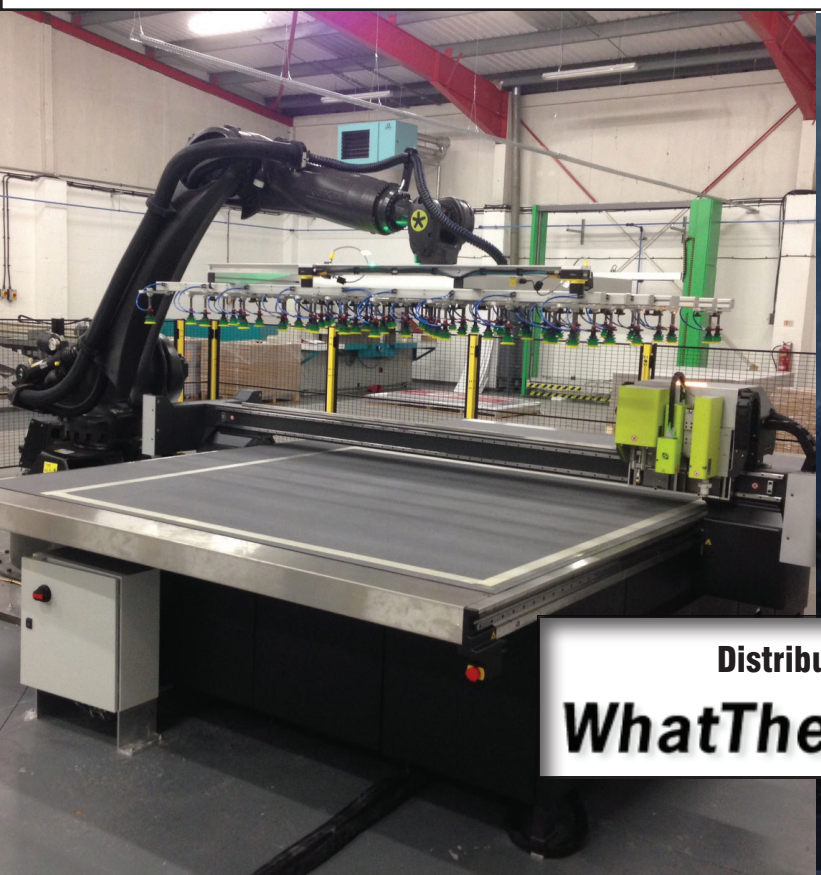
Printing Forecast 2018

The WhatTheyThink Economic and Research Center's
Overview of the Current Economic State of the Printing Industry

Project Directors: Dr. Joe Webb and Richard Romano



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WhatTheyThink?

Printing Forecast 2018

The WhatTheyThink Economic and Research Center's Overview of the Current Economic State of the Industry

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Introduction

Whew! 2017 is mercifully over. What can we expect from 2018? More of the same, or a refreshing change of pace? A new hope, or the last Jedi? Well, that's what this report is all about.

First, what kind of year was 2017? (We will thankfully confine ourselves to the printing industry.) First of all, Tom Whitwell at Fluxx offers "52 Things I Learned in 2017."[1] Some vaguely relevant items he highlights:

- The Pay-with-a-Selfie project is a micro-payment system funded by the Melinda & Bill Gates Foundation.
- Vice media is worth more than the New York Times, Washington Post and Financial Times combined.
- In August, Virginia Tech built a fake driverless van—with the driver hidden inside the seat—to see how other drivers would react. (This sounds a little like "The Turk,"[2] an 18th-century chess-playing "robot" that wasn't quite what it seemed.)
- Beggars in China have sophisticated ways to collect payment; using QR Codes, WeChat accounts and in one case a Point Of Sale machine to collect donations. ("QR Code Blue," perhaps?)
- A fifth of all the Google searches handled via the mobile app and Android devices are voice searches.

And, interestingly:

- Pebble Post[3] is a startup that lets websites send physical mail; if you abandon an item in an online shopping cart, you can get a reminder through the post the next day.

We recommend checking out the full list and associated links.

Anyway, as a new year dawns, it's time to take a look ahead at what the new year is likely to offer. We start by looking back at the year that was, and there's no use sugar-coating it: 2017 has been the worst year for printing shipments since 2008 (or even 1995, if you want to take a longer look back), and even our own WhatTheyThink Business Conditions Survey (see Section 1 of the present report) shows that business has been less than stellar in 2017 compared to 2016. It's not difficult to understand why. Mobile technology continues to occupy a greater and greater portion of peoples' lives, and as we enter the Age of Alexa and the Internet of Things, it's not that anyone is particularly *averse* to print; it's just that print is not high on a lot of peoples' list of priorities, especially when compared to electronic, mobile, and social technologies and applications that are getting better and faster.

So there's that.

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[1] Tom Whitwell, "52 Things I Learned in 2017," Fluxx Studio Notes, December 1, 2017, https://medium.com/fluxx-studio-notes/52-things-i-learned-in-2017-d9fb0040bdcb.
[2] Richard Romano, "A Turkish Get Up," *Print Connections*, Museum of Printing, http://museumofprinting.org/print-connections-by-richard-romano/a-turkish-get-up/.
[3] See http://pebblepost.com/.

In the survey results that comprise the first half or so of the present report, we look at 2017 business conditions and expected 2018 conditions; top business challenges and opportunities' top planned investments (such as they are); new product areas that printers have (or have not) been expanding into, like various kinds of specialty printing; and specific hiring plans for 2018.

When you look at the results of the survey, it's important to interpret them through the lens of survivor bias. Here is how we usually explain it.

Survivor Bias

In this report, what we refer to as "survivor bias" plays a very important role, as it has in past reports. In our Mid-Year 2017 report, we offered an extensive explanation of how survivor bias affects the interpretation of survey data which we repeat here. When an industry is growing, this type of bias is not an important statistical issue.

At a time when the industry is undergoing extensive consolidation—which it has been for may years—it's important to look at industry statistics through the lens of survivor bias, a result of the fact that really unhealthy print businesses have exited the industry (and thus have not taken our survey), and the ones that survived are healthier than the ones who went out of business. Similarly, businesses that are really ailing tend to disregard survey participation requests, since they're too busy trying to stay in business to bother answering a questionnaire.[4]

Survivor bias is nothing unusual, nor is it unique to the printing industry; it's almost always what happens in markets.[5] But how they perceive the remaining print landscape may not be a true reflection of the overall market.

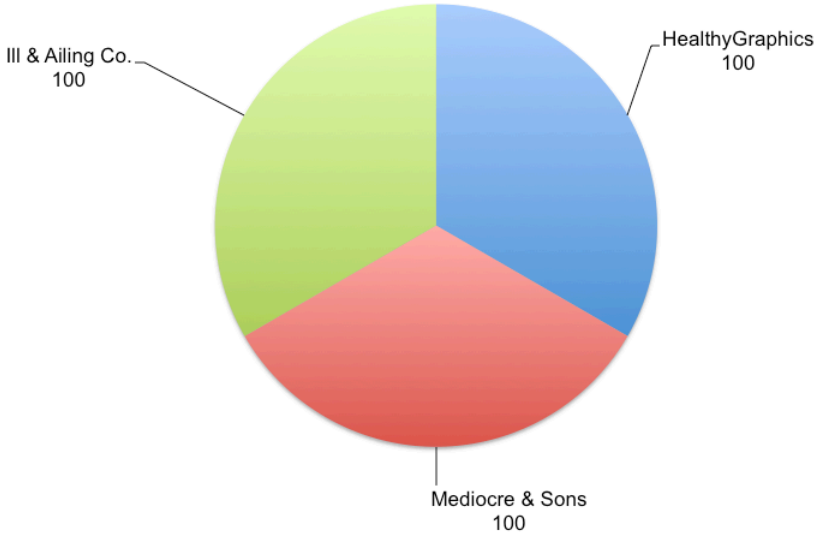
Here's what we mean.

Say you have a given print market with three printers. One is doing really well (HealthyGraphics), one is doing OK but not great ("Mediocre & Sons Printing"), and one is doing very badly ("Ill & Ailing Co."). Assume at the outset that in their region, the overall market for print is 300 print buyers, at this point in time, they each serve 100 customers:

[4] However, the free book they are offered for participating may contain helpful advice on helping save those business.

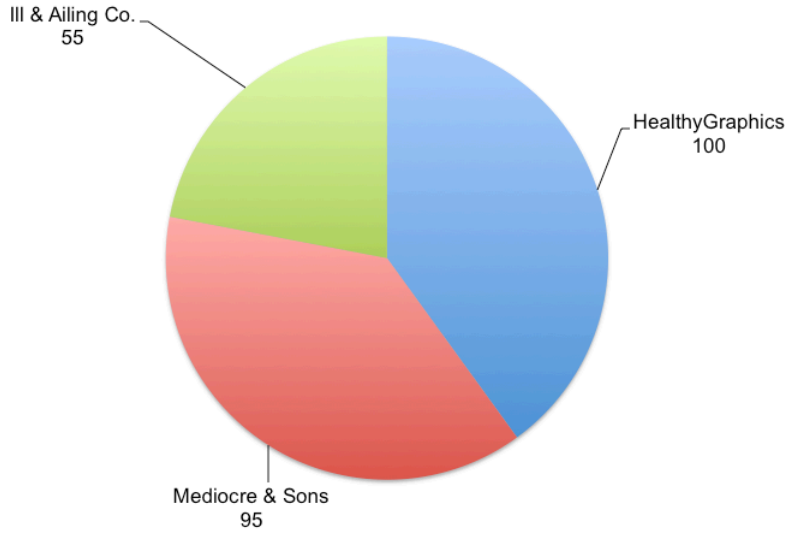
[5] It's also common in medical and health research, where the term "survivor" is used a bit more literally.

Figure 1. The initial market—My Three Printers
Market=300 customers



These three printers plug away merrily for a period of time. Now, say there is some sort of upheaval—50 of those customers are gone. Some may have moved away, some may have had their marketing budgets cut and thus stopped printing things, relying instead on digital or social media, and some may have gone out of business or been acquired. In a word, the market for print shrinks. When the smoke clears, there are only 250 customers spread among these three shops. The healthy printer keeps all its original customers, the mediocre printer loses a little bit, and the sick printer loses the most:

Figure 2. Upheaval! The market changes
Market=250 customers

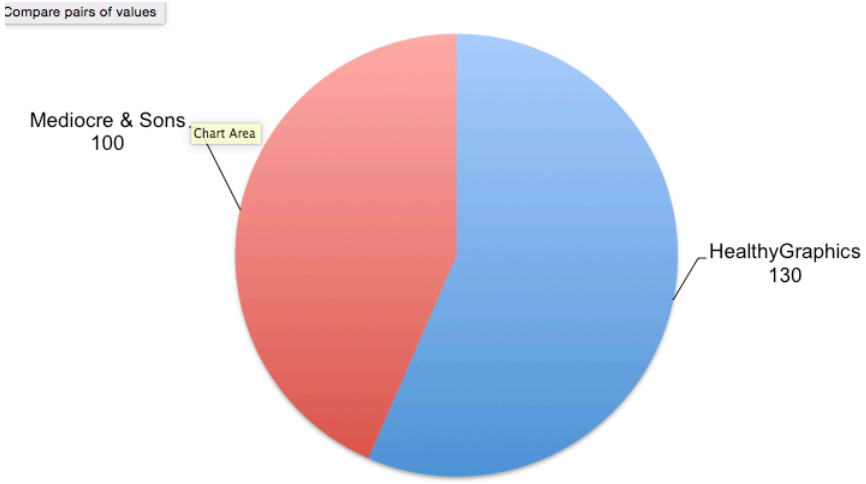


How does each of these printers describe the prevailing economy?

- HealthyGraphics: "Business isn't growing strongly, but we're holding steady." (What they say on our survey: "Business conditions have stayed about the same.")
- Mediocre & Sons: "Business is tough, but we've only lost 5% of our business." (What they say on our survey: "Business decreased up to 5%.")
- Ill & Ailing Co.: "We're in a recession. Things are terrible. We have to go out and sell harder." (What they say on our survey: "Business decreased more than 10%.")

Things go on like that for a bit and ultimately Harold Ill and Dennis Ailing of Ill & Ailing decide to pack it in, and the company exits the market (so it goes). As a result, both the healthy printer and the mediocre printer each pick up some of the volume from the I&A's customers. However, at the same time, another 20 of print customers have themselves left the market, or at least the print market:

Figure 3. And then there were two...the printing landscape changes
Market=230 customers



How do the printers now describe the prevailing market?

- HealthyGraphics: "Business is great! We're up 30%." (What they say on our survey: "Business increased more than 10%.")
- Mediocre & Sons: "Hey, business is pretty good! We were down 10%, now we're up *more than 10%* from where we were since we went from 90 to 100 accounts. This is because we're smart. We're terrific executives. Next year will be even better." (What they say on our survey: "Business increased more than 10%.")
- Ill & Ailing: "I played a round of golf this morning, and Dennis is going sailing later today. Retirement is great!" (What they say on our survey: Nothing.)

When things are good, you're a genius. When things are bad, it's the economy. Right? However, neither of these things was the case in this example. Because look at what happened to the overall market for print:

Table 1. The effects of survivor bias on market perception

	Time Period 1	Time Period 2		Time Period 3	
Market size/change (number of accounts)	300	250	-17%	230	-8%
Healthy printer	100	100	0%	130	+30%
Mediocre printer	100	95	-5%	100	+11%
Sick printer	100	55	-45%	-	-
What the market survey says	"All printers are doing the same"	"We did a survey and only one out of three printers said business was holding steady."		"Printers are doing great; survey respondents said that business is up 10%+!"	
What really happened	Flat market	Market shrank by -17%		Market shrank by -8%	

Even when aggregate business conditions were up, the print market still declined. So the survivor bias phenomenon leads to a false assessment of aggregate business conditions that ends up being reflected in the way participants in industry surveys answer questions about business performance. When we ask whether business increased in the past year, both the healthy printer and the mediocre printer would say, "yes," skewing the results in a positive direction because the sick printer is lolling in the Florida sun and isn't around any longer to select any of the "business is declining" survey options. None of these respondents were lying: they were reporting about their individual business, which is what they're supposed to do.

Now, you might say, "Well so what? If the industry is left with healthy printers, isn't that a good thing? Isn't that what usually happens in a dynamic market?" If it were the case that the *only* variable in this example was the health of the printers, then yes, it would be a good thing. But that's *not* the only variable. The more important variable is the number of print customers—the overall market for print. In our theoretical example, that kept declining, an effect that the relative health of the remaining printers masked. If that keeps declining, then the mediocre printer will become the sick printer, and the healthy printer a mediocre printer. Lather, rinse, repeat, and the next time there is a survey, the shops that are left are still in the roughly the same position as our example and will say the same basic things. It's just that the numbers will be smaller. At some point, you may just have the healthy printer who has all the print business in the area. So he'll be doing quite well. For a while...

Now, this is not to say that survey results are useless; if they were, we wouldn't keep doing them. It's only during times of consolidation that this becomes an issue. Over the years, we've done surveys where respondents were quite frank about how bad their business conditions were, and we've seen survey results that we felt accurately did reflect an industry that was in better shape then it had been previously.

Survey data need to be looked at in the context of what we know about the market both in terms of broader statistics like changes in monthly printing shipments and other general economic data, as well as anecdotal evidence gleaned from talking

with printers and printers' suppliers and vendors. Other data in the survey also help shed a light on business conditions data.

So think of this: industry-wide government data give us a "top-down" view of the marketplace. Survey data give us a "bottom-up" perspective. The job of the researcher is to reconcile the two truthful perspectives with analysis that reveals the dynamics of the industry.

There are telltale signs of survivor bias lurking in the data if you know where to look for them. It comes down to interpreting data that you know just can't be true, or at least don't tell the whole story. There is a bit of that in Section 4 of this report.

So keep this idea in mind as you read through the data in this report. You will see generally upbeat numbers for many respondents in the business conditions segment of the survey, even though industry shipments have taken a very bad turn since Fall 2016. Surveys are for winners, it seems. Printers having trouble staying afloat have to keep paddling; they don't have time for surveys.

That's the end of our lecture. Except perhaps for this comment: if you're a printer who has been a survivor, stay vigilant. When business is great, everyone thinks they're a genius. When business is bad, you really need to be one to adapt and reposition.

How This Report Is Organized

Section 1 presents our 2017 survey data about current (2017) and expected (2018) business conditions, specifically how print businesses fared *vis-à-vis* revenues, number of orders, and profits.

Section 2 presents our survey data on print businesses' top challenges, opportunities, and planned investments.

Section 3 presents the results of our survey question asking the extent to which commercial print businesses are investigating things like sign printing, digital signage, textile printing, 3D printing Augmented Reality, and other unconventional products and services.

Section 4 presents the results of our survey question about print businesses' hiring plans. Do they have any and, if so, for which positions?

Section 5 rounds up a variety of printing industry data—shipments, profits, employment, and so on.

Section 6 provides the latest general macroeconomic data as we head into the new year. These data are important as a transition to a new administration is underway.

Section 7 offers what we see as the hot, cold, and lukewarm trends for 2018, as well as Dr. Joe's economic and printing industry forecast.

The survey methodology is detailed in Appendix A. Full survey data tabulations with all employee size breakdowns are provided in Appendix B. In Appendix C, we provide value of shipments data for paper and print NAICS categories from the

Annual Survey of Manufactures (ASM), a supplement to the shipments data discussion in Section 5.

For More Information

For more information on this report or other WhatTheyThink products and services, please contact Cary Sherburne at 603-430-5463 or cary@whattheythink.com, or visit www.whattheythink.com.

The authors are available for private presentations of this report to leadership teams and other industry gatherings, whether in-person or on-line. Please contact Ms. Sherburne for details

1. Business Conditions

I had no reason to be over-optimistic
But somehow when you smiled I could brave bad weather
—Pete Townshend

In October and November 2017, the WhatTheyThink Economics and Research Center's (ERC) survey asked print business executives and owners about their current and expected business conditions. Specifically, we asked about:

- perceptions of 2017 business conditions compared to 2016
- expectations of 2018 business conditions compared to 2017

Specifically, we asked about:

- revenues
- number of orders
- profits

Let's dive in.

Revenues

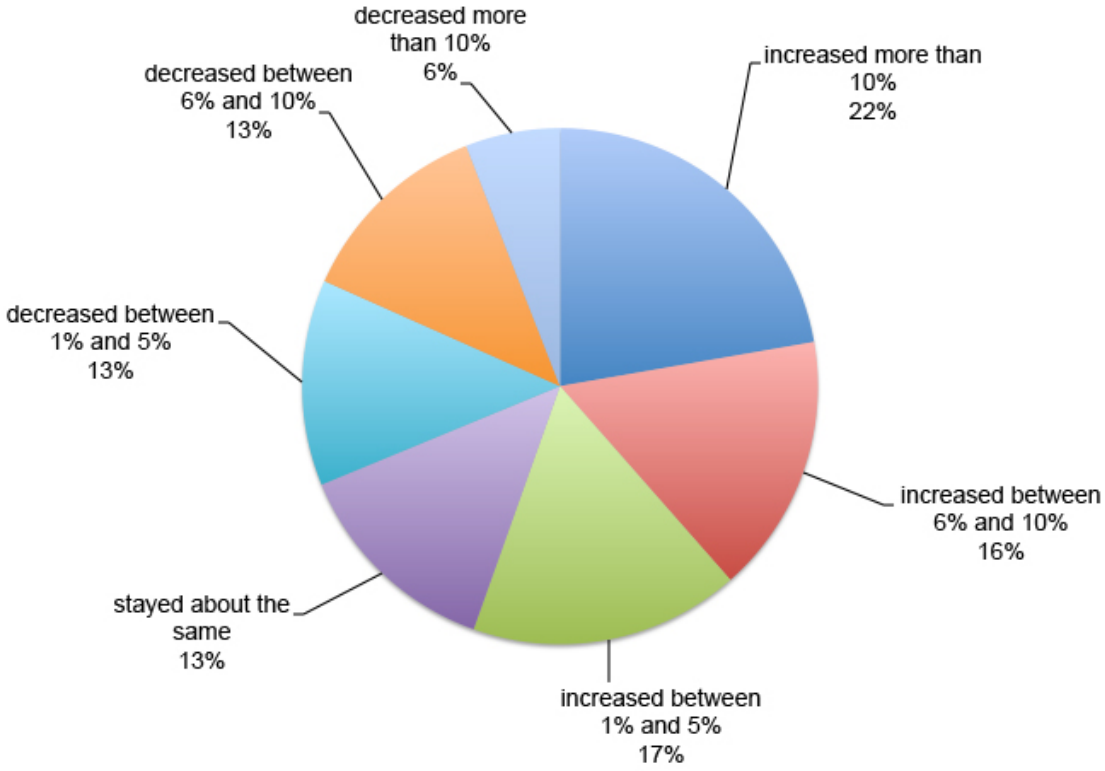
If you have read or listened to Dr. Joe over the past few decades, you know that one of his major recurring themes is inflation adjustment. So to get a better sense of these business conditions data, we are going to look at revenues and profits in the context of inflation adjustment. When we then compare them to changes in the umber of jobs, which do not have to be inflation-adjusted, we get a very strong sense of the changes that digital printing has wrought on print businesses.[6]

2017 Revenues

In terms of revenues, business in 2017 has been perceived by our survey respondents as generally OK; 38% said that revenues had increased by six percent or more compared to 2016 (up a few percentage points from last Fall's survey), while 19% said that they had *de*creased by six percent or more, although this is up five percentage points from last year. In general, revenues got better as establishment size increased. We calculated the average change in revenues—3.1% overall—and if we adjust for inflation by backing 2.2%[7] out of that change, we get a 0.9% growth in revenues from 2016 to 2017, which gibes a little bit better with what we have been seeing in the Census Bureau data on printing shipments (see Section 5).

[6] For an explanation of how we calculated these averages to begin with, see the Business Conditions Summary at the end of this section.
[7] Based on the current CPI.

Figure 4. In terms of your 2017 *revenues*, how do they compare to 2016?
All Respondents, Fall 2017
Average change: 3.1%
Average change adjusted for inflation: 0.9%



If we look at survey results by establishment size, we find the strongest businesses are the at the low end (1–9 employees) and the high end (50+ employees), with the mid-size shops experiencing little revenue growth, especially when you adjust for inflation.

For 1–9-employee shops, 41% said that revenues had increased six percent or more from 2016 to 2017 while 19% said they had decreased six percent or more. Four out of 10 (39%) reported revenues staying roughly the same, or experienced a minimal increase or decrease.

For 10–19-employee shops, on the other hand, 29% said that revenues had increased six percent or more while 17% said they had decreased six percent or more. More than one-half (54%) reported revenues staying roughly the same, or experiencing a minimal increase or decrease (but do note the 29% that said revenues decreased between one and five percent).

The 20–49-employee shops had it a little but better: 31% said that revenues had increased six percent or more while 20% said they had decreased six percent or more. Just about one-half (49%) reported that revenues stayed roughly the same, or experiencing a minimal increase or decrease.

For 50–99-employee shops, 44% said that revenues had increased six percent or more while only 16% said they had decreased six percent or more. Still, 44%

reported that revenues stayed roughly the same, or experienced a minimal increase or decrease.

Among the largest establishments (100+ employees), 31% said that revenues had increased six percent or more while a scant 5% said they had decreased six percent or more. Still, almost two-thirds (63%) reported that revenues stayed roughly the same, or experienced a minimal increase or decrease.

Table 2. In terms of your 2017 *revenues*, how do they compare to 2016?
Respondents by establishment size, Fall 2017

	1–9 employees	10–19 employees	20–49 employees	50–99 employees	100+ employees
increased more than 10%	23%	22%	19%	20%	14%
increased between 6% and 10%	18%	7%	12%	24%	17%
increased between 1% and 5%	17%	10%	20%	18%	24%
stayed about the same	13%	15%	14%	11%	20%
decreased between 1% and 5%	9%	29%	15%	11%	19%
decreased between 6% and 10%	12%	15%	15%	9%	4%
decreased more than 10%	7%	2%	5%	7%	1%
Average change	2.7%	1.2%	1.5%	2.9%	2.7%
Average change adjusted for inflation	0.5%	-1.0%	-0.7%	0.7%	0.5%

Even after we adjust for inflation, the revenue situation is not all *that* bad for those businesses at either end of the establishment size spectrum.

2018 Revenues

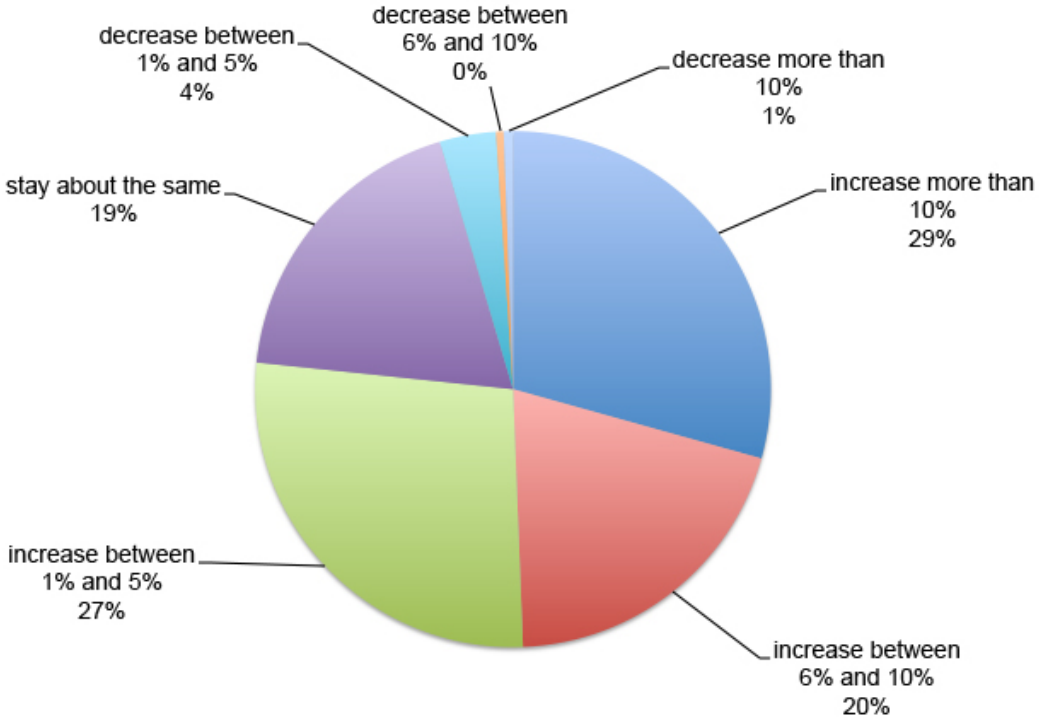
Asking about anticipated business conditions is always fraught with danger: even during recessions, we find a lot of ebullient optimism, much of which is unwarranted. Still, in many cases, that's a sign of a healthy business; those that are truly on the ropes would certainly not be this positive, so here we can say that even somewhat unwarranted optimism is a good sign.

Fully one-half (49%) of survey respondents expect revenues to increase by six percent or more in 2018. (Last year, in our Fall 2016 survey, 44% of respondents expected 2017 revenues to rise by six percent or more. As we just saw, that worked out in reality to 38%, so they weren't off by that much.) Only 1% of respondents expect revenues to decrease by six percent or more. (For those playing along at home, last year 4% expected a six percent or more decrease in revenues, which worked out to 19% in reality. So optimism does needs to be tempered to some extent.)

Overall, though, exactly one-half (50%) expect revenues to hold steady, with minimal increase or decrease.

Looking at the expected average change in revenues, establishments expect a 5.7% change in 2018. If we adjust for inflation, that's looking more like a 3.5% change. That's probably still on the over-optimistic side, but even accounting for that doesn't seem apocalyptic.

Figure 5. How do you expect your 2018 *revenues* to compare to 2017?
All Respondents, Fall 2017
Average change: 5.7%
Average change adjusted for inflation: 3.5%



For 1–9-employee shops, 50% expect revenues to increase six percent or more from 2017 to 2018 while no one in this size cohort expects revenues to decrease six percent or more. Fifty-one percent expect revenues to stay roughly the same, or undergo a minimal increase or decrease.

For 10–19-employee shops, on the other hand, 54% expect revenues increase six percent or more, while 3% expect them to decrease six percent or more. More than one-half (53%) expect revenues to stay roughly the same or see a minimal increase or decrease in 2018.

Forty-six percent of 20–49-employee expect revenues to increase six percent or more while 5% expect them to decrease six percent or more. One-half (50%) expect revenues to stay roughly the same.

For 50–99-employee shops, 51% expect revenues to increase six percent or more and 4% expect a similar decrease. Still, 45% expect revenues to stay about the same.

The largest establishments (100+ employees) seem to be the most pessimistic; only 41% expect revenues to increase six percent or more in 2018 although only 1% expect a corresponding decrease. Almost six out of ten (58%) expect revenues in 2018 to be generally same-o-same-o.

Table 3. How do you expect your 2018 *revenues* to compare to 2017?
Respondents by establishment size, Fall 2017

	1–9 employees	10–19 employees	20–49 employees	50–99 employees	100+ employees
increase more than 10%	35%	17%	19%	18%	12%
increase between 6% and 10%	15%	37%	27%	33%	29%
increase between 1% and 5%	29%	23%	24%	25%	31%
stay about the same	20%	17%	14%	16%	23%
decrease between 1% and 5%	2%	3%	12%	4%	4%
decrease between 6% and 10%	0%	0%	3%	2%	1%
decrease more than 10%	0%	3%	2%	2%	0%
Average change	6.1%	5.4%	4.3%	5.1%	4.4%
Average change adjusted for inflation	3.9%	3.2%	2.1%	2.9%	2.2%

Optimism seems to be a bit more tempered for 2018 than it has been in past years, with the largest print businesses—which had the best revenue showing in 2017—expecting the lowest for 2018. Still, though, these are not gloomy expectations and even if we back out *X*% for over-optimism, it still doesn't portend doom.

Number of Jobs/Orders

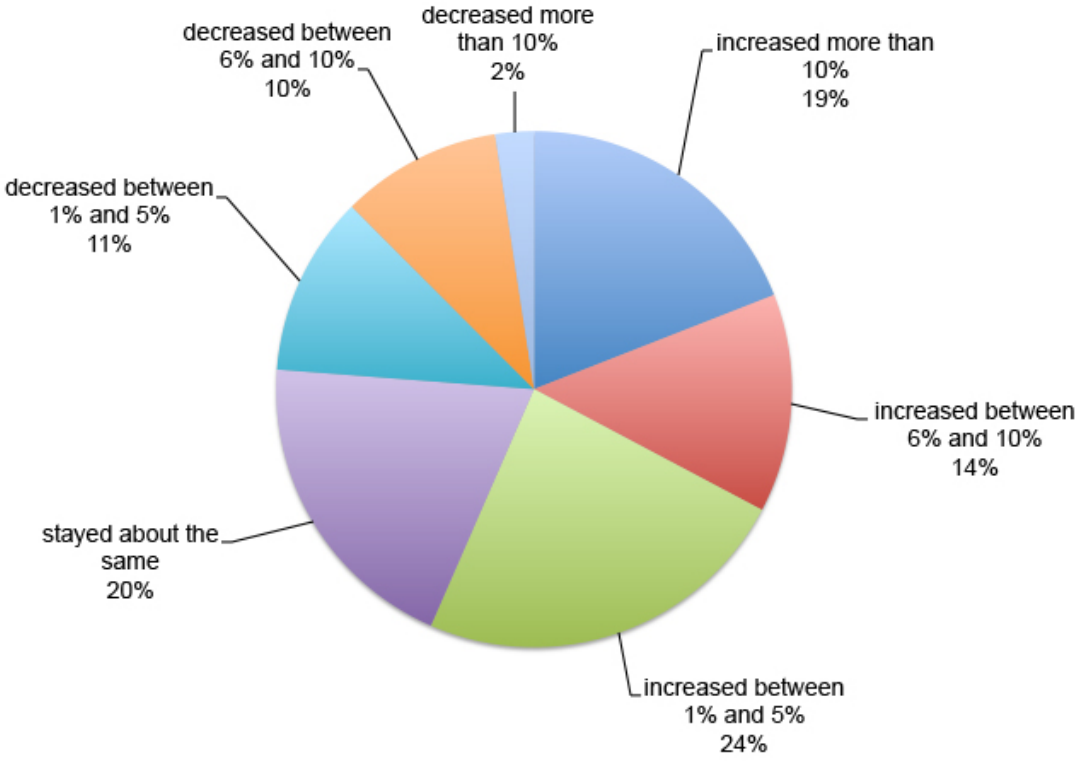
We remarked in past survey reports that there tends to be a bit of a disconnect between the number of jobs/orders and revenues. With our inflation-adjustment factor, we can go some ways toward quantifying that disconnect.

2017 Jobs/Orders

Jobs/orders in 2017 were up over 2016; one-third of print businesses (33%) reported that jobs increased six percent or more from 2016. (But then in our 2016 survey, 40% had reported a job/order increase of six percent or more.) Twelve percent of respondents reported that jobs/orders had decreased by six percent or more over 2016 (this is twice the percentage who said this in our 2016 survey).

The average change in jobs/orders from 2016 to 2018 was 2.7%. If we compare this to a "real" job/order change of 0.9%, we can see the extent to which the number of jobs is outstripping revenues. This is digital printing in action, specifically, short-run printing. After all, a "job" or "order" can be a single, one-off wide-format print, or it can be a 10,000-sheet offset run. Anything that generates an invoice is a job or an order. Aggregating sufficient jobs like the former (or any short-run work) has been a perennial challenge—as has been charging enough to yield enough revenue to make those short-run jobs equivalent to a longer-run job—see the next section), so it explains why, as we'll see in the next section, things like plant productivity and pricing are top challenges for these businesses.

Figure 6. In terms of your 2017 *jobs/orders*, how do they compare to 2016?
All Respondents, Fall 2017
Average change: 2.7%



For 1–9-employee shops, 31% said that jobs/orders had increased six percent or more from 2016 to 2017 while 19% said they had decreased six percent or more. More than one-half (56%) reported jobs/orders staying roughly the same, or experiencing a minimal increase or decrease.

For 10–19-employee shops, roughly the same percentage (32%) said that jobs/orders had increased six percent or more while 13% said they had decreased six percent or more. More than one-half (55%) reported jobs/orders staying roughly the same, or experiencing a minimal increase or decrease—but do note the 22% that said jobs/orders decreased between one and five percent; a similar number said that revenues had decreased by this amount as well.

The 20–49-employee shops had it a little but better: 39% said that jobs/orders had increased six percent or more while 14% said they had decreased six percent or more. Just about one-half (48%) reported that jobs/orders stayed roughly the same, or experienced a minimal increase or decrease.

For 50–99-employee shops, 51% said that jobs/orders had increased six percent or more while only 9% said they had decreased six percent or more. Forty percent reported that jobs/orders stayed roughly the same, or experienced a minimal increase or decrease.

Among the largest establishments (100+ employees), 28% said that jobs/orders had increased six percent or more while 4% said they had decreased six percent or more. Still, a whopping 68% reported that jobs/orders stayed roughly the same, or experienced a minimal increase or decrease.

Table 4. In terms of your 2017 *jobs/orders*, how do they compare to 2016? Respondents by establishment size, Fall 2017

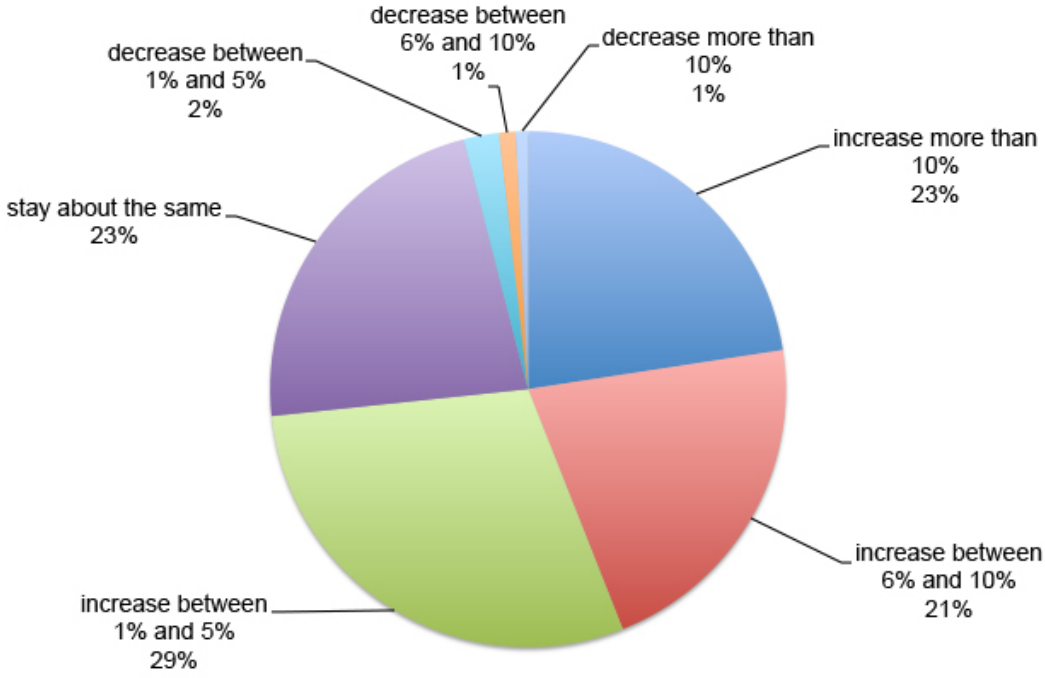
	1–9 employees	10–19 employees	20–49 employees	50–99 employees	100+ employees
increased more than 10%	19%	20%	17%	22%	21%
increased between 6% and 10%	12%	12%	22%	29%	7%
increased between 1% and 5%	27%	8%	20%	18%	39%
stayed about the same	20%	25%	14%	15%	22%
decreased between 1% and 5%	9%	22%	14%	7%	7%
decreased between 6% and 10%	10%	10%	12%	4%	3%
decreased more than 10%	2%	3%	2%	5%	1%
Average change	2.6%	1.8%	2.8%	4.3%	3.6%

2018 Jobs/Orders

Do print businesses see jobs/orders continuing to grow? Generally, yes; 44% expect jobs/orders to increase six percent or more in 2018, while only 2% expect them to decrease by the same amount. The majority (54%) expects jobs/orders to stay about the same or perhaps increase slightly (29%). (In 2016, 45% expected 2017 jobs to increase by six percent or more; the real number was 33%, so that offers some sense of the extent of last year's over-optimism.)

We calculated an average change in jobs/orders of 5.1% from 2017 to 2018; on a non-inflation-adjusted basis, that is lower than the corresponding expected 5.7% average increase in revenues—but given an inflation-adjusted 3.5% expected increase in revenues, it seems likely that job growth will continue to outstrip revenue growth.

Figure 7. How do you expect your 2018 *jobs/orders* to compare to 2017?
All respondents, Fall 2017
Average change: 5.1%



Forty-five percent of small (1–9-employee) shops expect jobs/orders to increase six percent or more from 2017 to 2018, while a scant 1% expect them to decrease six percent or more. Fifty-five percent expect jobs/orders to stay roughly the same, or undergo a minimal increase or decrease (with a tilt toward the former: 27% expect a one- to five-percent increase in jobs/orders).

Exactly one-half (50%) of 10–19-employee shops expect a job/order increase of six percent or more, while 3% expect a decrease of ten percent or more. More than one-half (57%) expect jobs/orders to stay roughly the same or see a minimal increase or decrease with, again, a heavy skew toward an increase (37% expect jobs/orders to increase between one and five percent).

Forty-one percent of 20–49-employee expect jobs/orders to increase six percent or more while 6% expect them to decrease six percent or more. Just over one-half (53%) expect jobs/orders to stay roughly the same (with 32% expecting them to increase between one and five percent).

For 50–99-employee shops, 51% expect jobs/orders to increase six percent or more and 4% expect a similar decrease. Still, 45% expect jobs/orders to stay about the same.

The largest establishments (100+ employees) are, again, among the most pessimistic of the lot; only 35% expect jobs/orders to increase six percent or more in 2018 although only 1% expect a corresponding decrease. More than six out of ten (62%) expect jobs/orders in 2018 to be generally the same or at least a scosh better (38% expect jobs/orders to increase between one and five percent).

Table 5. How do you expect your 2018 *jobs/orders* to compare to 2017?
Respondents by establishment size, Fall 2017

	1–9 employees	10–19 employees	20–49 employees	50–99 employees	100+ employees
increase more than 10%	24%	23%	17%	20%	18%
increase between 6% and 10%	21%	17%	24%	31%	17%
increase between 1% and 5%	27%	37%	32%	28%	38%
stay about the same	25%	15%	19%	11%	23%
decrease between 1% and 5%	2%	5%	2%	6%	1%
decrease between 6% and 10%	1%	0%	3%	2%	1%
decrease more than 10%	0%	3%	3%	2%	0%
Average change	5.3%	4.8%	4.2%	5.3%	4.6%

Profitability

And then there's Maude:[8] profits.

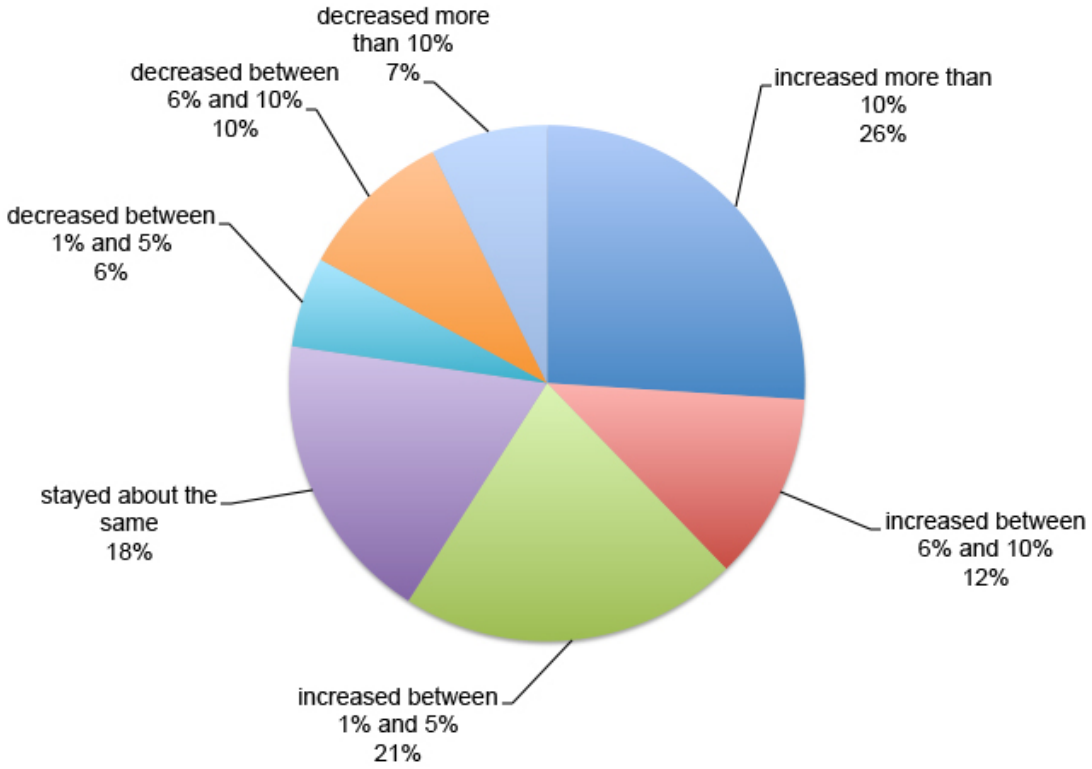
2017 Profits

We can make the same inflation adjustment (back 2.2% out, as we did with revenues) to get a sense of what the real change in profitability has been and is expected to be. Remember, these data are not the rates of profitability, but are the change in the dollar value of total profits compared to the prior year.

According to survey respondents, profits in 2017 were up over 2016; 38% reported that profits increased six percent or more from 2016, exactly the percentage that said this in our Fall 2016 survey (about 2016 profits compared to 2015). Seventeen percent of respondents reported that profits had decreased by six percent or more over 2016, compared to 4% who said this in our 2016 survey. So whilst revenues and jobs are growing favorably, compared to previous years, profits are not. We will explore this more throughout this report.

The average change in profits from 2016 to 2017 was 2.9% or, adjusted for inflation, 0.7%.

Figure 8. In terms of your 2017 *profitability*, how did it compare to 2016?
All respondents, Fall 2017
Average change: 2.9%
Average change adjusted for inflation: 0.7%



[8] Sorry for the 1970s television reference. *Maude* was a spin-off of the successful *All in the Family*. The fact that profits are a spinoff of revenues and that most print businesses are still family-owned is just a coincidence.

Here's where things get dodgy.

For 1–9-employee shops, 41% said that profits had increased six percent or more from 2016 to 2017 while 18% said they had decreased six percent or more. Four out of ten (41%) reported that profits stayed roughly the same, or saw a minimal increase (22%) or decrease (2%).

For 10–19-employee shops, 37% said that profits had increased six percent or more while 10% said they had decreased six percent or more. More than one-half (52%) reported profits staying roughly the same, or experiencing a minimal increase (25%) or decrease (12%).

