

The Coming Communications Boom?

Jobs, Innovation and Countercyclical Regulatory Policy

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Introduction

This policy memo brings together three important strands of current policy debate: jobs, innovation, and regulatory policy. Everyone these days is concerned about the slow pace of job creation coming out of the Great Meltdown. Over the past six months, the economy has generated less than 600,000 net new private sector jobs—hardly enough to make a dent in the 14.6 million unemployed.

A bigger issue, though, is that the job drought actually started well before the meltdown. In the last business cycle—running from 2000 to 2007—the private sector created 4.4 million net new jobs. But out of those, fully 74 percent were in the health/education sector. That is, most of the private-sector jobs were being created in places like hospitals, nursing homes, and universities that are heavily government-funded. In effect, the public sector has been keeping the job market afloat since the beginning of the decade.

Most distressingly, America's great strength—its innovative sector—actually lost jobs during the 2000-2007 business cycle. This sector includes everything from aerospace to pharmaceuticals to telecommunications to software (see Table 1). Some individual industries added employees, but collectively the innovative sector lost almost 700,000 jobs from 2000 to 2007, before the bust hit.

That performance was far worse than anyone expected: In 2001, the Bureau of Labor Statistics published projections implying that the innovative sector would create 1.7 million net new jobs by 2007. In other words, the innovative sector had a shortfall of 2.4 million jobs relative to expectations, even before the bust.

There are promising signs, however, of a rebound in one part of the innovation sector: communications. Internet companies, along

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TABLE 1: INNOVATIVE INDUSTRIES: RECENT JOB PERFORMANCE

	Change in Employment
	average of latest six months compared to previous six months
Internet companies*	3.2%
Wireless telecom	1.0%
Computer systems design**	1.0%
Data processing	-0.4%
Medical equipment manufacturing	-0.5%
Radio and television broadcasting	-0.6%
Scientific research and development	-0.8%
Software publishing	-1.0%
Computer and electronic products manufacturing	-1.1%
Pharmaceuticals	-1.3%
Aerospace manufacturing	-1.6%
Cable programming	-1.7%
Wired telecom	-3.2%

*Internet publishing and broadcasting and web search portals

**Includes web design and apps programming

Data: Bureau of Labor Statistics

Calculations: South Mountain Economics

with firms engaged in wireless telecom and computer systems design, seem to be emerging as “job leaders” in the next economic expansion. Unfortunately, these companies are also embroiled in struggles with federal agencies – and among themselves – over whether more regulation is required to police competition in communications.

With unemployment stuck at just under 10 percent, federal policy makers would be wise to take a countercyclical approach to regulatory policy as well as fiscal policy. No serious economist wants to clamp down on public spending or raise taxes until the economy starts creating jobs at a more rapid clip. By the same token, there should be no rush to regulate sectors of the economy that are finally beginning to reweave the severed connections between innovation and new jobs. For now, getting more Americans working is more important than regulating growing industries to ward off dangers that at this point remain more speculative than real.

Job Growth in Innovative Industries

The innovative sector includes industries that we’ve identified as being at the leading technological edge of the economy. Taken together, the companies in these industries do roughly 75 percent of all business in research and development, according to new data from the National Science Foundation.¹ They also employ almost 70 percent of all R&D personnel.²

The 2.4 million shortfall in innovative sector jobs from 2000 to 2007, relative to projections, was a major contributor to the pre-bust economic weakness.³ The biggest jobs shortfall, measured as a share of projected employment, was found in information technology software and services. That includes the category of Internet companies, whose employment level in 2007 was still 35 percent below its 2000 dot-com bubble high (see Table 2).

If we want to address the underlying jobs problem in the U.S. economy today, we need to ask why the job performance of the innovative sector weakened so dramatically, and what can be done about it.

