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The New Media Boom in Historical Perspective[1]

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ABSTRACT *The new media technologies that began to assert themselves in the 1990s—the Internet, networked computers, and the other hardware and software that make possible the new media—have captivated both the investment community and the general public like nothing else in the memory of most people alive today. These new information technologies are changing the way we live, work, think, and make our day-to-day decisions. To the surprise of many, including economists, they have already led to large increases in productivity and the sustainable rate of economic growth of the US and other economies. By unleashing new forms of economic competition, they have also put a damper on inflation. They will continue to do these positive things for a good long time. Life as we know it will change in irreversible ways. Nonetheless, the reaction of the financial system to new media technologies is providing clear signals of 'irrational exuberance'.*

Keywords: new media technologies, the Internet, stock markets, financial manias.

Introduction

To an economic and financial historian, new media technology developments are by no means unprecedented. Rather, they are just the latest in a long line of major breakthroughs in network technologies that arose over the past three to four centuries. It is worth noting that modern financial systems, which do so much to foster the rapid development and economic penetration of new technologies, are themselves an example of such technologies. Financial networks were perhaps the first such technologies to have major historical impacts on modern economies and societies. The Dutch Republic parlayed financial innovations around 1600 into economic leadership in the 17th century. When the British hired the Dutch leader, William of Orange, to be their king in 1688, he brought his Dutch financiers with him to England. The British then had their own financial revolution early in the 18th century. Great Britain then had the first industrial revolution and went on to become the major economic, financial, and political power of the 18th and 19th centuries.[2]

When the Americans broke away from Britain and established their new Constitution, they too had a financial revolution under Alexander Hamilton's

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leadership in President Washington's administration. Within a century, the United States, formerly a collection of English colonies on the periphery of the European world system, became the world's largest and most dynamic economy. The 20th century that followed became 'the American century'. Japan also had a financial revolution more than a century ago led by finance minister Masayoshi Matsukata. Japan then proceeded to advance far beyond the rest of Asia economically, becoming in our time the second largest of the world's economies. Modern history thus indicates that early and innovative developments in the network technologies embodied in financial systems can be a means of attaining a much broader range of economic and other successes.[3]

Financial network innovations pioneered by the Dutch, the British, the Americans, and the Japanese gave rise to financial systems characterized by strong public finances and public credit, stable money, banking systems and a central bank, business corporations, and securities markets to raise and liquefy capital. In the early 19th century, they were in place to finance further breakthroughs in the network technologies of transportation and communications systems: better-engineered roads, canals, steamboats and steamships, regularly scheduled trans-oceanic shipping services, railroads, postal services, the press, and telegraphs. Later in that century and in the early 20th century, they again financed the spread of new network technologies of telephony, electricity distribution, radio and television, and—with the advent of the automobile—still grander road and highway networks.

The rapid expansion of transportation and communications networks made possible by modern financial systems had feedback effects that improved the financial networks. Information flows are at the heart of financial institutions and markets—they consume vast quantities of information and, in turn, they produce vast quantities of information. So it is hardly surprising that financial systems were among the earliest and most extensive users of telegraphic and telephonic technologies when they appeared. Or that financiers were on the cutting edge of technology extension—J. P. Morgan backed Thomas Edison's electrical innovations financially, and Morgan's was the first private home in New York City to replace gas lights with electrical illumination.

It is evident from this long historical perspective that today's new network technologies have economic parallels with past ones. One to do with the distribution of income and wealth within and across countries. Cutting-edge financial network technologies led to commercial and industrial revolutions in the countries where they appeared. Transportation and communications network technologies sustained and extended the earlier economic revolutions, leading to large output, income and living-standard gaps among individuals and countries in the world economy during the past two centuries. Electrical and automobile technologies roughly a century ago had the same effects. Between periods of rapid technological breakthroughs, new network technologies developed in one or a few countries spread to others, reducing the economic gaps between the leaders and the followers. In the middle decades of the 19th century, countries on the continent of Europe tended to catch up with Britain. In the later 20th century, countries around the world tended to gain ground on, if not catch up with, the technological leaders in North America, Western Europe, and Japan.

Today there are signs that new media and Internet technologies may be widening economic gaps among nations again, particularly between the United States, where much of the cutting-edge technological development is taking place,

and other countries. To what extent this is happening, and how long it will persist, are important questions to keep in mind in coming years and decades as economic history continues to unfold.