The 20–49-employee shops took a plunge profit-wise: only 23% said that profits had increased six percent or more while 21% said they had decreased six percent or more. Almost six out of ten (57%) reported that profits stayed roughly the same (32%), or experienced a minimal increase or decrease.

Things were a little happier for 50–99-employee shops: 39% said that profits had increased six percent or more while only 10% said they had decreased six percent or more. Fifty-two percent reported that profits stayed roughly the same, or experienced a minimal increase (24%) or decrease.

Among the largest establishments (100+ employees), things were less happy: 29% said that profits had increased six percent or more while 17% said they had decreased six percent or more. Still, 54% reported that jobs/orders stayed roughly the same (21%), or experienced a minimal increase (18%) or decrease.

Table 6. In terms of your 2017 *profitability*, how did it compare to 2016?
Respondents by establishment size, Fall 2017

	1–9 employees	10–19 employees	20–49 employees	50–99 employees	100+ employees
increased more than 10%	29%	25%	16%	22%	15%
increased between 6% and 10%	12%	12%	7%	17%	14%
increased between 1% and 5%	22%	25%	11%	24%	18%
stayed about the same	17%	15%	32%	19%	21%
decreased between 1% and 5%	2%	12%	14%	9%	15%
decreased between 6% and 10%	11%	5%	9%	4%	11%
decreased more than 10%	7%	5%	12%	6%	6%
Average change	3.2%	3.4%	0.2%	3.5%	1.4%
Average change adjusted for inflation	1.0%	1.2%	-2.0%	1.3%	-0.8%

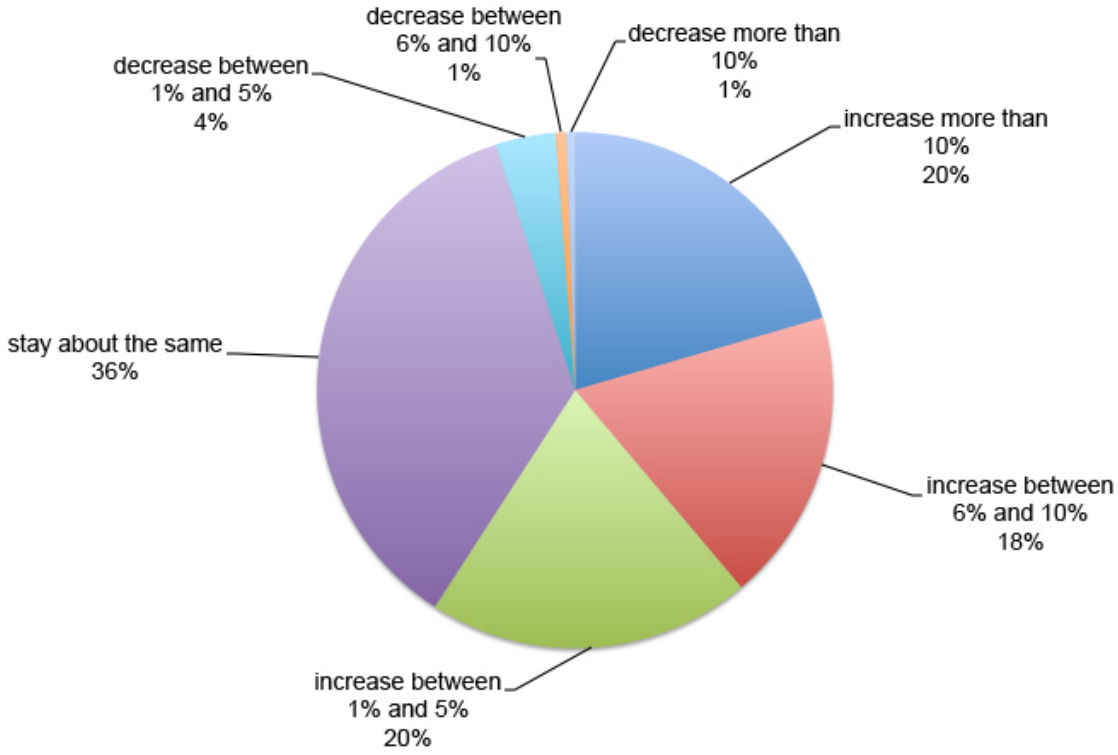
2018 Profitability

Given the foregoing, how sanguine are print businesses about profitability in 2018?

Overall, 38% expect profits to increase six percent or more in 2018, while only 2% expect them to decrease by the same amount. The majority (60%) expects profits to stay about the same (36%) or increase slightly (20%). (In 2016, 38% expected 2017 profits to increase by six percent or more, and it appears they were dead on.)

We calculated an average expected change in profits of 4.3% from 2017 to 2018, or 2.1% if we adjust for inflation.

Figure 9. How do you expect your 2018 *profitability* to compare to 2017?
All respondents, Fall 2017
Average change: 4.3%
Average change adjusted for inflation: 2.1%



Thirty-nine percent of small (1–9-employee) shops expect profits to increase six percent or more from 2017 to 2018, while no one expects them to decrease six percent or more. Six out of ten expect profits to stay roughly the same (46%), or undergo a minimal increase or decrease.

Thirty-eight percent of 10–19-employee shops expect profits to increase by six percent or more (only 8% by ten percent or more), while 3% expect them to decrease ten percent or more. Six out of ten expect profits to stay roughly the same or see a minimal increase (40%) or decrease.

Thirty-seven percent of 20–49-employee expect profits to increase six percent or more while 7% expect them to decrease six percent or more. More than one-half (56%) expect profits to stay roughly the same or increase or decrease minimally.

For 50–99-employee shops, 46% expect profits to increase six percent or more and 2% expect a corresponding decrease. Still, 52% expect profits to stay about the same or increase (41%) or decrease minimally.

The largest establishments (100+ employees) are, ironically, among the most optimistic of the lot, given what we saw regarding their current profit situation; 39% expect profits to increase six percent or more in 2018 while only 2% expect a corresponding decrease. Just under six out of ten (59%) expect profits in 2018 to be generally the same (23%) or a little better (36%).

Table 7. How do you expect your 2018 *profitability* to compare to 2017?
Respondents by establishment size, Fall 2017

	1–9 employees	10–19 employees	20–49 employees	50–99 employees	100+ employees
increase more than 10%	24%	8%	16%	22%	15%
increase between 6% and 10%	15%	30%	21%	24%	24%
increase between 1% and 5%	12%	40%	38%	41%	36%
stay about the same	46%	15%	11%	7%	23%
decrease between 1% and 5%	3%	5%	7%	4%	0%
decrease between 6% and 10%	0%	0%	5%	2%	2%
decrease more than 10%	0%	3%	2%	0%	0%
Average change	4.3%	4.1%	3.9%	5.6%	4.7%
Average change adjusted fir inflation	2.1%	1,9%	1.7%	3.4%	2.5%

Business Conditions Summary

As you saw throughout this section, for each size classification, we took the survey responses and calculated an average change in revenues, jobs/orders, and profits, both for 2017 and 2018. (We remarked earlier how we then adjusted these figures to account for inflation.)

So, for Table 8, we calculated[9] a 2.4% industry average increase in revenues, a 2.7% increase in jobs/orders, and a 2.9% increase in profits. We also added our inflation adjustments.

Growth in orders is outpacing revenues and profits, which is the short-run digital printing situation rearing its head again.

Table 8. 2017 vs. 2016 average percentage change in revenues, orders, and profits
Respondents by establishment size, Fall 2017

	1–9 employees	10–19 employees	20–49 employees	50–99 employees	100+ employees	All respondents
Revenues	2.7%	1.2%	1.5%	2.9%	2.7%	2.4%
Revenues adjusted for inflation	0.5%	-1.0%	-0.7%	0.7%	0.5%	0.2%
Jobs	2.6%	1.8%	2.8%	4.3%	3.6%	2.7%
Profits	3.2%	3.4%	0.2%	3.5%	1.4%	2.9%
Profits adjusted for inflation	1.0%	1.2%	-2.0%	1.3%	-0.8%	0.7%

Table 9. 2018 vs. 2017 average percentage change in revenues, orders, and profits
Respondents by establishment size, Fall 2017

	1–9 employees	10–19 employees	20–49 employees	50–99 employees	100+ employees	All respondents
Revenues	6.1%	5.4%	4.3%	5.1%	4.4%	5.7%
Revenues adjusted for inflation	3.9%	3.2%	2.1%	2.9%	2.2%	3.5%
Jobs	5.3%	4.8%	4.2%	5.3%	4.6%	5.1%
Profits	4.3%	4.1%	3.9%	5.6%	4.7%	4.3%
Profits adjusted for inflation	2.1%	1.9%	1.7%	3.4%	2.5%	2.1%

We know from Census Bureau data that printing shipments have declined substantially this year (see Section 5), so the generally rosy numbers we have seen in these business conditions data suggest that we have generally healthy respondents. (See our explanation of survivor bias in the Introduction.) So this is the reason we have a 2.4% growth rate for revenues in 2017. Even with our inflation adjustment, the situation we see among our respondent pool its not so bad.

[9] The estimates were calculated using the mid-points of the percentage ranges, and used 12% for the "10% or more" category.

The sluggish profits data generally gibe with government data (see Section 5), with the profit situation better for businesses with less than $25 million in assets (basically everyone under 100+ employees, save for the 20–29-employee cohort).

As for projected 2018 profits, well, that's because these businesses are going to be oh so much better run, with all the productivity enhancements and automation in place, that they will have taken all the slack out of their systems. Or at least this is how they think things are going to go. Some of them may be right.

Overall, the issues are that revenues are declining, which pushes out weak companies. If, as we have done, you apply the 2.4% revenue growth less the 2.2% inflation rate, then the market is going to be essentially flat. That means you have revenues for 2018 going up by 3%, which adds about $2 billion in revenue.

As we have remarked, the changes in revenues vs. jobs is instructive. Look, for example at the revenues of the 10–19-employee group compared to jobs. If revenues are going down on an after-inflation basis, while jobs are increasing at original rate (you don't have to adjust the number of jobs for inflation), that disparity tells us that the run length of the jobs is the thing that is changing the most. If revenues are increasing 0.2% while jobs are increasing 2.7%, that really does suggest that something is awry.

It's tempting to think that "short run" is a small-establishment phenomenon, but it's a question of short*er* runs for establishments across the board. That is, it's not so much "short run" as "shorter run" jobs coming in. That's more than a semantic issue; "shorter-run" means "shorter runs than a plant is productively used to." (We once did a research project many years ago that asked respondents in all employee size classifications to specifically quantify what "short run" meant. For small sheetfed or digital shops, "short run" can be under 1,000 or even under 100 copies/impressions, while for a large web offset magazine printer, "short run" can be 50,000 copies. It's all relative. When a company's production capabilities and thus cost structure are based on jobs of a certain length range, when jobs come in that fall below that optimal run length, it can play havoc with not just productivity but also profitability.

We often hear the phrase "economies of scale," which usually refers to scaling the manufacturing of something up from a relatively few units (demos, proofs of concept, or first-generation units) to mass production (millions of units for the mass market), but it can also refer to scaling *down* production from mass quantities to fewer units. In the first case, a facility reaches a point where producing lots of units is more cost-effective than producing few of them (for example, digital cameras were a lot less expensive to produce and thus buy in 2004 than the first-generation of them were in 1997). The more that were produced, the lower the cost of each incremental unit. The printing industry has been in this situation for hundreds of years; production had been geared toward mass production of materials. The advent of digital printing enabled the emergence of a market that required far fewer copies than the industry was used to creating—or at the very least pricing—effectively. And it all happened so fast that the economics of short-run printing have not adjusted to the new economy of scale.

The situation is improving, but as the opportunities, challenges, and investment data in the next section indicate, it still remains a problem.

Going Forward

Indeed, the next section looks at challenges, opportunities, and planned investments.

2. Challenges, Opportunities, and Investments

What do print businesses see as their top challenges and where do they see the biggest business and/or sales opportunities in the next 12 months? And what are they planning on buying to meet those challenges or pursue those opportunities?

These kinds of questions help qualify the data obtained in the business conditions part of the survey. After all, it's one thing to know what current and expected business conditions are, but quite another to understand *why* they are what they are. These questions' responses also help verify or refute business conditions data which, as you have probably seen, are not entirely objective measures of a company's performance.

Top Business Challenges

It's interesting that the once-perennial number one challenge—"economic conditions"—has dropped way down the list. The new number one—"pricing"—was selected by 44% of respondents, up from 26% a year ago. As the shift to digital (and specialty—see Section 3) printing continues, how to price these items, and in a way that market will bear, becomes an ever-greater issue. This is also due to the high number of 1–9-employee shops responding to our survey; tis tends to be a bigger issue for them than for other size classifications. Still, it does indicate how difficult that marketplace is.

The number two business challenge moves up from number three: "increasing plant productivity," selected by 33% of respondents, up from 31% a year ago. Remember our commentary in the Business Conditions section about jobs/orders outpacing revenues and profits? Here is evidence of that issue (as is pricing). Shops have to aggregate as many shorter-run jobs as they can and get them through the workflow as quickly as possible.

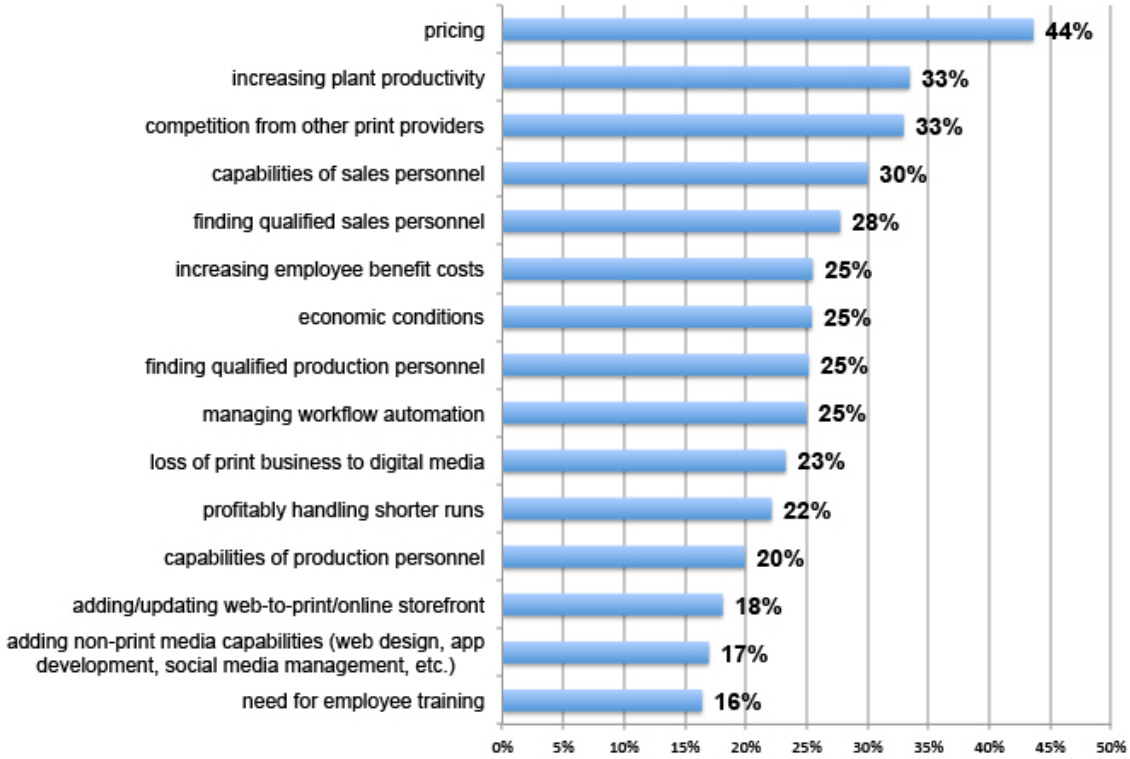
Number three drops three percentage points: "competition from other print providers" was selected by 33% of respondents. For small printers, this competition is more often than not office superstores like Staples or online sources like Vistaprint, and for larger (but not the largest) printers it can be large printing establishments moving downmarket to capture more volume. Either way, it's about contending with less expensive and higher-productivity competitors.

Number four is the usual sales guy antagonism: "capabilities of sales personnel" was selected by 30% of respondents, up two points from one year ago. This is a perennial challenge, or is always perceived as one. "You lazy sales guys! Get out there and sell! What's wrong with you?"[10] Essentially, this challenge is about the difficulty in attracting revenue. We're less and less convinced that the salesperson is the problem, especially these days when print "sales" is more and more about "business development," but the old attitudes persist. (And the industry hiring data in Section 6 don't really bear this out.)

[10] Yes, it's a bit *Glengarry Glen Ross*-like.

And of course, rounding out the top five is "if you can't satisfy me, I'll find someone who can": "finding qualified salespeople" was selected by 28%, up from 23% a year ago. Again, this is what we have called "rear-view mirror thinking."[11]

Figure 10. In the next 12 months, which of the following will be your biggest *business challenges*?
All respondents, Fall 2017 *(multiple responses permitted)*



Naturally, challenges vary by shop size. The top three in each size classification:

- 1–9 employees: The top three challenges are "pricing" (37%), "competition from other print providers" (33%), and "increasing plant productivity" (31%).
- 10–19 employees: The top three challenges are "competition from other print providers" (36%), "capabilities of sales personnel" (33%), and "finding qualified sales personnel" (31%).
- 20–49 employees: "increasing plant productivity" (50%), "capabilities of sales personnel" (43%), and "finding qualified sales personnel" (42%).
- 50–99 employees: "increasing plant productivity" and "capabilities of sales personnel" (both at 47%), "finding qualified sales personnel" and "finding qualified production personnel" (both at 46%), and "managing workflow automation" (42%).
- 100+ employees: "increasing plant productivity" (50%), "capabilities of sales personnel" (40%), and "finding qualified sales personnel' and "finding qualified production personnel" (both at 36%).

[11] See https://www.amazon.com/This-Point-Forward-Marketplace-Demands/dp/1502327031/.

Table 10. In the next 12 months, which of the following will be your biggest *business challenges*?
Respondents by establishment size, Fall 2017

	1–9 employees	10–19 employees	20–49 employees	50–99 employees	100+ employees
pricing	37%	26%	40%	40%	34%
increasing plant productivity	31%	24%	50%	47%	50%
competition from other print providers	33%	36%	33%	40%	31%
capabilities of sales personnel	27%	33%	43%	47%	40%
finding qualified sales personnel	21%	31%	42%	46%	36%
increasing employee benefit costs	23%	10%	30%	24%	25%
economic conditions	23%	14%	30%	15%	16%
finding qualified production personnel	19%	29%	27%	46%	36%
managing workflow automation	21%	31%	42%	42%	34%
loss of print business to digital media	21%	17%	17%	7%	11%
profitably handling shorter runs	17%	14%	8%	31%	16%
capabilities of production personnel	21%	26%	13%	16%	23%
adding/updating web-to-print/online storefront	21%	14%	12%	20%	15%
adding non-print media capabilities (web design, app development, social media management, etc.)	15%	10%	5%	13%	5%
need for employee training	17%	19%	18%	27%	26%
deciding whether to keep or discard our offset equipment	17%	12%	10%	7%	3%
keeping up with technological changes	15%	19%	20%	26%	13%
understanding the needs of today's communications buyers	17%	12%	13%	15%	15%
competing against digital media agencies	10%	10%	3%	11%	6%
selling our business	10%	12%	5%	2%	0%
job tracking	8%	5%	7%	9%	9%
owner/management retirement	10%	19%	8%	9%	5%
getting web-to-print to work on smartphones and other mobile devices	8%	5%	7%	2%	6%
consumables and supplies prices	4%	7%	5%	13%	15%
adding wide-format equipment/services	6%	7%	7%	9%	4%
adding packaging printing equipment/services	4%	2%	2%	7%	4%
transitioning jobs from offset to high-speed digital printing equipment	8%	7%	5%	13%	9%
retirement of key production personnel	6%	10%	5%	11%	13%
finding capital for investments	4%	7%	8%	15%	5%
migrating customer service and sales to the cloud	0%	14%	5%	2%	1%
migrating business functions to the cloud	2%	10%	3%	6%	3%
migrating production to the cloud	4%	5%	2%	0%	0%

	1–9 employees	10–19 employees	20–49 employees	50–99 employees	100+ employees
training employees to use cloud applications	0%	7%	3%	0%	3%
financing costs of our equipment	0%	7%	0%	6%	3%

It's interesting to look at the business challenges on our list that were *not* selected by many respondents. For example, "finding capital for investments" (4%) or "financing costs (1%)." Either they're not buying anything, or capital is plentiful. But it's not plentiful, at least for this industry. Or it's reflective of the shift to digital; newer equipment is leased and paid for on a per-click basis, while their older equipment may already be paid off.

"Understanding the needs of today's communications buyers" is only a challenge for 14% of respondents. Really? Shouldn't this be near the top, if these businesses were truly marketing services providers"? Do they think they already understand today's communication buyers' needs? That seems a bit presumptuous.

Only one-fourth are challenged by "need for employee training." Aren't all employees trained? And isn't that a way of managing workflow automation? If employees aren't trained, maybe that's the reason that "finding qualified production personnel" is so much higher. Has the technology changed so much that you can't retain the people who are already employed?

So, basically, more jobs, shorter run lengths, and smaller invoice values are where the problem is. That combination stresses the fixed costs of a printing operation and its sales processes.

Business Opportunities

Some unusual items have taken precedence in our opportunities list.

One of them is *not* "improving economic conditions," which, at 41%, again tops the list and is up from 30% last year.

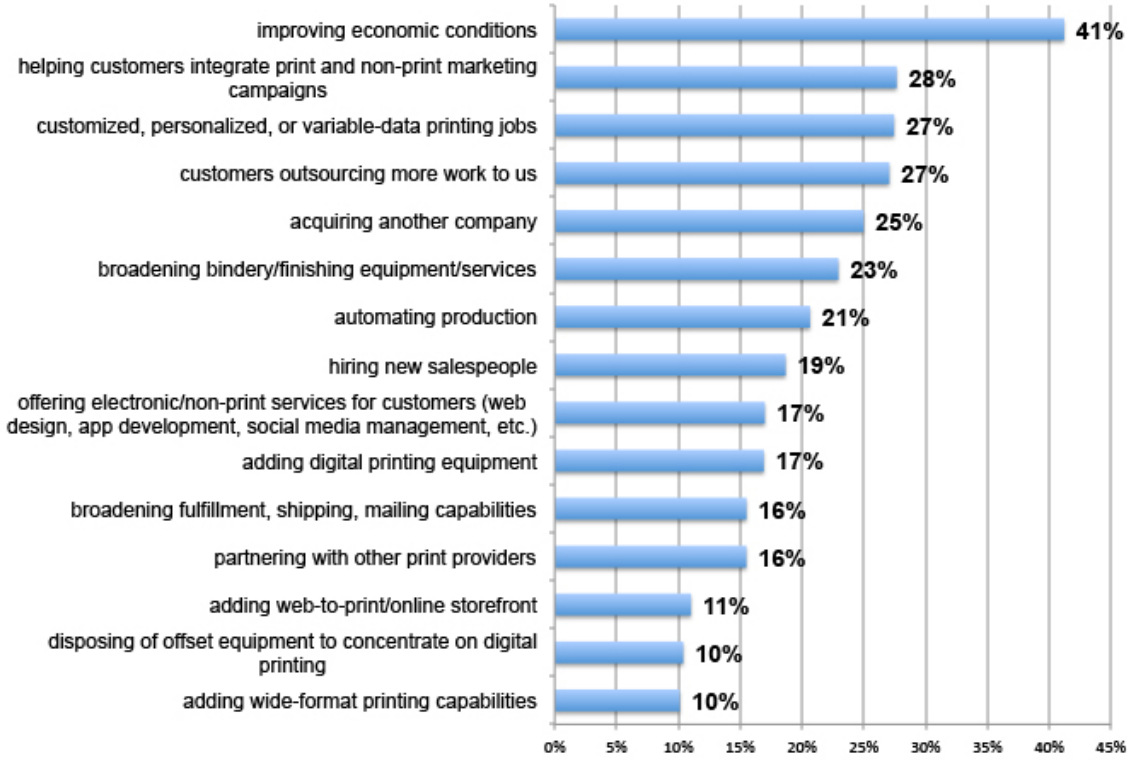
Moving into the number two spot, and up one percentage point to 28% of respondents, is "helping customers integrate print and non-print marketing campaigns." This is, after all, what we mean by "marketing services." (The best way of effecting this is by "selling marketing automation services" which, alas, is down at 8%. So there's still a bit of education required.)

Down two slots and down three percentage points to 27% is "customized, personalized, or variable-data printing jobs," which is tied with "customers outsourcing more work to us," which is *up* three percentage points. There is so much print and other marketing-related work that end users can do themselves (a lot of which was brought in-house years ago), so print service providers are looking to be able to take those tasks back away from them and let them focus on their core businesses. Or that's the hope anyway. In many ways businesses have come full circle. Back in the 1990s, when printers' customers began acquiring their own high-speed and high-quality desktop and network printing equipment, a lot of work that used to be outsourced could suddenly be brought in-house. Letterhead could simply be a Microsoft Word template output on a local printer; forms and other documents could be done in-house, and so on. Over the course of the 2000s and 2010s, as more of these items shifted to electronic media, in-house printing capabilities atrophied. Some of these items still need to be printed to some extent, and this is where this re-outsourcing can come into play, and this is something that a print businesses can aggressively pursue.

At number four is "acquiring another company" at 25%, up five percentage points. One strategy for expanding into new product and service areas is to acquire a company that already has the relevant equipment and customer base. However, it's too often the case that companies acquire other companies that are too similar to themselves, which defeats the purpose of an acquisition, except, perhaps in a "We all go down together" kind of way.

Rounding out the top five opportunities is "broadening bindery/finishing equipment/services," selected by 23% of respondents, up quite a bit from 11% last year. As we will remark often in this report, binding/finishing services is one of the bright spots of the industry.

Figure 11. In the next 12 months, which of the following represent your best *new business opportunities*?
All respondents, Fall 2017 *(multiple responses permitted)*



The top three opportunities in each size classification are:

- 1–9 employees: The top three opportunities are "improving economic conditions" (31%), "customers outsourcing more work to us" (29%), and "customized, personalized, or variable-data printing jobs" and "adding digital printing equipment" (both at 25%).
- 10–19 employees: The top three opportunities are "improving economic conditions" (36%), "customers outsourcing more work to us" (29%), and "adding digital printing equipment" (26%).
- 20–49 employees: The top three opportunities are "hiring new salespeople" (32%), "customized, personalized, or variable-data printing jobs" (28%), and "acquiring another company" (27%).
- 50–99 employees: The top three opportunities are "improving economic conditions" (42%), "customized, personalized, or variable-data printing jobs" and "customers outsourcing more work to us" (both at 38%), and "hiring new salespeople" (36%).
- 100+ employees: The top three opportunities are "automating production" (30%), "customers outsourcing more work to us," (29%), and "helping customers integrate print and non-print marketing campaigns" (26%).

Table 11. In the next 12 months, which of the following represent your best *new business opportunities*?
Respondents by establishment size, Fall 2017

	1–9 employees	10–19 employees	20–49 employees	50–99 employees	100+ employees
improving economic conditions	31%	36%	25%	42%	20%
helping customers integrate print and non-print marketing campaigns	23%	19%	13%	29%	26%
customized, personalized, or variable-data printing jobs	25%	19%	28%	38%	20%
customers outsourcing more work to us	29%	29%	23%	38%	29%
acquiring another company	23%	10%	27%	20%	24%
broadening bindery/finishing equipment/services	17%	21%	12%	20%	15%
automating production	14%	19%	22%	24%	30%
hiring new salespeople	17%	24%	32%	36%	21%
offering electronic/non-print services for customers (web design, app development, social media management, etc.)	14%	7%	5%	26%	19%
adding digital printing equipment	25%	26%	20%	24%	20%
broadening fulfillment, shipping, mailing capabilities	8%	14%	18%	31%	20%
partnering with other print providers	14%	12%	15%	16%	9%
adding web-to-print/online storefront	14%	19%	12%	15%	9%
disposing of offset equipment to concentrate on digital printing	14%	10%	0%	4%	3%
adding wide-format printing capabilities	15%	12%	10%	11%	3%
increasing sales through print brokers	15%	7%	10%	11%	3%
selling our company	6%	10%	10%	4%	0%
helping clients get their websites to work on mobile devices	6%	2%	2%	4%	6%
adding additional offset printing equipment	2%	2%	2%	4%	8%
adding digital label/wrapper printing capabilities	2%	2%	2%	0%	1%
using marketing automation for our business (like HubSpot, Eloqua, Marketo)	4%	10%	5%	4%	9%
selling marketing automation services to our customers	2%	7%	8%	2%	15%
adding packaging printing capabilities	2%	2%	7%	11%	5%
adding textile/fabric printing capabilities	4%	2%	3%	4%	3%
adding “digital enhancement” finishing technologies (like Scodix, Highcon, MGI)	0%	5%	8%	6%	5%
getting more customers using smartphones and other mobile devices	6%	0%	2%	0%	0%
migrating business functions to the	2%	5%	3%	6%	1%

	1–9 employees	10–19 employees	20–49 employees	50–99 employees	100+ employees
cloud					
training employees to use cloud applications	2%	5%	2%	0%	1%
migrating customer service and sales to the cloud	0%	5%	5%	0%	1%
video production services	0%	0%	3%	0%	3%
migrating production to the cloud	0%	0%	2%	2%	3%

Improving economic conditions is a perennial issue and one perceived opportunity we have always taken issue with. Sure, who *doesn't* want improving economic conditions? In a thriving economy, everyone has a sense that they have a fighting chance of doing better. And of course if you are expanding into new products like signage, you're going to sell more with a thriving retail sector. (Speaking of retail, we will talk in Section 7 about the looming "retail apocalypse," but as a preview here on the subject of economic conditions, print businesses may have to reemphasize the local nature of their businesses and local economic conditions. Sure, big retail may have its problems and may be switching to mobile and ecommerce, but some downtown locations may be thriving and there may be good prospects for signage and smaller promotion things.)

Another key point is that it has been demonstrated that print demand does not follow economic conditions. Print has lagged GDP for about 25 years, in strong economies and bad ones. It is human nature to think that better conditions yield better opportunities. In today's economy, better conditions mean more investment in digital communications that displace print or reduce the need for it.

"Hiring new salespeople" is only an opportunity for less than one-fifth (19% of respondents. Hmmm...wasn't finding qualified salespeople such a major challenge? Why then isn't it such a correspondingly big opportunity? (Hint: it's not *really* the problem.)

"Adding digital printing equipment" is an opportunity for one-fourth of 1–9-employee establishments—that's understandable and may be why financing wasn't such a big challenge; if you have a pulse, you can get equipment on a per-click basis.

"Adding wide-format capabilities" is fairly low across the board; our suspicion is that the migration/expansion to wide-format is largely done and that those shops that have gone that route have already done so. We'll talk more about that later in this report.

"Adding 'digital enhancement' finishing technologies (like Scodix, Highcon, MGI)" is wa-a-a-a-y down at 5%. We think this continues to be a missed opportunity, as are a lot of items on this list. That so many predictable and "rear-view-mirror" items top the opportunities list suggests that print businesses still need to think creatively about how to expand their businesses and exploit new opportunities.

Planned Investments

What are print businesses planning to buy in 2018? Well, not a great deal.

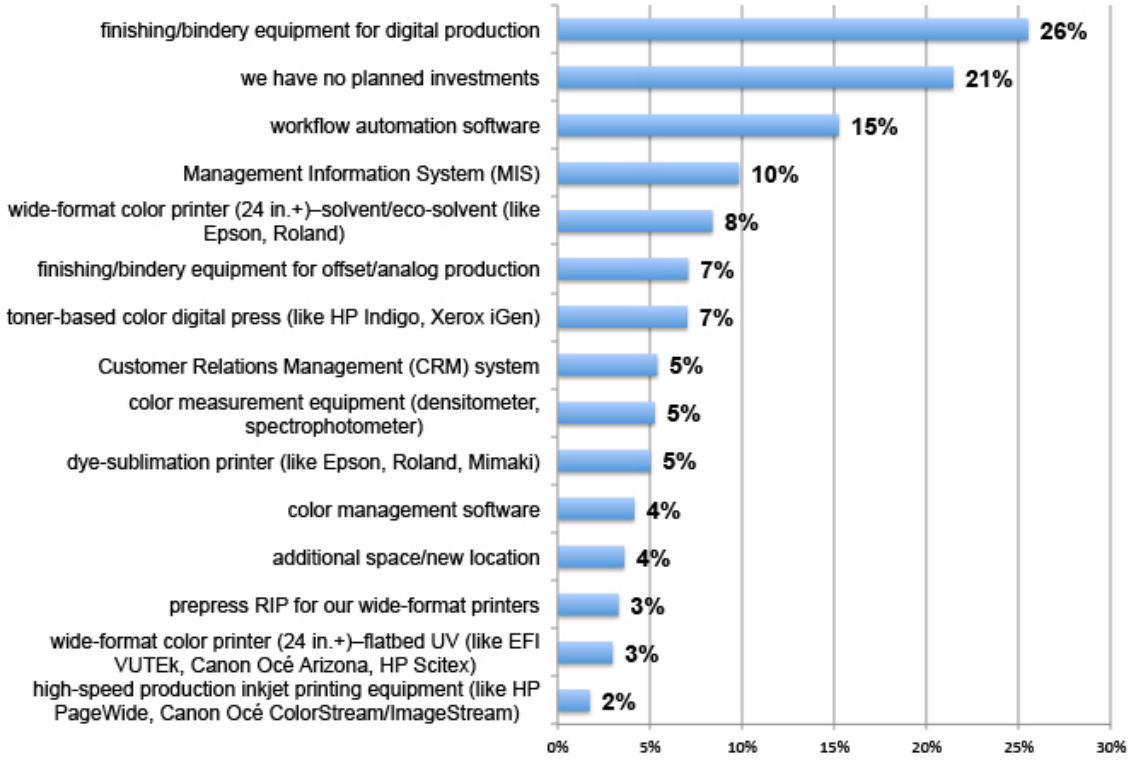
The number one item is "bindery equipment for digital production" (26%, up from 22% in last year's survey).

The number two response was actually in the top spot last year: "we have no planned investments," selected by 21%, down from 25%.

Software occupies the next two spots—"workflow automation" and "MIS," selected by 15% (unchanged from a year ago) and 11% (up one point), respectively. Automation is one perceived solution to the productivity problem, and MIS is seen as a solution to the pricing challenge, as understanding costs is a key to understanding pricing.

Rounding out the top five is an eco-solvent wide-format printer (24 inches or greater), selected by 8% of respondents. It was at 2% a year ago.

Figure 12. Which of the following *investment items* have you budgeted for and plan to acquire in the next 12 months?
All respondents, Fall 2017 *(multiple responses permitted)*



The top three investments in each size classification are:

- 1–9 employees: The top three responses are "we have no planned investments" (27%), "finishing/bindery equipment for digital production" (19%), and "Management Information System (MIS)," "wide-format color printer (24 in.+)–solvent/eco-solvent (like Epson, Roland)," and "toner-based color digital press (like HP Indigo, Xerox iGen)" (all at 10%).

- 10–19 employees: The top three responses are "finishing/bindery equipment for digital production" (31%), "workflow automation software" (26%), and "we have no planned investments," "Management Information System (MIS)," and "finishing/bindery equipment for offset/analog production" (all at 12%).
- 20–49 employees: The top three planned investments are "workflow automation software" (32%), "finishing/bindery equipment for digital production" (22%), and "Management Information System (MIS)" (20%).
- 50–99 employees: The top three planned investments are "finishing/bindery equipment for offset/analog production" (22%), "finishing/bindery equipment for digital production" (18%), and "workflow automation software (16%).
- 100+ employees: The top three responses are "workflow automation software" and "high-speed production inkjet printing equipment (like HP PageWide, Canon Océ ColorStream/ImageStream)" (both at 16%), "Management Information System (MIS)" (15%), and "additional space/new location" (14%).

Table 12. Which of the following *investment items* have you budgeted for and plan to acquire in the next 12 months?
Respondents by establishment size, Fall 2017

	1–9 employees	10–19 employees	20–49 employees	50–99 employees	100+ employees
finishing/bindery equipment for digital production	19%	31%	22%	18%	9%
we have no planned investments	27%	12%	13%	11%	8%
workflow automation software	8%	26%	32%	16%	16%
Management Information System (MIS)	10%	12%	20%	9%	15%
wide-format color printer (24 in.+)–solvent/eco-solvent (like Epson, Roland)	10%	2%	2%	0%	4%
finishing/bindery equipment for offset/analog production	4%	12%	7%	22%	9%
toner-based color digital press (like HP Indigo, Xerox iGen)	10%	5%	5%	6%	10%
Customer Relations Management (CRM) system	4%	7%	3%	4%	10%
color measurement equipment (densitometer, spectrophotometer)	4%	2%	8%	6%	6%
dye-sublimation printer (like Epson, Roland, Mimaki)	8%	0%	0%	6%	1%
color management software	2%	2%	5%	6%	0%
additional space/new location	4%	2%	10%	16%	14%
prepress RIP for our wide-format printers	2%	0%	2%	0%	1%
wide-format color printer (24 in.+)–flatbed UV (like EFI VUTEk, Canon Océ Arizona, HP Scitex)	4%	10%	3%	4%	4%
high-speed production inkjet printing equipment (like HP PageWide, Canon Océ ColorStream/ImageStream)	0%	0%	8%	9%	16%
sheetfed offset press	0%	7%	3%	4%	8%
wide-format color printer (24 in.+)–latex (like HP Latex)	0%	5%	3%	4%	3%
computer-to-plate equipment	2%	0%	2%	4%	4%
digital label printing equipment	2%	0%	2%	2%	1%
prepress RIP for other devices	0%	2%	2%	0%	3%
packaging press/printer–flexible packaging	2%	0%	0%	0%	0%
rebuilding our web offset press	0%	0%	0%	2%	1%
web offset press—new	0%	0%	0%	0%	0%
packaging press/printer–corrugated	0%	0%	0%	0%	0%
packaging press/printer–folding carton	0%	0%	0%	0%	0%

One additional thought on binding and finishing equipment. The fact that it's so high may not be a big interest in it *per se*, but perhaps because it's the last category standing. That is, shops were buying lots of digital printing equipment, small- or

wide-format, and now that everybody has the print engine, they've turned to finishing. This has always been the traditional pattern dating back to the days of heavy offset equipment investment; there will be a flurry of press investments followed by a flurry, some years later, of bindery equipment.

What's interesting is the investment in finishing equipment for offset among the 50–99-employee shops. It may be the group that is left with the most offset capacity in the long term.

That, generally, there are few planned investments industry-wide, and that's not a great surprise. Most substantial investments in this industry are multi-year investments, and now we're in a cycle where they don't need any major new equipment and there's nothing they find compelling to buy. Back in the 90s and 00s, production software like Photoshop, Illustrator, or QuarkXPress/InDesign was always top-of-investment-list items, as shops prepared and budged for updates and new versions. In the era of Adobe Creative Cloud, where software doesn't need to be updated the way it used to be (it's now a subscription model and legacy non-cloud versions are no longer supported), it isn't thought of as a specific line item.

Perhaps high-speed production inkjet is the most compelling of the major investment categories, we're only seeing it at the high end of the market (16% of 100+-employees establishments, with quickly declining interest in it as shops get smaller).

Of great concern should be that resources used in consolidation, such as the buying of other businesses, crowd out spending on new technologies. On one hand, this should increase the productivity and profitability of the acquirer. On the other hand, the time and money expended may delay the ability of the firm to acquire new and better equipment or launch a new venture.

3. New Product Service Areas

In each survey, we try to gauge the extent that print service providers are branching out into new product and service areas, such as wide-format printing and all the various applications that fall under that increasingly broad category. In this survey, we asked about:

- Print signage
- Digital/electronic signage
- Textile printing for soft signage
- Textile printing for garments/fashion
- Digital label/wrapper printing
- Specialty printing (like coffee mugs, golf balls, smartphone cases)
- Packaging printing/converting
- 3D printing
- Augmented Reality (AR) development
- Event management

For each of these items, we asked if they...

- Were interested in adding it, but have no timetable for it
- Were actively considering and researching it
- Had added it in past 18–24 months
- Have specific budget plans to add it in next 12–18 months
- Considered it, but found it not appropriate to their business
- Will outsource this work as needed
- Have never considered it/don't know

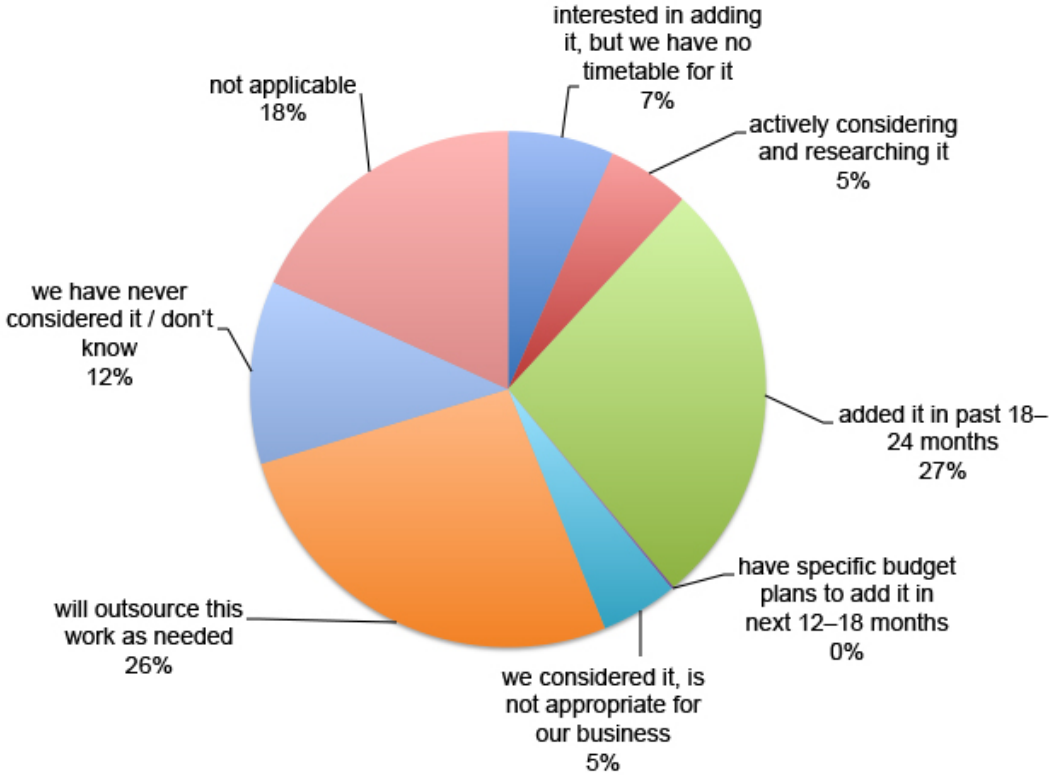
Granted, we had some preconceptions of the kind of response we would get to some of these items, although we were surprised by some of the responses (both positive for some, and negative for others). We also got a substantial number of blank responses, which we are calling "not applicable."

Print Signage

One of the leading wide-format applications that has emerged as an offshoot of display graphics has been printed signage. Digital wide-format printing has revolutionized the sign industry,[12] and has also opened up opportunities for commercial printers. But do commercial printers see it that way?

Actually, yes, ad in some ways it is old news. Although fewer than 1% of our respondents say they have budget plans to add print signage in the next year and a half and 5% are actively considering and researching it, the fact remains that more than one-fourth (27%) have already added it, while another one-fourth (26%) say they will outsource it as needed. Seven percent were interested in adding it but have no specific timetable. Only 5% have found printed signage to be not appropriate to their business, and 12% have not even considered printed signage. So it has been on shops' radars and has largely been adopted where deemed appropriate.

Figure 13. Please indicate the extent to which you have looked at or considered adding *print signage (not soft signage)*
All respondents, Fall 2017



[12] Sign shops are a specific business category (and NAICS) and few if any are included in our survey sample or, indeed, in the NACS 323 printing shipments data we traditionally cite.

By establishment size, all classifications have taken an equally active interest in print signage—one-third of 10–19- and 20–49-employee shops have already added print signage capabilities, while 25% of 1–9-employee shops have already added it and 6% are actively researching it. Only 50–99-employee shops (4%) have any specific budget plans to add it in the near future.