Certainly there are a wide range of reasons why innovative job growth has fallen so far short of expectations. Offshoring accounts for part of the job loss, especially in the infotech hardware industry. Internet-related businesses took years to recover after the dot-com crash. In some industries, notably pharmaceuticals and biotech, important innovations took longer than expected to get from scientific discovery to commercial products.⁴

But the intensified regulatory regime that followed the tech bust—notably the Sarbanes-Oxley Act of 2002, which set new accounting standards—clearly has to be part of the explanation for the job losses in the innovative sector. Congress imposed greater compliance costs on companies, including start-ups, in order to deter the excesses of the tech boom. Studies have produced a wide range of estimates for the size of extra costs, but it’s only common sense that such regulations weigh heavier on new companies.

TABLE 2: THE JOBS SHORTFALL IN THE INNOVATIVE SECTOR, 2000-2007

	Change in Employment, 2000-2007 (In Millions)		Shortfall as Share of Projected 2007 Employment
	Projected	Actual	
Info-tech software and services	1142	34	-34%
Software		-5	
Data processing		-48	
Internet companies*		-38	
Computer systems design		118	
Other information services		7	
Info-tech hardware	69	-548	-32%
Telephone	98	-239	-27%
Wired telecom		-257	
Wireless telecom		18	
Other communications	89	-18	-19%
Radio and television		-16	
Cable broadcasting		-2	
Aerospace	71	-28	-16%
Medical equipment	35	1	-10%
Pharmaceuticals	51	20	-8%
Scientific research and testing**	162	99	-8%
	1716	-903	

Projected employment based on 2001 BLS employment projections

**Internet publishing and broadcasting and web search portals*

***Includes testing laboratories for the purposes of this calculation*

Data: Bureau of Labor Statistics Calculations: South Mountain Economics

Similarly, over this period, the Food and Drug Administration moved to tighten up approvals of new drugs, especially after the 2004 Vioxx debacle. Once again, the intensified regulatory regime was driven by good intentions, but the negative effect on innovation may have been significant.

The sad truth is that two and a half years after the official December 2007 recession started, most innovative industries are still losing jobs. Computer and electronics manufacturing employment is down by 1.1 percent over the past six months (measured as a six-month moving average). Pharmaceutical jobs are down, as is employment at “scientific research and development” establishments, which includes biotech. Aerospace jobs are down, and so are jobs in the software industry (Table 1).

Job Leaders in Previous Recessions

For the purposes of countercyclical regulatory policy, we have to be able to identify which industries are going to be the big job growth engines of the next recovery. That may seem like an impossible task in the middle of a deep recession. However, it turns out that if we look at the hiring patterns of industries during a downturn, we can get a good idea of whether they will be a good source of jobs during the next expansion.

An industry is a job leader in a particular downturn if it starts adding workers well before the rest of the private sector recovers. Every recession has different job leaders. In the recession of 1990-91, software was a job leader, with software firms adding jobs in seven out of the eight

months of the downturn. But software was not a job leader in the recession of 2001. By contrast, finance/insurance was a job leader in 2001, but not in 1990-91.

Table 3 shows the key job leaders for the recessions of 1981-82, 1990-91, and 2001⁵:

TABLE 3: SELECTED JOB LEADERS

Recession	Job Leaders
1981-82	Retail trade
	Finance
	Computer and data processing services
1990-91	Software
	Data processing
	Computer systems design
	Management and technical consulting
2001	Construction
	Finance/insurance
	Real estate
	Legal
	Management and technical consulting

Data: Bureau of Labor Statistics
 Calculations: South Mountain Economics

In each case, the names of the job leaders in the recession clearly show the shape of the coming expansion. Start with the deep 1981-82 downturn, where the job leaders were in retail, finance, and computer services and data processing (which at the time included software companies). In the eight-year expansion that followed, retailers added more than four million jobs, as shopping

malls and big-box retailers were built around the country. Similarly, the 1980s were the great era of expansion for software companies such as Microsoft and Oracle.