Another parallel with the past is the close relationship between the new media and information technologies and the financial system. Once again we see the financial sector pouring capital resources into new technologies, while at the same time the new technologies are having a major impact on the way financial services are delivered. Earlier in history, the telegraph, the stock ticker, and the telephone integrated financial markets within and between countries. These communications technologies also speeded up the delivery of financial services, reduced the costs of financial transactions, and drew more participants into financial institutions and markets.

Now the same thing is happening with the new media and the Internet. Global financial markets are becoming instantaneously integrated, securities are traded on electronic communication networks, on-line brokers are reaching growing numbers of individual investors, transactions costs are falling, and all sorts of specialized financial information services—for example, CNBC on television and Bloomberg machines in financial firms—are appearing. These evident synergies between the new media and information technologies and the financial system are positive developments. They are making the financial system broader, deeper, more liquid, more efficient, and more useful in its traditional roles of financing new entrepreneurs and existing enterprises.

'Irrational Exuberance?'

At the same time, financial history provides some more disturbing parallels for those of us living in the here and now of the early stages of yet another epochal breakthrough in network technologies. It reveals that individual investors and financial intermediaries at such times tend to get carried away over the eventual economic-profit and financial-return prospects of the new technologies—to become irrationally exuberant, as Fed Chairman Alan Greenspan put it a few years ago.[4]

The result of irrational exuberance is that financial asset values first get bid up to unforeseen and previously unimaginable heights. As that is happening, the euphoria is rationalized and justified by purportedly great prospects and profit potential of the new technologies. Eventually, however, something happens to challenge all the irrational exuberance. It could be an unexpected negative shock from outside the system—a war or a natural disaster, for example—that changes for the worse the economic and financial outlook. Or it might be more internal to the system, such as when one or more major 'darlings' of speculation report unexpected bad results or even fail as enterprises. Or it could be that the so-called 'smart money' suddenly decides to beat the crowd and exit by selling out, triggering an extended decline in asset values as others join in. Or it might arise because those charged with the responsibility for economic and financial stability—central bankers and other policy makers—decide that irrational exuberance has gone too far and has to be reined in by interest-rate hikes and credit tightening.

When such things happen, irrationally exuberant asset values fall, often quickly as in the banking panics and financial market crashes that litter history. These 'corrections' can ruin individual investors and business enterprises. Ruin happens more surely and quickly when they are highly levered, that is, when they are

operating with a lot of borrowed money. Unfortunate as that is, the ruin of some individuals and firms is probably the least damaging thing that can happen during an asset-value correction in an enterprise economy that encourages risk taking and, in the apt phrase of the great economist Joseph Schumpeter, 'creative destruction'. The real danger is that the correction of financial exuberance damages the financial system and the economy, either directly or through its indirect ramifications, for some time—perhaps a long time—after the correction.

Financial history is littered with the wreckage of such corrections, panics, and crashes. Fortunately, the wreckage is usually cleared away fairly quickly, and economic growth resumes. This, it should be mentioned, always seem quicker to historians looking at units of years and decades than to people who live through the hours, days, weeks and months of corrections and are perhaps victimized, either directly or indirectly, by them. Thus the stock market crash of 1987, which in 1 day wiped out more than 20% of stock market values and led to a winding down of 'the decade of greed' in the United States, now seems to us—to the extent it is remembered at all—as just a blip in a great bull market that continues after two decades. We have almost forgotten the Wall Street layoffs, the banking and S&L problems, the financial scandals and prison sentences, and the slow economic growth that followed it for several years.

Financial-market corrections arising from irrational exuberance over new network technological innovations often had more damaging effects of longer duration. When financial innovations were the newest thing some three centuries ago, Britain adjusted economically to the financial debacle of its famous South Sea Bubble (1720) fairly well. But at that time Britain put in place legislation, for example the Bubble Act of 1720, that restricted Britain's corporate development until it was repealed in 1825. In the interim, the American colonies gained their independence and in barely three decades after 1790 developed a financial system that was as good as, and in some respects better than, Britain's. France was less fortunate than Britain. Its related Mississippi Bubble under John Law in 1720 led Frenchmen to distrust money, banking, securities markets, and their government for decades, perhaps even a century, during which the French economy slipped further behind its Anglo-Saxon economic rivals across the Channel and the Atlantic.[5]

Closer to home, the collapse of real estate values and the early railroad investment boom in the United States at the end of the 1830s led no fewer than nine US states in the early 1840s to default on debts they had incurred to launch transportation and banking projects. With other business bankruptcies and financial failures of that era, the result was one of the worst depressions in US history from 1839 to 1843. Similarly, the collapse of American railroad investment booms in 1873 and 1893 put many of the nation's largest railroads into receivership during the ensuing depressions of 1873–1879 and 1893–1897. These, like the crash of 1987 and the sluggish economy that followed it for a few years, are now mostly forgotten, but a historian can tell you that they seemed like hell to people living at the time.