Table 13. Please indicate the extent to which you have looked at or considered adding *print signage (not soft signage)*
Respondents by establishment size, Fall 2017

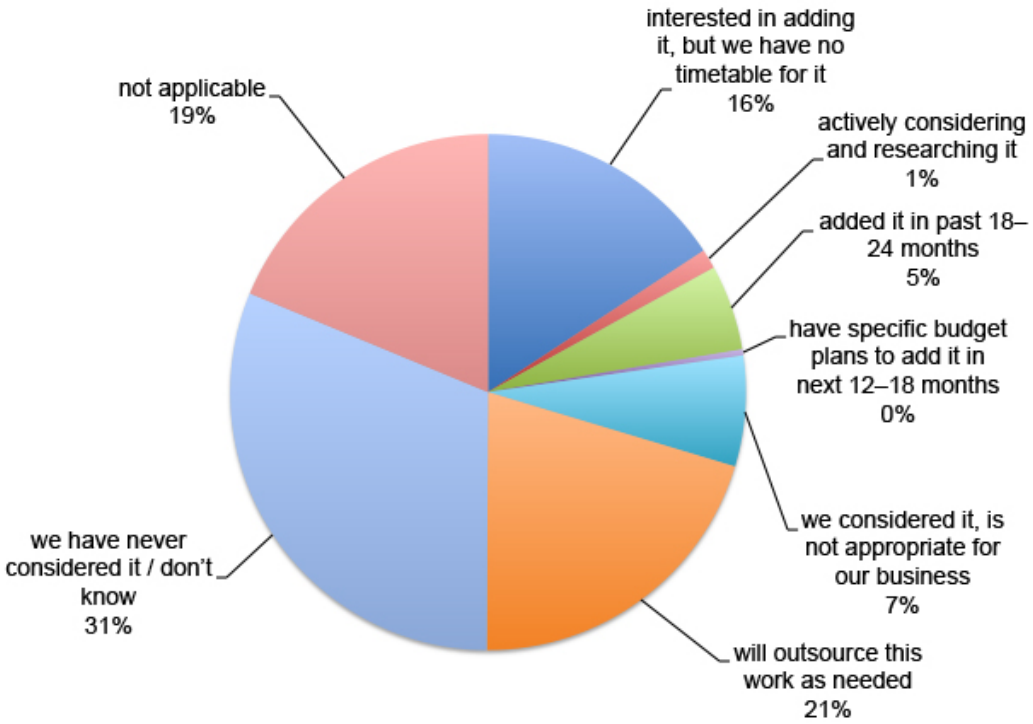
	1–9 employees	10–19 employees	20–49 employees	50–99 employees	100+ employees
interested in adding it, but we have no timetable for it	7%	7%	5%	9%	3%
actively considering and researching it	6%	5%	2%	4%	1%
added it in past 18–24 months	25%	33%	32%	27%	31%
have specific budget plans to add it in next 12–18 months	0%	0%	0%	4%	0%
we considered it, is not appropriate for our business	5%	2%	5%	4%	6%
will outsource this work as needed	29%	21%	20%	24%	8%
we have never considered it / don't know	9%	14%	18%	15%	21%
not applicable	18%	17%	18%	15%	30%

Digital/Electronic Signage

If you have been out in the world at all in recent years, you know that digital and/or electronic signage has been proliferating, be it interior digital signs (such as restaurant or bar menus) or large outdoor electronic messaging systems such as what you find outside banks, schools, and convention centers. These are increasingly complementing—or even replacing—print signage, and they represent a very real opportunity for print service providers interested in sign and display graphics (the FastSigns franchise has been actively involved in digital signage for many years).

And yet we find it is scarcely on or survey respondents' radars. Less than one percent of our respondents say they have budget plans to add digital signage in the next year and a half, 1% percent are actively considering and researching it, and only 5% have already added it. One-fifth (21%) say they will outsource it as needed. Almost one-third (31%) have never considered it, although 16% are interested in adding it, but have no specific timetable.

Figure 14. Please indicate the extent to which you have looked at or considered adding *digital/electronic signage*
All respondents, Fall 2017



By establishment size, here appears to be of at least some interest among the small establishments (19% of both 1–9- and 10–19-employee shops are interested in adding it, even if they have no specific timetable). Nine percent of 100+- and 6% of 1–9-employee shops have already added digital signage, and 7% of 50–99-employee shops are actively considering adding it.

Table 14. Please indicate the extent to which you have looked at or considered adding *digital/electronic signage*
Respondents by establishment size, Fall 2017

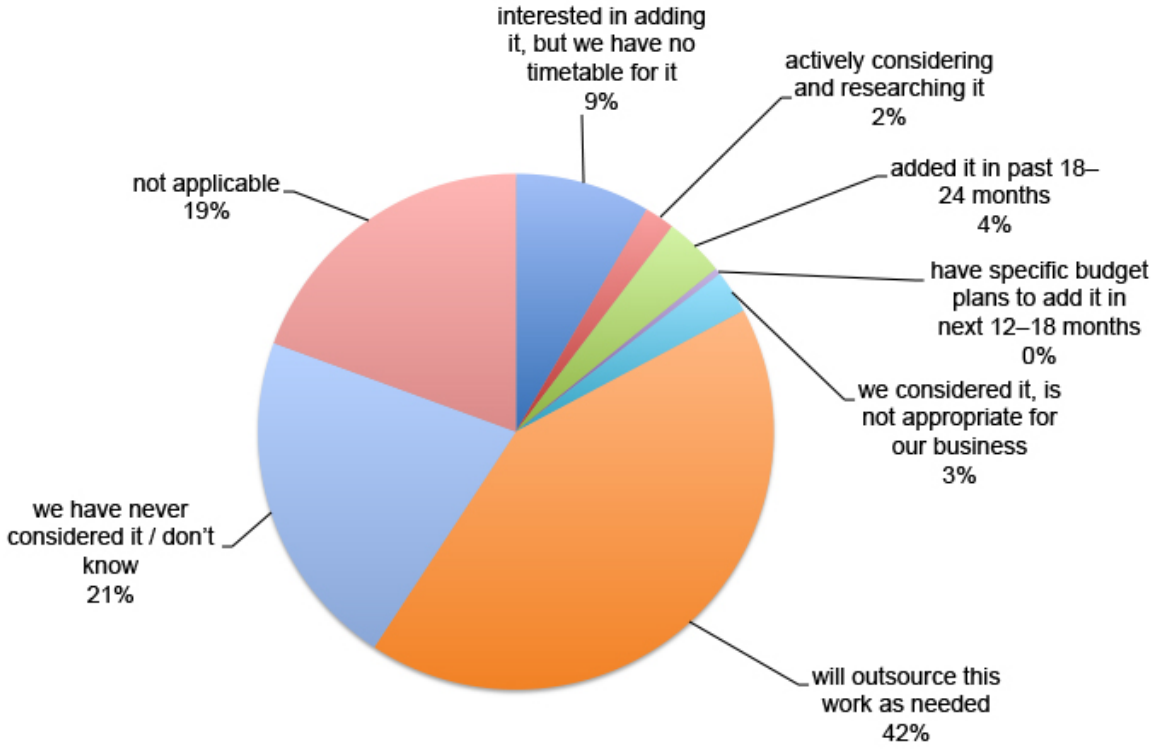
	1–9 employees	10–19 employees	20–49 employees	50–99 employees	100+ employees
interested in adding it, but we have no timetable for it	19%	19%	0%	5%	6%
actively considering and researching it	0%	2%	5%	7%	3%
added it in past 18–24 months	6%	2%	3%	5%	9%
have specific budget plans to add it in next 12–18 months	0%	2%	0%	2%	0%
we considered it, is not appropriate for our business	7%	2%	12%	5%	13%
will outsource this work as needed	19%	24%	33%	16%	11%
we have never considered it / don't know	31%	33%	25%	45%	27%
not applicable	19%	14%	22%	13%	30%

Textile Printing for Soft Signage

If you have been to an SGIA Expo (or even a Graph Expo/PRINT) in the past couple of years, you may have seen that there is a growing interest in (or at least prevalence of) soft signage, which is signage that is printed on textiles. This has been a hot area for the past half decade or so. Where does it stand among our response base?

They're, uh, pretty soft on it, seeing it more as something to outsource (42%) than to add. Less than 1% say they have budget plans to add soft signage in the next year and a half, 2% percent are actively considering and researching it, and 4% have already added it. One-fifth (21%) have never considered it, and 9% were interested in adding it, but have no specific timetable.

Figure 15. Please indicate the extent to which you have looked at or considered adding *textile printing for soft signage*
All respondents, Fall 2017



Textile printing for soft signage doesn't crack double digits on any of the active pursuit items. More than one-half of 1–9-employee shops say they will outsource it as needed, while only 9% of 100+-employee establishments say this; 27% of the largest establishments say they have never considered it and 32% didn't respond, so for six out of ten of the biggest shops, soft signage isn't even on their radar. Nine percent of 50–99-employee shops are actively considering it and researching soft signage.

Table 15. Please indicate the extent to which you have looked at or considered adding *textile printing for soft signage*
Respondents by establishment size, Fall 2017

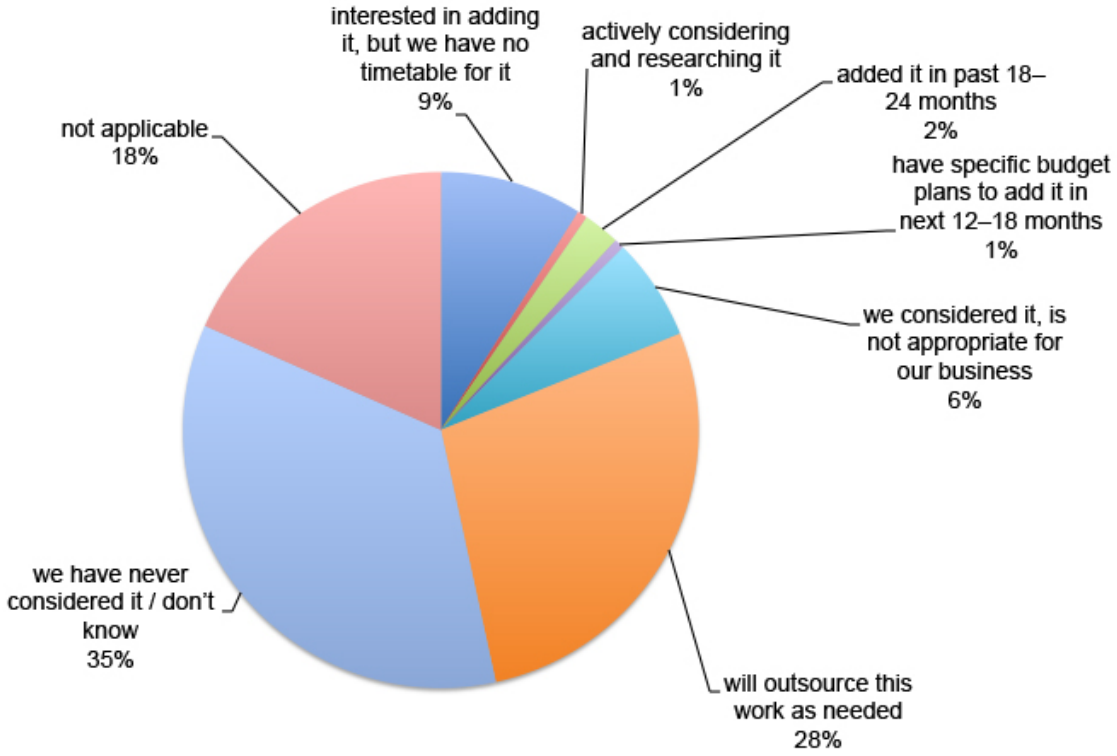
	1–9 employees	10–19 employees	20–49 employees	50–99 employees	100+ employees
interested in adding it, but we have no timetable for it	9%	7%	8%	5%	9%
actively considering and researching it	0%	5%	7%	9%	6%
added it in past 18–24 months	4%	2%	2%	7%	7%
have specific budget plans to add it in next 12–18 months	0%	2%	0%	2%	0%
we considered it, is not appropriate for our business	2%	2%	8%	2%	10%
will outsource this work as needed	52%	21%	20%	22%	9%
we have never considered it / don't know	15%	40%	33%	40%	27%
not applicable	19%	19%	22%	13%	32%

Textile Printing for Garments/Fashion

Textile printing for garment/fashion is of even less interest (this category also includes direct-to-garment printing for specialty items like T-shirts).

More than one-third (35%) have never considered it, although almost three out of ten (28%) will outsource it as needed. One percent say they have budget plans to add textile garment printing in the next year and a half, another 1% percent are actively considering and researching it, and 2% have already added it. Nine percent were interested in adding it, but have no specific timetable.

Figure 16. Please indicate the extent to which you have looked at or considered adding *textile printing for garments/fashion*
All respondents, Fall 2017



Textile printing for garments or fashion finds more interest a the smaller end of the establishment size continuum—10% of 1–9-employee shops are at least interested in adding these capabilities, while another 32% say they will outsource it as needed. Three percent—the highest of all the categories—have already added it, while 1% have specific budget plans to add garment printing capabilities. Five percent of 20–49-employee shops are actively considering and researching it, but 15% of this cohort has deemed it inappropriate for their business.

Table 16. Please indicate the extent to which you have looked at or considered adding *textile printing for garments/fashion*
Respondents by establishment size, Fall 2017

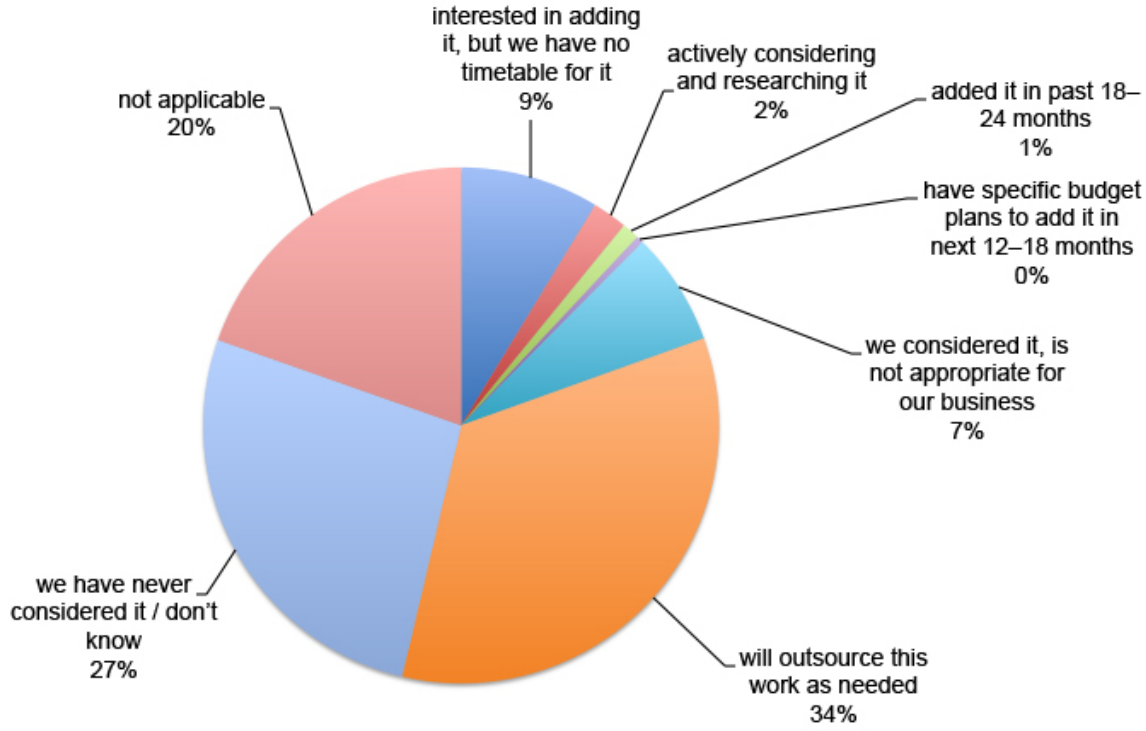
	1–9 employees	10–19 employees	20–49 employees	50–99 employees	100+ employees
interested in adding it, but we have no timetable for it	10%	7%	3%	5%	6%
actively considering and researching it	0%	0%	5%	0%	3%
added it in past 18–24 months	3%	0%	0%	2%	0%
have specific budget plans to add it in next 12–18 months	1%	0%	0%	2%	0%
we considered it, is not appropriate for our business	5%	7%	15%	4%	13%
will outsource this work as needed	32%	19%	22%	13%	11%
we have never considered it / don't know	31%	48%	35%	56%	33%
not applicable	17%	19%	20%	18%	33%

Digital Label/Wrapper Printing

Something that is of slightly more appeal—but was surprisingly less appealing than we would have thought—is digital label and/or wrapper printing. Industry analysts (like us) love to cite third-party research that finds digital label printing to be a massive, high-growth area—and yet few of our survey respondents see it that way.

More than one-fourth (27%) have never considered label printing, although one-third (34%) will outsource it as needed. Fewer than 1% say they have budget plans to add digital label printing in the next year and a half, 2% percent are actively considering and researching it, and 1% have already added it. Nine percent were interested in adding it, but have no specific timetable. One-fifth didn't even respond to the question.

Figure 17. Please indicate the extent to which you have looked at or considered adding *digital label/wrapper printing*
All respondents, Fall 2017



Digital label printing finds its highest (as it were) level of interest among smaller shops, particularly the 10–19-employee group: 7% say they are actively considering and researching it, 2% have specific budget plans to add it, and 5% have already added it. A further 26% of these shops will outsource it as needed. Among 20–49-employee shops, 8% are actively researching it and two percent have already added it.

Table 17. Please indicate the extent to which you have looked at or considered adding *digital label/wrapper printing*
Respondents by establishment size, Fall 2017

	1–9 employees	10–19 employees	20–49 employees	50–99 employees	100+ employees
interested in adding it, but we have no timetable for it	10%	10%	3%	5%	6%
actively considering and researching it	0%	7%	8%	2%	9%
added it in past 18–24 months	0%	5%	2%	4%	4%
have specific budget plans to add it in next 12–18 months	0%	2%	0%	2%	1%
we considered it, is not appropriate for our business	8%	2%	8%	7%	10%
will outsource this work as needed	40%	26%	23%	16%	10%
we have never considered it / don't know	24%	29%	33%	45%	27%
not applicable	19%	19%	22%	18%	31%

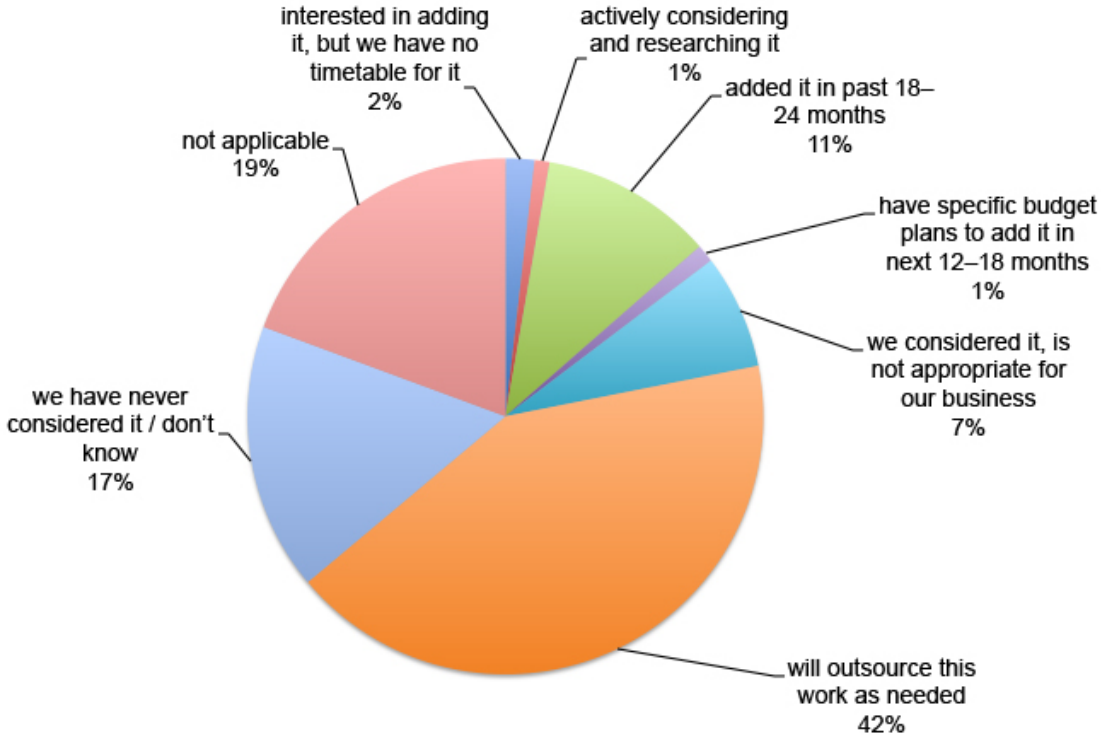
Specialty Printing

Here was something surprising, and in a way opposite to digital label printing: 11% of survey respondents say they have already added specialty printing in the past two years or so. Specialty printing includes things like coffee mugs, golf balls, smartphone cases, and other items that have traditional been considered "ad specialties." These have long been traditional parts of overall marketing and promotion, and for decades have had a rather byzantine distribution structure which has of late been upended (as most things have) by the ability to digitally product short-run, customized, and even personalized specialty printing items.

In addition to those who have added specialty printing, 42% outsource these items as needed. Only 1% say they have budget plans to add specialty printing in the next year and a half, and 1% are actively considering and researching it.

Seventeen percent have never considered specialty printing, while 7% didn't feel it was appropriate for their business.

Figure 18. Please indicate the extent to which you have looked at or considered adding *specialty printing (like coffee mugs, golf balls, smartphone cases)*
All respondents, Fall 2017



Who were the ones who added specialty printing? Generally 1–9-employee shops: 13% have added specialty printing in the past 12 to 18 months. Seven percent each of 20–49- and 50–99-employee shops have added it, as have 5% of 10–19-employee shops. Two percent of 1–9-employee shops have specific budget plans to add specialty printing, and a smattering of mid-size shops are actively considering it and researching it.

Table 18. Please indicate the extent to which you have looked at or considered adding *specialty printing (like coffee mugs, golf balls, smartphone cases)*
Respondents by establishment size, Fall 2017

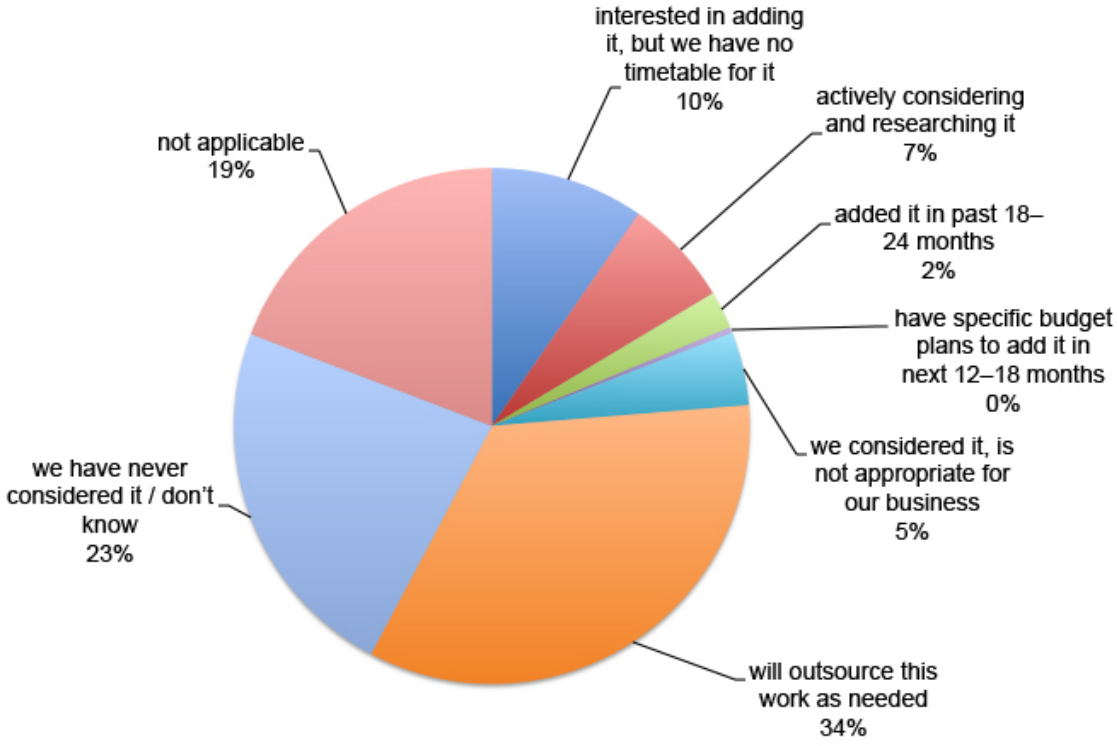
	1–9 employees	10–19 employees	20–49 employees	50–99 employees	100+ employees
interested in adding it, but we have no timetable for it	0%	10%	2%	7%	3%
actively considering and researching it	0%	2%	3%	2%	6%
added it in past 18–24 months	13%	5%	7%	7%	0%
have specific budget plans to add it in next 12–18 months	2%	0%	0%	0%	0%
we considered it, is not appropriate for our business	8%	0%	12%	9%	9%
will outsource this work as needed	47%	33%	30%	25%	28%
we have never considered it / don't know	11%	31%	27%	33%	23%
not applicable	19%	19%	20%	16%	31%

Packaging Printing/Converting

For the past several years, industry pundits—and no small number of equipment vendors—have touted packaging printing and converting as the next great adventure for printers. Our question, then, is: any interest from our response base?

Sorta. It's still a likely-to-be-outsourced service at present (34% say they will outsource packaging printing/converting as needed), although 10% say they are interested in adding it but have no specific timetable. Seven percent are actively considering and researching packaging printing, and less than 1% have specific budget plans to add it any time soon. Two percent have added it in the past year and a half or so. Five percent have deemed it inappropriate to their business and almost one-fourth (23%) have never considered it.

Figure 19. Please indicate the extent to which you have looked at or considered adding *packaging printing/Converting*
All respondents, Fall 2017



Who is interested in packaging printing? As one might expect, this is something of interest more to larger establishments. Those who have already added it are largely concentrated among 100+- (16%) and 50–99-employee shops (13%). Likewise, 13% of 50–99- and 12% of 100+-employee shops are actively considering and researching packaging. This decreases with establishment size. Still, 9% of 1–9-employee shops are interested in adding it, and 6% of them are actively considering and researching it. And 38% say they will outsource packaging work as needed.

Table 19. Please indicate the extent to which you have looked at or considered adding *packaging printing/converting*
Respondents by establishment size, Fall 2017

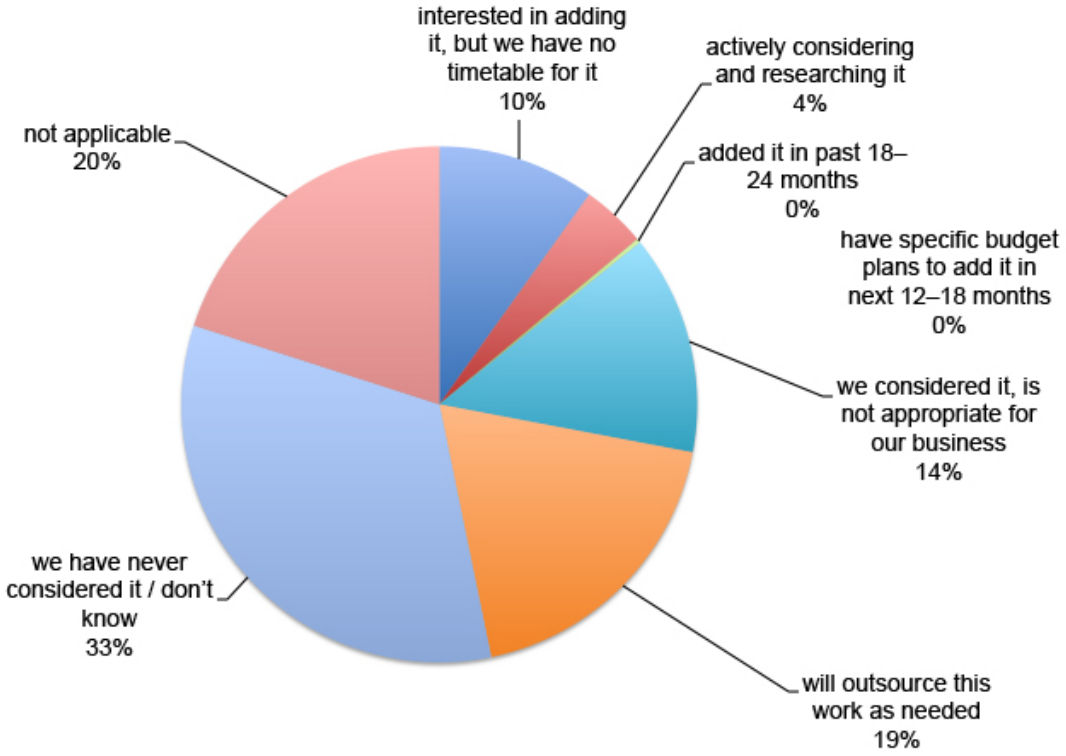
	1–9 employees	10–19 employees	20–49 employees	50–99 employees	100+ employees
interested in adding it, but we have no timetable for it	9%	12%	10%	15%	9%
actively considering and researching it	6%	5%	10%	13%	12%
added it in past 18–24 months	0%	5%	7%	13%	16%
have specific budget plans to add it in next 12–18 months	0%	0%	2%	2%	3%
we considered it, is not appropriate for our business	5%	2%	7%	5%	1%
will outsource this work as needed	38%	31%	25%	22%	9%
we have never considered it / don't know	23%	29%	18%	16%	17%
not applicable	19%	17%	22%	15%	33%

It must be noted that packaging and converting is a very diverse range of products. It is possible that if 10% of printers said they were getting into this area that it could be ten product areas of 1% each. This should be considered as representing a high level view of the general topic.

3D Printing

We included some of these items knowing full well (or at least suspecting) that they would generate a low positive response. But sometimes we have been surprised; 10% of respondents say they are interested in adding 3D printing, and 4% say they are actively considering and researching it. That's not massive, but it's higher than we were expecting. No one has already added it, and even only 19% say they will outsource it as needed (suggesting it's not often, or expected to be, needed). Fully one-third (33%) have never even considered it, and 20% didn't even answer the question.

Figure 20. Please indicate the extent to which you have looked at or considered adding *3D printing*
All respondents, Fall 2017



Where are those small pockets of interest in adding 3D printing? There is a bit more interest at the smaller end of the industry; 9% of the two smallest categories and 9% of the two largest categories are actively considering and researching 3D printing, although general interest is higher at the smaller end: 12% of 1–9-employee shops are at least interested in 3D printing.

Table 20. Please indicate the extent to which you have looked at or considered adding *3D printing*
Respondents by establishment size, Fall 2017

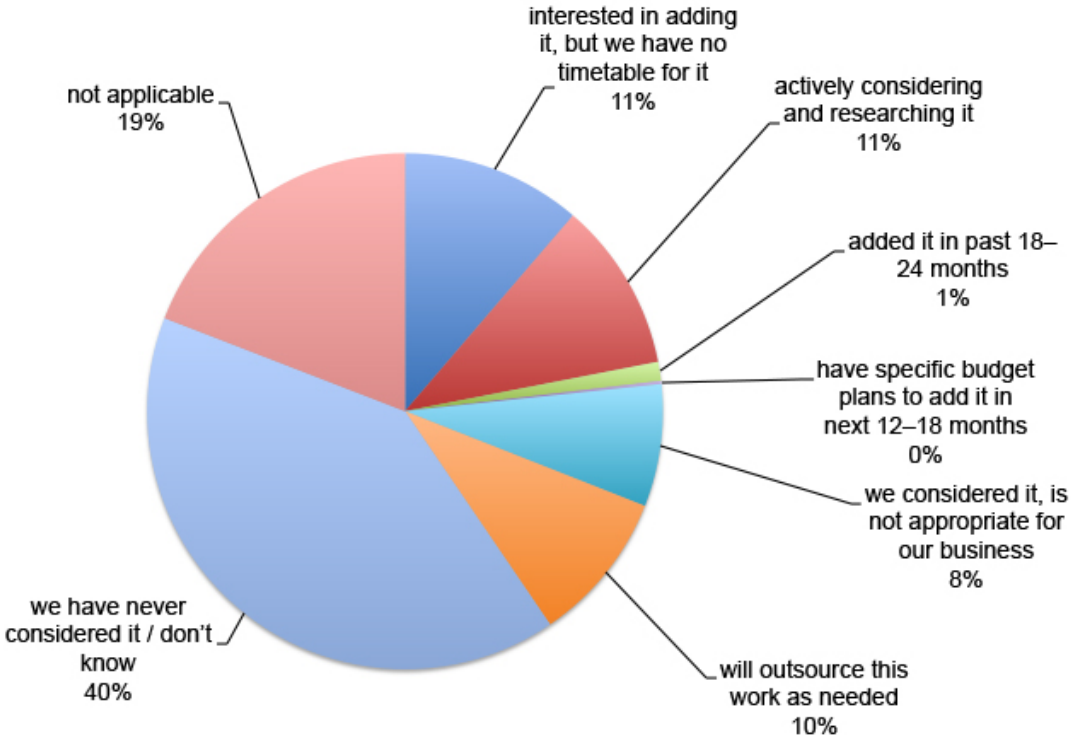
	1–9 employees	10–19 employees	20–49 employees	50–99 employees	100+ employees
interested in adding it, but we have no timetable for it	12%	2%	7%	9%	4%
actively considering and researching it	4%	5%	0%	5%	4%
added it in past 18–24 months	0%	0%	2%	0%	2%
have specific budget plans to add it in next 12–18 months	0%	0%	0%	0%	0%
we considered it, is not appropriate for our business	13%	12%	22%	13%	16%
will outsource this work as needed	20%	17%	18%	15%	14%
we have never considered it / don't know	32%	45%	28%	36%	24%
not applicable	19%	19%	23%	22%	35%

Augmented Reality (AR)

Here's another source of surprise: 11% of respondents say they are actively considering and researching it Augmented Reality (AR), while another 11% say they are interested in adding it but have no timetable for it. Still, only 1% has added AR capabilities, only 10% will outsource it as needed, 40% haven't even considered it, and 8% have considered it but deemed it inappropriate to their business.

We will discuss AR somewhat at length in Section 7.

Figure 21. Please indicate the extent to which you have looked at or considered adding *Augmented Reality (AR) development*
All respondents, Fall 2017



AR capabilities are more likely to be already added at the mid-size to high end (10% of 100+-employee establishments have already added it, as have 7% of 20–49-employee shops), but 15% of 1–9-employee establishments are actively considering and researching it, and 13% are at least interested in it. Still, only a scattered few shops at the high end have specific budget plans to add AR capabilities in the discernible future.

Table 21. Please indicate the extent to which you have looked at or considered adding *Augmented Reality (AR) development*
Respondents by establishment size, Fall 2017

	1–9 employees	10–19 employees	20–49 employees	50–99 employees	100+ employees
interested in adding it, but we have no timetable for it	13%	10%	5%	11%	5%
actively considering and researching it	15%	0%	0%	5%	3%
added it in past 18–24 months	0%	0%	7%	4%	10%
have specific budget plans to add it in next 12–18 months	0%	0%	0%	2%	4%
we considered it, is not appropriate for our business	7%	7%	15%	7%	4%
will outsource this work as needed	8%	12%	13%	22%	11%
we have never considered it / don't know	39%	55%	40%	33%	29%
not applicable	19%	17%	20%	16%	33%

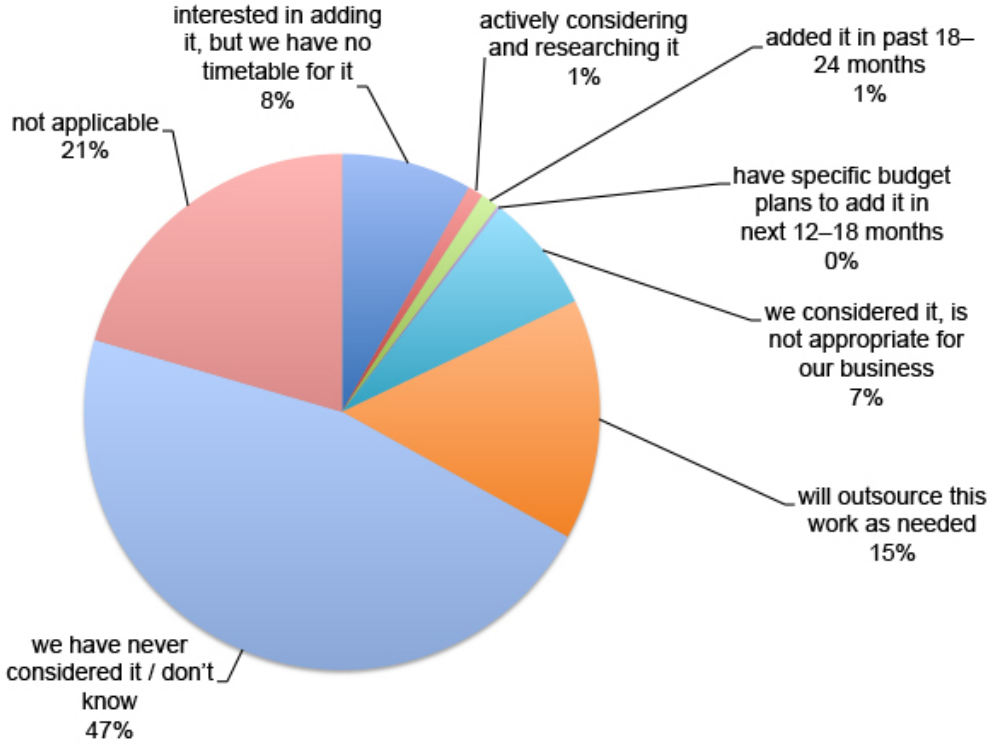
Augmented Reality may seem difficult, but it doesn't have to be. For example, last year, we published our oft-touted book *The Third Wave* was developed in conjunction with HP, and the book used HP's Link technology to make Internet links embedded in the pages clickable via a smartphone app. On the content creation side, the challenge was thinking about book writing in a more creative, interactive way than we have been used to. In terms of embedding the actual links, it can be a little more technically demanding, but no more so than, say, color management. That is, it is not a massively abstruse process.

Event Management

Here's one that was not much of a surprise: nearly one-half (47%) of respondents have never even considered adding event management services (that is, managing not only the printed materials for events such as seminars, trade shows, open houses, etc., but also managing the data associated with these events such as attendee and exhibitor databases). One percent say they have added these services, another 1% say they are actively considering and researching it, although 8% say they are interested in adding it but have no timetable for it. Only 15% will outsource event management services as needed, 7% have considered it but deemed it inappropriate to their business, and more than one-fifth didn't even answer the question.

Figure 22. Please indicate the extent to which you have looked at or considered adding *event management*

All respondents, Fall 2017



Event management services are more likely to be already added at the mid-size to high end (10% of 100+-employee establishments have already added it, as have 7% of 20–49-employee shops), but 10% of 1–9-employee establishments are at least interested in it and 17% say they will outsource it as needed.

Table 22. Please indicate the extent to which you have looked at or considered adding *event management*
Respondents by establishment size, Fall 2017

	1–9 employees	10–19 employees	20–49 employees	50–99 employees	100+ employees
interested in adding it, but we have no timetable for it	10%	7%	2%	7%	3%
actively considering and researching it	0%	2%	3%	4%	4%
added it in past 18–24 months	0%	0%	7%	4%	10%
have specific budget plans to add it in next 12–18 months	0%	0%	2%	0%	0%
we considered it, is not appropriate for our business	7%	10%	8%	7%	9%
will outsource this work as needed	17%	12%	12%	4%	6%
we have never considered it / don't know	46%	50%	47%	58%	36%
don't know	21%	19%	20%	16%	32%

Summary

To find out where the pockets of interest in these items are, we added up the "added it in past 18–24 months," "have specific budget plans to add it in next 12–18 months," "actively considering and researching it," and "interested in adding it, but we have no timetable for it" responses.

Of all these items, the one that garners the most interest is print signage, followed by AR and digital/electronic signage. It is bizarre to us that digital label/wrapper printing is down at the bottom of the list, even behind textile printing for garments/fashion. Well, *c'est la vie*.

All of these items are potentially lucrative products, applications, or services to get involved with to some degree, and many are the hottest, most-discussed technologies in the industry. For vendors, this section indicates where the opportunities (or education) lie. Likewise for print service providers. These are of course not completely unserviced or neglected applications, but for commercial printers looking for greener pastures (or greenfield projects), these are good areas to forge relationships or even focus acquisition efforts (which, as we saw, is a top opportunity).

Table 23. Areas of interest in new print-related applications
Respondents by establishment size, Fall 2017

	All Establish-ments	1–9 employees	10–19 employees	20–49 employees	50–99 employees	100+ employees
print signage	39%	38%	45%	38%	44%	35%
Augmented Reality (AR)	23%	28%	10%	12%	22%	23%
digital/electronic signage	23%	25%	26%	8%	20%	18%
packaging printing/converting	19%	15%	21%	28%	42%	40%
specialty printing	15%	15%	17%	12%	16%	9%
textile printing for soft signage	15%	13%	17%	17%	24%	22%
3D printing	14%	17%	7%	8%	15%	11%
textile printing for garments/fashion	12%	15%	7%	8%	9%	9%
digital label/wrapper printing	12%	10%	24%	13%	13%	21%
event management	10%	10%	10%	13%	15%	17%

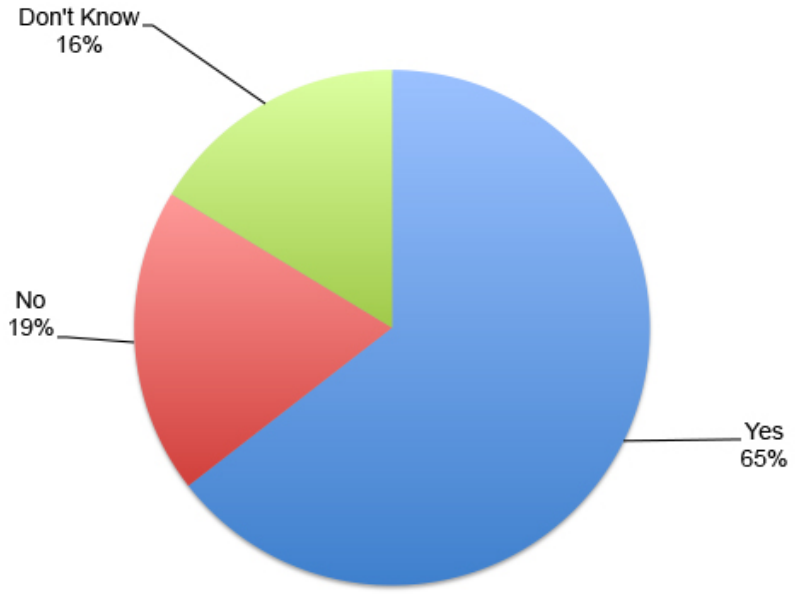
4. Hiring

We saw in the challenges and opportunities sections that hiring qualified employees of various kinds (primarily sales, but also production) is a top-of-mind concern for print business owners. Given what they routinely tell us about their staffing challenges, what are their hiring plans for the next 12 months?

Situation Vacant?

First of all, are print businesses planning to hire any employees in the next 12 months? As it turns out, yes: two-thirds (65%) do plan to hire staff. One-fifth (19%) do not—and 16% don't know, which suggests that they are not lacking in qualified staff but may need to fill whatever vacancies crop up over the course of the year.

Figure 23. Are you considering hiring/adding staff in the next 12 months?
All respondents, Fall 2017



Perhaps not unexpectedly, hiring plans increase with increasing establishment size. More than three-fourths (77%) of 100+-employee establishments plan to hire or add staff in 2018, compared to just under one-half (46%) of 1–9-employee shops.

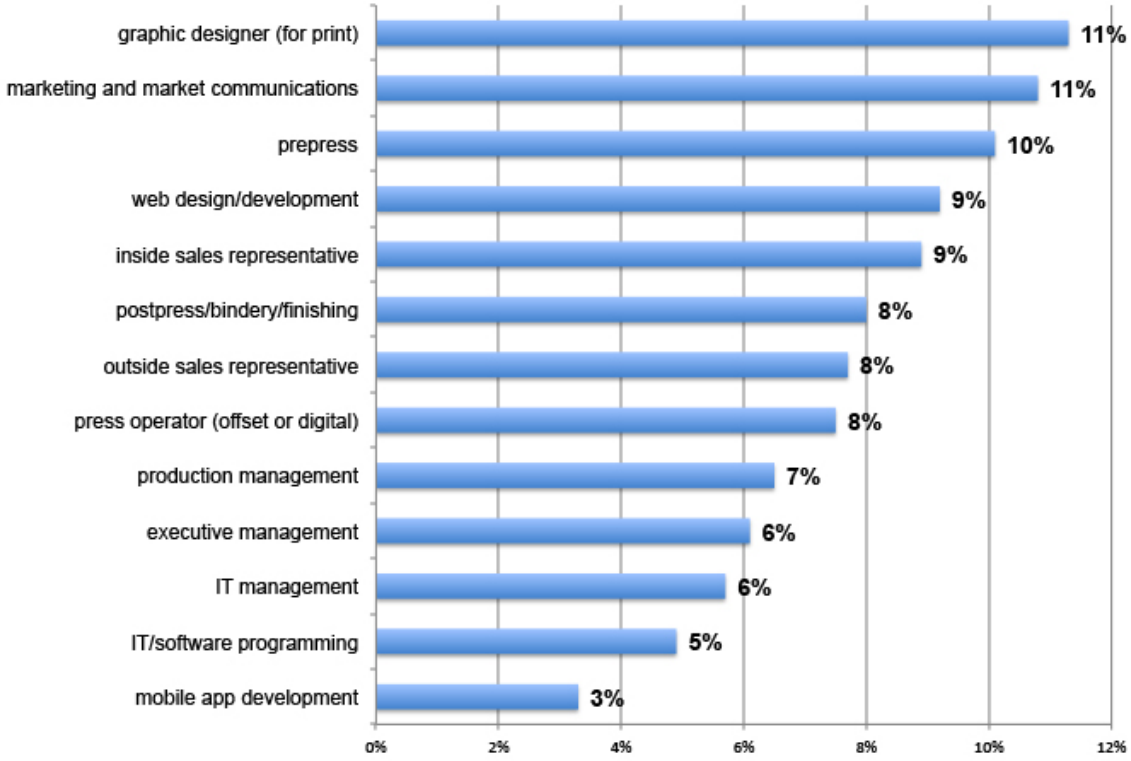
Table 24. Are you considering hiring/adding staff in the next 12 months?
Respondents by establishment size, Fall 2017

	1–9 employees	10–19 employees	20–49 employees	50–99 employees	100+ employees
Yes	46%	63%	58%	73%	77%
No	35%	24%	21%	12%	10%
Don't Know	20%	13%	21%	16%	13%

Looking For Mr./Ms. Goodbar

Who do shops on the hunt for staff plan to hire? What situations are vacant? Despite all their talk about sales personnel, the top position selected by survey respondents is graphic designer (for print), chosen by 11% of those looking to hire. This is tied with marketing and market communications staff. Prepress staff are sought by 10%.