What about the 1990-91 recession? Infotech services such as software, computer systems design and data processing services were still job leaders in the recession, and went on to become big job creators in the tech boom that followed. But the list of job leaders in the recession also included the consulting industry, whose employment more than doubled during the expansion.

Now we come to the 2001 recession. Remember that the 2001 recession was officially short and mild, lasting only from March 2001 to November 2001. However, the recession was followed by a jobless recovery that lasted until July 2003. That's when private-sector employment finally hit bottom.

However, some industries were expanding employment even during the jobless recovery. Despite the stock market crash, the financial sector gained almost 200,000 jobs between the beginning of the recession in March 2001 and the end of the jobless recovery in July 2003. Employment in the broad real estate and leasing industry did drop during the recession, but bottomed out in July 2002, a full year before the rest of the economy. And while construction jobs bounced up and down, the underlying trend seemed to turn upward in late 2002 or early 2003. Residential construction, in particular, actually added 50,000 jobs between the middle of 2001 and the middle of 2003.

The strength of finance, real estate and residential construction employment in 2001 and 2002 was a clue to the housing-related boom that followed. All three industries produced sizable net job gains from 2001 to 2007, the last year before the current slump started.

The Communications Sector: Job Leaders in the Next Expansion

In light of that recent history, what shape will the next recovery take? What industries will spearhead the next expansion?

There has been one obvious bright spot in the current labor market: the communications sector. Just look at the headlines: Americans want and are willing to pay for new smart phones, new wireless applications and faster connections able to carry more data.

As a result, several communications-related industries are adding jobs, despite the general gloom and doom. Let’s start with “Internet publishing and broadcasting and web search portals”—the government’s official name, but we’ll shorten it to “Internet companies.” This industry—which includes Google and Facebook—has boosted employment by 3.1 percent over the past six months (see Figure 1).

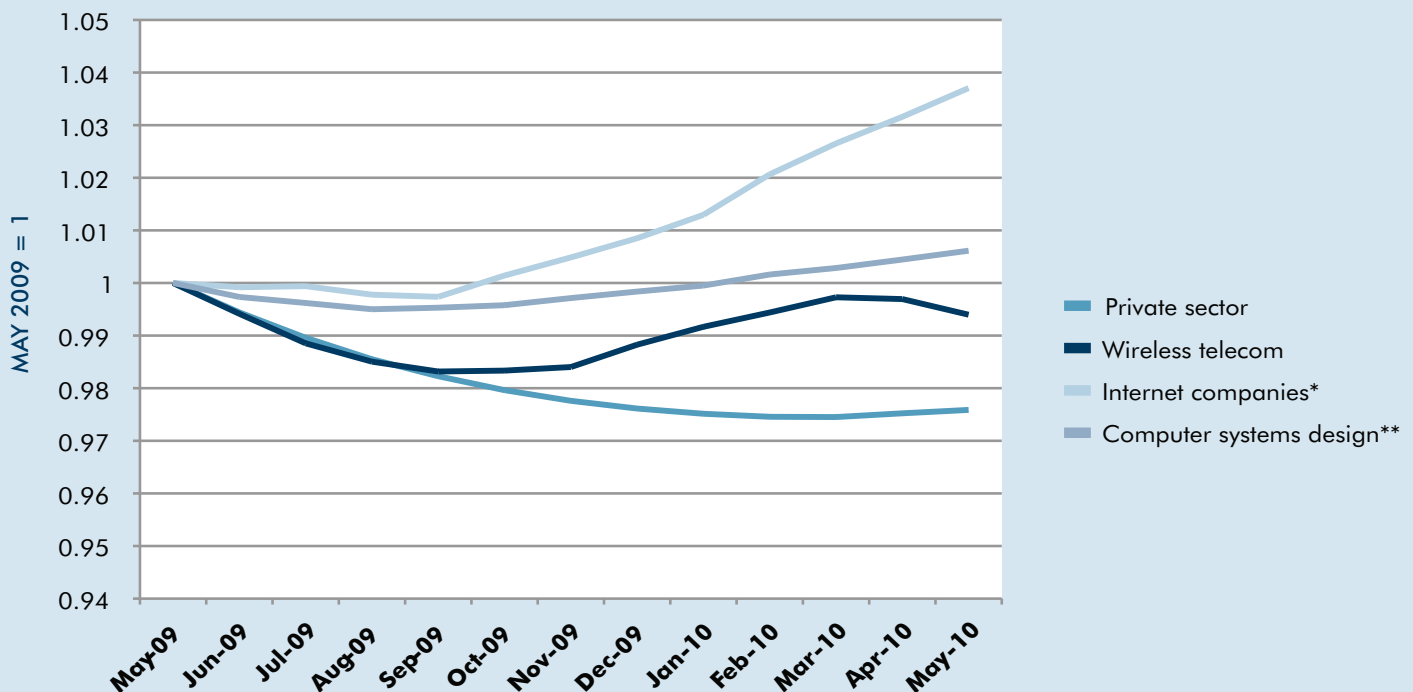
At the same time jobs are being added at wireless telecom carriers, as more and more Americans go mobile. And employment is up in the broad

