market Disruption tones in 1992–96, to 30.7% in 2010–16: a decrease of 12.8%. For all tones, Market Disruption was used 10% less often in 2010–2016 than in 1992–1998. The 2010–2016 period also saw a rise in the Employment frame across all tones, at 42.3%; up from 30.4% in 1992–96.

The biggest changes across time periods are in the Employment and Market Disruption frames. The general shift away from Market Disruption frames and towards Employment frames in the 2010–2016 period suggests a shift in the framing of technology’s role in the economy. This shift is most supportive of the evidence found in Weaver et. al (2009), which shows that early frames of nanotechnologies in the late 1990s were more focused on progress, whereas later frames in 2007 addressed regulatory responsibility. Ideas of economic progress can be seen in both the Growth frame and the Market Disruption frame. The drop in positive Market Disruption frames in

the 2010–16 period, and the subsequent increase in Employment frames of all tones, indicate that technology’s role in the economy took a more applied, and perhaps less ideological, turn over time. The increase in Employment frames can be seen as a manifestation of this more applied approach, similar to the regulatory responsibility found in Weaver et al. The more positive tone frames of Market Disruption from 1992–98 are claims for how technology will beneficially change the economic marketplace and how we do business. In the 2010–16 period, these frames are replaced with a more focused conversation about the costs and benefits to employment these market disruptions may cause.

For some issues, it is possible to trace their framing from positive Market Disruption in 1992–98 to a negative framing of Employment in 2010–16. One such example is the relation of technology to outsourcing and globalization. In the 1992–98 recovery, the potential changes that new technologies would incur were focused on how they would change the marketplace.

Today, insourcing has given way to outsourcing. Integration has given way to disintegration. Call it the plug-and-play economy[...]it’s now clear that silicon technology is creating a vastly more efficient form of decentralized, friction-free capitalism[...]When the silicon dust settles, the [plug and play] economy will have emerged—immeasurably more competitive, flexible, dynamic and productive. (The Plug-and-Play Economy, Forbes, 1997).

Efficiency is seen as the immediate outcome of new technologies, which in turn will disrupt the current market, leaving a wake of silicon dust in its path. However, since efficiency is the determined outcome of these silicon technologies, the impact on the economy, despite whatever disruption may take place, can only be positive. The dominant trend is the assumption that what is good for the market will be good for everyone.

The 2010–16 period also addresses the issue of globalization, but in many cases technology is no longer taking the role of positive market disruptor, but rather as agent in both the positive and negative outcomes of the past 20 years of globalization.

In the recession that started in 2007, U.S. employers turned to layoffs earlier than they had during past downturns, they cut deeper into their labor force than declines in GDP would have predicted were necessary, and they have been slower than ever before to begin hiring after the recession ended. Some of these trends can be attributed to the globalization of markets and changes in technology that reduce the demand for labor and put a higher premium on education and skills. (A Jobs Compact for America, Harvard Business Review, 2012).

This demonstrates a more calculated approach to the role of technology in economic recovery that goes beyond its ability to disrupt markets. In a way, many of the predictions from the “Plug-and-Play Economy” article did come true. The rise of platform companies and the gig economy have certainly increased flexibility in the labor market and reduced transaction friction, but these disruptions have not made the economy more productive or dynamic.² The business press seems to acknowledge here that some technology-driven efficiencies have not been as positive for jobs as they have been for market transaction costs. Based on the narrative of slow job growth, this change in technology narrative seems to be due to the economic realities of the 2010–16 recovery, as opposed to organizational changes within the business press.

Another change in the 2010–16 period was an 8% increase in positive Social Recomposition. This frame focuses on changes that would occur outside the formal economy that technology facilitates through its role in the economy. A good example of this is when technological innovation changes employment to such a degree that it requires a whole reformulation of health care or education, or when mobile devices push work into home life,

² In fact, one could argue that the rise of flexible labor and the gig economy are the direct result of the failure of the economy to be more productive and dynamic.

changing family relations. With the positive tone being the most popular tone of all frames and time periods, the rise in positive Social Recomposition in 2010–16 is partially explained as making up for the significant decrease in the positive Market Disruption that was present in 1992–98. This indicates a change in narrative that focuses less on the positive changes that technology will have on markets, and more on the social changes we will all have to make if we want to stay employed and be successful.

Examples of these shifts in the 2010–16 time frame are shown below.

Now the proliferation of connected devices—smartphones, wearables, thermostats, autos—combined with powerful and integrated software spells a golden age of behavioral science. Data will no longer reflect who we are—it will help determine it. The emerging field is sometimes called Captology, short for Computers as Persuasive Technologies, as coined by Stanford computer scientist B.J. Fogg in 1996. A more cogent term for what has resulted: the Guinea Pig Economy. There's already big money here[...]The root of the Guinea Pig Economy can be traced to the 1990s and a Sun Microsystems researcher named Jakob Nielsen, who seized on the potential of early Internet browsers as testing platforms. (The Guinea Pig Economy, Forbes, 2015)

The transition to an industrial economy in the Western nations, and the accompanying shift in skill values, took well over 100 years. The subsequent turn to a knowledge-based economy took most of the 20th century. Now, as technology gallops ahead with longer strides every year, the transition to the newly valuable skills of empathizing, collaborating, creating, leading, and building relationships is happening faster than corporations, governments, education systems, or most human psyches can keep up with. That's disorienting, and it gets more so as the fundamental nature of value shifts from what you know to what you're like. (Humans Are Underrated, Fortune, 2015)