Figure 24. If yes, for what positions are you looking to hire? (*multiple responses permitted*) Respondents considering hiring in 2018, Fall 2017



Different size establishments have different hiring/staff needs. The top three positions shops are looking to hire, broken down by size classification, are:

- 1–9 employees: The top positions open are graphic designer (for print) (18%), prepress and web design/development (both at 14%), and marketing and market communications (12%).
- 10–19 employees: The top three positions open are marketing and market communications (20%), inside sales representative (14%), and production management (13%).
- 20–49 employees: The top positions open are inside sales representative (13%), prepress (12%), and postpress/bindery/finishing, outside sales representative, and executive management (all at 11%).
- 50–99 employees: The top positions open are executive management (14%), press operator (offset or digital) (10%), and outside sales representative, web design/development, and IT/software programming (all at 9%).
- 100+ employees: The top three positions open are (and number one is very interesting) mobile app development (15%), graphic designer for print (11%), and IT management (10%).

The presence of IT management and IT/software programming among the larger establishments is telling; handling data and developing variable-data print applications (remember the Opportunities section?) are competitive advantages for these businesses, and having employees with software savvy is, likewise, a competitive advantage. In many ways, this helps solve some of the perennial challenges of finding graphic arts employees: if you're not looking for actual graphic arts employees, but employees with other, perhaps more common skills that can be ported to a graphic arts environment, then it becomes that much easier to staff up.

Table 25. If yes, for what positions are you looking to hire? (*multiple responses permitted*) Respondents considering hiring in 2018by establishment size, Fall 2017

	1–9 employees	10–19 employees	20–49 employees	50–99 employees	100+ employees
executive management	2%	5%	11%	14%	5%
inside sales representative	6%	14%	13%	6%	5%
outside sales representative	5%	10%	11%	9%	6%
marketing and market communications	12%	20%	7%	3%	7%
prepress	14%	3%	12%	7%	6%
production management	5%	13%	3%	7%	8%
press operator (offset or digital)	8%	3%	8%	10%	6%
postpress/bindery/finishing	8%	6%	11%	7%	6%
IT management	3%	8%	5%	8%	10%
IT/software programming	3%	3%	7%	9%	8%
graphic designer (for print)	18%	12%	3%	4%	11%
web design/development	14%	3%	5%	9%	8%
mobile app development	0%	0%	5%	7%	15%

What does all this tell us? The larger printers are focused on sales reps, but at the smaller a greater emphasis on employees whose skills allow these businesses to offer a greater portfolio of products and services—graphic design, web design, marketing communications people, and so on. They are doing more things to capture more work, and as means of providing higher levels of service. And a graphic designer is always helpful to have on hand, especially now that no one brings in camera-ready copy anymore. Fixing files is often more than a simple value-added service; it's often a production necessity.

Number of Positions

We used our survey data to estimate the number of positions in each job category that will be open in 2018, to give a sense of the need for staffing in the industry. All told, the printing industry will be on the hunt for about 17,000 employees in 2018, most at the lower end of the industry (simply because there are so many of these establishments than at the larger end). These are not necessarily additions to the workforce, but replacements for obsoleted positions, attrition, or people trading jobs looking for new employers or better positions. Assuming about 425,000 industry employees, these positions would be about 4% of total employment.

Table 26. Number of positions
Respondents by establishment size, Fall 2017

	All Establish-ments	1–9 employees	10–19 employees	20–49 employees	50–99 employees	100+ employees
executive management	1,041	162	159	353	282	85
inside sales representative	1,510	444	423	417	133	93
outside sales representative	1,304	362	292	353	188	109
marketing and market communications	1,827	829	591	218	70	119
prepress	1,711	977	103	382	147	102
production management	1,100	338	388	96	137	141
press operator (offset or digital)	1,268	581	92	272	212	111
postpress/bindery/finishing	1,365	564	178	369	152	102
IT management	972	235	230	170	163	174
IT/software programming	840	201	98	218	175	148
graphic designer (for print)	1,919	1,216	345	85	81	192
web design/development	1,566	977	103	153	183	150
mobile app development	566	-	-	153	147	266
Total	16,989	6,886	3,002	3,239	2,070	1,792

5. Graphic Communications Industry Economic Trends

Let's pull back from our own survey and round up other industry data from our usual suspects (Bureau of the Census and other government sources). We will look at:

- Commercial printing establishments
- Births and deaths
- Printing industry shipments
- Printing industry employment

Remember, these are aggregate industry data, a combination of industry leaders, laggards and everyone in between. When you see the trends, it's a baseline or an average that often reflects mediocrity. Keep a good perspective: there are many profitable, healthy, and growing companies that are performing exceptionally well, unlike many of the industry trends.

Printing Establishments

The composition of the printing industry today—NAICS 323[13]—is predominantly small businesses; 70% of the 25,688 establishments counted in 2015 were those that had under then employees. About one-fourth are "medium" printers (10–49 employees), and only 7% are 50+employee plants. Those 7% are very important: they still represent a large portion of industry revenues, and about 70% of the industry's capital investment.

The two charts that follow have updated last year's data with 2015 *County Business Patterns* as well as estimates from our own forecasts. Figure 26 includes a 2022 forecast. By the way, a complete demographic resource has been made available through NPES called PrintStats.[14]

Between 2015 and 2022, we are looking to consolidate the smaller end of the industry by about 2,700 establishments, while at the higher end, we're looking at a decline of another 200 or so establishments.

[13] "The North American Industry Classification System (NAICS) is the standard used by Federal statistical agencies in classifying business establishments for the purpose of collecting, analyzing, and publishing statistical data related to the U.S. business economy" (http://www.census.gov/eos/www/naics/). NAICS 323 is "Printing and Related Support Activities."
[14] See the PRINT 17 announcement of PrintStats at http://bit.ly/2AFbqjb.

Figure 25. US commercial printing establishments by size, 2015
Total establishments: 25,688

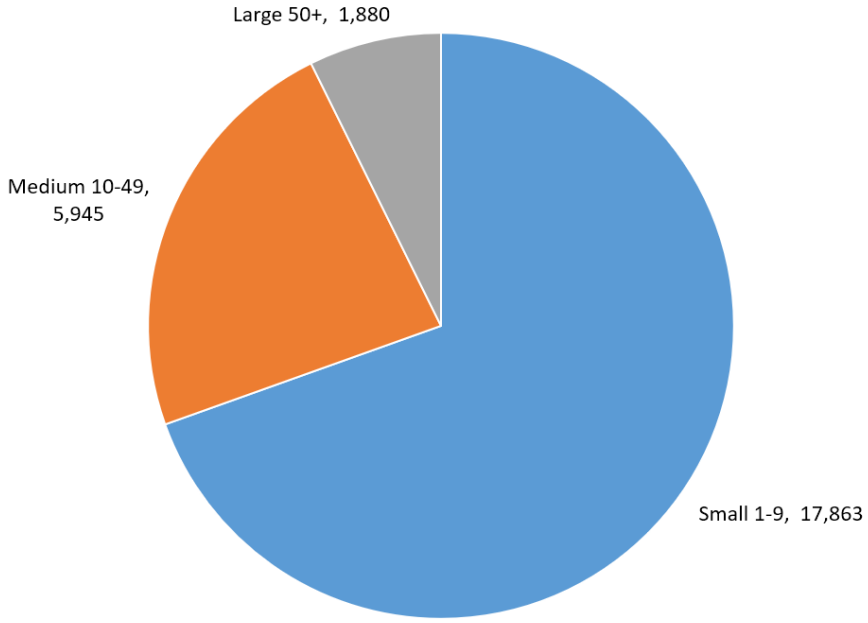
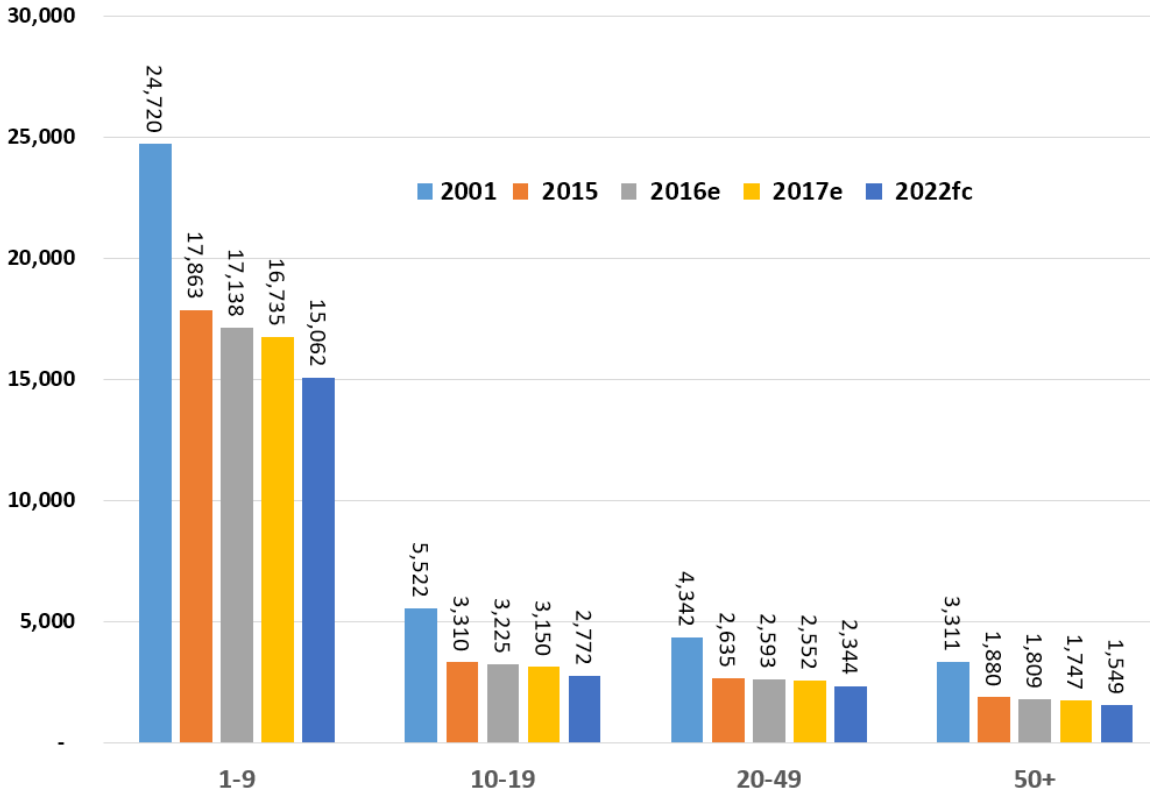


Figure 26. Change in US commercial printing establishments by size, 2001–2022



Births/Deaths

We can look at industry birth and death data in more detail to get a sense of how the industry is stabilizing to some degree. From 2014 to 2015 (the most recent period for which we have data), there has been an increase of nearly 1,300 establishments, but a decrease of jus over 1,900 establishments, for a net loss of about 600 establishments. This represents the same percentage change as previous years, so we're not seeing a huge acceleration of deceleration of industry consolidation. (However, the initial number of establishments is contracting so every year's percent change represents a smaller number of establishments.)

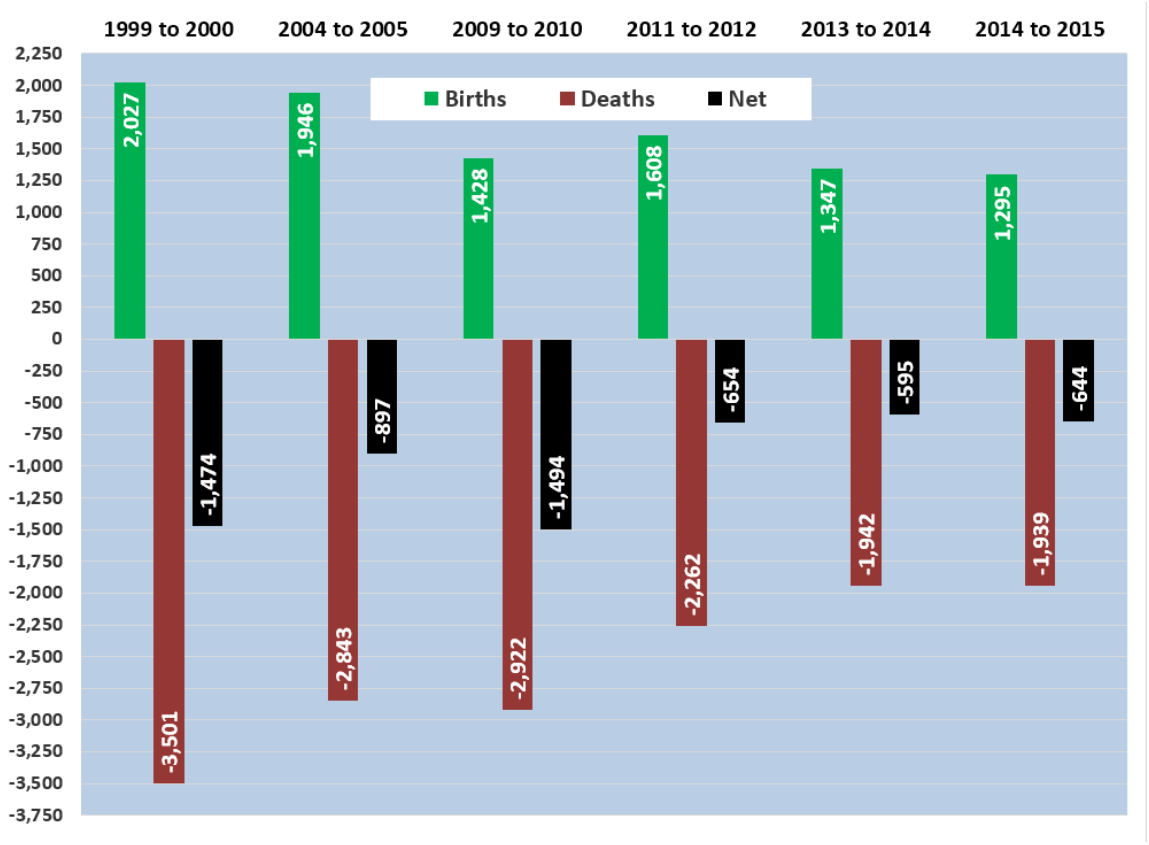
Essentially, we're still looking at a net attrition of the printing business, and consolidation by purchase or merger is actually the least of it. Really, it's straight-out plant closures, as these "exiting" businesses were small, but of little or no financial value for being acquired, not even for a "book of business" (of course, if they had a book of business worth acquiring, they'd still be in business). Owner retirements without a sale to a new owner are the most common closures for small establishments. Also, the 1–4-employee category can be considered where corporations go to die: most businesses are open one year longer than their operations as a practical matter of filing last tax returns and closing their books. Many of the closed establishments, therefore, actually concluded their business the year before.

At the same time, births and deaths don't always represent brand-new businesses or pushing-up-the-daisies dead ones. Rather, businesses often change their corporate structure. A corporation closes, a proprietorship opens. So it is often the same people just changing their tax structure. Also, this is often a "poor man's consolidation." Two struggling print businesses decide over coffee to combine their businesses, find it is cheaper to close each of them and then open as a single new business, without dealing with the legalities and complicated details of a merger or an acquisition.

It's also possible that certain businesses change their business enough that they end up in a different NAICS (the data presented here only represent NAICS 323).

So there can be a lot of stuff happening beneath the surface of these birth and death data.

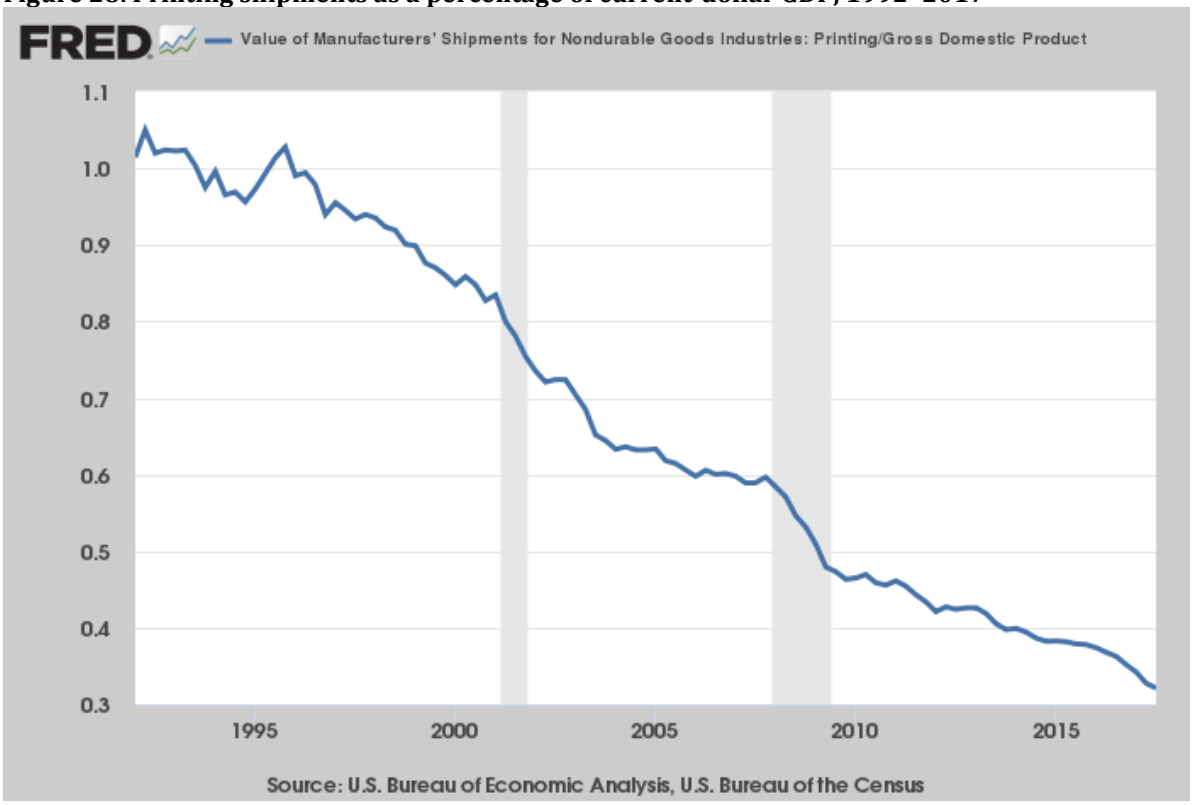
Figure 27. Printing industry establishment births/deaths, 1999–2015



Printing Industry Shipments

Hoo boy. Here's where the fun begins. Let's start with printing shipments as a percentage of GDP (these figures are not inflation-adjusted so as to avoid disagreements about which inflation adjustment to use, but we're just looking for an overall pattern). This chart is pretty upsetting; since 1992, the value of printing shipments went from around 1.05% of GDP all the way down to about 0.36%. After the recovery in July 2009, things kind of evened out, but it just kept going down. Essentially, this is the story of technology. It started to plummet when the Internet truly "arrived" (circa 1996) and while we can blame the recession for some of the drop after 2008, remember also that this was also the period that saw the advent of social media, the smartphone, and mobile media. (Basically, this chart illustrates the first two waves we discuss in our book *The Third Wave*.)

Figure 28. Printing shipments as a percentage of current-dollar GDP, 1992–2017

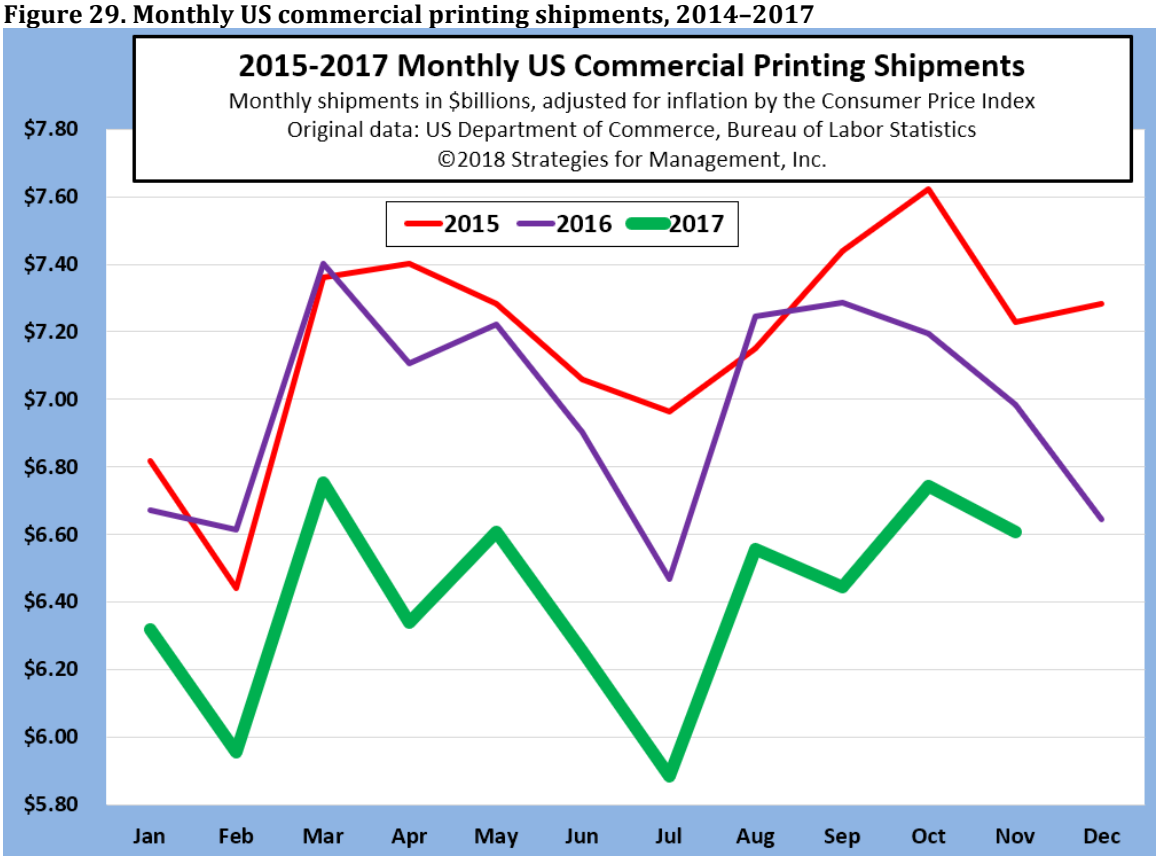


The monthly shipments data in Figure 29 below includes November 2017, the most recent month for which we have data for this report. As was to be expected, November fell into the regular seasonal pattern, dipping a bit from October. Still, the decline in November 2017 was smaller than that in November 2016, but declined nevertheless. In November, shipments overall were down $295 million, the smallest decline since January 2017. This represents a 4.2% decline, compared to a $121 million, or 1.7% decline, in November 2016. This 4.2% is the smallest percent decline since January, so excluding January and November, the average monthly decline for 2017 has been 7.8% in current dollars, or 9.7% in inflation-adjusted dollars. November 2017 ranks 256th out of the 308 months for which we have data. Indeed, since January 2017, four of the months in 2017—in current-dollar terms—have been among the worst 10 months in shipments data history On an inflation-adjusted basis, six of 2017's months have made the worst 10 list. Not good.

Crunching the numbers and looking at some forecasts, it looks like total shipments for 2017 will shake out at around $76.5 billion, which is quite disappointing.

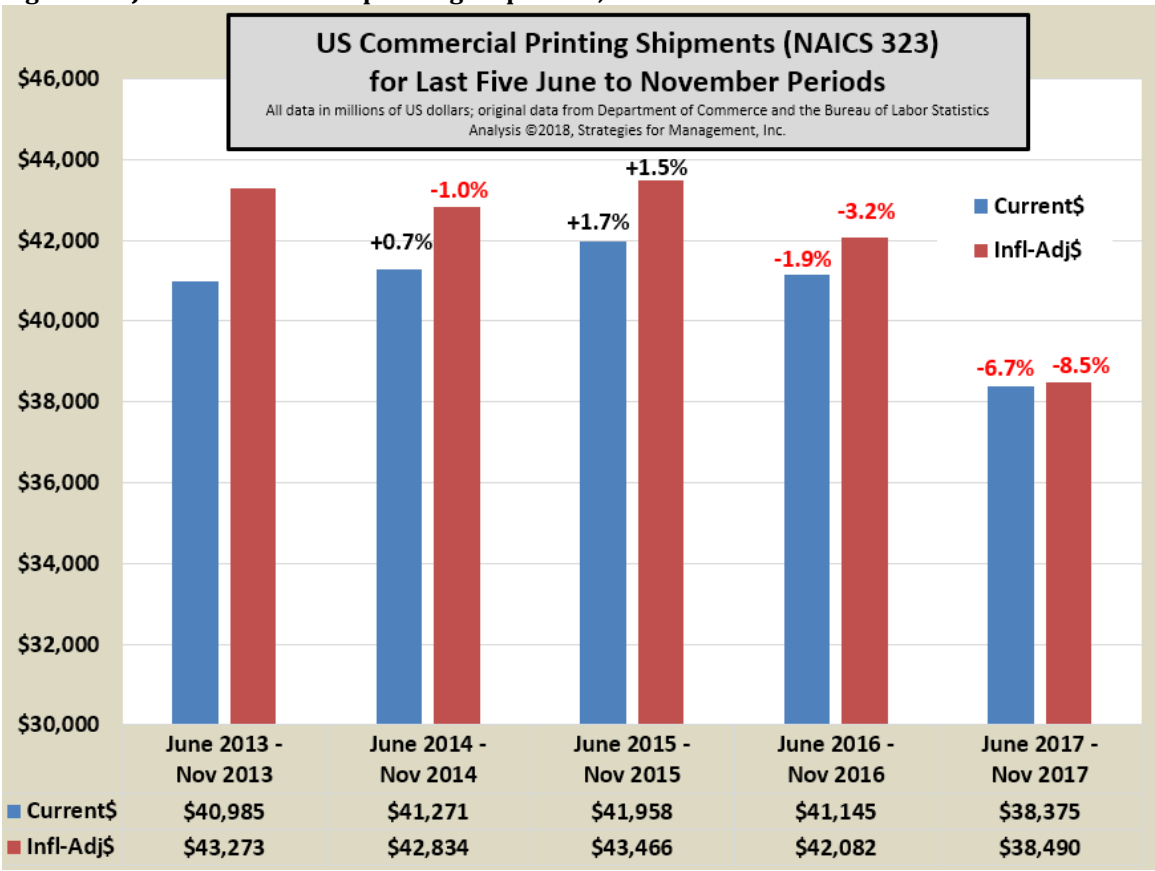
Looking at some seasonal patterns, it seems that March has become the industry's biggest with October a close second.

Figure 29. Monthly US commercial printing shipments, 2014–2017



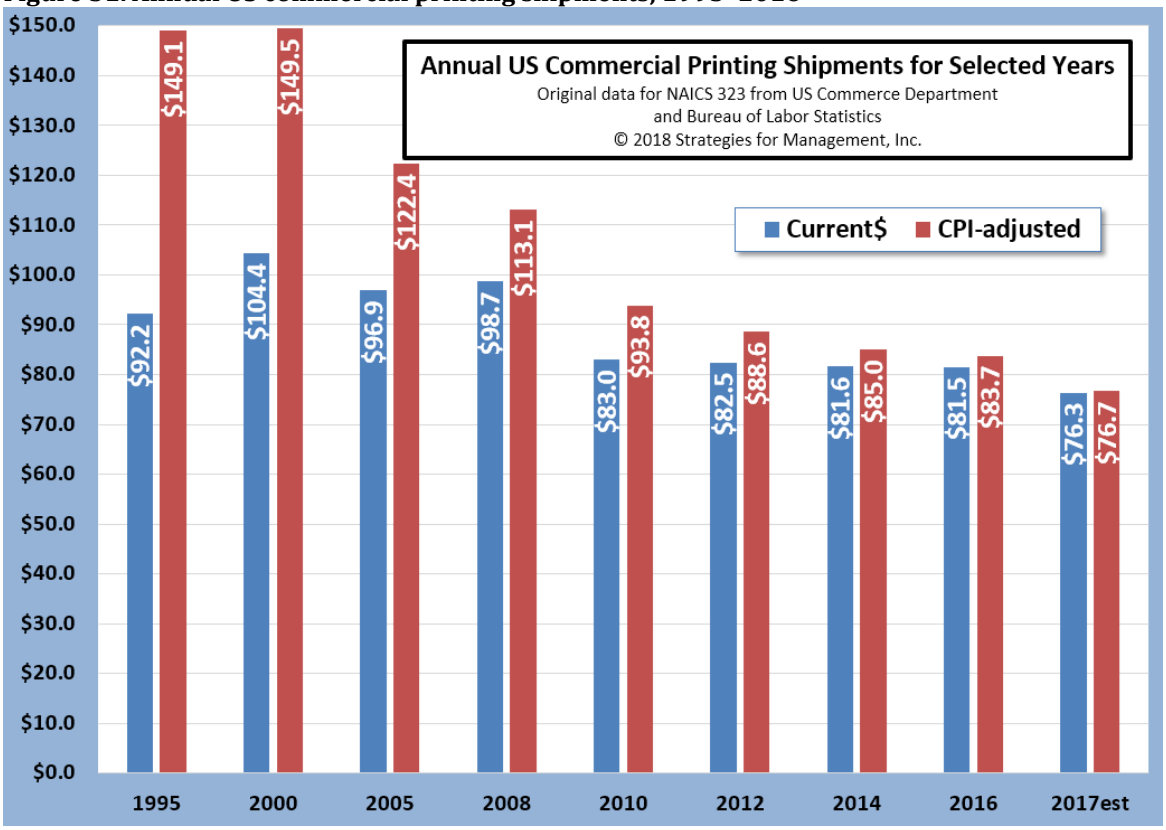
Looking at shipments for the last five June-to-November periods shows the decline in shipments perhaps a bit more comparatively—and depressingly.

Figure 30. June-to-November printing shipments, 2013 vs. 2017



Looking at annualized shipments for selected years since 1995, we can see how things have changed since the advent of the Internet. We've leveled off a bit this decade, but 2016 shipments are almost half what they were 21 years earlier.

Figure 31. Annual US commercial printing shipments, 1995–2016



Shipments Per Employee

The shipments per employees chart is a 12-month moving total of inflation-adjusted printing shipments divided by the 12-month moving average of employment. And it is creepy. Shipments per employee have declined 11% since the peak (2009) and the big decline has been going since March 2016.

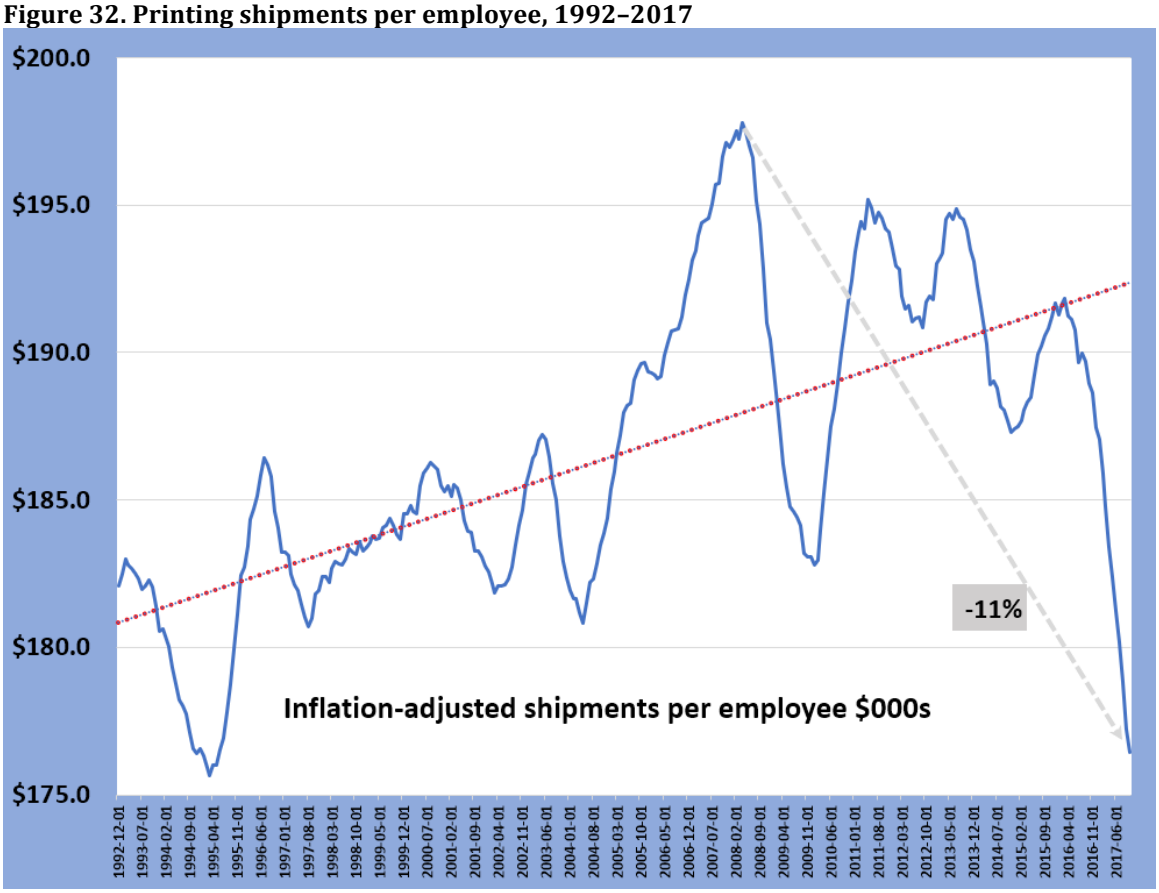
This represents that shipments are declining (as we just have been looking at), but also that employment is going down. If shipments per employee continues to go down, it probably means lot of employees will be losing jobs or businesses will be closing.

If we look at shipments per employee on a monthly basis, the data tend to be very noisy, as months jump up and down. Some months have big jumps, small have small jumps, but there is no real, discernible trend. The important thing is that there is not a lot of flexibility on the employment side. Staffing is done at constant level based on expected revenues, and it's when that expectation changes that businesses make changes in employment.

All businesses, printers included, have regular seasonal up and downs, and these are often well-known and anticipated, so slack time can be used for for training, acquiring new equipment or capabilities, etc. At the same time, some shipments may not get billed immediately. (A shipment doesn't count until it's billed—or payment received.) So unless business owners see some big change in the offing, shipments are going to vary but employment won't. But the employment drop has been fairly smooth, which suggests that the real underlying change is in employment. After all, if the shipments don't show up, then employment can drop precipitously.

With all of the consolidation we have been seeing, there should be an upward pressure to be more productive and get more done with fewer people, but that doesn't seem to be happening. We could be in for a tumultuous year for plant closures.

Figure 32. Printing shipments per employee, 1992–2017



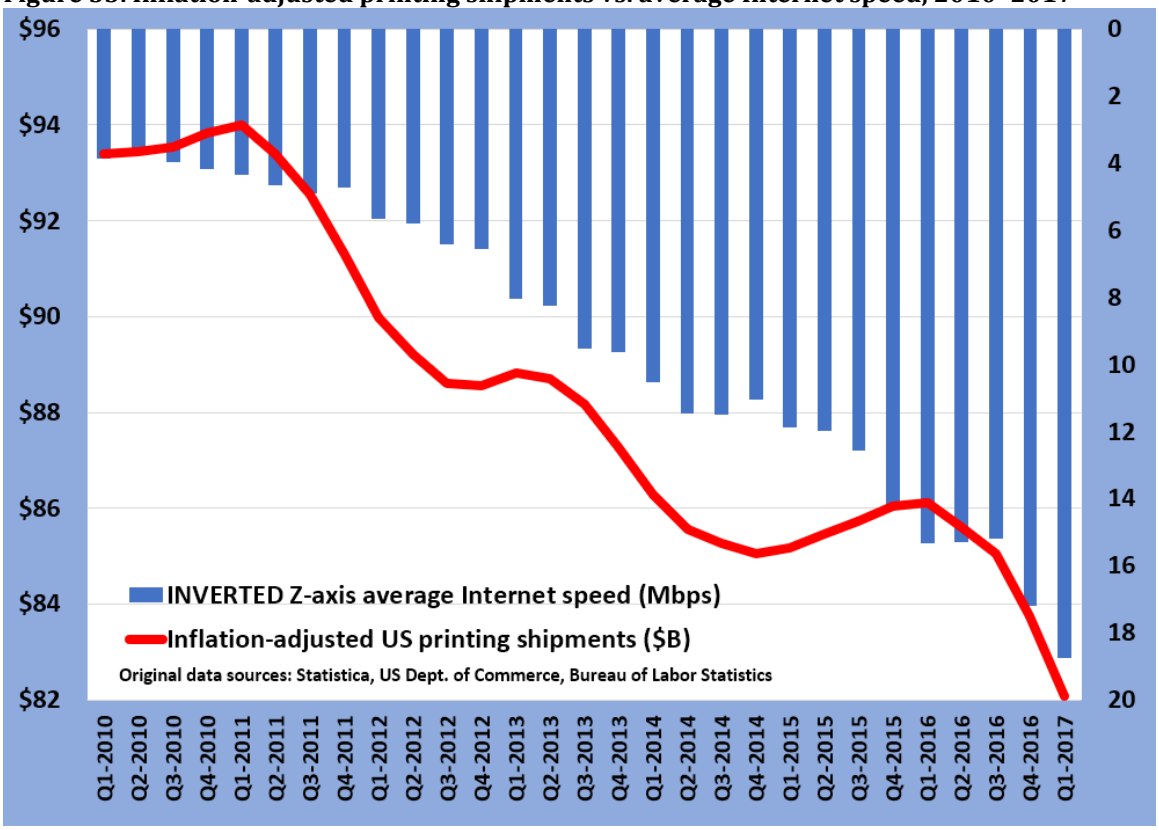
Printing Shipments vs. Internet Speed

Here's another way of looking at printing shipments: plotted against Internet speed. To make our point, note that the right hand axis has been inverted: the data start at the top of the chart and the faster internet speeds are at the bottom.

We've brought this up in past reports, but generally speaking, as Internet speed gets faster, demand for print decreases more or less correspondingly. Why? The more things you can do on the Internet, especially where video is concerned. Ten years ago, streaming, for example, was a terribly frustrating affair, and now one of the bright spots of the TV and entertainment industry is made-for-streaming programs and movies, enabled by faster Internet speeds.

The chart indicates that as speed has increased, the decrease in inflation-adjusted shipments holds to a similar pattern.

Figure 33. Inflation-adjusted printing shipments vs. average Internet speed, 2010–2017



Graphic Arts Employment

For the year, printing employment is down 1.7%, and the all the declines have been on the production side. If we had to make a guess about what's going to happen this year, we will probably see non-production, administrative staff take a big hit as consolidation effects occur.

Note that the content creation side of things also is down across the board. Part of this could be a greater shift to content marketing efforts rather than traditional marketing and advertising materials. Companies can do content marketing on their own or, more commonly, hire freelancers. That means less involvement with ad agencies, especially on the production side. Companies are also creating their own videos, managing marketing automation, and otherwise bypassing the traditional advertising and marketing food chain.

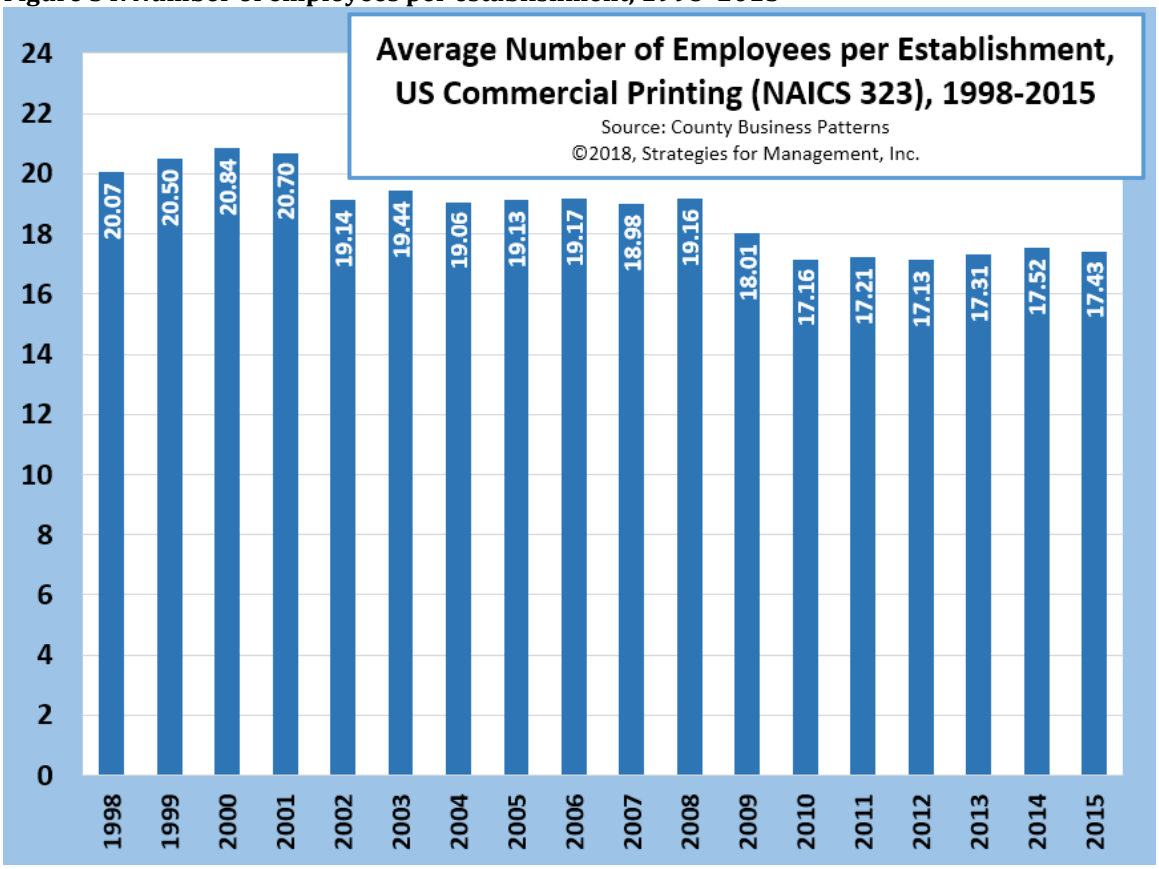
Table 27. Graphic arts employment, 2016 vs. 2017

Employment in thousands of workers	Nov. 2016	Nov. 2017	Y/Y Change	Dec. 2016	Dec. 2017	Y/Y Change
Printing, all	444.3	436.7	-1.7%	444.1	436.6	-1.7%
Printing, production	311.1	301.5	-3.1%	312.0	304.5	-2.4%
Printing, less production	133.2	135.2	1.5%	132.1	132.1	0.0%
Publishing	731.1	719.6	-1.6%	733.2	719.5	-1.9%
Periodicals	97.5	94.2	-3.4%	97.1		
Newspapers	177.0	162.7	-8.1%	175.6		
Publishing ex-newspapers	554.1	556.9	0.5%	557.6		
Graphic design	63.9	63.5	-0.6%	64.0		
Public relations	59.6	60.0	0.7%	59.2		
Ad agencies, includes PR	490.5	489.5	-0.2%	491.4		
Ad agencies, less PR	430.9	429.5	-0.3%	432.2		
Agency (incl PR) + design	554.4	553.0	-0.3%	555.4		
Direct mail advertising	45.5	45.3	-0.4%	45.3		

Employees Per Establishment

For most of the 2000s, the average number of employees per establishment was on the decline, although not by an awful lot. After 2008, the average number of employees dropped, but has remained somewhat stable over the course of the 2010s. The story of the 21st century has been the gradual elimination of prepress as discrete stages of production (yes, shops still have one or two prepress experts, but they don't need strippers, separators, and platemakers the way they used to. Computer-to-plate helped reduce the staff, and then digital printing continued that trend. So the past five to seven years has been largely a consolidation and digital printing story.