Less forgotten by history is the great investment boom of the 1920s, featuring such new technologies as autos, airplanes, radios, movies, electrical appliances for households and industries, and, of course, the development and consolidation of electricity distribution networks that made many of the other innovations possible. In that 'new era', Wall Street soared—until it crashed in October 1929. The Great Crash of '29 likely had less to do than many people assume with the

Great Depression of the decade that followed, but Wall Street was blamed for the depression anyway, and a host of good and bad financial regulations and reforms were introduced in the depression decade. These furnish examples of the indirect and long-term effects of irrational exuberance. Wall Street in the long run probably benefited from reforms such as the SEC, but depository institutions, particularly commercial banks, were hamstrung by regulations of interest rates, entry, and types of business allowed. Banks then lost market share in financial services for half a century. Even on Wall Street, the Dow average of industrial stock prices did not attain its pre-crash peak for a quarter of a century. That ought to be pondered in our current period of irrational exuberance by those who feel that every dip in the market is a good opportunity to buy more stock.

Historical Parallel: The English Railway Mania of the 1840s

Britain in the 1840s was in much the position of the United States today. Based on its industrial revolution, it was the acknowledged economic and financial leader of the world. It was also the acknowledged 'superpower', and the relatively peaceful 19th century became known as Pax Britannica. It also had several years of irrational exuberance related to a new network technology, in this case, the railways. A look at Britain's experience then challenges the notion that the world has never before seen anything like the Internet and our other new technologies.

It is easy for me to summarize the main features of Britain's bout of irrational exuberance over railways; I can draw on a recent book by Edward Chancellor, *Devil Take the Hindmost*, which discusses the mania in some detail.[6] Like computers and the Internet in the 1990s, railways were not exactly new in the 1840s. They had been around for a couple of decades, but it was only in the 1840s that their potential to change the world in a big way began to be realized.

First came the hype. 'Throughout the country', Chancellor says, 'journals and pamphlets proclaimed the railways as a revolutionary advance unparalleled in the history of the world'.[7] Here are some of the things that were said then about railway technologies:

> Nothing, *next to religion*, is of so much importance as a ready communication.[8]

> The length of our lives, so far as regards the power of acquiring information and disseminating power, will be doubled, and we may be justified in looking for the arrival of a time when the whole world will have become one great family, speaking one language, governed in unity by like laws, and adoring one God.[9]

> The prejudices and mistaken interest which separate one district . . . from another, are broken down by such noble inventions as these; and the same spirit of civilisation which results from that increase of our reason, which bestowed by a beneficent Providence, will eventually render all men as brethren, and children of one great Father . . . and will, there is no possible doubt, above all, spread knowledge and diffuse intelligence . . ., and finally tend to 'universal good' (H. Wilson, *Hints to Railway Speculators*, London, 1845).[10]

Along with the hype came the investment mania. Queen Victoria helped get it going by taking her first trip by railway in 1842. So did Parliament by passing a Railway Act in 1844. The Act was meant to introduce some regulatory oversight to all the schemes that were being hatched, but railway interests succeeded in watering it down—no problem in an age that believed in and actually practiced *laissez faire*—and it probably served to fuel the mania by creating the illusion that the government actually was overseeing it.