industry called “computer systems design,” which includes, among other activities, web design and programming. So it’s likely that makers of smart phone applications are helping fuel this job growth.

Why is it important that these three communications-related industries—representing content, infrastructure, and application development—are hiring? As discussed above, in the last three downturns, the industries that started hiring first—the job leaders—were the ones that led the next boom.

Today, the broad communications sector is an innovation success story in an otherwise sluggish economy. And that success feeds on itself. The Internet companies have access to bigger potential markets as the broadband providers deepen and extend their networks. The broadband companies

FIGURE 1: JOB LEADERS IN THE INNOVATIVE SECTOR
(six-month moving average of employment, indexed to May 2009)



*Internet publishing and broadcasting and web search portals

**Includes web design and apps programming

Data: Bureau of Labor Statistics

benefit from innovative applications that drive traffic and demand. And the applications developers, small and large, are able to take advantage of new capabilities.

This interconnected and self-reinforcing collection of industries is reminiscent of the early stages of past booms, which were never driven by a single industry. In this case, the employment expansion of several communications-related industries, despite the overall weak labor market, is a sign that the broad communications sector is going to be a leader in the coming recovery.

Consider this: On average, industries that are job leaders in recessions grow at least twice as fast as the rest of the private economy during the next expansion. That’s based on our analysis of the past three business cycles, going back to the early 1980s.

Table 4 compares the employment performance of job leaders with the rest of the private sector (omitting health, education and social services). For example, the industries that were job leaders in the 1990-91 recession added jobs at a 5.2 percent annual rate in the expansion that ran from 1991 to 2000, compared to only 2.1 percent in the rest of the private sector. A similar gap shows up in the other two business cycles (remember that the employment expansion after the 2001 recession didn’t start until 2003).

Intuitively, this makes sense: Industries that are expanding fast enough to hire during a recession will usually carry that strength into the recovery that follows. Conversely, industries that shed a lot of workers during a downturn usually don’t generate very many new jobs in the recovery. One final note from history: The continued job losses in some communications industries during the recession—notably wired telecom and radio and television broadcasting—should be taken as an indication of how the sector will continue to transform itself if there is a communications boom. To see how that might work, take a look back at the 1990-91 recession and the tech boom that followed. It’s worth noting that the list of job leaders in the 1990-91 recession included software

TABLE 4: WHO GENERATES JOBS IN EXPANSIONS?