Figure 34. Number of employees per establishment, 1998–2015



Printing Industry Capacity Utilization

We always include capacity utilization more out of tradition or habit than any other reason. We have found it to be an increasingly anachronistic economic indicator for the industry, although it can be important for individual companies, but even at the individual level, it's a flawed metric. We include it because people still like to refer to it, and it's not *completely* unimportant, although people can attach too much significance to it.

Capacity utilization is a measure of the proportion of potential output that a company or industry actually produces. It's designed to identify how much "slack" there is, or the extent to which production could be increased without incurring additional costs, such as having to buy more equipment, hire new employees, and so on. In other words, are the presses running as much as they could be? If you have a capacity utilization of 100%, you are producing as much as you can. The idea is to use the figure to gauge pricing and thus profits.

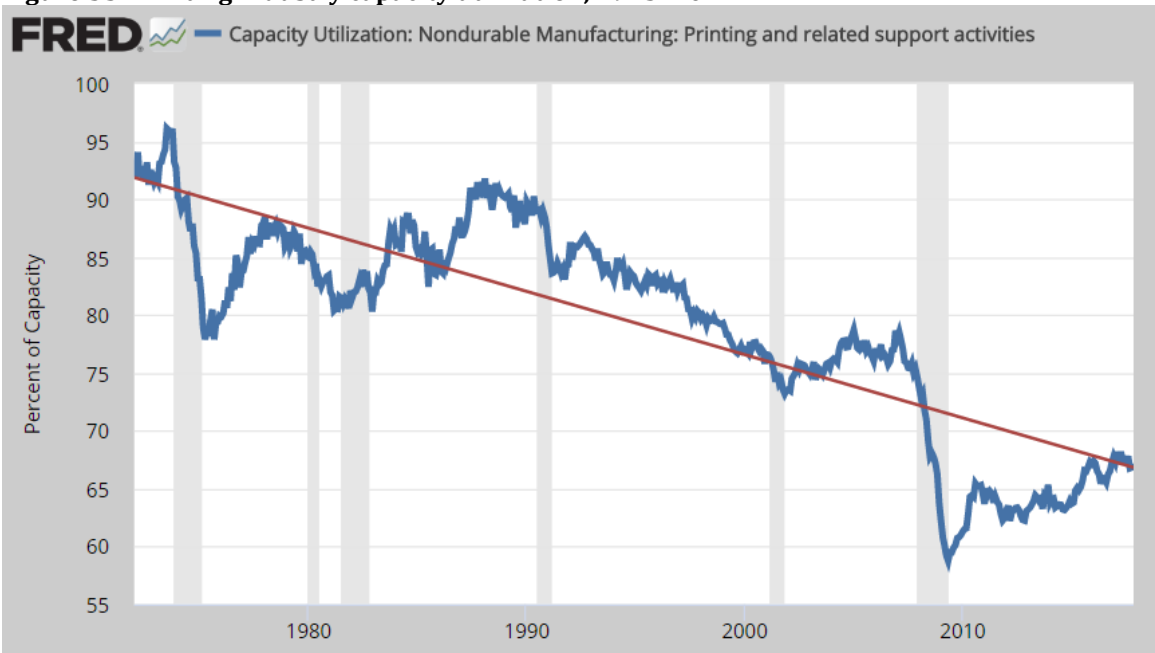
The problem with this metric, at least for the printing industry, is that it assumes that prices and profits are solely dependent on production capability. Other inputs are involved beyond sheer production capacity. The calculation does not reflect the unit costs of goods (not all equipment is the same), the selling prices of output (some printed goods are more profitable than others), or the effects of wise management or skillful workers. Skilled employees can reduce unproductive utilization and increase profits—and automation can also increasingly serve that function.

The biggest drop in capacity utilization was in the 1980s, when the value of printed goods rose thanks to cost reductions from digital prepress and the growth of process color printing, which had greater ROI than black and white. As a result, profits were good even though utilization was going down.

In recent years, capacity utilization has been getting better, although with all the consolidation we have been experiencing, you'd think it would be stronger, but it's still nowhere near its pre-recession level. We can blame a large part of this on the job mix issue. We question the use of capacity utilization because a lower utilization is often blamed for lack of pricing power, which is not likely to be the case. Think about that a minute: how do you increase capacity utilization? Close plants. The thing s, we've *been* closing plants for 20 years now, and the pricing issue is no better, as our own survey data have repeatedly told us. How long have people complained about there being too many printers?

We've remarked elsewhere that pricing challenges have many causes, but capacity utilization is not one of them. This is why we advise caution when using certain kinds of metrics; they can often lead to illogical conclusions.

Figure 35. Printing industry capacity utilization, 1975–2017



Producer Price Index

The Producer Price Index (PPI) is a weighted index of prices measured at the wholesale, or producer, level. The Bureau of Labor Statistics' PPI shows trends within specific industries. In other words, how much—more or less—does it cost to produce what a given industry or market produces? Different industries that produce different products have different inputs. For printers, it's equipment, paper, ink, and other consumables. For the creative markets (designers, ad agencies, etc.), it's computers, software, and other tools. In some cases, those inputs are getting more expensive (paper, for example, in the case of printers) and in some cases, cheaper (software, in the case of creatives).

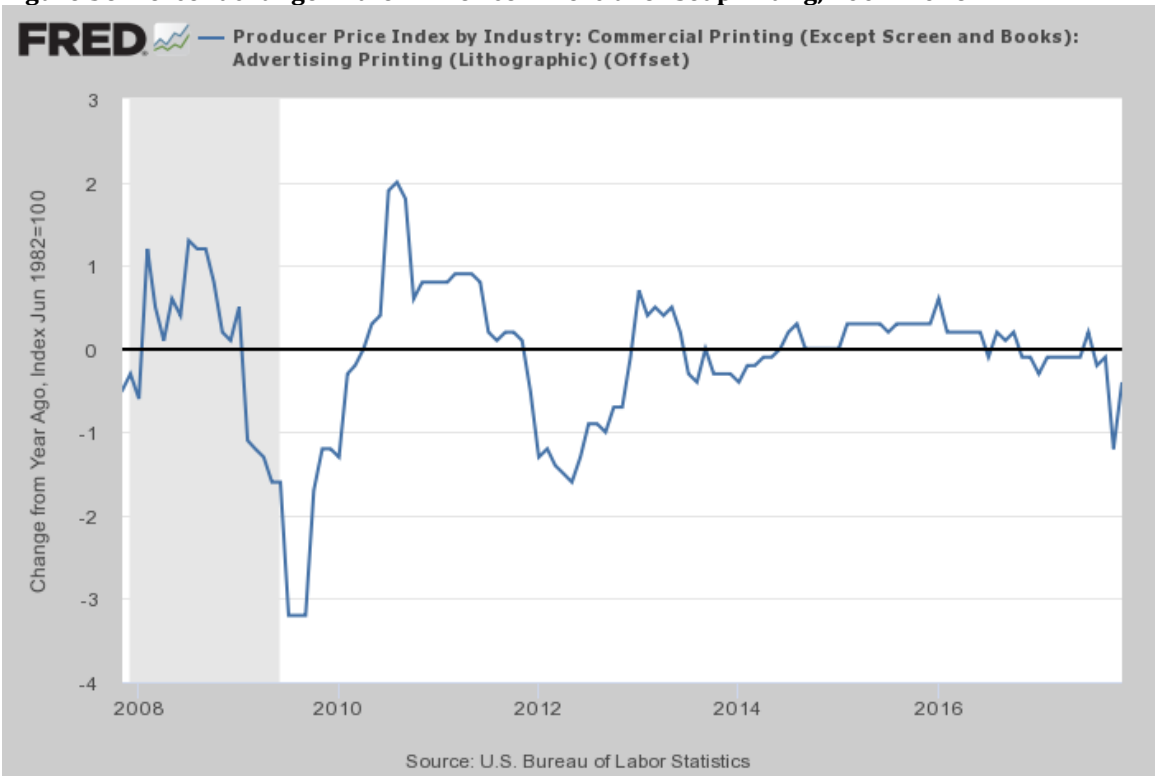
We typically look a the PPI for different aspects of printing, as well as related communications. As you can see from Figure 36, the PPI for offset has plummeted.

In some ways, this is a calculation issue. There is always the question of what should we use to deflate prices of the printing business. We often use the *Consumer* Price Index (CPI) because that reflects the prices of most relevance to our own wallets. But PPI helps us understand what's going on with supply and demand.

Here's the reason: the prices of the goods you are selling and the materials, labor, etc. The only things that are declining in terms of costs are certain technologies, such as cellphones costs. There is not a whole lot that is really going to impact printers' costs. Revenue is affected by market prices, and all other costs are following the CPI. So, if you can't raise prices and are having trouble getting sufficient demand, and costs are going up, you can't cover those costs properly and as a result the bottom line looks really bad.

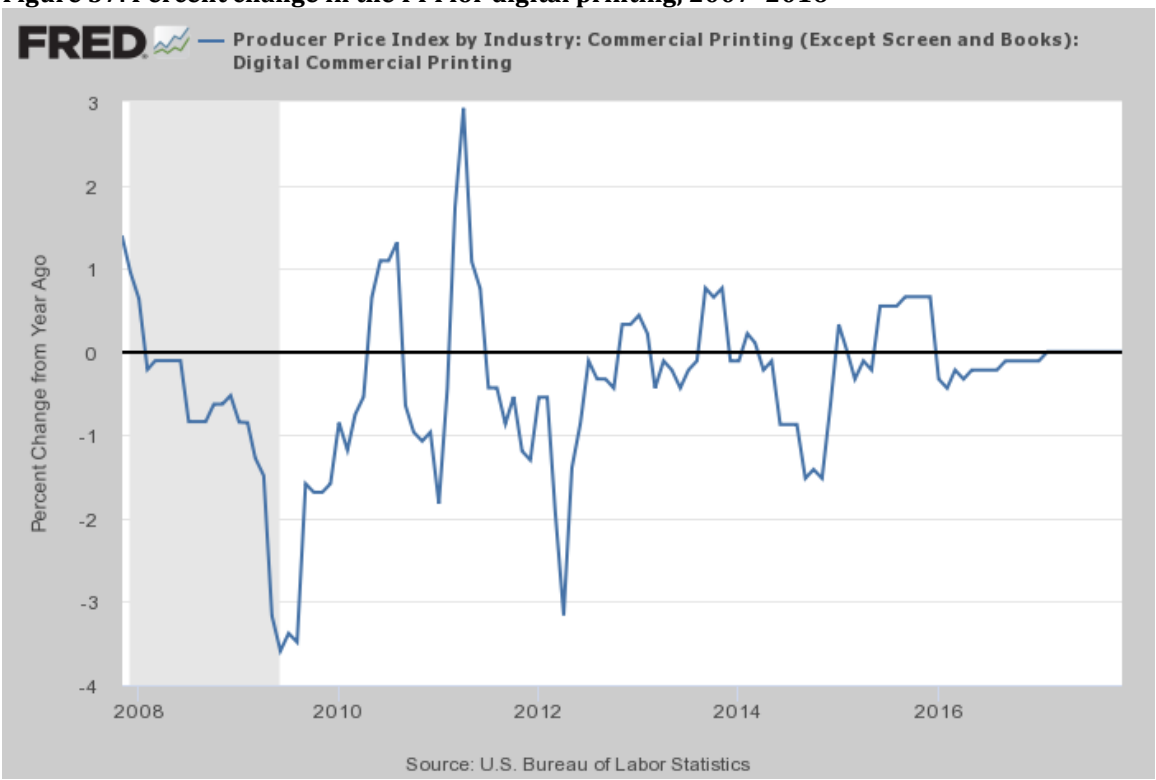
And this is the crux of the problem: this has largely been the story of the industry, costs increasing, demand decreasing, and pricing a challenge. Still, this issue is not affecting everyone in the same way. As we will see in the profits data, comparing plants with under $25 million and over $25 million in profits, the precipitous nature is mainly among large printing plants because the big demand, big volume items are not what they used to be. However, the equipment is still designed to produce those things. (Remember our economies of scale discussion in Section 1.) So those fixed costs just keep staring them in the face and they can't downsize fast enough. When they try to move into digital technologies that require shorter runs, they can't cover the downward pressure of the legacy part of the business.

Figure 36. Percent change in the PPI for commercial offset printing, 2007–2016



The change in PPI for digital printing, on the other hand, has been remarkably steady.

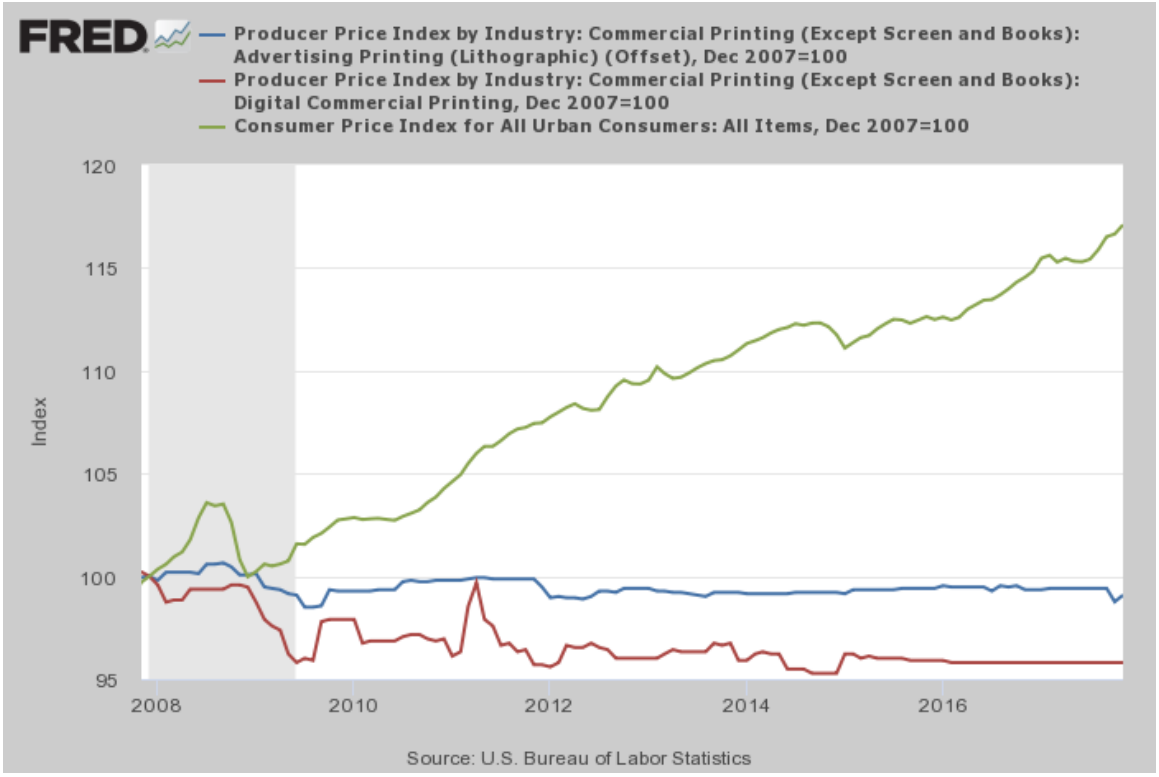
Figure 37. Percent change in the PPI for digital printing, 2007–2016



But when you compare the change(s) in PPI to the change in CPI, it gives you a good sense of how printers' costs are going up on a per-unit basis. Remember, the inflation report does not tell you anything about the supply of, or demand for, goods. All it tells you are their prices, so you still have to try to work out *why* prices have changed. There may be price pressures inside the cost structure and the value production side of the business, and market prices may not be keeping up with them, which, again, is why "pricing" remains such a challenge for our industry.

Look at the gap (17 percentage points) between the blue line (commercial printing PPI) and the green line (CPI) in the chart below. (It's even bigger for digital printing, the red line.) On the offset side, you have lower prices than you had seven years ago and on the digital side, you have lower prices than you had five years ago. On the plus side, with digital, you have newer equipment that is more efficient, especially in that digital presses are not long-term investments and can be upgraded or replaced fairly readily.

Figure 38. Percent change in the CPI vs. PPI for commercial offset and digital printing, 2007–2016



In Figure 39, we look at the PPIs of various kinds of print vs. the CPI. Book printing prices have fallen even as the volume of books printed have fallen. The prices of individual books can go up because the long-run inexpensive books are no longer being sold.

Flexo has been pretty steady these last few years, and digital has yet to steal any of flexo packaging's thunder, although that threat continues to loom.

Screen printing has backed off, which makes us wonder if a) specialty and promotional items are not selling as well as they had been, and/or b) digital inkjet equipment, which can now print on the same kinds of materials as screen but in shorter, more customized/personalized runs, is having an impact. We think it's a healthy dose of b) with a little bit of a).

Figure 39. Percent change in the CPI vs. PPI for commercial offset, digital, screen, book, flexo printing, 2007–2016

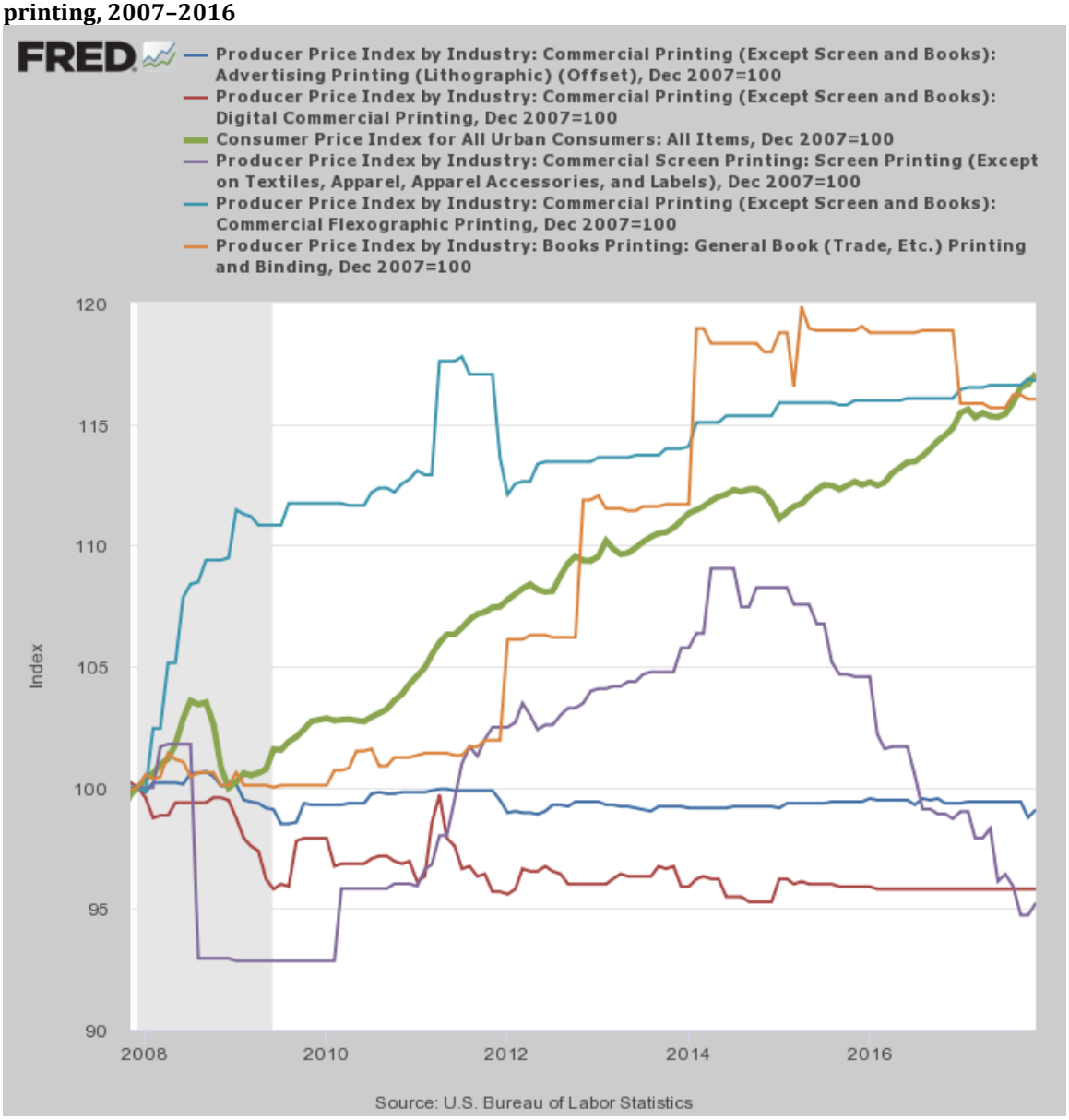
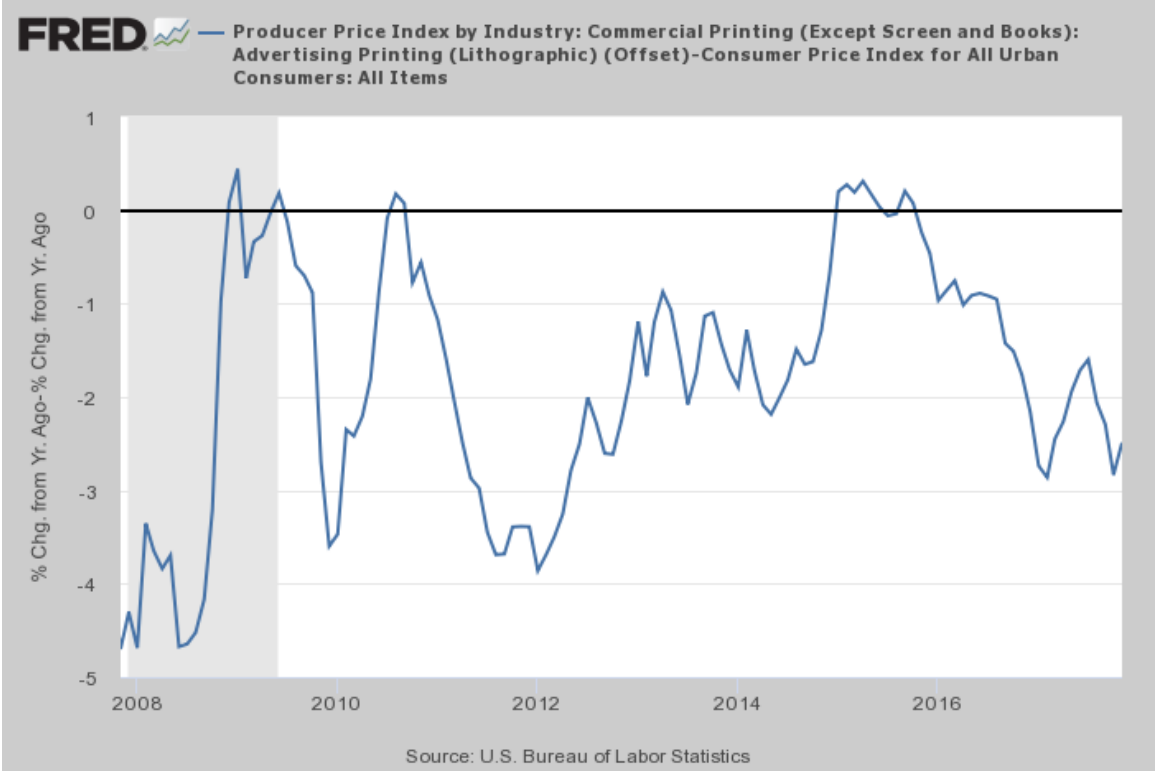


Figure 40 represents the shortfall that offset printing prices have had against the Consumer Price Index. One way of interpreting this is that for every dollar of revenue, the print business needs to find 2.7 cents of savings in order to cover some of the increases in costs.

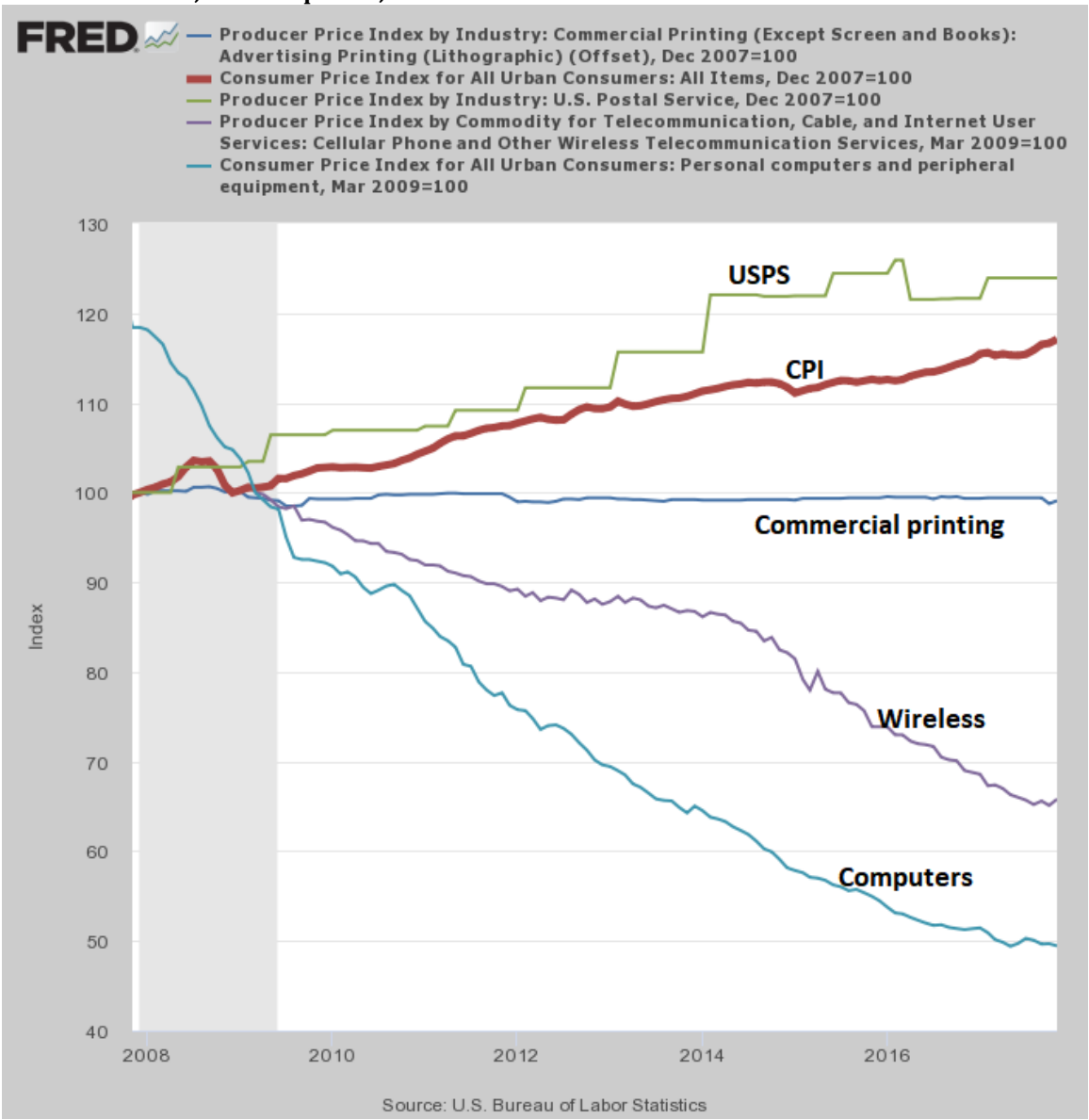
In other words, print is getting cheaper every day because its price lags general inflation. This is a severe constraint on printing businesses because they have to make up that difference elsewhere in their organizations. That is, productivity in a combination of forms must pay for that pricing shortfall. It's not easy being a print business owner under these pricing conditions.

Figure 40. Net annual decline in printing prices vs. CPI, 2007–2016



Here is our traditional chart of printing prices compared to the prices/costs of other technologies. Commercial print is flat as a pancake, while the USPS is increasing its prices even more than CPI. Prices have been steady (kind of) for two or three years but they're still higher than inflation and still don't reflect competition from other products. Wireless and computers continue to drop in price.

Figure 41. Percent change in the CPI vs. PPI for printing prices, postal costs, wireless communications, and computers, 2007–2016



Industry Profits

Commercial printing profits have been rather stable over the past several years, bouncing up and down between $2 and $4 billion. In fact, profits have been generally more stable than shipments. Annualized, profits form Q3 2016 to Q3 2017 were $2.52 billion.

It has been interesting to look at the profitability of large print businesses and compare it to that of smaller businesses (see the tables following the line chart below). Until 2007, large and small shops were pretty close in terms of their profitability, but then smaller businesses started doing much much better in terms of profitability. Average profitability since 2007 for print businesses with *less* than $25 million in sales has been 4.66%, about three-and-a-half times that over the more than $25 million businesses. Since 2012, that profitability gap has only grown wider.

Why is this? Again, it's a function of survivor bias. That is, the herd has been culled. Smaller printers can't refinance themselves or merge the way larger ones can. So when they go bad, they go bad quickly and exit the market. When big printers go bad, they still have assets they can sell off to stay in business, which prolongs the process. In the meantime, they run into trouble unwinding all their assets.

Figure 42. Printing industry shipments vs. profits, Q4 1995–Q3 2017

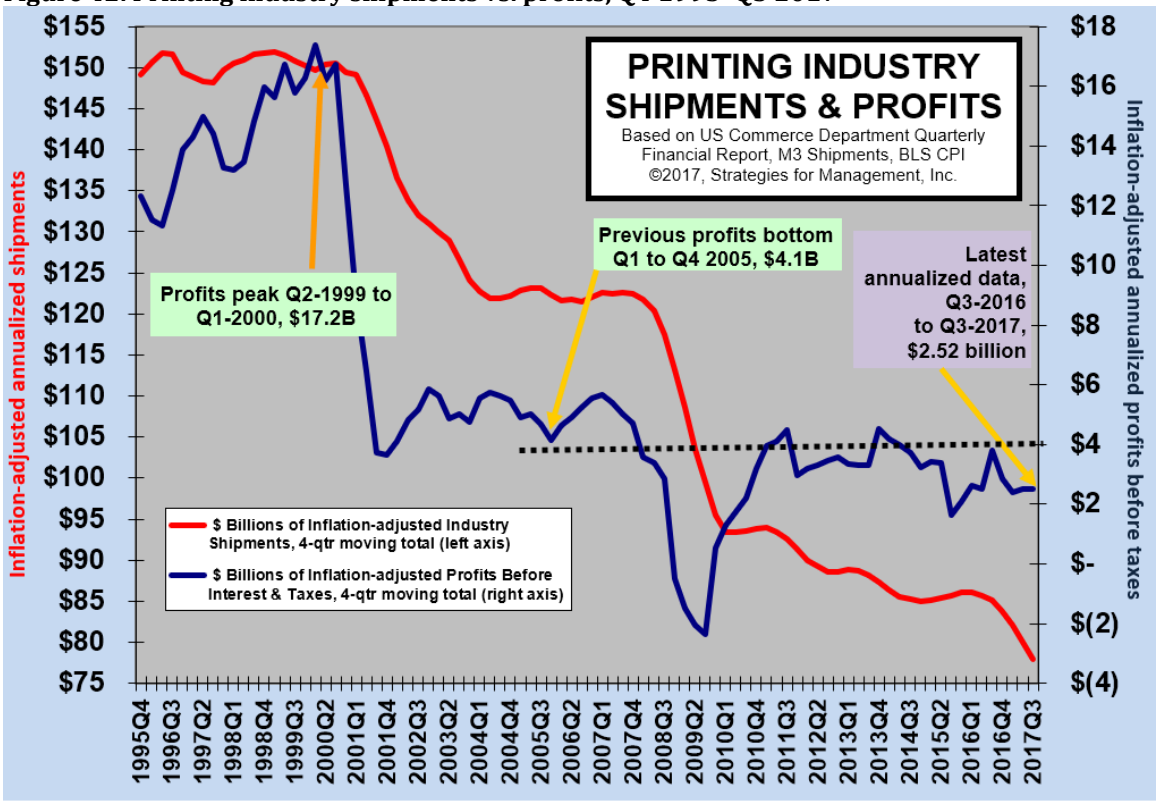


Figure 43. Printing profits by assets, Q2 2016–Q3 2017

Net Income Before Taxes	2Q 2016	3Q 2016	4Q 2016	1Q 2017	2Q 2017	3Q 2017	Simple average, last six quarters
All commercial printers	**4.56%**	**3.48%**	**-0.76%**	**4.48%**	**5.58%**	**3.96%**	**3.55%**
<$25 million in assets	9.31%	4.20%	3.51%	7.27%	6.97%	6.72%	6.33%
>$25 million in assets	-0.81%	2.80%	-4.71%	1.69%	4.22%	1.34%	0.76%

NOTES: Approximate breakpoint for $25 million is 100 employees; Q3-2015 had -$1.3 billion and Q4-2016 had -$0.75 billion of "writedowns," defined as "nonrecurring items, including gain (loss) on sale of assets, restructuring costs, asset writedowns, etc."; Data are from the Department of Commerce *Quarterly Financial Report* released December 5, 2017.

Data analysis ©2017, Strategies for Management, Inc.

Table 28. The profitability gap—small vs. large printers

	Since 2007	Since 2012
<$25MM	4.66%	6.22%
>$25MM	1.33%	1.09%

And there's more…

The table below adds profits as a percentage of sales and interest expenses for the prior six quarters. Note the very high interest expense of the larger firms. These firms have written down goodwill from acquisitions that turned out to be overvalued, closed plants, and jettisoned obsolete equipment and other nonperforming assets. Those assets may no longer be on the balance sheet, but the loans and financial obligations incurred in the support of those assets are still there. These obligations can only be disposed through bankruptcy. Until then, the interest payments are a reminder of their malinvestment, their inability to assess future market conditions at the time of the asset acquisitions.

Table 29. Printing industry profits as a percentage of sales plus interest expenses, past six quarters

Assets <$25 million		**Assets >$25 million**	
Profits	6.30%	Profits	0.76%
+ Interest	0.75% ← 11%	+ Interest	4.50% ← 86%!
Total	**7.05%**	**Total**	**5.26%**

The smaller enterprises, on the other hand, had always been considered poor credit risks, often "red-lined"[15] by financiers. Because outside financing was hard to come

[15] "Red-lining" typically refers to marking on a map where mortgages and other loans should not be made because of high risk for non-payment. Some of the reasons are legitimate (such as environmental risk) and not (discrimination based on race and not objective factors). This, however,

by, these firms could not finance their mistaken management actions, or even their good ones, and were protected from the effects of the industry upheaval.

That raises a question. Profits are the payments for entrepreneurial risk. Interest payments are for the use of someone else's capital. Who owns these businesses? Eighty-six percent of the combination of profits and interest are paid to banks by the firms with more than $25 million in assets. It appears that the large enterprises are owned by the banks, and not by the stockholders.

This means that their decisions, even those that may be important to the future of the business, are subject to the risk assessments of outsiders who do not have the same entrepreneurial goals as the owners. That creates a serious strategic problem for righting these larger ships.

The smaller enterprises have greater freedom of action, even though they are capital- constrained. This is one reason why smaller businesses tend to use more leasing and volume payments (aka "click charges" in the case of digital printing), where the financial risks are often borne by the technology suppliers, and not the owners. Leasing attaches to specific assets, and not the business as a whole.

Red-lining of this sector of the industry perversely protected it from malinvestment.

is an industry issue and not a geographic one. Small businesses, in general, are considered risky, and owners often have to pledge personal assets to secure loans. In this sense, the assets securing the loans are not on the balance sheets of the smaller businesses. For the larger ones, those assets are.

Industry Capital Expenditures

As we saw in Section 2, print businesses don't have many big investment plans. Binding/finishing equipment (especially that compatible with digital presses) and software were top investment categories—but recall that number two on the investment list was "we have no planned investments."

The latest data tell us that about 3.5% of revenues are being spent on capital investments, and remember that "capital expenditures" can also include things like buildings.[16] One concern is the fact that consolidation spending is, in some accounting systems, considered as a capital expense (though not in the reports whose findings we cite). From a print business's accounting perspective, it counts toward capital spending. More importantly, though, it takes money away from reinvestment in the productive base of the company. There's only so much money hanging around.

It's interesting to look at cap ex data from a trade show perspective. Look at look at 1997. That was the year of the famous PRINT 97 where a plethora of digital, Direct Imaging, and computer-to-plate systems was introduced. CapEx fever was also fueled by the euphoria of the dot-com bubble. What happened, though, was that all the presses bought in 1997 were sold off in 2003 (look at the spike in used equipment bought in 2003 in Figure 45). GraphExpo 2007 and 2008 also look like they were decent shows.

[16] Even going back to our original TrendWatch surveys back in the 1990s, we always included "delivery truck" on our questionnaire, because it's tempting, but wrong, to assume that "capital investment" always means some kind of production equipment.

Figure 44. US commercial printing capital expenses as a percentage of revenues, 1967–2015

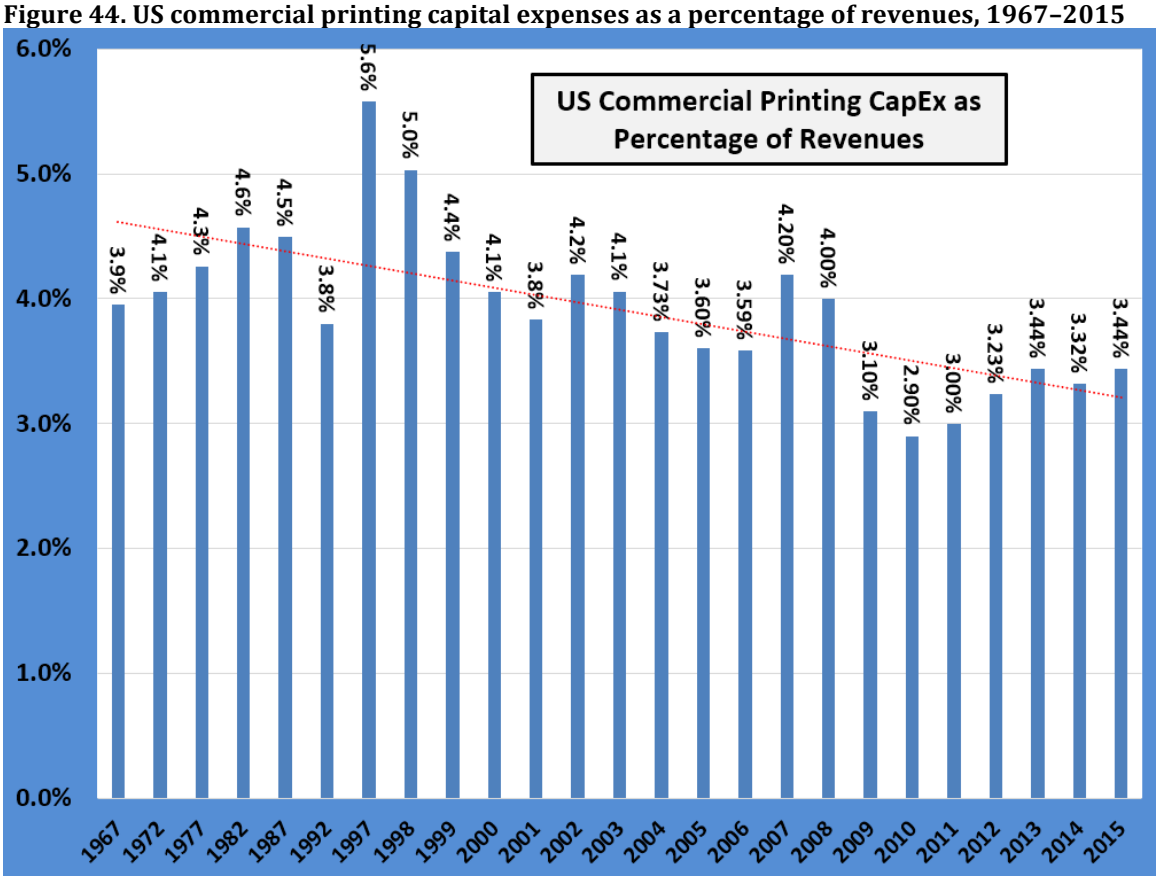
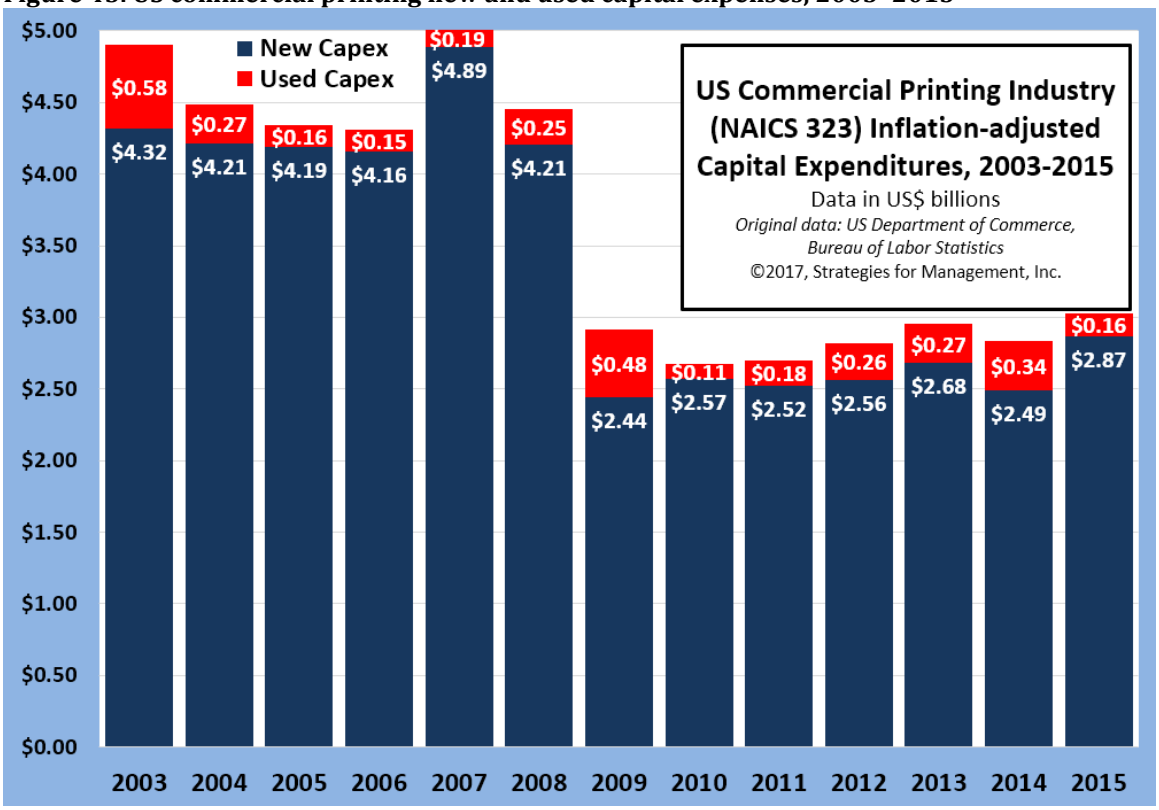


Figure 45. US commercial printing new and used capital expenses, 2003–2015



Publishing and Advertising

The figure below rounds up the latest revenue data for the various publishing segments as well as ad agencies.

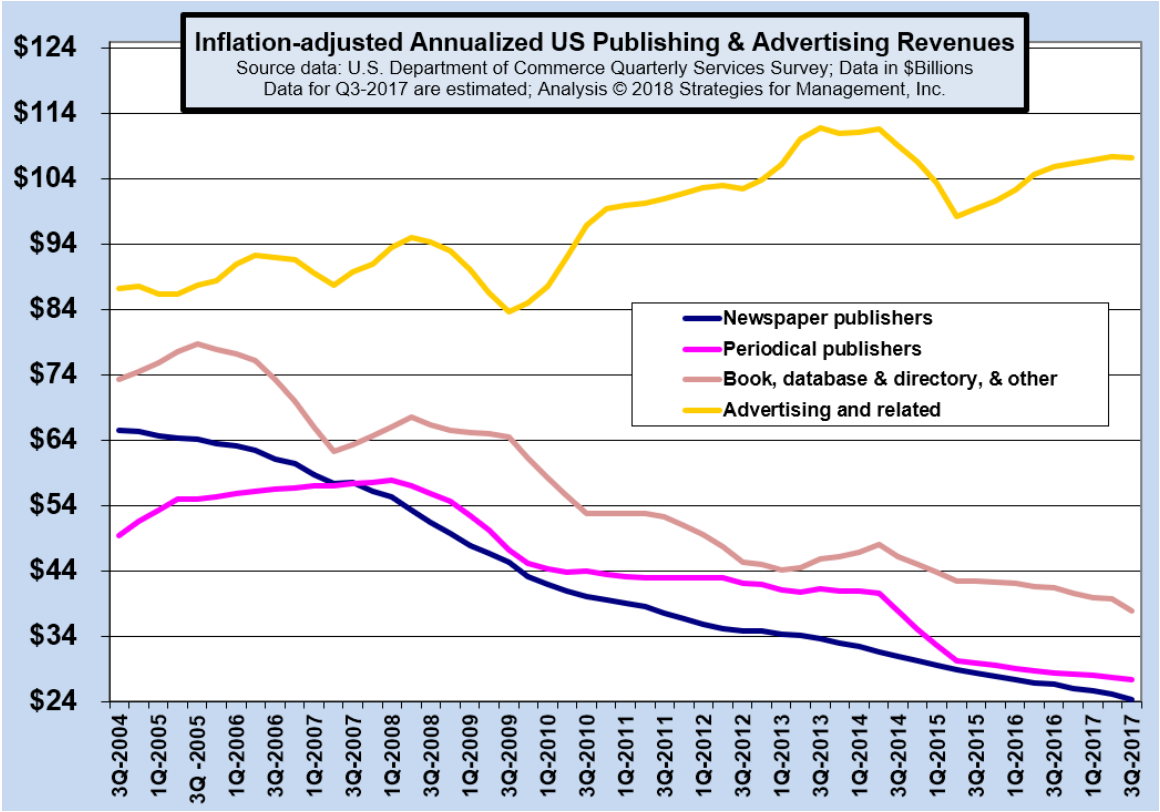
First of all, it's obvious we are going to have to adjust the *y*-axis next year for the newspaper industry, whose revenues just keep dropping. On an annualized basis, since 2004, newspaper publishing revenues have plummeted by about $40 billion. Periodical and book publishers aren't in much better shape.