By 1844, and especially by 1845, all sorts of new railways were projected and began to sell stock to investors swept up by the mania. Chancellor cites the following observations that were made at the time:

> From Edinburgh to Inverness, the whole people are mad about railways. The country is an asylum of railway lunatics. The Inverness patients, not content with a railway to their hospital from Aberdeen, insist on having one by the Highland road from Perth. They admit that there are no towns, or villages, no population, and chance of many passengers (William Wordsworth, 1845).[11]

> There is not a single dabbler in scrip [subscriptions to railway shares] who does not steadfastly believe—first, that a crash sooner or later, is inevitable; and second, that he himself will escape it. When the luck turns, and the crack play is . . . devil take the hindmost, no one fancies that the last mail train from Panic Station will leave him behind. In this, as in other respects, 'Men deem all men mortal but themselves' (*The Times*, London, 12 July 1845).[12]

> Never was anything like the amount of business done in this town . . . the streets which are blessed with the presence of our three Stock Exchanges resembled a fair on the mornings of those days. Crowds of anxious brokers and speculators thronged them, and the rushing to and fro of brokers, eager to save the precious moments, was worthy of the promoters of rapid locomotion (*Leeds Mercury*, 28 July 1845).[13]

> It is only the play of children, trying to lift up one another in the air all at the same time . . . It is the simpler part of the public which is deceived (*The Times*, London, 11 October 1845).[14]

> The market value [or railway scrip] . . . depends, not on the opinion as to the ultimate success of the undertaking, but rather how far circumstances will tend to sustain or increase the public appetite for speculation. Nothing can show this more powerfully than the fact that we see nine or ten proposals for nearly the same line, all at a premium, when it is well known that only one CAN succeed, and the rest must, in all probability, be minus their expenses (*The Economist*, 25 October 1845).[15]

> To a man, all live upon the present moment, or look at most but a fortnight before them, from one settling-day to another (*The Times*, London, 1 November 1845. Stock trades in London at the time were settled once a fortnight, or every 2 weeks).[16]

In the midst of the above evidences of mania, *The Economist*, then a new publication, but one that would last right down to our own time with a long-standing reputation for probity and level-headedness, made the following forecast:

> To think or dream that the present mania will subsist without a crisis the most severe ever experienced in this country would be to shut our eyes to all past experience (*The Economist*, 16 August 1845).[17]

Those who have read *The Economist* in recent years are aware that its analysis and forecast of the likely outcome of the Internet investment mania differs little from the one it made in similar circumstances a century and a half ago.

In 1845, *The Economist* did not have to wait as long as it has in recent years to see its forecast come true. Late that year the stock market bubble associated with the railway mania suffered its first, but not last, burst. Many railway shares plummeted 40% or so from their peaks:

> A mighty bubble of wealth is blown before our eyes, as empty, transient, as contradictory to the laws of solid material, as confuted by every circumstance of actual condition, as any other bubble which man or child ever blew before (*The Times*, London, 24 October 1845).[18]

That correction was hardly the end of the matter. When investors purchased railway scrips, tantamount to buying an IPO, it was only the beginning of their financial obligations. The scrips were just seed money, and as the railway actually commenced construction, scripholders received calls to put up more and more money to construct the railway. If an investor did not have that money, he could sell the scrip to someone else, as long as the market allowed it. The bursting of the bubble in late 1845, however, meant that it was not easy to unload scrips to others. Liquidity, in short, dried up. As the railways demanded funds from their investors, they encountered problems:

> The lust of gain which animated all speculators is now changing into the cruelty of a reign of terror, and the ferocity of a revenge . . . the world of speculation is transforming into a world of litigation (*Glasgow National Advertiser*, 1846).[19]

Nonetheless, although some railway projects were abandoned and others were merged into other companies, the expansion of Britain's railway network continued. It really was a great new technology, even if some investors had been chastened.

But Britain in 1846 and 1847 was trying to do too much, too fast. Railway construction devoured capital. In Scotland, new financial institutions called exchange banks were formed to make loans on railway shares; in the end, they did not survive the crisis. All the demands for capital put upward pressures on the British price level, and interest rates rose, from 2.5% in 1845 to 10% by late 1847. By that time the Bank of England, the country's central bank, was losing gold and had to raise its rates. The financial crisis of October 1847 caused the stock market to tank. The next year, railway shares lost an amount approaching half of Britain's entire national income, and shares of a leading railway such as the Great Western went from £236 to £65. The bloodbath continued to 1850, when many railway shares were off 85% from peak levels and the market value of railway shares became only about half the value of the capital that had been invested in the lines. That happened because of overconstruction, increased competition, and the dividend cuts that followed.