	Job Leaders in Previous Downturn	Rest of Private Sector
	average annual employment growth*	
1982-1990	3.5%	1.9%
1991-2000	5.2%	2.1%
2003-2007	2.1%	0.8%
Average	3.6%	1.6%

**Excluding health, education and social services
Data: Bureau of Labor Statistics
Calculations: South Mountain Economics*

and computer services, but did not include makers of tech hardware such as computers, semiconductors, and communications equipment, which shed jobs in the downturn. This divergence in growth in the 1990-91 recession set the pattern for the rest of the 1990s: Plenty of jobs in tech software and services, but relatively small gains in tech hardware employment.

The Role of Regulatory Policy

Over the medium run, regulatory policy is probably a more important tool than fiscal policy for influencing job creation. A jolt of government spending can quickly create jobs, but the effect will likely be only temporary. Regulatory policy, however, promises to have a more enduring impact on our economy. It can affect both how many jobs are created and in what industries.

To give one positive example: The relatively permissive regulatory regime for the Internet in the 1990s, especially compared to the telephone industry, helped the fledgling online sector grow quickly. It’s likely that imposing “telephone-like” regulations on the Internet in the early 1990s would have greatly slowed its adoption.

But we can easily find a negative example of regulatory policy as well. There’s little doubt that a permissive regulatory regime for derivatives and securitization helped foster the housing boom, creating millions of jobs in construction and finance. But it also set the stage for the financial

crisis that eventually sent unemployment soaring. Right now regulators seem intent on tightening the regulatory regime on the communications sector, despite it being one of the few growth sectors in the economy, and despite the fact that communications-related industries were completely blameless in the housing boom and bust. The Federal Communications Commission (FCC) is considering imposing tighter regulations on broadband, bringing it under the same common carrier rules that govern older phone networks. That would be part of a move towards net neutrality, a policy that would require broadband providers to follow rules about what kind of services and products they could offer. There are different approaches to net neutrality, but the strictest version would be like requiring airlines to sell all tickets to a particular destination at the same price, no matter what the time of day or when the ticket was bought.

The debate over net neutrality is intense. But whether or not you think that such a move is a good idea, it seems unlikely that such regulations would boost investment or employment in the telecom industry. The experience of the airline industry suggests that differentiated pricing and service is an essential part of keeping a high-fixed-cost industry running.

At the same time, antitrust regulators are closely watching Google and to a lesser extent, Facebook. Once again, no matter what the merits of the particular investigations, these are successful companies that have been adding jobs despite the recession. Indeed, employment in Internet companies is up 13 percent since the recession officially started in December 2007.

Ironically, regulators may partly be responding to complaints from the companies themselves. The industries that are poised to lead us out of the job wilderness are embroiled in a self-defeating effort to entangle each other in government regulation. In the worst case scenario, the incipient communications boom may be potentially undermined by a threat of aggressive federal rule-making.

A New Approach: Countercyclical Regulatory Policy

So here's the dilemma: How can we shape regulatory policy to encourage the job creation that has already started in the communications sector, while avoiding the painful boom-bust pattern of the past two business cycles? How can we stimulate innovation and job growth while preventing the excesses that have torpedoed our economy in the past?

Luckily, or unluckily, we have experience with two recent bubble-bust cycles that provide us with good lessons. Looking back on the tech and housing booms, it appears that timing is key. In the early stages of an innovation-driven boom, permissive regulatory policy is important to let new products and services take root. No one knows beforehand what will work, and what won't, so experimentation is crucial. The innovative process is more fragile than it seems, so tightening up regulation at this early stage can potentially choke off the boom. Indeed, regulators should give the benefit of the doubt to innovative industries.

But as the housing boom in particular has shown us, permissive regulatory policy can be a mistake if left in place too long. Experimenting with innovative financial products and securities was socially beneficial—until Wall Street went overboard with complicated and potentially unstable securities in the middle of the decade. At that point, regulators should have stepped in to selectively tighten up the rules and deal with excesses.