Advertising revenues have flattened out to some extent. After all, as revenues for the places that used to feature a lot of advertising—periodicals and newspapers—have dropped, that is reflective of perhaps not just a shift to non-print forms of advertising, but other kinds of marketing initiatives than what we think of as "advertising." A lot of it is content marketing, a greater reliance on social media and other forms of digital marketing, smarter use and negotiation of cable and TV. After all, TV audiences are smaller, people are cutting the cord faster, and streaming is the "new cable," and conspicuously is largely advertising-free. (Ironically, you're now exposed to more ads in a movie theater than at home if you primarily stream programming.) With content marketing, more work is done internally or by freelancers. Most content marketing is not that sophisticated, and it takes the place of more sophisticated advertising campaigns.

You don't get a sense of a robust economy here—but then looking at printing shipments data you also don't get a sense of a robust economy. And maybe that's a new trend coming to the fore; there has traditionally been a connection between ad spending and GDP, where advertising picks up one or two quarters after GDP picks up (and it's the first thing that is cut back on during a recession). Perhaps the ad spending/GDP connection, like the print shipments/GDP connection that once existed, is simply being severed.

The nature of advertising is changing because things like content marketing, e-newsletters, mobile apps, and things like that can be done internally or with freelancers, and offer much more bang for much less buck.

Figure 46. Inflation-adjusted annualized US publishing and advertising revenues, 3Q 2004–3Q 2016



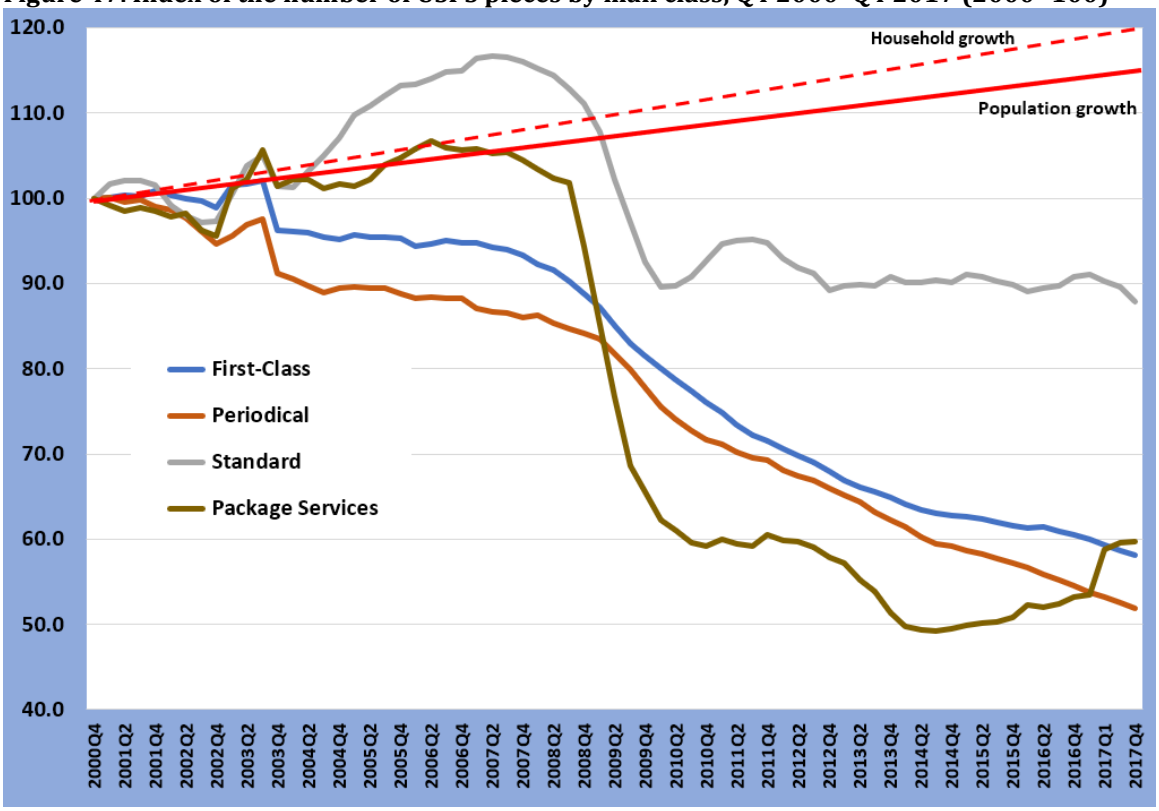
The Post Office

Not surprisingly, the number of First Class pieces being mailed continues to drop. That's an old story. Virtually every other class of mail has also been dropping. We added Package Services to our postal data roundup because packages and parcels have become one of the (if not the only) highlight of the Postal System, largely thanks to ecommerce, and Amazon in particular. It will be interesting to see what the last quarter of 2017 (Christmas) looks like. (The chart below uses Postal Service quarters; Q4 ended September 30.)

The USPS used to have a better package services business, but it's been doing OK even with competition from UPS. At the same time, we also have to remember that there are more and more things that don't need to be sent—ebooks, in particular. In-store pick-up, which a lot of retailers offer, can provide further savings for consumers, although depending on the store, these items may be sent using their own transportation services and not sent through either the Post Office or UPS.

It's also worth mentioning that none of these postal items have kept up with population growth—or even household growth. (We added "household growth," which is becoming a more useful metric. Some of those households are single people living alone—either young people, or older people who have been widowed or divorced later in life.)

Figure 47. Index of the number of USPS pieces by mail class, Q4 2000–Q4 2017 (2000=100)

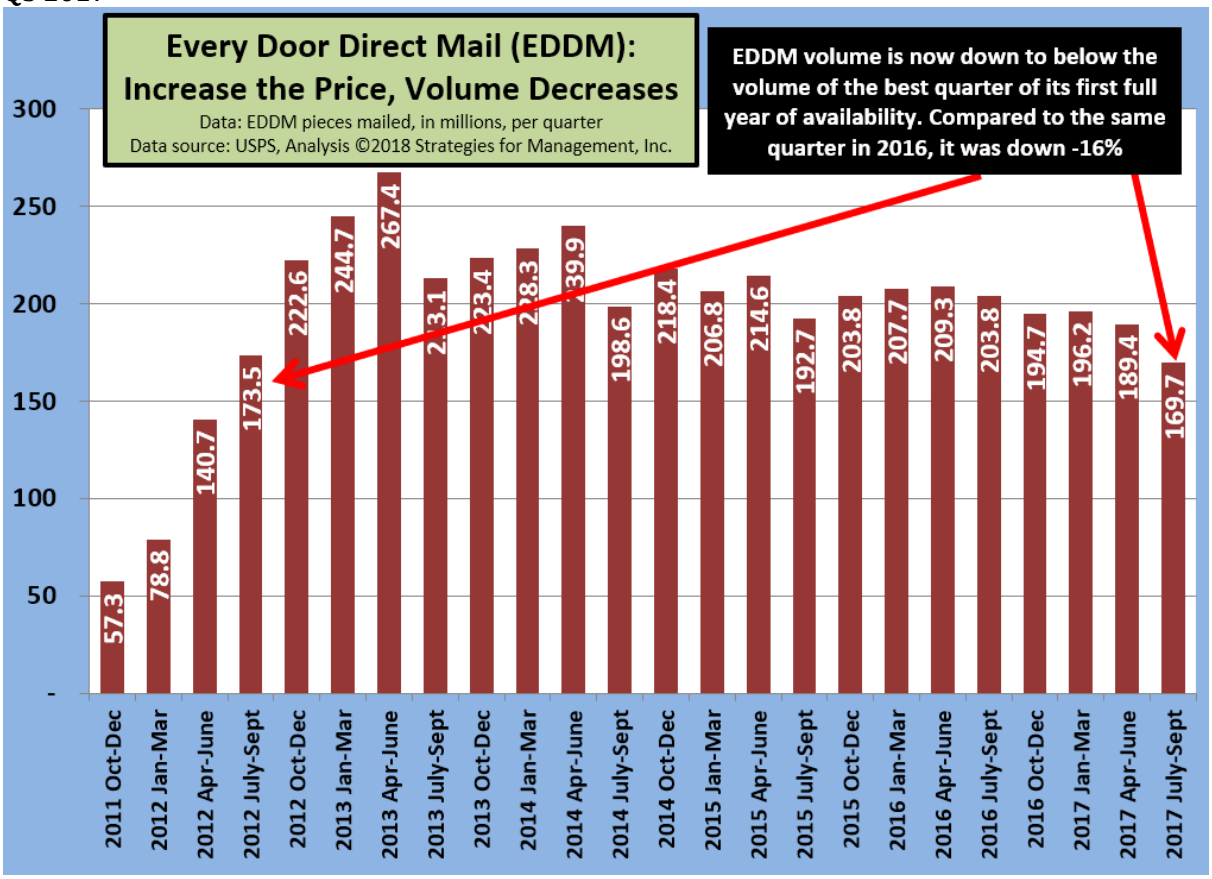


Closing the Door On Every Door Direct Mail?

Every year, we wipe away a few years at the lingering demise of Every Door Direct Mail (EDDM). It's such a great idea: local businesses can target print direct mail campaigns literally by street, or by whatever geographical breakdown they want. And yet it's tragically under-utilized. It got off to a slow start when it was launched in 2011, and volume peaked two years later, but it's been downhill ever since.

What happened? First of all, the USPS raised the price, which wasn't a help, especially as the price of other media kept falling, and then they didn't promote it. Somehow, they were convinced they couldn't make money with it. You'd think it would be a no-brainer, and they could lower the price to be more competitive.[17]

Figure 48. Number of Every Door Direct Mail pieces per quarter (millions of pieces), Q4 2011–Q3 2017



[17] Some print businesses actively promote their own use of EDDM for customers. 4Over, for example, has actively promoted its EDDM services (https://printplanet.com/articles/263975-targeted-direct-mail-without-a-postal-permit—yes).

6. Prevailing Macroeconomic Conditions

In this section, we pull out to get a larger sense of the general economy.

GDP

In Figure 49 below, the blue line is the year-to-year GDP, while the red line is quarter-to-quarter; the former removes some of the data noise endemic to the latter. GDP has been getting better, but is still nowhere near the 3.3% post-World-War II average, although we're starting to get there. It has broken through a couple of times, but not in a sustained manner.

Figure 49. Percent year-over-year (blue line) change in real GDP vs. quarter-to-quarter (red line), 2008–2017

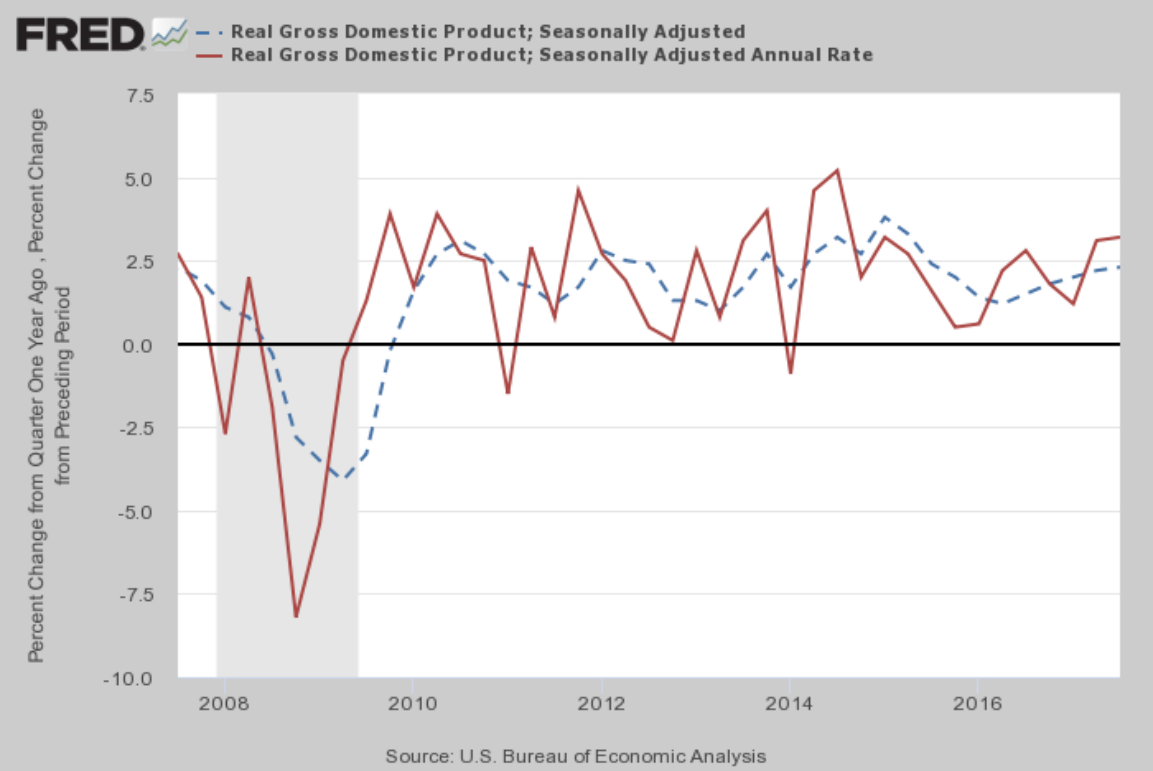
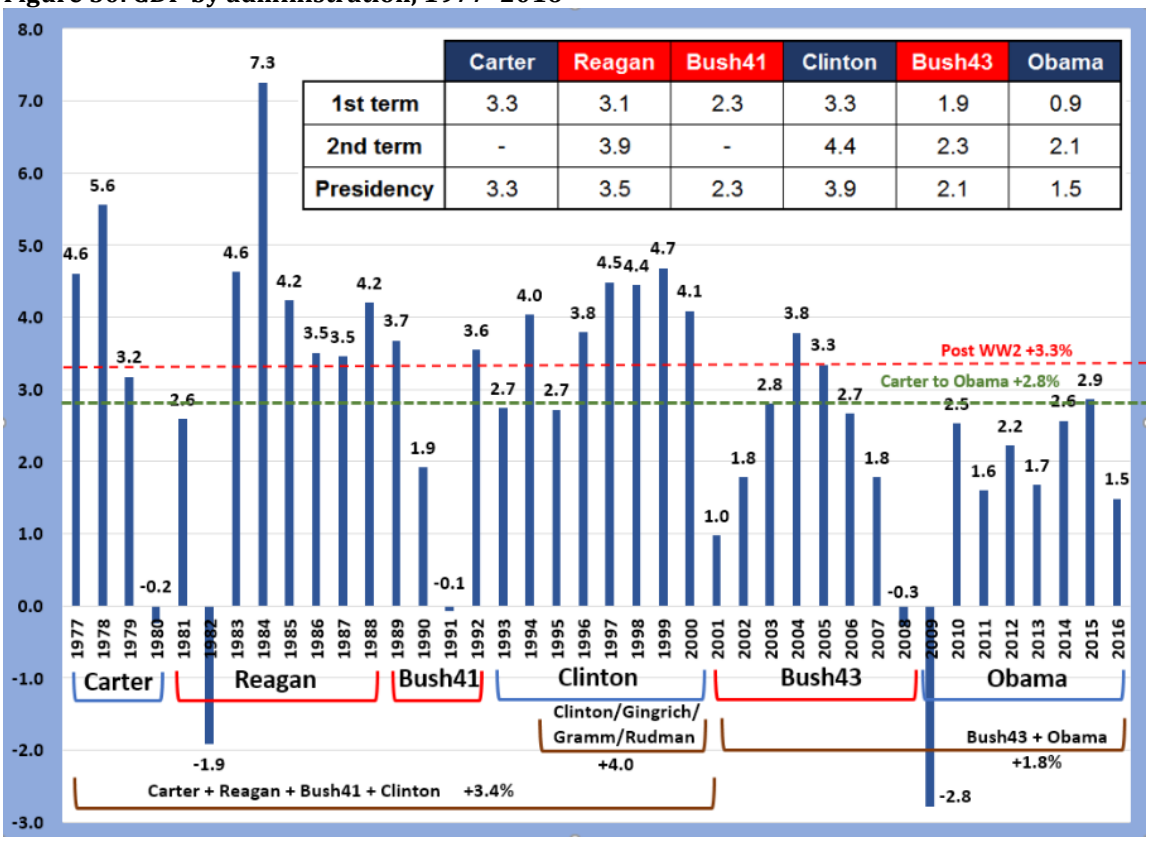


Figure 50 below shows yearly GDP growth going back to 1977. Let's say the NY Fed is right when it forecasts that Q4 2017 GDP growth will be 4.0%; that would raise it for the year to close to 2.9%, which would be the best performance since 2015. (That number won't be released until the end of January). Obviously, the milestone years were the 1995 to 2000 "boom" years, as well as the period immediately following the 1982 recession.

Figure 50. GDP by administration, 1977–2016



	Carter	Reagan	Bush41	Clinton	Bush43	Obama
1st term	3.3	3.1	2.3	3.3	1.9	0.9
2nd term	-	3.9	-	4.4	2.3	2.1
Presidency	3.3	3.5	2.3	3.9	2.1	1.5

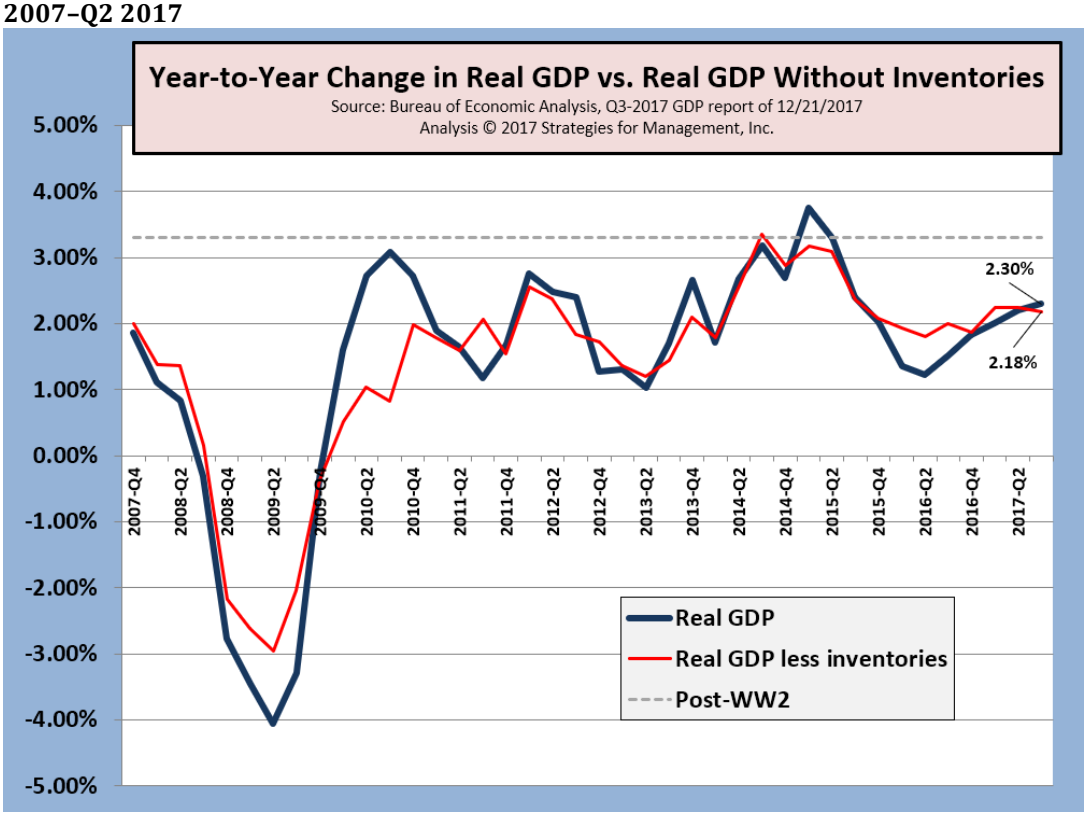
GDP Less Inventories

As always, we point out the importance of looking at GDP data with and without the distortion of changes in inventories. Theoretically, net inventories should be zero, because every business should be able to precisely match production with demand. Theoretically. In the real world, however, that's impossible, so there are occasional changes in net inventories that affect the measurement of GDP. Inventory buildups make GDP larger, but there also can be a warning sign that GDP will be lower in the future as inventories are worked off.

When economies are growing, inventory figures tend to be increasing due to optimism. A sign of a recession is a steep decline in net inventories that shows a correction occurring. It's hard to interpret what all of this means without a greater context: is an inventory build-up a reaction to expectations of the future, or is it a miscalculation about future business conditions? Unfortunately, we can only determine that in hindsight.

Sometimes it's better to just ignore net inventories and look at the underlying GDP figures. In Figure 51 below, the red line shows that economy is slow. Figure 49 above showed the variation on a quarter-to-quarter basis as well as a smooth year-to-year basis. Here, we see that from the fourth quarter of 2011 through the end of 2015, the real GDP and GDP less inventories were actually fairly close. There was a brief pulling away in 2016—inventories dropped—but they appear to have linked back up together again. Ultimately, this identifies a fairly sluggish economic environment.

Figure 51. Percent year-over-year change in real GDP vs. real GDP without inventories, Q4 2007–Q2 2017



Proprietors' Income

Figure 52 below shows the percentage change in proprietors' income for the past ten years from compared to current dollar GDP (Figure 53 zooms in to look at the past five years.) Proprietors' income is often seen as a surrogate for small business, and it tends to be out of phase with GDP as large businesses outsource work to small businesses at the beginning of recoveries and then make those services the first to be cut in expectations of a downturn.

Proprietors came out of the recession pretty strongly compared to GDP—that's a lot of freelancers, particularly those working in construction and related services, who took a beating after the housing crash that prefaced the recession. They seem to have eased back in line with the economy in general. If we look at the more detailed five-year chart, we can see more clearly the extent to which proprietors' income has lagged GDP since 2014.

Figure 52. Percent change in proprietors' income vs. GDP (10 years), 2007–2017

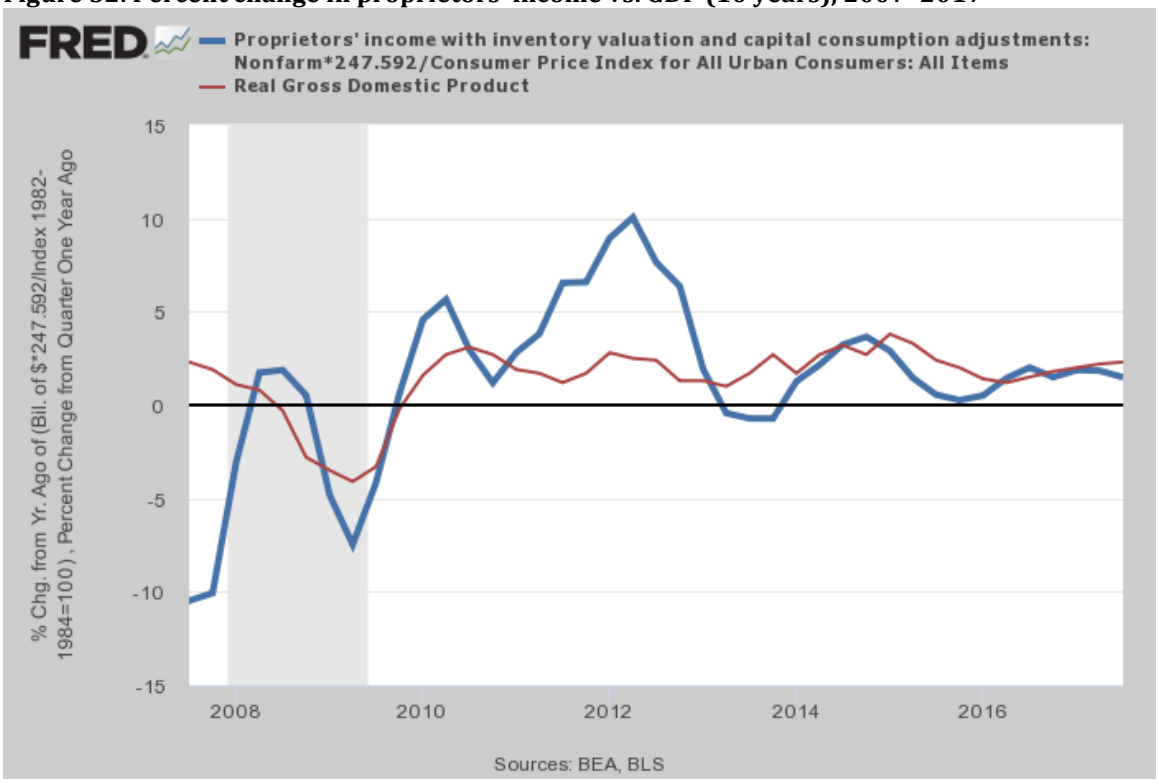
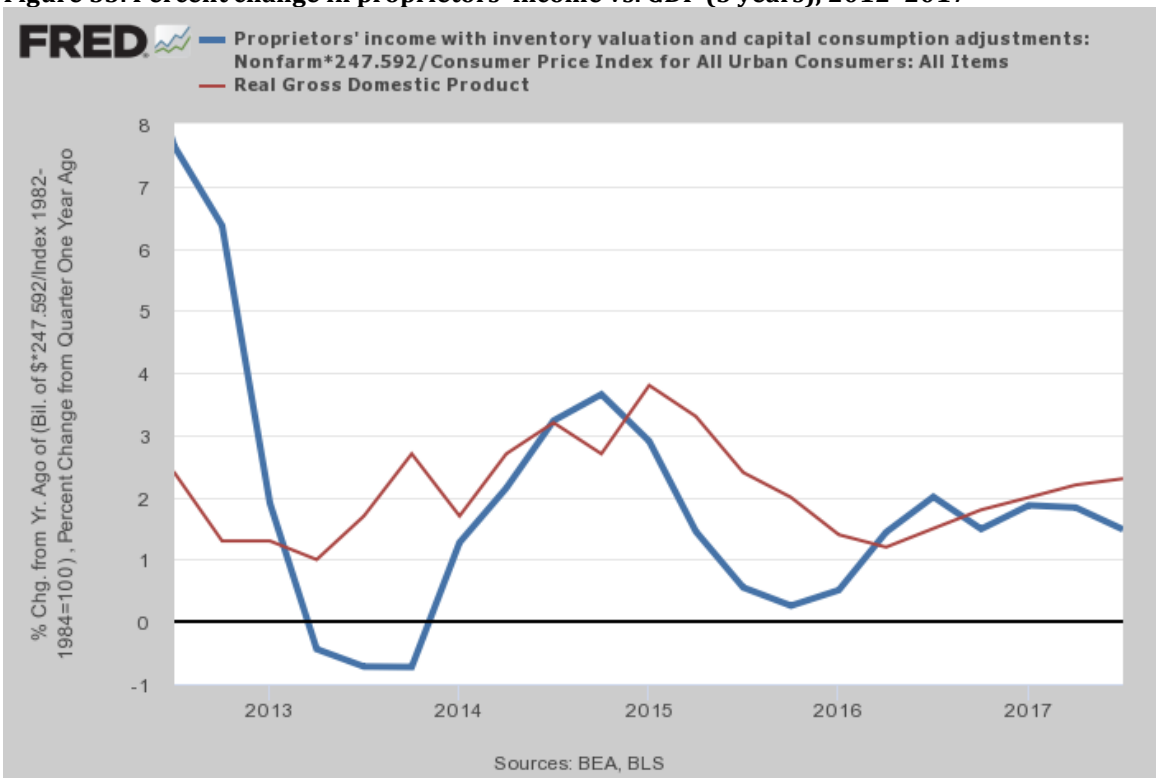


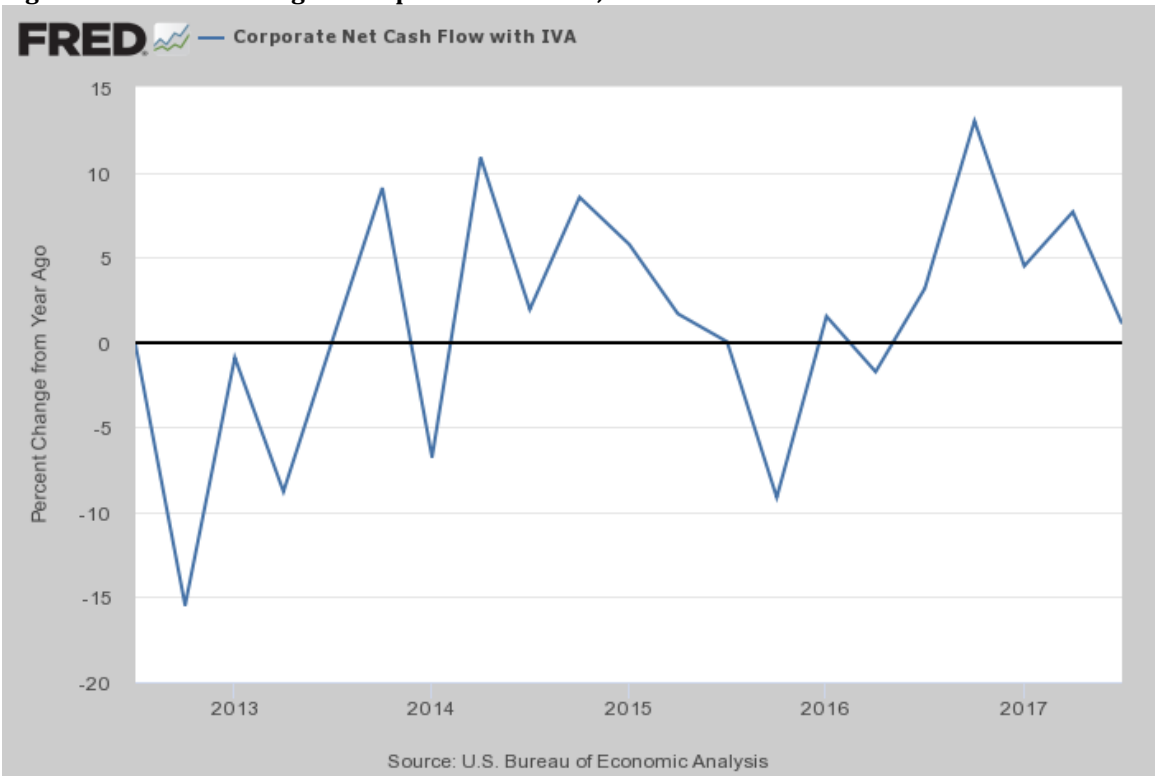
Figure 53. Percent change in proprietors' income vs. GDP (5 years), 2012–2017



Corporate Cash Flow

Likewise, corporate cash flow growth has been inconsistent for the majority of the 10s. It's been down this year, but may tick up substantially in Q4, and this is one area that will likely see some improvement in 2018 thanks to repatriation and the cut in the corporate tax rate.

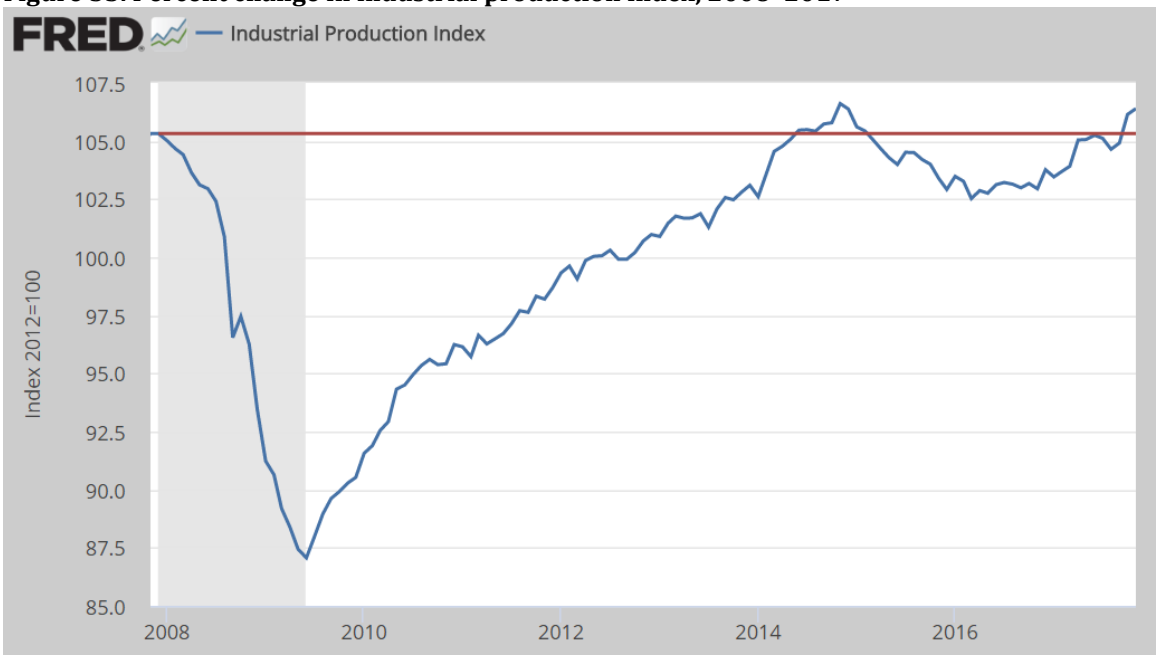
Figure 54. Percent change in corporate cash flow, 2012–2017



Industrial Production Index

If we look at the industrial production index, 2016 had been pretty terrible, and even though it us up in 2017, it is still about 7% or so below where it should be. It has broken through the recession line again, and while we don't think it will retreat, it needs to be higher than this to make up for all the time that was lost.

Figure 55. Percent change in industrial production index, 2008–2017



Durable Goods

Durable goods—items like appliances, home and office furnishings, lawn and garden equipment, consumer electronics, toys, small tools, sporting goods, and other goods that last for at least three years (per the official definition)—have been getting better. They retreated a bit in 2016, which could have been an election effect in terms of manufacturing. Durable goods started to perk up again in 2017.

Figure 56. CPI-adjusted durable goods orders (10 years), 2008–2017

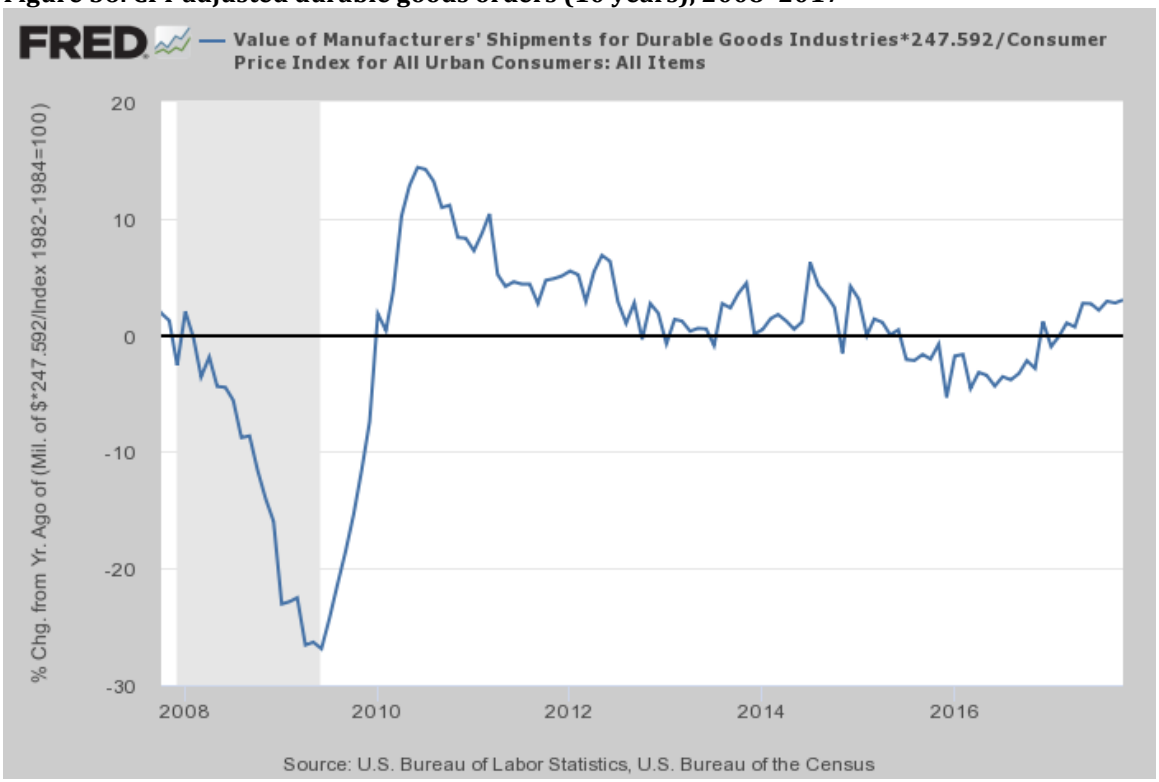
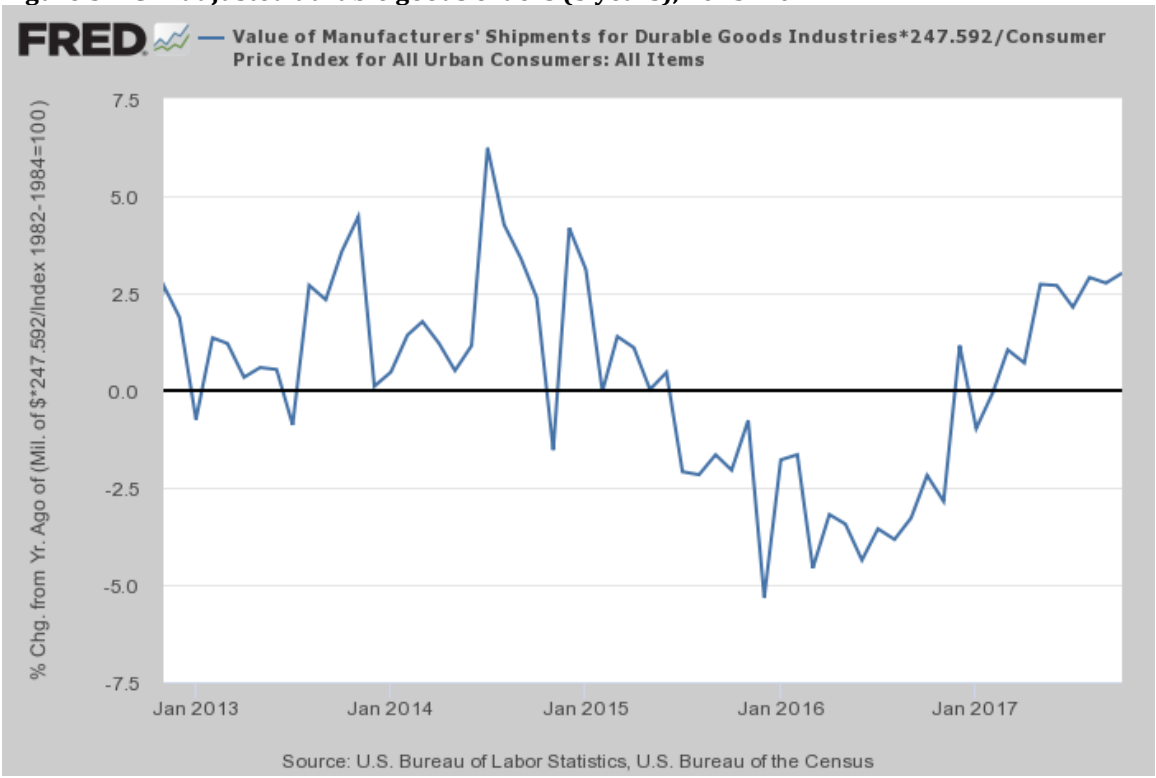


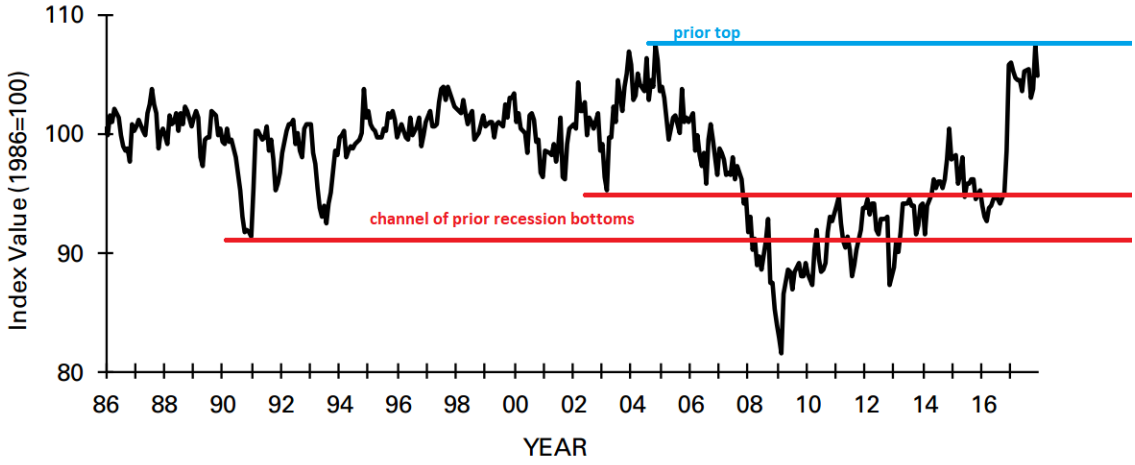
Figure 57. CPI-adjusted durable goods orders (5 years), 2013–2017



NFIB Small Business Index

The NFIB's Small Business Economic Satisfaction Index is based on the annual survey from the National Federation of Independent Businesses (NFIB). It's been pretty low since even before the recession, and there was a slight peak in 2014, although dropped immediately thereafter. This index seems to be tax law- and regulation reform-sensitive, and they seem to see forthcoming relief on both of those fronts. In some case this is warranted; there are some good things in the recently passed tax law for people who own businesses, but potential regulatory relief has been fairly vague save for businesses in the extraction industries. Specific items that will benefit small businesses have been fewer and farther between, save for some of the eroding of the Affordable Care Act.

Figure 58. NFIB Small Business Economic Satisfaction Index, 1986–2017

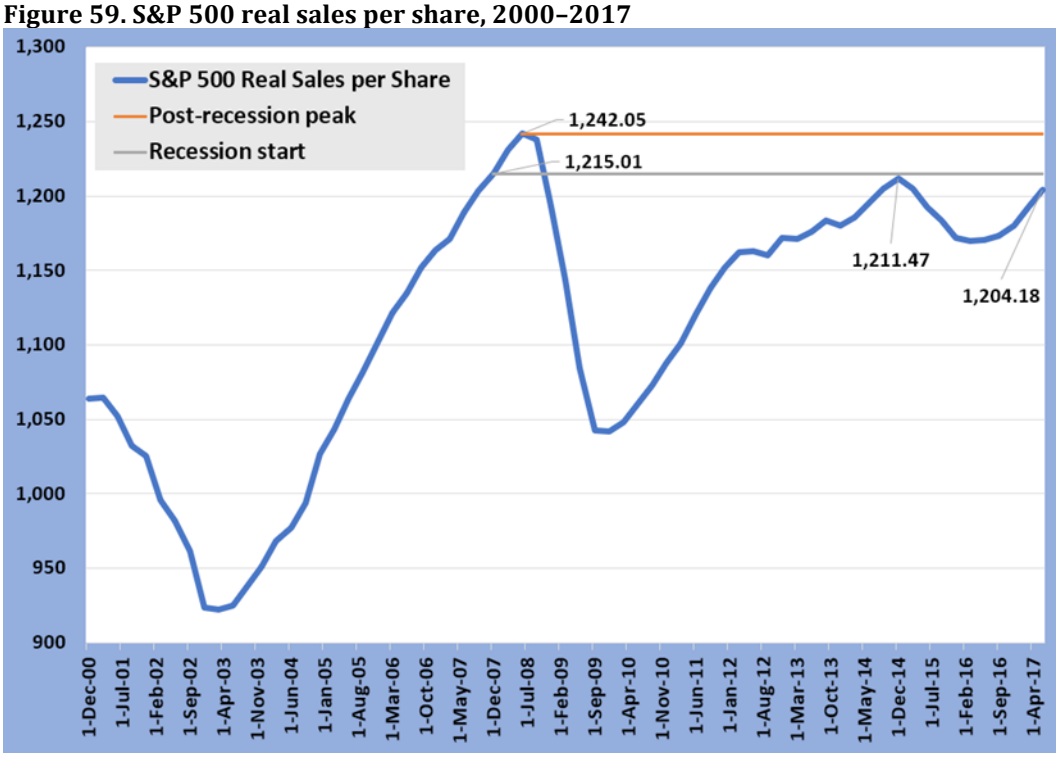


S&P 500 Real Sales Per Share

Meanwhile, at the other end of the business continuum are the S&P 500 companies. Just after the recession began, the S&P 500's sales per share, which lags other economic indicators, went up to over $1,200 (in Q4 2007, it had hit $1190), but it's never recovered. That is despite all the buybacks and other financial engineering, as well as initial stimulus spending and bailouts.