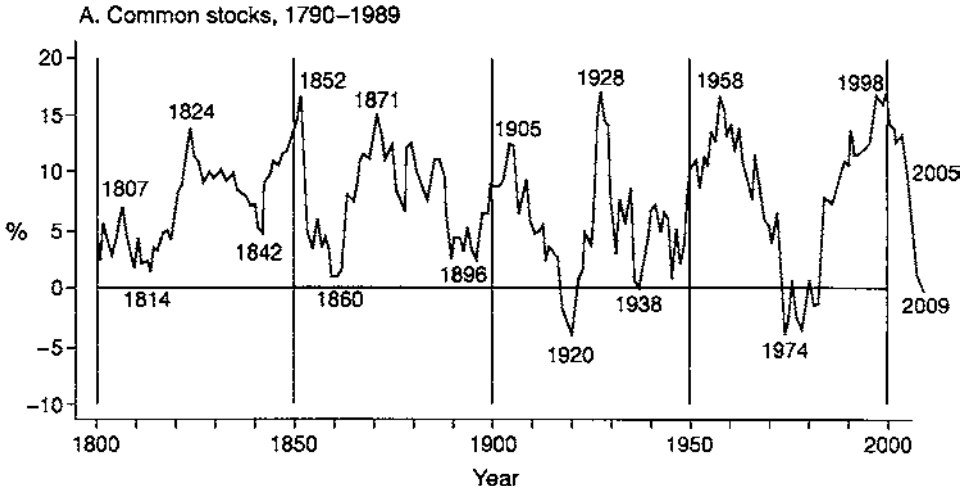

Figure 1. US real (inflation-adjusted) stock returns, 1800–1999. Source: See text and endnote 21. The figure plots 10-year moving averages of real returns; thus, for example, the peak returns of 1928 represents the 10-year average real return from 1919 through to 1928.

Still, the railways went on, but most of the investors who had been swept up in the mania and stuck with it because of all the hype suffered. An observer of the wreckage that littered the landscape in 1850 described the situation poignantly:

> It is the conviction of those who are best informed that no other panic was ever so fatal to the middle class. It reached every hearth, it saddened every heart in the metropolis. Entire families were ruined. There was scarcely an important town in England but what beheld some wretched suicide. Daughters delicately nurtured went out to seek their bread. Sons were recalled from academies. Households were separated: homes were desecrated by the emissaries of the law. There was a disruption of every social tie. The debtor's jails were peopled with promoters . . . (John Francis, *History of the Railways*, London, 1850).[20]

The mania had taken the better part of a decade to play itself out. In the end, the picture was not pretty.

Conclusion

This review of a few episodes in the history of speculation in new network technologies is suggestive of how we might view our own current fascination with today's Internet and new media technologies. Will it really be different this time? As our mania, our bubble, continues in 2000, warnings about its dangers seem to be increasing, and the monetary authority is tightening here, just as it did in England in 1847. Still, others say the new technologies will keep on changing the world, and investors should use dips to buy more stock.

Economists do not have particularly good forecasting records, but in our defense I have to say we are better at forecasting what will happen than we are at

predicting when it will happen. As of this writing (late October 2000), US stock prices have come down quite a bit since peaking in the spring of the year. Some years ago, two collaborators and I made a study of long-run US real (inflation-adjusted) stock returns from 1800 to 1989. The chart that resulted, updated to 1999, appears here, along with a 'forecast' of what the chart would look like if real US stock returns were zero for the 10 years 2000–2009.[21] The assumption is not far-fetched. So far in 2000, real stock returns are in the vicinity of zero for the year.

Two points are of interest. First, at the end of 1999, 10-year average real stock returns were at a level reached on just a few occasions in 200 years of market history. Second, the assumption that real returns will be zero from 2000 to 2009 shows up in the graph as not looking so very different from what happened on earlier occasions in history when returns reached the lofty levels of the late 1990s. This coincidence, of course, is more food for thought than a forecast. It does suggest that the high returns of the 1990s are unlikely to continue in the decade ahead.

Keep in mind another forecast, noting both its source and when it was made:

> Gold rushes tend to encourage impetuous investments. A few will pay off, but when the frenzy is behind us, we will look back incredulously at the wreckage of failed ventures and wonder, 'Who funded those companies? What was going on in their minds? Was that just mania at work?' (Bill Gates, *The Road Ahead*, New York, 1995).[22]

An economist and financial historian cannot really say it any better than that.

Notes and References

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22. Bill Gates, *The Road Ahead*, Viking, New York, 1995, as cited by Chancellor, p. 151.