While the burden of responsibility is placed on different actors in both these examples, technology's role in the economy heralds a future change in how we work and live our lives. For the “The Guinea Pig Economy” article, individuals are mostly seen as passive agents, outside of

their role as consumers of new technology. Once consumed, the new technology commodifies a previously non-commodified facet of life, which in turn changes the behavior of the consumer. The article sees these as mostly positive changes in human behavior, focusing primarily on the public health benefits of fitness tracking companies like Jawbone and Fitbit. For the “Humans are Underrated” article, there is more of an onus on individuals to be aware of the social changes that new technologies are bringing and to change their behavior if they want to have successful futures. One of the underlying questions in this article is how automation will affect employment, and what labor activities show the least chance of being automated. The articles still believe in a positive outcome for economic growth and social recomposition, but only if humans are willing to adapt to technological developments.

Chapter 5. DISCUSSION

This aim of this paper is to gain a better understanding of how technology’s role in economic recovery has been framed by the business press. The results of this study show instances of both continuity and change between the two periods considered. RQ1 shows a positive Growth frame as being the most popular across both time periods, adding to current scholarship on media narratives of the economy and technology. Rössler (2001) and Weaver et. al (2009) both demonstrated that narratives of nanotechnology and the internet were framed as being beneficial to the economy, while Cacciatore et. al (2012) showed nanotechnology to be commonly associated with a business frame in print and online media. The results of RQ1 support these findings and expand them to include mentions of technology in general as opposed to specific nanotechnologies or the internet. Since the literature on how the media frames economic issues tends to point to the economy being negatively portrayed (Goidel & Langley, 1995; Hester & Gibson, 2003; Lischka,

2015; Hetsroni & Sheaffer, 2013), the findings of RQ1 are a valuable addition. When technology is also included in media framing and narratives of the economy, the tone is positive, as opposed to negative. Throughout both time periods, negative frames were only used three times, twice about Employment, and once about Growth.

RQ2 indicates how the framing of technology's role in economic recovery has changed over time. Despite not being the central focus of this paper, the substantial reduction in the number of articles that mention both technology and the economy is a valuable finding. While it does not address how the frames have changed, it does indicate that the general conversation about technology's role in the economy occurs less often in the 2010–2016 period than in 1992–1998. Previous scholarship shows that the 1990s were a period of business press expansion, specifically in the technology sector, but that after the dot com bubble of 2000, many of these outlets were wiped out (Roush, 2006). Since this study used well-established business magazines that withstood the dot com bubble, it does not seem likely that the reduction in technology and economy articles in the 2010–2016 era is due to the closing of technology-focused business magazines in 2000. However, it is possible that this reduction is due to an unwillingness to publish articles on these topics in the wake of the dot com bubble and great recession.

To address the debates surrounding the potential reformation of the business press post 2008 financial crisis, the results are mixed. RQ1 demonstrates that the positive framing of technology as an agent of economic growth has not changed drastically, supporting the claims of those skeptical of business press reform (Chakravartty & Schiller, 2010; Knowles et al., 2017). However, the changes in Market Disruption and Social Recomposition identified in RQ2 suggest some level of recognition about the potential social consequences of technology's impacts on the economy, partially supporting the arguments of Shaw (2015) and Roush (2006) that some reform

has taken place. It is also possible that the reduction in overall articles that address technology and the economy, which occurred in 2010–2016, can be seen as a form of restraint from writing too many optimistic articles on the subject. While the answer to this question requires further research, if this were the case, it would also indicate a level of reform in the business press.

Today, we may be facing wild, even revolutionary, times of technological change, but if this time is actually different from the New Economy of the 1990s, these differences have only slightly been reflected in the business press's framing of technology and economic recovery. This supports the findings of Kelly (2009) that despite narratives of revolutionary change, media framing of technology such as microcomputers focuses on status quo narratives of economic progress and utilitarianism. If anything, the observed changes seem to indicate a degree of tonal dissonance regarding the role of technology in the current economic recovery. The drop in positive Market Disruption frames, and the more micro-level framing of Growth, suggest a reduction in scale for how beneficial technology is to the economy. With fewer claims that new technology will generate rapid economic growth, a lackluster feature of the current recovery, benefits are demonstrated through other measures indicated by the increases in total Employment frames and the positive Social Recomposition frame. This shift in framing by the business press seems consistent with the economic conditions of the current recovery in comparison to the New Economy of the 1990s.

Chapter 6. LIMITATIONS

There are certain limitations in this paper, from the dataset to the method, which could be addressed in future scholarship. The first is the limited sample size in the dataset. A larger dataset that included more outlets, such as Bloomberg BusinessWeek, would help increase the validity of the results. A larger sample size would also allow for more meaningful statistical tests to be conducted,

strengthening a quantitative approach to these research questions. The method of keyword archive search also presents some limitations because it is possible that not all articles are represented in the keyword search. The addition of multiple coders and the reporting of intercoder reliability would also increase the overall reliability of the frame analysis method. Finally, while the comparative frame analysis identified the reduction in the total number of articles between time periods, it cannot offer a satisfactory answer as to why this drop-off occurred. Interviews with editors in business press publications could help understand institutional motivations for this change. Further research could contribute towards offsetting these limitations and could produce valuable scholarship on the business press, as well as on technology's role in the economy.

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