We won't have another good sense of how this will pan out for 18 months. We've seen the results of financial engineering, and it will be interesting to see the results of the rest of the incentives to actually produce stuff. These businesses have been improving their balance sheets by borrowing a lot of money at low rates, but the low rates will start to disappear fairly soon. If the economy becomes more active, a lot of new production and new projects will end up covering those interest costs easily.

Figure 59. S&P 500 real sales per share, 2000–2017



Personal Income

Real Personal Income

Real personal income has been doing better; by all accounts, the Q4 2017 retail season was very strong. In the last income report, income was only up a little while consumer spending was up more. This suggests increased confidence about wages in the future.

Figure 60. Real personal income, 2008–2017

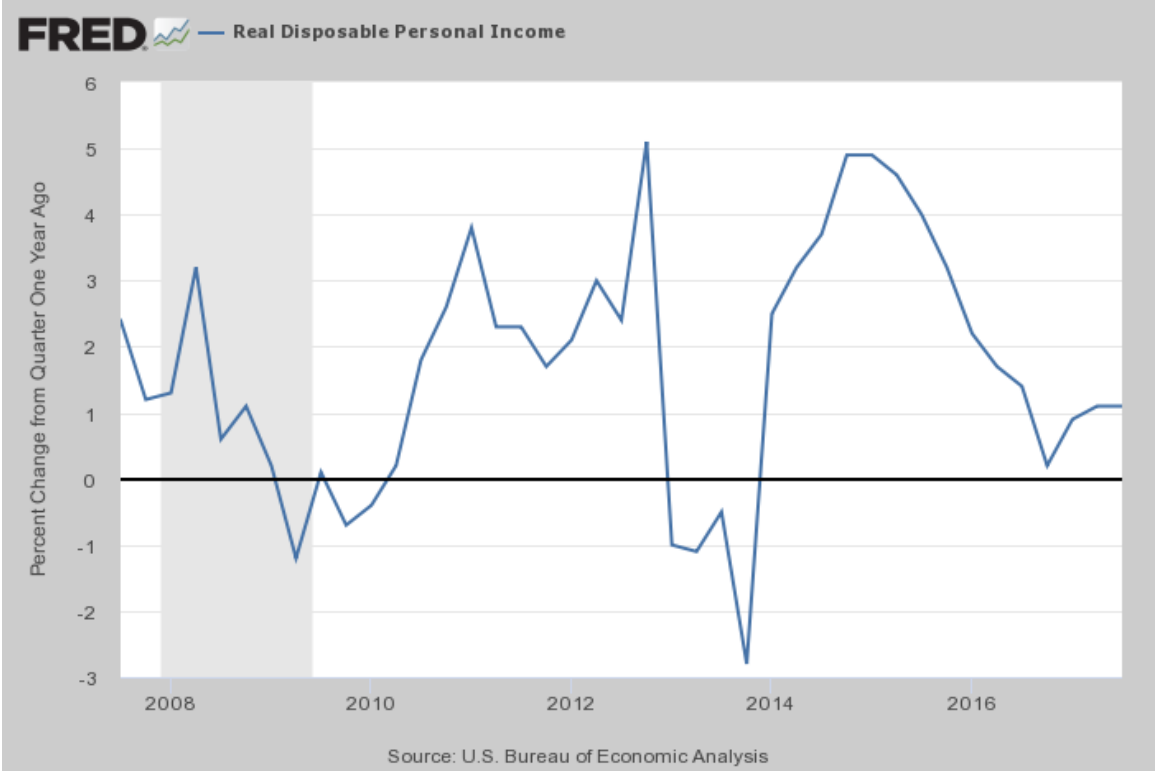
Real Disposable Personal Income

Disposable income is real personal income after taxes, and it is not up as much as real personal income. This should change substantially with doubling of the standard deduction as part of the recently-passed tax bill.

Here's the things with this chart. People can often decide to target a particular tax rate; that is, if they want to only earn up to the 10% or 12% marginal rate, they can control their income so they can earn up to $90,000 without getting into a marginal tax rate above 12%. That's going to be going on with a lot of small businesses; there will be a lot of deferred income. However, this will put a damper on the GDP number for the fourth quarter as they "forget" to invoice customers until 2018, or delay processing checks until the new tax year. We saw that effect in 2014, with a rise in income in 2013 prior to the implementation of the ACA.

By the way, with the tax plan's elimination of the deduction for state and local taxes as well as the mortgage interest deduction, there may also be a lot of individuals in states such as New York and California pre-paying their 2018 taxes in 2017. (Tax planners are not in 100% agreement that this is a good strategy, but the idea is in the water supply.)

Figure 61. Real disposable personal income, 2008–2017



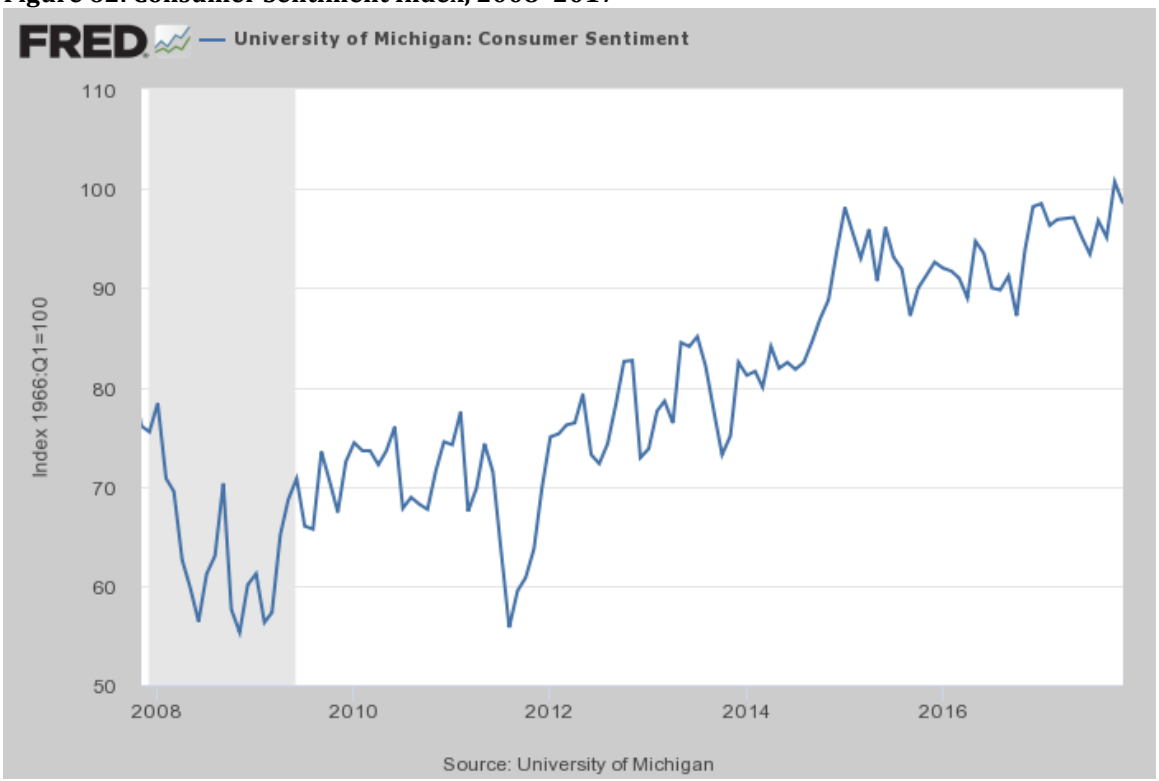
Consumer Confidence

Consumer Sentiment Index

Consumer sentiment is a hard thing to figure, as it seems to ebb and flow independent of what other data points would suggest. (Of course, most consumers don't pore over economic data and pretty much go on "gut" instincts. As we all know, some people have bigger guts than others.)

Somewhere around 2015, there was a breakout increase in consumer sentiment seemingly *a propos* of nothing. Perhaps many of the respondents to these surveys are used to the idea that this is normal, so they accept slight improvements. They don't have the memory of old-timers who recall the "good old days."

Figure 62. Consumer Sentiment Index, 2008–2017



Consumer Price Index

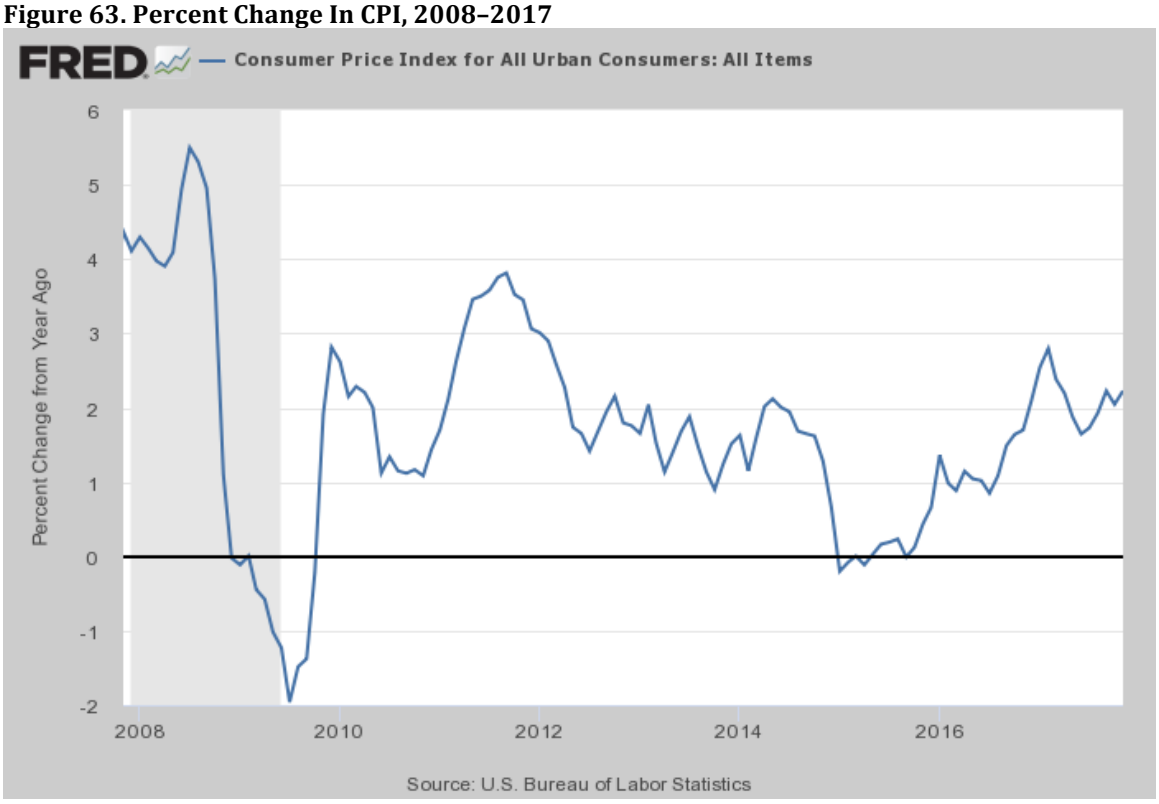
The figure below shows the percent change in the Consumer Price Index from 2008 to 2017.

The Federal Reserve is finally getting its way, and has managed to get the CPI above 2%, so they're going to raise interest rates. However, they are nervous that, with the impending tax reform, that the economy could get out of control, and it would not be a big surprise to see inflation rates up to 3%. Still, having a stronger economy is going to be the way the Fed can unwind all its quantitative easing.

When former Fed Chair Alan Greenspan was called "the maestro," he was acting in response to changes in the market prices of interest rates. When he started to get cute in anticipation of Y2K and his successor Ben Bernanke got cute in trying to move the markets, it only changed the decisions that people ultimately made. Who did it benefit most? Wealthy investors and large corporations who refinanced their balance sheets. People who were trying to save, on the other hand, were pelted with negative real interest rates. If people can get a CD rate for 5 years of 5% or 6%, it will help a lot of consumers, especially those interested in building nest eggs, retiring, and so forth.

There is what's known as the "Rule of 72": if you have a 1% interest rate, it takes 72 years to double your money. On the other hand, a 6% interest rate will take you 12 years to double your money. That's a pretty big difference.

Figure 63. Percent Change In CPI, 2008–2017



In Figure 64 below, we show the change in CPI for meat, poultry, fish, and eggs—food, basically (this is a non-vegan CPI), as well as medical care. (In Figure 65 we index it to the start of the recession.) Prices have dropped recently, but the prices of those items are still above general inflation. Medical care is 17 index points higher than CPI, and food is almost 10 points higher. So even though prices have dropped, they're still higher than inflation.

Figure 64. Percent change in CPI for medical and food (Y/Y), 2008–2017

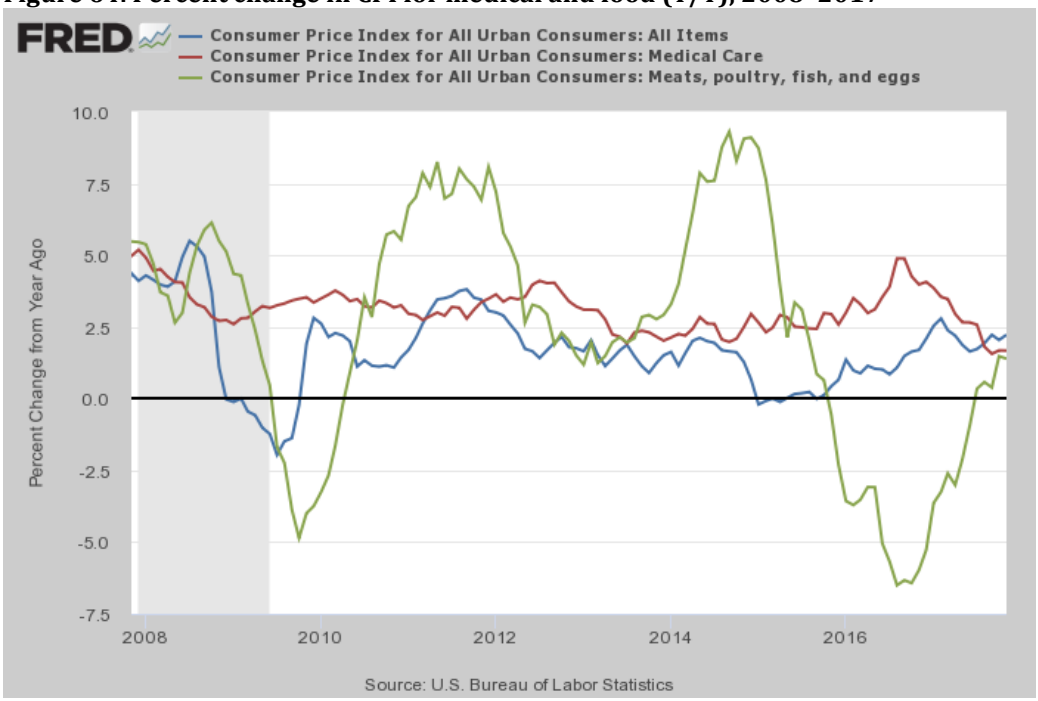
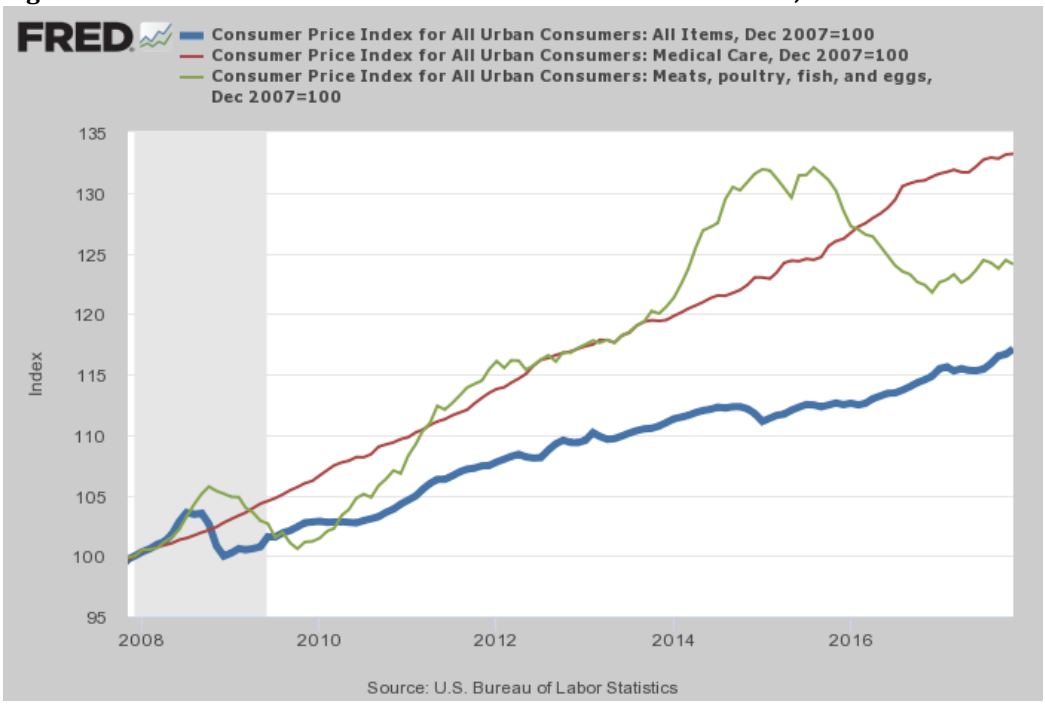


Figure 65. CPI for selected items indexed to start of the recession, 2008–2017

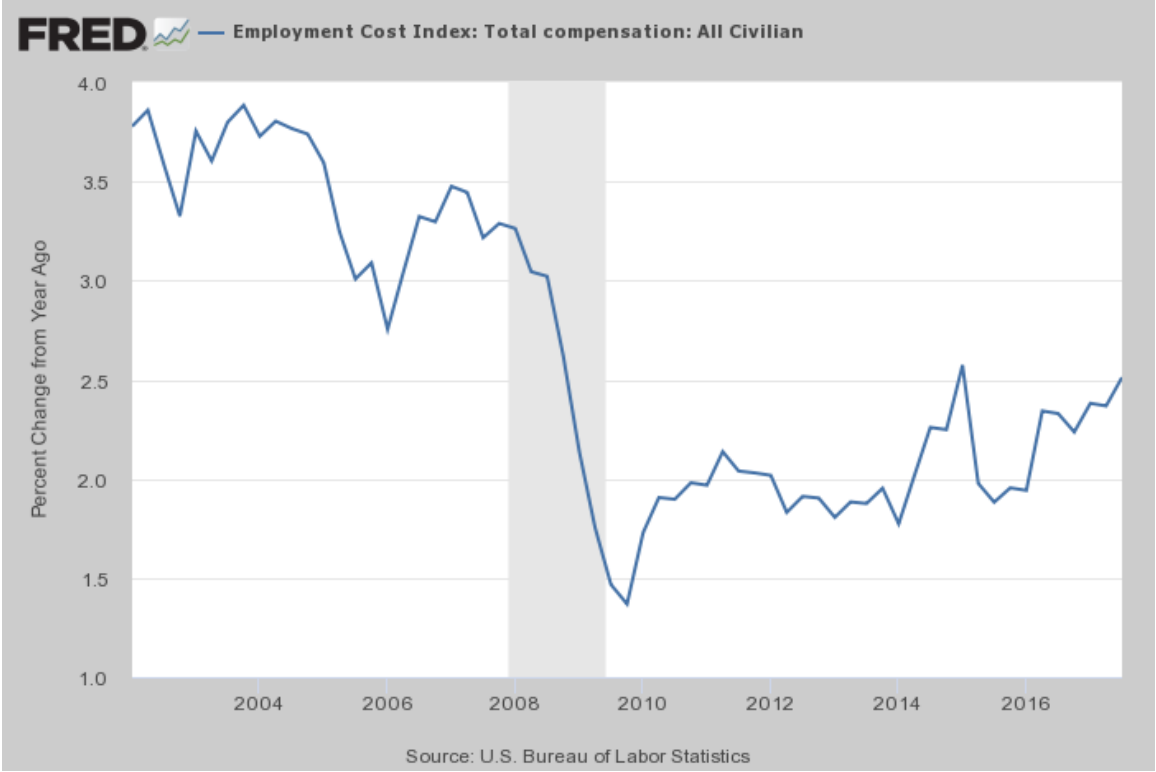


Employment Cost Index

The Employment Cost Index includes the total compensation for all civilian workers, and had been rising over the course of the 2010s, started to slow around 2015, was up and down in 2016, and has been steadily rising in 2017. We actually want to see this rising, as it is a sign of a potentially improving employment market, representing a slight amount of pressure to raise wages because of employee shortages.

This index had been going up prior to the recession, and then sank like a stone. It never went below 0; instead, employment itself dropped more than the cost of employment. We would like to see this start to go up; with a growing economy people can save and invest more. Also, higher wages may lure back some of those able-bodied workers who had left the workforce (see below).

Figure 66. Employment Cost Index, 2002–2017



Employment and Unemployment

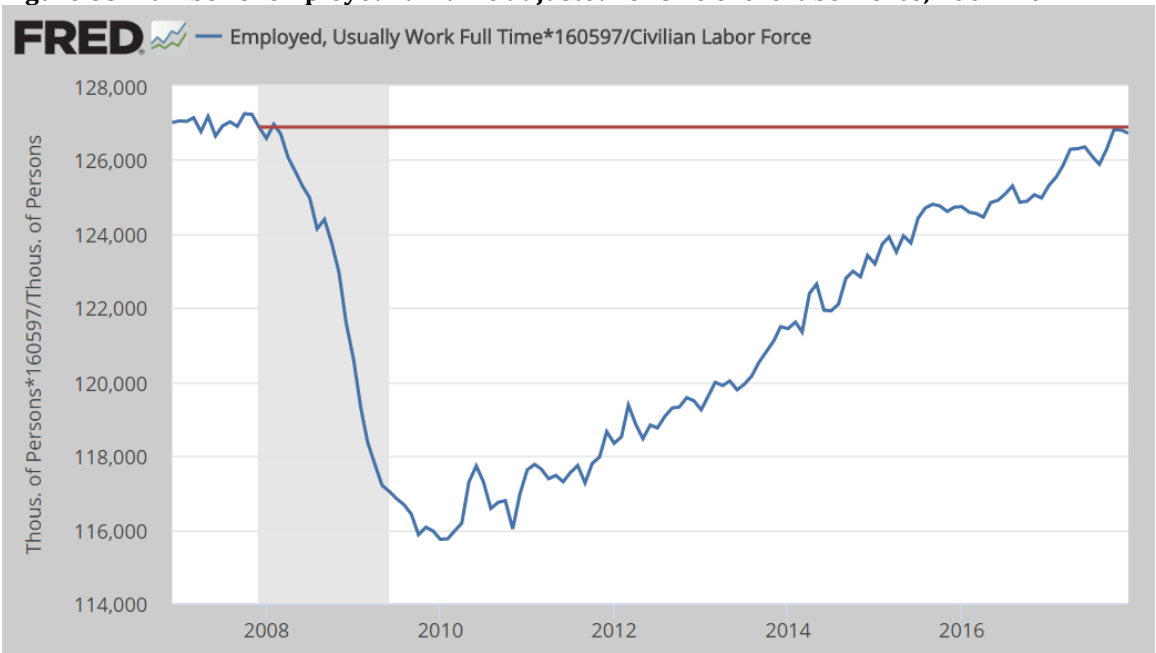
Full-Time Employment

In general, the employment situation is not bad. It's certainly better than it had been following the recession and even if the headline unemployment rate of 4.1% understates unemployment because of lower-than-desirable labor force participation, it's still pretty good in the grand scheme of things, even if it's not has good as it should be—or has historically been.

So full-time employment is still growing, and has finally exceeded the pre-recession level. However, adjusted for the size of labor force (Figure 68), full-time employment has only just grazed the line indicating the pre-recession level, and in fact appears to ticking downward slightly.

Figure 67. Number of employed full-time, 2007–2017

Figure 68. Number of employed full-time adjusted for size of the labor force, 2007–2017



If we take the long view (Figure 69), the full-time labor force-adjusted employment is just getting back to where it was when the recession started and is still substantially below the level it was during the last boom in late 1990s. It's not entirely accurate to compare today's figures to the late 60s and early 70s. The entrance of women into the workforce in the 70s brought this number down (higher labor force participation drove down the overall employment rate). It was a very different workforce back then, so our best point of comparison is starting in the late 90s.

Figure 69. Number of employed full-time, 1970–2017

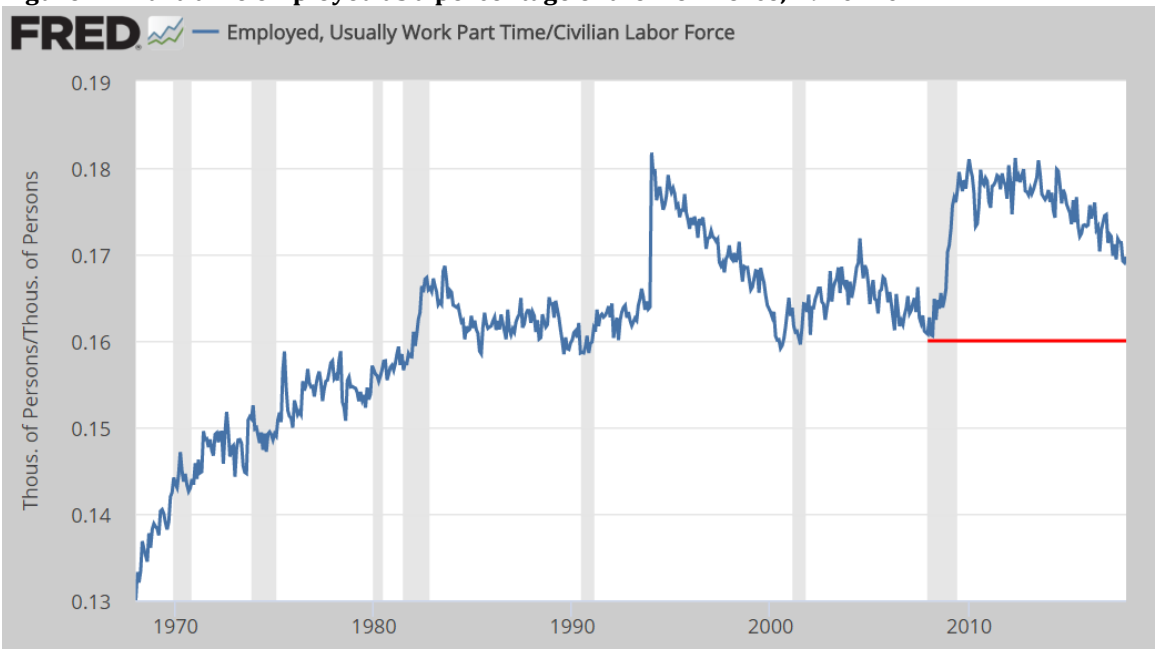
Figure 70. Number of employed full-time as a percentage of the workforce, 1970–2017

Part-Time Employment

We have been seeing a greater than usual percentage of part-timers. The reason for big jump around 1992/1993, by the way, was a redefinition of "part-time." If you look at the late 1990s, you can see what an economic boom does: it reduces part-rime employment in favor of full-time jobs. We're slowly getting back down to that point.

Of course, we shouldn't make the assumption that everyone who works part-time longs for a full-time job. Some do, sure, but some people choose to work part-time, either because they are raising a family, or because, thanks to the Affordable Care Act, they may not need a full-time job to get health care coverage. So we shouldn't paint all part-time employees with the same brush.

Figure 71. Part-time employed as a percentage of the workforce, 1970–2017



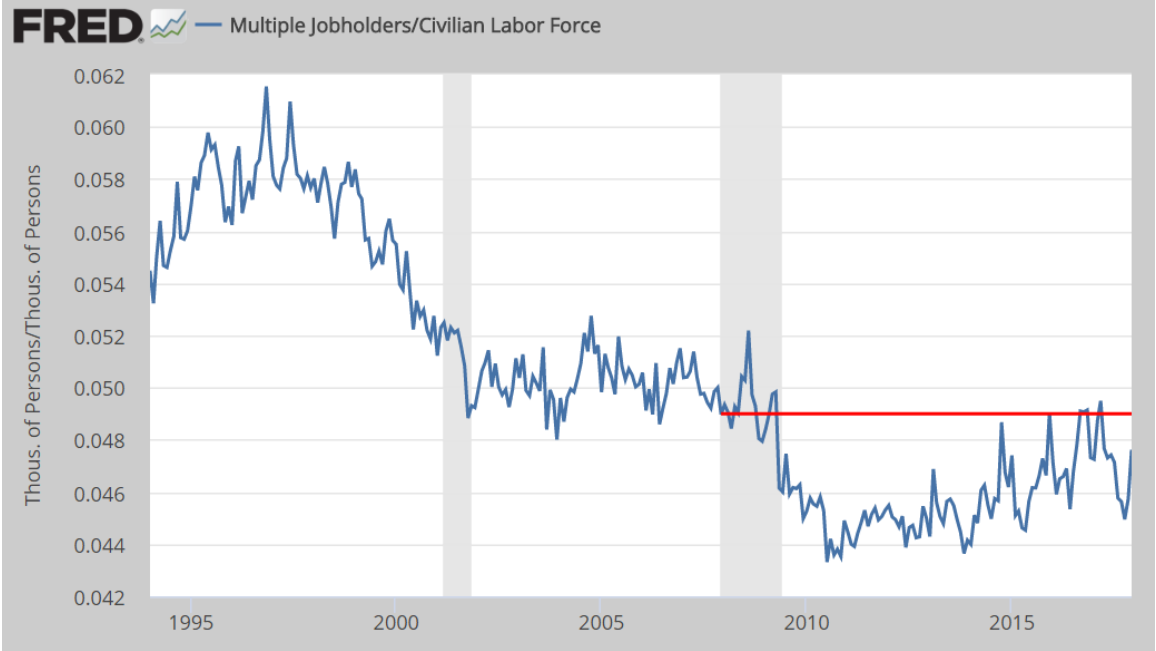
Multiple Jobholders

Multiple jobholders are an issue for the payroll employment data because the workers they tally can be double-counted. Payroll data count how many people are going to get W-2s (if you work more than one job, you get more than one W-2), whereas the household survey counts each worker once regardless of how many jobs they have.

The important thing here is that multiple jobholders are at a lower than usual level. One conclusions is that people "like" having multiple jobs (at least have to meet financial obligations for which a single job is inadequate). Look how high the number got just prior to the 1990s boom, during which it dropped. It's great when it's an employees' market, isn't it? A tight labor market means companies have to offer higher pay and benefits to attract workers.[18] Multiple job holders were fairly steady throughout the 00s, and it was only after the recession (not during; they rose during the recession, for obvious reasons) that they fell.

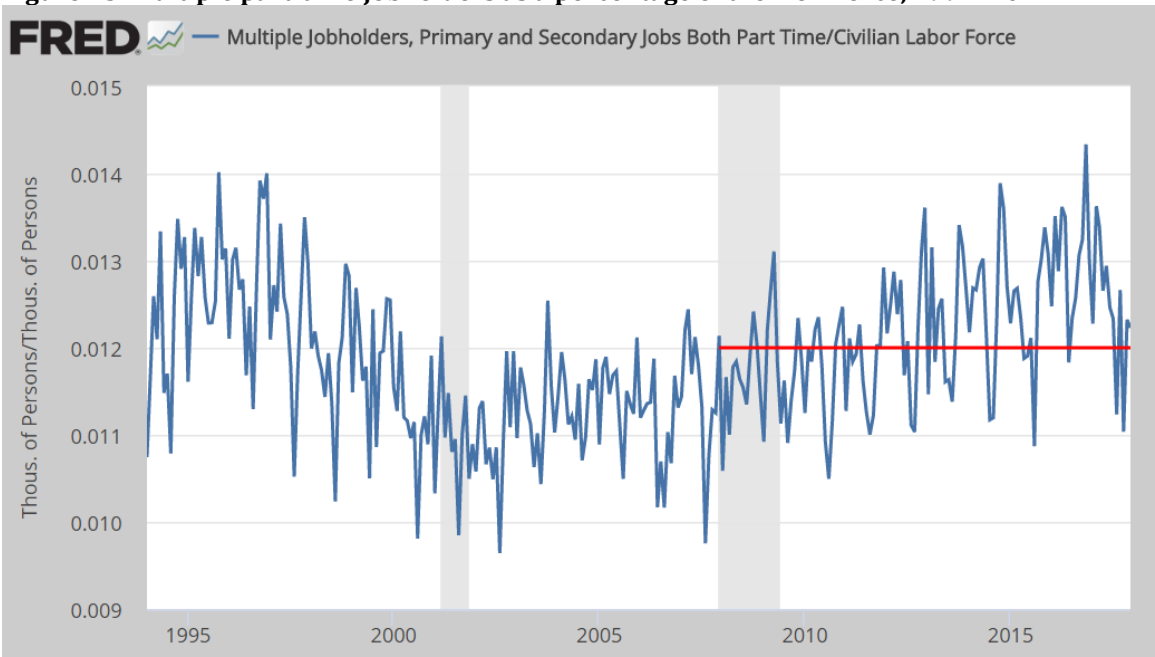
Figure 73 looks at multiple part-time job holders as a percentage of the labor force—and there's a lot of noise in that data. There can be a number of reasons for such high part-time multiple jib holders, either conscious choice on the part of employees (desire for part-time jobs rather than full-time for the reasons identified earlier) or employers (cut back on hours to avoid paying health care and other benefits, etc.). Still, the overall trend is on the rise, despite the noise.

Figure 72. Multiple jobholders as a percentage of the workforce, 1994–2017



[18] If you ever interviewed people for jobs in the 1998–2000 period—especially those just out of college—there were some pretty outlandish demands on their part that job candidates never made before—or since. It was also not unusual for an employee to start a job one day, get a new job offer, and leave the same day s/he started. Even in print magazine publishing, we saw this kind of thing. Good times...in some ways.

Figure 73. Multiple part-time jobholders as a percentage of the workforce, 1994–2017

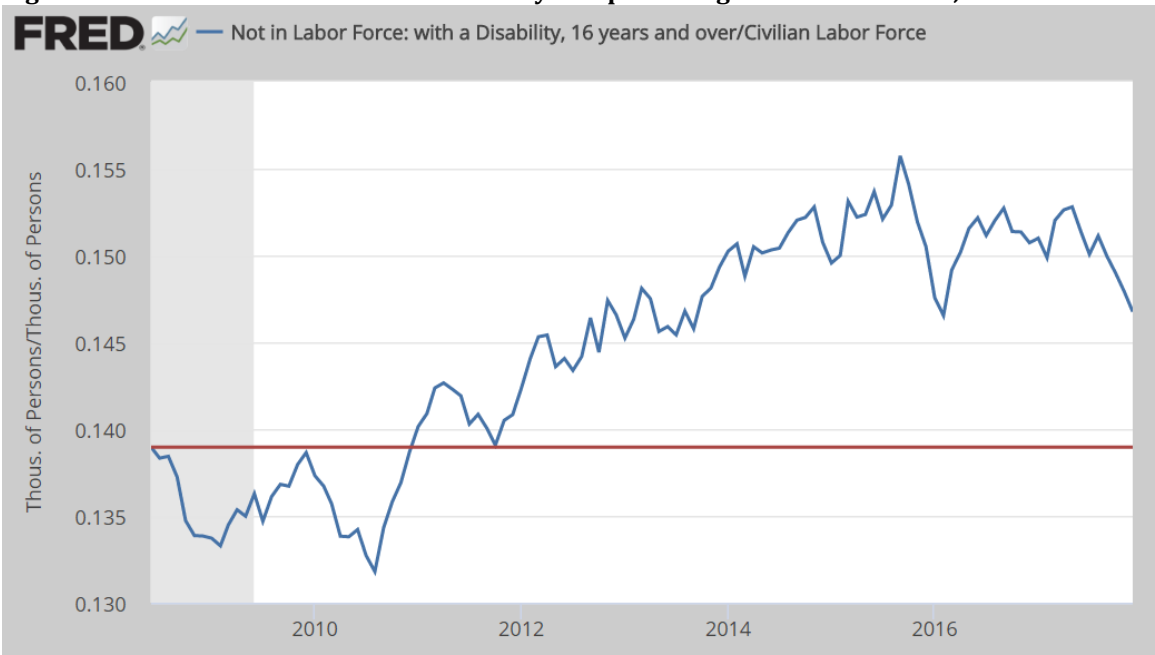


Disability

One way some people leave the workforce is by going on disability. If someone who works in construction develops a bad back, which is not out of the realm of possibility, they have several options. If they have the requisite experience, they can take a less physically intensive job in the same business or at least the same basic industry (driving a truck or an office position rather than installing sheetrock or putting on a roof). Some can transfer to other industries entirely, if they have certain skills that are transferrable from one industry to another. Or they can simply take a low-wage position as, say, a Walmart greeter. It all comes down to individual circumstances, which large aggregate data sets like Figure 74 just don't tell us.

Still, those who have opted out of the workforce to go on disability has been declining.

Figure 74. Not in labor force due to disability as a percentage of the workforce, 2008–2017



Unemployment Rate

In the last employment report at the time of this analysis, the headline unemployment rate is down to 4.1%, which on the surface of things sounds pretty good, but, as we have remarked (and will again below) a big chunk of that decrease is being driven by people leaving the workforce.

Figure 75. Unemployed as a percentage of the workforce, 2008–2017

Initial Jobless Claims

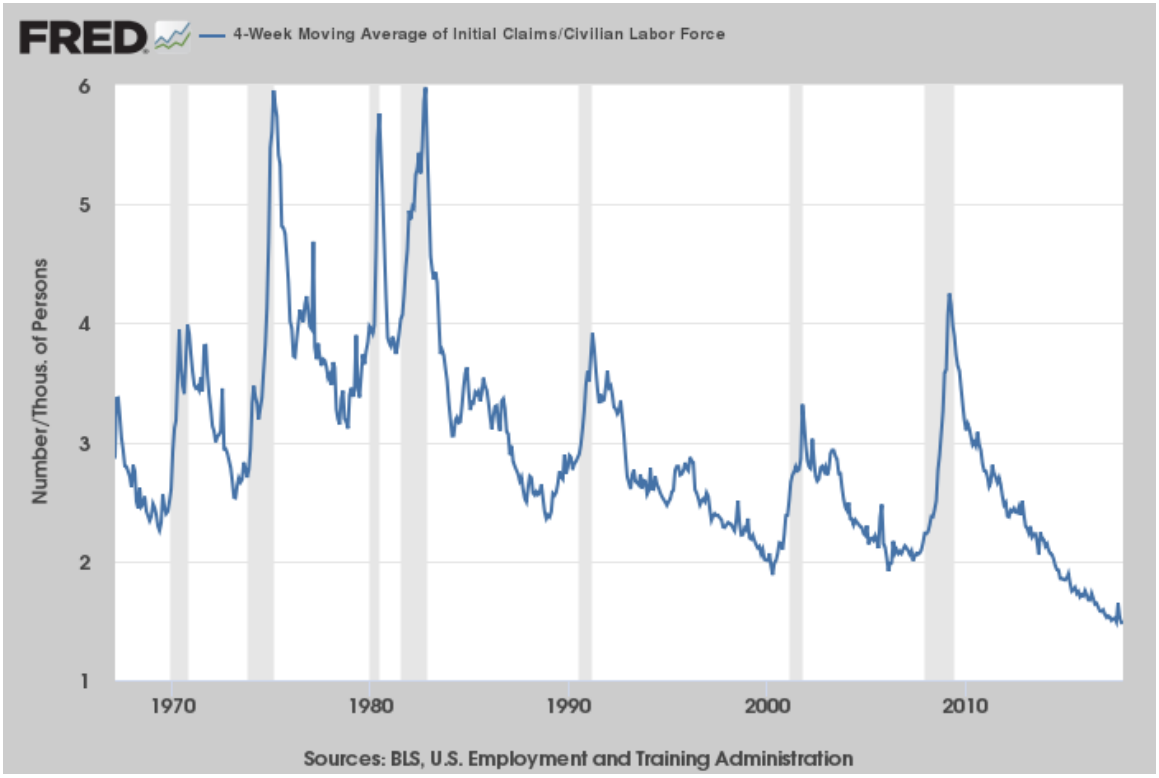
We've remarked in the past that initial jobless claims really hasn't been a good indicator for a long time.

Initial jobless claims have been going down, which on the surface is a good thing. They're at a recent (but not all-time) low. Still, the labor force was a lot smaller back in the 1970s, so we're in a kind of apples-and-oranges zone here.

If we adjust for the size of the labor force (Figure 77), you can see how bad prior recessions were. Of course, people don't have the same kinds of jobs they use to have, and today there are more part-time workers, and many part-timers are not eligible for unemployment insurance. Companies are more austere, they don't have big layoffs (perhaps just more smaller ones), there is a more flexible workforce, there are better hiring practices, fewer people change jobs, and so on, so a lot of the issues here have rendered this measure almost useless in today's employment environment.

Figure 76. Initial jobless claims, four-week moving average, 1970–2017

Figure 77. Initial jobless claims adjusted for size of labor force, four-week moving average, 1970–2017



Employment-to-Population Ratio

Here's the crux of the matter: the employment-to-population ratio. We still have quite a long way to go in terms of getting the economy and the workforce going. There is a high amount of slack. Sure, some of Figure 78 is Baby Boomers retiring, but if we look at the employment-to-population ratio among 25-to-54-year-olds (Figure 79), there's still a fair amount of slack.

Figure 78. Employment-to-population ratio, 2007–2017

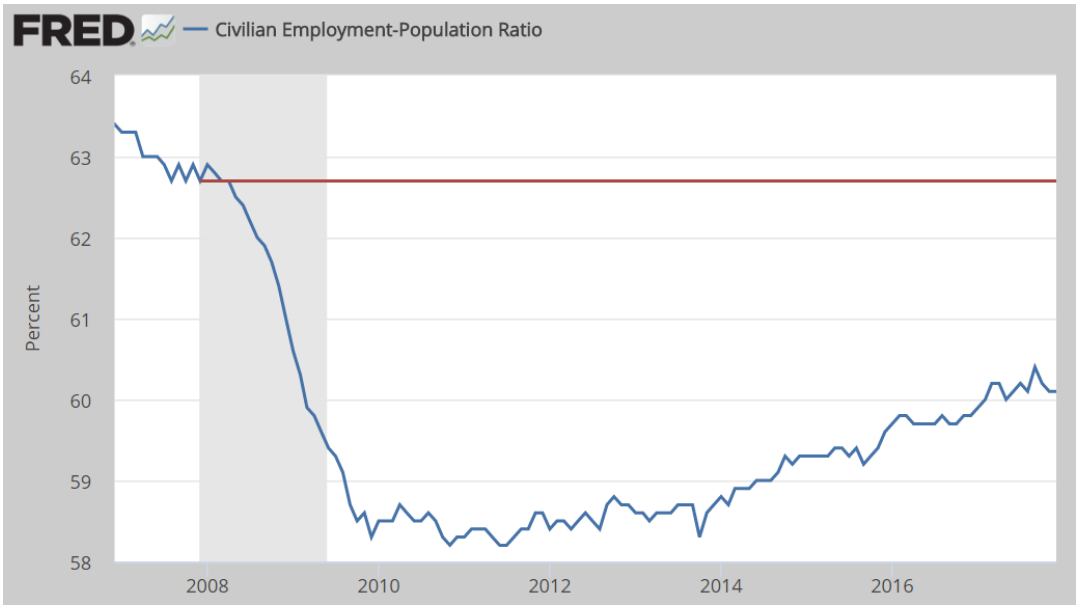
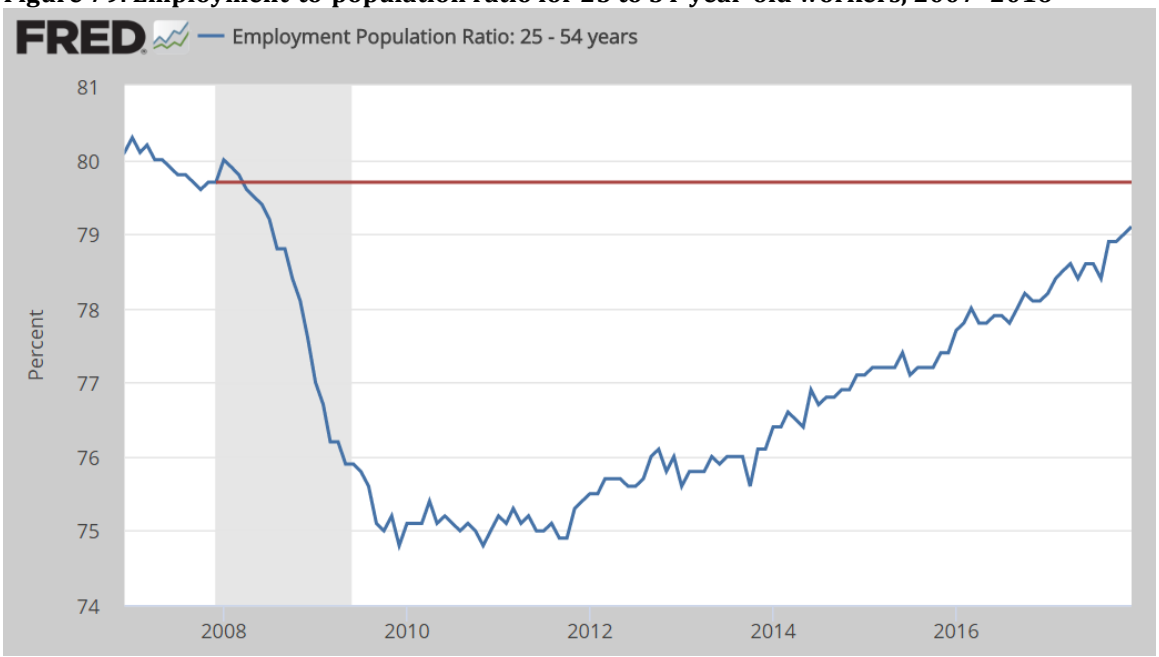


Figure 79. Employment-to-population ratio for 25 to 54-year-old workers, 2007–2016



Labor Force Participation Rate

Another way to look at this is civilian labor force participation rate. It peaked in the late 1990s, are started dropping between the two recessions (2001 and 2008) and just kept dropping. Even for the prime working age cohort (Figure 81) it's still down substantially from historical norms. There is the hope that if wages are poised to rise, it may draw some of these folks back into the workforce.