The implication: We should consider countercyclical regulatory policy for innovative industries—loosening up regulation when an innovative boom is just getting started, and then tightening up as excesses develop. The term 'countercyclical regulatory policy' has traditionally been applied to financial markets. In that context, it means that bank regulators should loosen capital standards in downturns, and tighten standards in boom periods.

But the idea of countercyclical regulatory policy for nonfinancial industries goes against prevailing

wisdom, which argues that businesses want and need a consistent standard of regulation from government, like baseball players want consistency from the umpires, or like children need consistent discipline from their parents. Laissez-faire economists argue for a consistently low level of regulation, while intervention-minded economists would like to see a consistently high level of regulation.

But we've seen how this simple-minded approach breaks down during innovative booms. The heavy-handed interventionist approach runs the risk of squeezing new products and services out of existence early in the cycle. But the laissez-faire "light touch" could become harmful during the periods of excess that seem to come in any boom.

What would this mean in practice? I propose that the FCC take a pause in putting in tighter regulations on broadband, perhaps for two years. That would allow the incipient communications boom to get started. After that period, the agency should systematically and proactively track down areas of excess and exploitive behavior and target them for selected intense regulation.

Countercyclical regulatory policy could bring enormous benefits. Investments would pour into the communications sector, and hiring would step up, as companies try to take advantage of the permissive regulatory period to build out their businesses. Less effort would go into gaming

the regulatory system and more into genuine innovation.

At the same time, communications companies would have an incentive to self-monitor if the FCC was credible in its threat to target excesses once the recovery was well under way. This is the piece that was missing during the housing boom, when financial regulators, including Federal Reserve Chairman Alan Greenspan, basically lost track of the changes in the financial system. With countercyclical regulatory policy, the FCC would intentionally be looking for the right moment to shift from permissive to selected regulation as needed.

The problem, of course, is that implementing countercyclical regulatory policy would be difficult politically and administratively. Every shift in regulations brings on an enormous lobbying battle, so it may be difficult to develop a credible threat to target excesses a couple of years down the road. This is the same problem that fiscal policy has always faced, which is why economists tend to prefer monetary policy, which is run by a more or less independent Federal Reserve.

However, as difficult as countercyclical regulatory policy is, we know that what we have been doing is just not working. We have been getting the big booms and busts, but without the innovative job growth. It's time we tried something different.

Endnotes

- 1 See “New Employment Statistics from the 2008 Business R&D and Innovation Survey,” National Science Foundation, July 2010.
- 2 The only major R&D-spending parts of the economy that were omitted from this study were the motor vehicle and machinery industries—adding them would not change the final conclusions.
- 3 Every two years, the Bureau of Labor Statistics updates its 10-year projection of industry employment growth. For example, the projections that were published in November 2001 gave per-industry job growth rates from 2000 to 2010. (“Industry output and employment projections to 2010,” *Monthly Labor Review*, November 2001) Note that the projections were published well after the tech bust started. Using the growth rates in these projections, we calculated projected employment in the innovative sector in 2007. (In previous work on this topic, I have used the projections published in 1999.) Then we compared the projected change in employment from 2000 to 2007 with the actual employment. Unlike the rest of the analysis in this policy memo, the table follows the old Standard Industrial Classification breakdowns because that’s how the 2001 projections were done.
- 4 See my piece “Innovation, Interrupted,” *BusinessWeek*, June 15, 2009.
- 5 There’s a small nuance in the 2001 job leaders. Remember that private-sector employment did not bottom out until mid-2003, so a job leader for that recession could be an industry that shed jobs during the actual recession, but started hiring before 2003. Construction falls in that group.
- 6 In previous work, I have suggested that the official statistics missed some of the biggest damage done by the 2001 recession, and it was actually not as mild as it seemed.
- 7 For each recession-expansion cycle, we took out the health/education/social services sector from the private sector. While the sector has added jobs in every recession and every expansion over the past 30 years, it receives so much government funding that it really follows very different dynamics than purely private businesses.

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