Figure 80. Labor force participation rate, 1950–2017

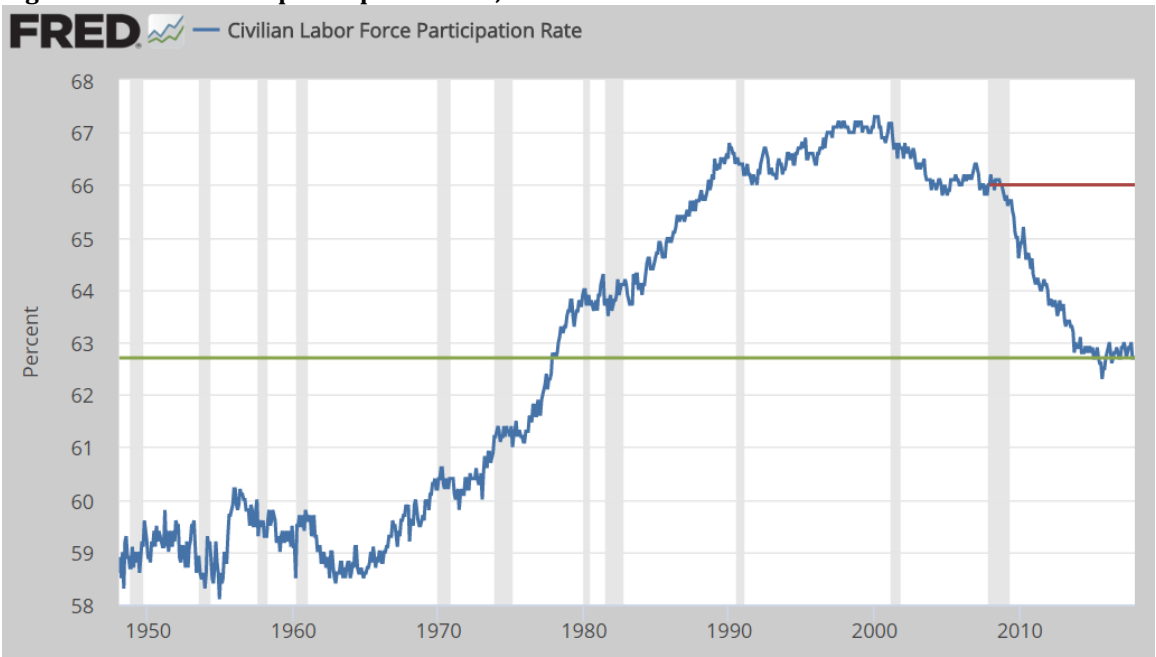
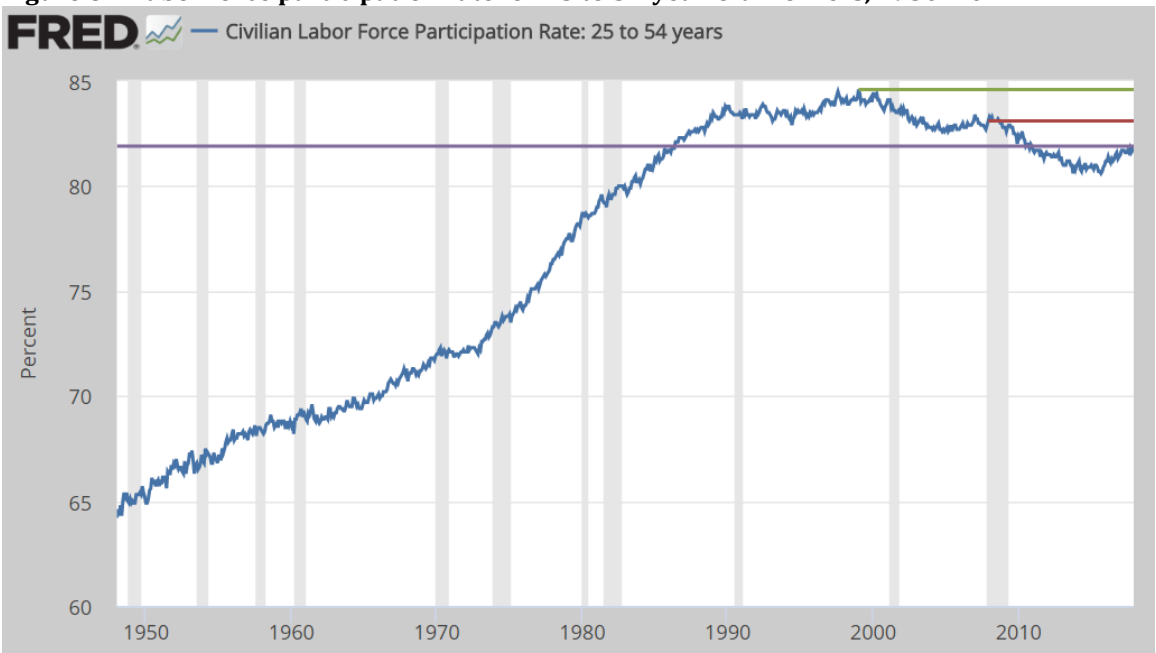


Figure 81. Labor force participation rate for 25 to 54-year-old workers, 1950–2017



Not In Labor Force

Correspondingly, "not in labor force" ticked up somewhat, but is still at an abnormally high level. Some of this, yes, is retirees, but a lot of these folks should be in the workforce. Again, aggregate data don't tell us anything about individual situations. Maybe a particular industry has died or is in the process of dying and it's tougher to get work if that is someone's particular field of expertise (or at least basic skill). Maybe there is a general skills mismatch. Maybe someone is a prisoner of geography, stuck in an economically depressed area (it's not always easy for someone—especially if they have a daily—to pull up stakes and relocate). And maybe available jobs pay far lower than what the market used to bear.

Regardless, this number should never be zero, but neither should it be as high as it has been in recent memory.

Figure 82. Not in labor force, 2007–2017

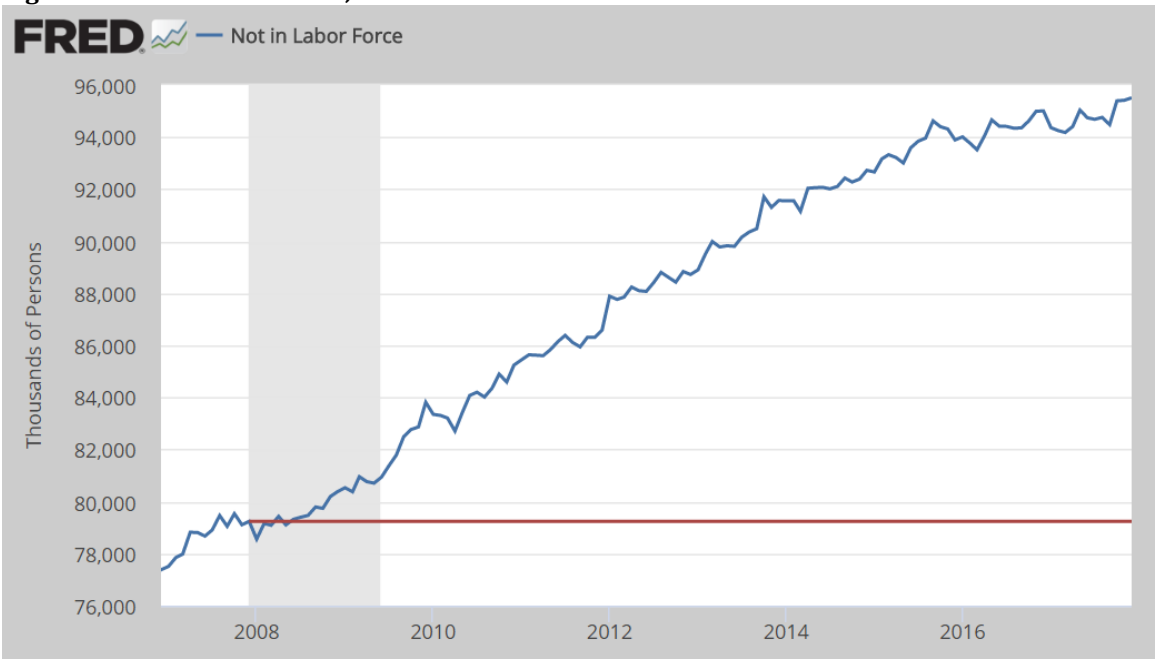
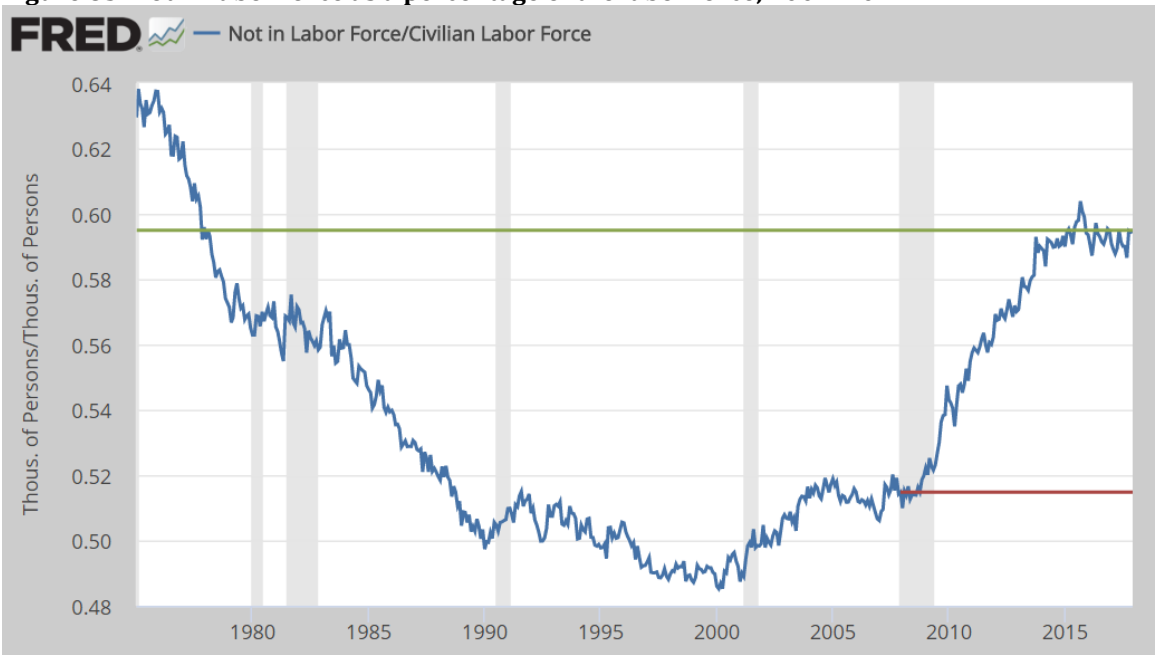


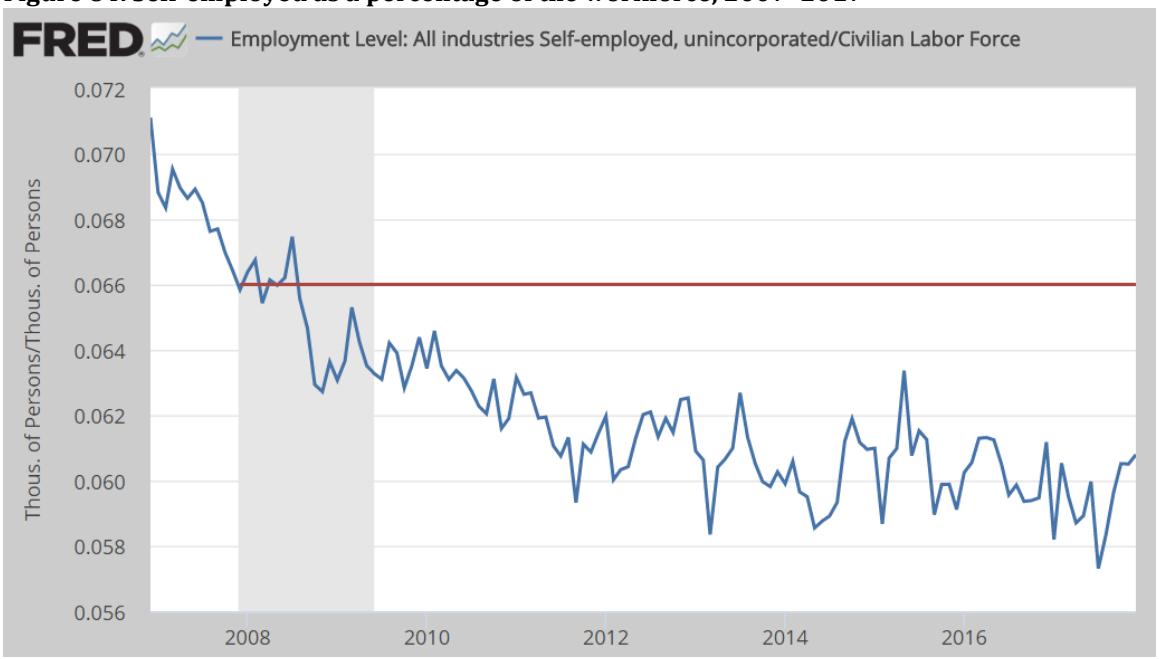
Figure 83. Not in labor force as a percentage of the labor force, 2007–2017



Self-Employment

Because we're in graphic communications, we automatically think of the self-employed as writers, designers, web developers, and other "information workers," but as it happens a hefty chunk of "self-employed" are construction workers, which is why there was such a drop-off after the recession (which was preceded by the housing crash which took a toll the construction industry for a time). Theoretically, you would see many of these workers come to the full-time or part-time workforce or be more entrepreneurial (which, admittedly, is not always possible, and not everyone is adept at being entrepreneurial). Then again, these data reflect self-employed but unincorporated, so it's entirely possible that some of them became S corporations or LLCs. Still, as a percentage of the workforce, the self-employed are down to around 6%—which is far below historical norms. So something else is likely going on.

Figure 84. Self-employed as a percentage of the workforce, 2007–2017



7. Industry Trends and Forecast for 2018

Here's what we see as some of the hot—and not so hot—trends for 2018.

Dr. Joe's Economic Forecast

Well, unless you have been trapped in an underwater pyramid for the past year (and how we wish we could have joined you), you know that Congress enacted tax reform. It cuts the corporate rate and has a lot of other spiffs for businesses, and some benefits for the middle class and low-income households, as well. The stated goal of the legislation has been to simulate investment, hiring, and wage growth, although some of the bill's drafters aren't entirely certain what the impact is going to be. The Congressional Budget Office is constrained by its rules to ignore historically proven stimulative effects (either direction) of tax changes. The most recent examples are their bad miss on capital gains revenues in the Clinton years, and their bad misses on the ACA economics. Will it have the desired effects, or will the primary results be stock buybacks, mergers and acquisitions , and executive bonuses, as some of the beneficiaries of the legislation have indicated? Ask us in a year. Right now, even the workers at Walmart are getting bonuses and higher hourly rates with the corporate tax reduction, although locations are closing and there are layoffs elsewhere. What matters, however, is the economy as a whole.

We are also now in a largely anti-regulatory environment, at least as far as the current Administration is concerned. The trouble with the current Administration-centric regulatory policy is the same problem we had with the last Administration: if regulations are too one-sided, it becomes a Battle of the Administrations, or at least of the parties in power. The problem is, when one party loses power (which inevitably happens), the new party reverses what the previous one did. This makes planning impossible and quite frustrating. What should happen is some kind of bipartisan approach to regulation (or even economic policy, but a guy can only dream so much) such that actual compromises are reached that address everyone's concerns. In that way, there isn't the danger that it'll all go back and forth every two, four, or six years. These sorts of things used to happen (the 1986 Tax Reform act passed the Senate 97-3). Until they can somehow happen again, we're going to be on an endless see-saw.

This means that businesses will take advantage of what they can while they can—which is detrimental to long-term business planning. It does not ensure the long-term best use of capital.

As for other economic issues, there has been talk of an infrastructure bill, but as of this writing no one in Congress seems to have much interest in drafting—much less fighting for—one. Don't expect too much to get done in 2018 in Congress. We're basically on our own at this point as they focus on fundraising for their re-elections.

Statistically, the unemployment rate may seem to get worse. If the economy in fact improves, and lures people back into the workforce, when the unemployment rate is calculated, the denominator will be increasing as well as the numerator, with the result being a larger unemployment figure. If it happens in this way, it will be kind of a good thing. (We'll likely know by the second quarter.) So, unlike the headlines

from the press, the most important thing to look at will be the number of employed workers as well as the labor force participation rate. If both are moving upwards, it'll be a good thing. These data are considered obscure, but they are the most meaningful.

Another statistical issue is that all of the employment reporting tends to be skewed toward larger businesses with big payrolls, and those may not be the places where you're going to get the biggest changes in employment. The models that the Bureau of Labor Statistics use may not reflect what is going on in small businesses since they don't file Form 941s weekly like large employers do; they file monthly, in some cases less often than that. Employment has always been a lagging economic indicator, and this is one of the reasons why. This where keeping an eye on revisions is going to be important; if we notice that there's a consistent increase in revisions to employment, we'll know a boom is imminent.

Expected Growth Rates

Despite all of these warnings and caveats, we still make forecasts. We just can't help ourselves.

- 2017 GDP growth +2.5%, +3.0% toward the end of year (we got that right!)
- 2018 +3.5%, the first year of new tax legislation, don't be surprised if we get a 4.0% or 4.5% quarter; more would be nice
- 2019 +3.8%, growth "catch up" from prior years
- 2020 +3.6%, economy matures
- 2021 +3.3%, economy settles in

Industry Shipments Forecast

As we always caution in these reports, any forecast can only predict the past, extrapolating existing data. Our own SFM/WTT forecasting model, is more judgment-based, adding a little more human perspective based on what we as humans know about the industry, technology, and culture as opposed to what the "robotic" models know just from looking at past data and assuming—depending on the model—that the past will repeat itself more or less aggressively.

The depth of declines in trend models heavily weights the downturn of the last 13 months, and the long-term pattern has been a steep decline, then 24 to 36 months that moved sideways, followed by another decline. We find a repeat of that pattern is unlikely.

Table 30. NAICS 323 forecast value of shipments, 2017–2025 (2017 $US)

likely 2017 =$78B	Exponential Smoothing	Curve	Box-Jenkins	Average	GDP (1992, +2.5%/yr)	SFM/ WTT
2017	$75.7	$68.1	$76.2	$73.3	$82.1	**$78.0**
2018	$66.6	$62.2	$70.3	$66.4	$77.8	**$74.0**
2019	$57.6	$56.1	$65.7	$59.8	$73.4	**$69.0**
2020	$48.5	$49.7	$61.1	$53.1	$68.8	**$66.0**
2021	$39.4	$43.2	$56.6	$46.4	$64.1	**$62.0**
2022	$30.3	$36.5	$52.1	$39.6	$59.4	**$59.0**
2023	$21.2	$29.5	$47.6	$32.8	$54.5	**$55.0**
2024	$12.1	$22.4	$43.0	$25.9	$49.5	**$51.0**
2025	$3.0	$15.1	$38.5	$18.9	$44.3	**$46.0**

By the way, here is Dr. Joe's CPI multiplier table. It is helpful to look at your own business metrics and adjust for inflation so you know whether you're *really* making any money.

Table 31. CPI multiplier table

Year	Multiplier
2012	1.074
2013	1.058
2014	1.050
2015	1.042
2016	1.021
2017	1.000

Technology and Other Trends Affecting the Industry

The Downeaster Alexa[19]

Before we turn to specific industry trends, its important to poke out heads up and have a look around at the culture at large, because larger media and communication trends inevitably impact us—usually in the form of lesser demand for print. So its important to have a look at ne of the hottest tech areas of the past couple of years: voice.

[19] An ancient reference for all you Dad Rock fans out there: https://youtu.be/LVlDSzbrH5M.

The past couple of years have seen the dawning of The Age of Alexa—Personal Voice Assistants like Apple's Siri, Google's Assistant, and of course Amazon's Echo/Alexa. Early last year, stories began appearing[20] warning of a "voice assistant war" as these applications become capable of doing more and more things and thus become more and more popular. They can be used to hail a Lyft, provide driving directions, make hotel or restaurant reservations, or even just retrieve information. "Alexa, what's the capital of Bulgaria?" "Sofia." "Thanks, Alexa." They can now handle more than 7,000 "skills" with more being added all the time. It has been determined[21] that one-fifth of all the Google searches handled via the mobile app and Android devices are voice searches.

Why is this important for us? A couple of reasons. We're kicking the information can further down the road. The way we search for information has changed—and continues to change—and this affects how people interact with media and communications. Way back when, pre-Internet, if we wanted information, we were content to request it by phone or mail (remember reader service cards?) and wait for it to arrive—sometimes up to *six or eight weeks*!

Since the advent of the Internet and Google, we have been able to search for the information we want and get it almost immediately, and are frustrated when we can't. (I'd be curious to know how much business is lost because one company's website loads faster than another's.) Mobile has made information retrieval even faster and more immediate, as well as portable.

Now, with Voice Assistants and their corresponding apps, typing itself has become a time-consuming and laborious task in a world where we can just ask a question out loud. Information retrieval becomes still even faster and more immediate. (You may remember that scene[22] in 1986's *Star Trek IV*, where the *Enterprise* went back in time to the 1980s and Scotty was annoyed by having to interact with a computer using a "quaint" keyboard rather than just talking to it. That was a cute joke back in 1986, but it's fast becoming our reality.)

These things are important because this is where companies and marketers are focusing their attentions and marketing efforts. And in fact, as I was typing this very paragraph, I came across the following story:[23]

> Amazon is looking into the possibilities of product promotion voiced by Alexa on Echo devices, according to a CNBC report.
>
> Brands like Procter & Gamble and Clorox are apparently talking with Amazon about the possibility of advertising via Alexa, rather like the sponsored results that

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[20] Eric Jhonsa, "Amazon Is Pulling Out All the Stops Against Apple and Google in the Voice Assistant Wars," *Real Money*, March 3, 2017, https://realmoney.thestreet.com/articles/03/03/2017/amazon-pulling-out-all-stops-against-apple-and-google-voice-assistant-wars.
[21] Tom Whitwell, "52 Things I Learned in 2017," Fluxx Studio Notes, December 1, 2017, https://medium.com/fluxx-studio-notes/52-things-i-learned-in-2017-d9fb0040bdcb.
[22] See it at https://youtu.be/xaVgRj2e5_s.
[23] Ariella Brown, "Alexa May Give Voice to Targeted Marketing," *DMN*, January 05, 2018, http://www.dmnews.com/digital-marketing/alexa-may-give-voice-to-targeted-marketing/article/734952/.

> browsing on Google retrieves. That would be a significant shift for Amazon, and a welcome move for brands who consider improving their position in voice search to be particularly advantageous. CNBC explains, "shoppers are more likely to select a top result on a voice assistant than they are on the web, where it's easy to scroll down or ignore written suggestions."

We're really only seeing the tip of the iceberg when it comes to what these voice assistants are going to do. Now, if Alexa starts pitching ads to us like a sultry carnival barker, she may get chucked out the window like the Defenestration of Prague, so marketers seeking to take advantage of Alexa (hmm...there has to be a better way to phrase that) will have to tread carefully.

But, we should be forewarned: this kind of thing absorbs some portion of a company's marketing budget. Wanna bet that certain kinds of print may be sacrificed to pursue it? After all, the history of 21st-century marketing so far has been cannibalizing print marketing budgets to fund non-print and new media marketing efforts. 'Twas ever thus.

The Thing

Related to voice assistants is the so-called Internet of Things (IoT), which refers to the ability for all our appliances, our cars, our homes—virtually everything we own—to be interconnected and share data with each other, a mobile phone app, or a third party (preferably one we have authorized to have his data). Granted, not all of these applications are...let's say "worthwhile" to be charitable. Do we really need a toaster that will send a text message when our toast is done? Do we want an Internet-enabled toothbrush for what Oral-B calls "the well-connected bathroom"? One shudders to think.

This CES tweet from Kohler, the bathroom fittings manufacturer, has to be one of the most terrifying things ever posted:

Um...no.

We may think the whole idea of the Internet of Things is just kind of silly (but then back in the 90s a lot of people thought the Internet itself was kind of silly), and some applications are, but as they start insinuating themselves into our lives, we will start using them more and becoming more reliant on them. Look how fast the mobile phone came to dominate everyone's life—and for everything but actually using it as a phone. These things have a way of creeping up on us.

The good news for our industry regarding the Internet of Things is that print can very well be one of those "things." QR codes, Augmented Reality, "smart packaging"—all of these things can connect print to the Internet. The book we wrote last year—*The Third Wave*[24]—uses HP's Link technology to make the printed book capable of accessing information over the Internet. How soon before we don't even need a app for that—we just talk to the book? You may laugh, but last September, Google teamed with Conde Nast to produce an issue of *Vogue* in which the printed magazine had voice-activated Internet links, so you could actually "talk to the magazine." (Of course, people have been doing this on the New York City subway for decades. However, it never had any effect except for making people move to the other end of the car.)

The Internet of Things is also changing the face of industrial printing, and printing sensors, chips, and other components that enable the IoT are becoming part and parcel of what industrial printers do. It also changes—again—marketing. Think about a refrigerator. Typically, a refrigerator manufacturer has a very temporary relationship with a customer. Someone buys a fridge, and except for maybe a

[24] Catch the wave at https://www.amazon.com/Third-Wave-Joseph-Webb-Ph-D/dp/197447058X/.

warranty, that's the end of the relationship, or at least the extent to which that relationship can be monetized.

But what if a company—like, say, Pepsi—can pay that fridge manufacturer for access to its IoT-enabled refrigerators, essentially piping ads to the fridge. So appliances can become part of an advertising network. And if this network can also have access to data about what you have in your refrigerator and what you buy, you can be pitched extremely relevant ads. You know how when you buy a product at the supermarket and you get a coupon out of the register for a competitor's similar product? That same principle can now be applied to our appliance's ad network.

Indeed, your IoT-enabled washing machine may pitch you ads for All-Tempa-Cheer—it could very well be the end of an Era.

The extent to which these things will come to practical fruition is still anyone's guess, but there are people in offices and labs working on this stuff. And it has the potential to further disrupt the market demand for print.[25]

In early January, the Consumer Electronics Show (CES) was held in Las Vegas, and has become perhaps the biggest trade show (anyone remember Comdex?), and is dedicated to cutting-/bleeding-edge technology and proofs of concept that sound extremely exciting or silly as all get-out. We could do at least 100 pages on the news that came out of this year's CES, but one we'll highlight—because it ties in with a presentation at last September's PRINT 17—is Samsung's vision of the home of the future.[26]

> In the future...almost anything in your home could be equipped with a sophisticated microphone the size of a fingernail. That sophistication could enable those microphones to pick up any audio command spoken at a reasonable volume. That could mean you wouldn't have to yell across the room at a smart speaker to turn the lights up and down. You could almost mutter to yourself, "Bixby, these lights are too dark." And Bixby, Samsung's proprietary voice assistant, could know to make the lights brighter.[27]

Back at PRINT 17 in Chicago, Tod Szewczyk, VP, Director of Emerging Technology & Innovation, Leo Burnett Group, presented a session called "The Future of People, Technology, and Advertising," and had described such a scenario as the Samsung home. The example he used was that you're sitting in your kitchen with your spouse, remembering a trip to Italy, and Internet-enabled microphones are monitoring your conversation and in the background a personal assistant is automatically planning

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[25] For a humorous look at some of the silly things the Internet of Things is spawning, one Twitter feed worth following is https://internetofshit.net.

[26] Adam Clark Estes "Why Samsung's Home of the Future Concept Scares the Hell Out of Me," Gizmodo, January 10, 2018, https://gizmodo.com/why-samsungs-home-of-the-future-concept-scares-the-hell-1821937946.

[27] Another Generation X reference for the over-50-year-olds out there: this reminds us of Bill Bixby who played David Banner who, when he got mad, turned into Lou Ferrigno (aka The Incredible Hulk). One wonders if such a feature is built into Samsung's Bixby. Does Bixby routinely say, "Don't make me mad. You won't like me when I'm mad."

travel itineraries and making other arrangements.[28] In another example, bricks-and-mortar retail locations will know when you're coming and automatically configure in-store displays to show what it knows you're looking for. Or a streaming service like Netflix can monitor your emails and texts, determine your mood, and individually tailor streaming content.

One can easily envision at least two seasons' worth of *Black Mirror* episodes from the previous paragraph alone, but the question for us in this environment is, what is the role of print? "Print becomes relevant by being a bridge between offline and online," Szewczyk had said. Some iteration of Augmented Reality (AR) is the most likely methodology, and he mentioned the voice-activated *Vogue* we cited earlier.

It's crazy isn't it: we're barely just getting to the point where we can figure out how to make print interactive and now we have to not only make print interactive, but also make it voice-activated. Well, welcome to the new reality. We have to keep up with this stuff if we ever hope to make print relevant.

Print Goes Wild

At this point, it bears mentioning that a second session at PRINT 17 devoted an hour to a jam-packed litany of truly visionary and cutting-edge print applications. Michael Chase, Chief Marketing Officer for St. Joseph Communications, provided highlights from the company's *2018 Print In a Digital World* trend report.[29] AR plays a very large role, but new kinds of inks and substrates are also enabling some truly creative printed applications. Chase also mentioned the talk-to-*Vogue* magazine issue, but here are some other highlights from the presentation:

- France's Castorama offers Magic Wallpaper, AR-enabled printed wall décor designed for kids that, when printed characters are scanned with a smartphone app, tells a story.
- Shoe company Asics ran a two-page print ad spread targeted at runners that used a thermal ink to allow readers to step barefoot on the ad, determine their unique footprint, and match it to a legend of foot types so s/he can better select the most appropriate running shoe.[30]
- Pizza Hut's "interactive DJ pizza box" uses conductive inks and wirelessly connects to a computer and speakers. Functioning controls and "turntables" allow pizza consumers to lay down their own beats.
- North Face created an ad that, when it is pulled out of the magazine and immersed in water, lights up and serves as a makeshift flashlight.
- Battersea Dogs & Cats, a UK animal rescue center, created a location-based campaign during which pedestrians were handed a printed leaflet that included an embedded RFID chip. This chip activated digital displays and posters throughout an outdoor plaza. When the person carrying the leaflet

[28] Word of advice: perhaps you had better not shout at your spouse "You go to Hell!" although it would be interesting to see what route the listening system comes up with.
[29] Download the report for free at https://stjoseph.com/insight/hello-print-in-a-digital-world-2018/. You'll be glad you did!
[30] As an avid runner, Richard is intrigued by this ad....

> passed one of these displays, a virtual dog would appear and follow him or her around, attempting to attract attention. The dog followed the person from one display to the next, referencing the printed leaflet. (said Chase: "It drove thousands of people to the Battersea website, generated a 79% click-through rate, and ten times more leads than there were dogs available.")

Here's another unique example, not from Chase's presentation, but from IKEA, which is no stranger to using cutting edge AR and other technologies in its catalogs and ads. They have an ad in their printed catalog (which also runs in certain magazines) that uses a paper that has been treated with the same material used in pregnancy tests. When the catalog reader (a female, presumably) urinates on the ad, it will identify of the woman is pregnant. If the result is positive, a discount code for a crib will be revealed, which the mother-to-be can bring into IKEA.[31] (Presumably it's just a code, and they would prefer that customers not bring pee-soaked paper into the store.)

Sure, most—perhaps all—of these applications are far beyond the reach of the average print business, but it's where a lot of the industry is going. It's worth at least knowing that these kinds of applications exist and perhaps scaled-down versions are within reach. The creativity to come up with a unique print application is most of the battle—and is not out of reach of anyone.

Specialty Printing As the Mainstream

Coming a little bit back to Earth, we now turn to a topic that we have been harping on this for most of 2017, but in 2018, we expect specialty printing to continue to become mainstream print (as you saw earlier in this report, there is more than a hint of that in our survey data). What we mean by specialty printing are short-run, customized, personalized promotional products, and we admit that specialty printing blurs with the already blurry and nebulous term "industrial printing," or printing on final objects and products. Think smartphone cases, golf balls, water bottles—even garments. (The best definition of the difference between industrial and commercial printing I have yet heard is "printing to fabricate rather than printing to communicate."[32]) Textile printing also falls into the category of specialty printing, with printed garments (T shirts, hoodies, hats, etc.) important parts of many promotional and marketing programs.

Anyway, adding these kinds of applications and products favors small and mid-size print businesses who can be a bit more nimble and creative in adding and changing up their capabilities. And the real advantages are integrating these kinds of product offerings with e-commerce and web-to-print. A customer selects a standard product, uploads a custom graphic, specifies a quantity, eyeballs a proof, and they're done. This isn't new—CafePress and others have been doing this for ages—but it's

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[31] Edward Helmore "Ikea invites customers to 'pee on this ad' to check for pregnancy – and a crib deal," *The Guardian*, January 10, 2018, https://www.theguardian.com/business/2018/jan/10/ikea-invites-customers-to-pee-on-this-ad-to-check-for-pregnancy-and-a-crib-deal.

[32] Courtesy Steve Hatkevich, General Manager, Trim A Door, and Chair of SGIA's Industrial Printing Committee.

woefully underutilized in the rest of the industry. Sure, there is a role for direct sales, and these kinds of items can be part of an overall business development approach to sales, if you are working closely with major customers to develop comprehensive marketing plans that include these kinds of items, but they lend themselves especially well to a commodity printing approach.[33]

Textile Printing

Digital textile printing is not new, but will continue its expansion beyond dye-sublimation with increased compatibility with a wider and wider variety of natural and synthetic fabrics. Get used to the term "fast fashion," or on-demand, short-run, customized garment printing. (WhatTheyThink has also launched a special topic section devoted to textile printing.[34])

Direct-to-garment has also become a growth area. This refers to non-dye-sub inkjet printers that print directly on T shirts and other fabric garments. Both Ricoh/Anajet and Epson have long been players in this area and both introduced new units at the start of 2018. As this report was being finalized, Cary Sherburne commented on Amazon's recent patenting of an on-demand clothing manufacturing warehouse, pointing to a big future in the on-demand, customized clothing "microfactory."[35]

One additional benefit of the digital fast fashion trend is that it facilitates "re-shoring." Remember how the textile industry moved overseas several decades ago (drive along I-90 in New York and Massachusetts and you'll encounter the remains of textile factory towns)? Customized, on-demand clothing—with the assumption that delivery will be immediate—precludes overseas manufacturing, so a lot of this textile work can come back to the States.

And of course it's not just clothing, but textiles of all kinds, especially décor, furnishings, and more. Spoonflower,[36] for example, is a site that enables custom printing of a variety of textile products.

So look for digital, custom textiles to be hot product areas in the year ahead.

Items That Are Remaining Warm

The Retail Apocalypse

If you have tuned in to Dr. Joe's monthly economics webinars[37], you know that retail is in a bit of a perilous state. A widely-circulated Bloomberg story[38] last November

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[33] There is a caveat in that some specialty printing is done by the actual manufacturers of the objects that are decorated. For example, YETI , who makes the increasingly ubiquitous YETI cups, offers the YETI Custom Shop where short-run customized YETI containers can be ordered. The process uses a laser-etching technology to add logos or other images to the Thermos-like containers. More details at http://yeticustomshop.com. And recall that the makers of M&Ms have long offered their own custom M&M printing service at https://www.mymms.com/home.do. None of this precludes commercial printers offering these services as well, but be aware that there is competition.

[34] Check it out at http://whattheythink.com/textiles/.

[35] Cary Sherburne, "Amazon and On-Demand Clothing Manufacturing," WhatTheyThink, January 15, 2018, http://whattheythink.com/articles/88313-amazon-demand-clothing-manufacturing/.

[36] Check them out at https://www.spoonflower.com.

[37] Archived for your dining and dancing pleasure at http://whattheythink.com/webinars/203/.

foretold a coming "retail apocalypse" (their term), and it turns out that retail's problems aren't *necessarily* those we usually cite—millennials having an aversion to shopping malls, the growth of ecommerce, the dominance of Amazon, and the other usual suspects—although these are not insignificant factors. Rather, say the article's authors:

> The root cause is that many of these long-standing chains are overloaded with debt—often from leveraged buyouts led by private equity firms. There are billions in borrowings on the balance sheets of troubled retailers, and sustaining that load is only going to become harder—even for healthy chains.

They add:

> The debt coming due, along with America's over-stored suburbs and the continued gains of online shopping, has all the makings of a disaster. The spillover will likely flow far and wide across the U.S. economy. There will be displaced low-income workers, shrinking local tax bases and investor losses on stocks, bonds and real estate. If today is considered a retail apocalypse, then what's coming next could truly be scary.

The reason the retail situation is important to us here is because one of the big drivers of growth in the display graphics segment has been retail and point-of-purchase graphics. So the million-dollar question is, if retail goes down, what happens to the providers of retail graphics?

At the SGIA Expo last Fall, and more recently, I spoke with a few equipment vendors and providers of retail graphics and while they are aware of talk about the looming apocalypse, they're just not seeing it in terms of their own business—yet.

However, all this is not to say that retail/POP graphics providers are inexorably doomed, or that these types of graphics are living on borrowed time. There are a few things to keep in mind when it comes to not just retail as a market sector, but also retail graphics as an application.

The first is, there is more to "retail" than big brands and chain stores. It's true that, when we think of "retail" we think of Sears, Ann Taylor, Best Buy, and other major names, but retail encompasses much more than those businesses. Think convenience stores, the mini marts you find at gas stations—these businesses make more money on the items they sell in the store than they do on gas. As long as cars exist and need to be fueled in some fashion, these stores are not going away, and if you have been in or around one, there is no shortage of display graphics, from shelf labels, to window graphics, to wall graphics, to...well, pick a surface.

The second is, geography matters, and some states/regions have been (and will continue to be—harder hit by retail fallout than others. (The Bloomberg story tracks retail employment changes by state and county.) And don't ignore regional and local chains or small independent retailers. Not that they are immune to the broader societal and cultural changes affecting retail (they have some of the same problems),

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[38] Matt Townsend, Jenny Surane, Emma Orr, and Christopher Cannon, "America's 'Retail Apocalypse' Is Really Just Beginning," Bloomberg, November 8, 2017, https://www.bloomberg.com/graphics/2017-retail-debt/.

but in some ways they can be in stronger positions. They also have fewer resources than their bigger-box brethren, which means there are opportunities for companies like print/marketing services providers to be a greater source of marketing strategies.

There is also more to display graphics than just retail/POP. What we call "retail graphics" are often part of much larger marketing campaigns which can include a wide variety of print and electronic products and applications. Many POP graphics producers are also involved in complementary packaging applications. This highlights the growing importance of print service providers to be more "brand managers" handling all the disparate parts of a brandowner's marketing campaign than just serving as an output provider for one or two of them.

So we should keep an eye on the challenges facing the retail sector, but not necessarily expect widespread doom and decimation in the near future. And a hedge against being adversely affected by any downward trends in retail—as in any print application these days—is to diversify one's application and customer base as much as possible, or at least be in a nimble enough position to switch gears if the market changes. Because it will, one way or another.

Automation

The beat goes on. The pressure to automate as much as possible in the plant will continue, and will spread further into specialty and wide-format printing. Remember the digital printing jobs discussion from Section 2, and all the various pricing and managing productivity challenges and opportunities from Section 3? This where those chickens come home to roost.

Binding/Finishing

Bringing finishing capabilities in-house—be they small- or wide-format-, offset- or digital- compatible—is growing not just as a value-added service for print clients, but also as a practical reality: who has time to outsource finishing to a third party anymore? We expect this to play out by year's end, however. Investment plans are always cyclical, and there tend to be alternating ebbs and flows of press then finishing investment, and finishing has been a cresting wave for a while now.

One exception may very well be the digital embellishment equipment market—Scodix, MGI, and Highcon, to name three—which are still in the early days of market penetration. They have not shown up substantially in our data, but we suspect it is just a matter of time, and all three of these manufacturers are prominent presences at trade shows and it's really just a matter of time before they become more mainstream.

Still, binding/finishing is such a hot area right now that WhatTheyThink is launching a special topic page devoted to the subject, to launch in early 2018.

Items That Are Cooling

The Wide-Format Transition

As we saw earlier in this report, wide-format investment fever has largely broken. This is not to say that wide-format is dead, not at all. There will always be new applications, new substrates, and new technology upgrades emerging, and wide-format applications are still extremely hot product areas, but the commercial print transition and expansion to wide format looks to be largely complete, and we should not expect a lot of that in 2018. Instead, we'll see greater adding of capacity, pursuit of new applications, and variations on what print businesses have already been ding *vis-à-vis* wide format.

Printed signage is seen as the most logical offshoot of display graphics, and we're also seeing more and more dynamic digital signage (DDS) deployments, and while they do replace *some* print display applications, they more often than not complement other kinds of large- and small-format print. Digital signage is one of those things that we ignore at our peril. Investing in the capability to develop digital signage—or fostering a relationship with an outsourcing partner—is a good way to complement and supplement one's current product and service mix.

Production Inkjet

As we said last year, the takeover of the industry by production inkjet has been forecast for the past several years, and while it's still gaining traction, our survey data indicate that it is not high on printers' lists of priorities. Production inkjet is being touted as a replacement for offset—allowing shops to cost-effectively cope with shorter and shorter run lengths—but digital toner still seems to be the way most shops, especially smaller ones, are going.

The industry still remains divided between those printers that don't see a need for inkjet and those that see a need but haven't quite pulled the trigger yet. We have probably reached a point where those companies that saw opportunities in digital have already made the shift, while the remainder have yet to see those opportunities. That will likely change—maybe after the current binding/finishing cycle has ended?—but not just yet.

Packaging/Corrugated

As we remarked last year, drupa 2016 was more or less a packaging drupa, or at the very least a corrugated drupa, with several digital corrugated systems announced. As we saw in our Fall 2017 survey, our respondents don't see big opportunities in packaging, but then the equipment announcements are targeted to those businesses that already produce analog packaging and need the advantages of digital printing. Packaging is a whole ecosystem and market unto itself, and getting into it requires more than just buying new equipment. Not that it's impossible, but it requires a lot of due diligence.

Still, there is an overlap between corrugated packaging and point of purchase (POP) materials, and the latter is easier to pursue than the former—and in fact POP may be a good entrée into packaging.

Some of the systems that were announced n 2016 are going to be hitting the market (at least in beta) this year (some are already in beta sites), so we'll have to see how this pans out.

Items That *Should* Be Warming

Digital Labels

We saw in Section 3 that digital label printing is scarcely on shops' radars—labels just aren't sticking—and yet it is such a potentially lucrative opportunity with as-yet untapped potential. There has been such strong growth in boutique items—craft beers, wines, sauces, and a zillion other consumer items—and all these folks need labels, or at leas some kind of packaging. They also don't need massive quantities, which precludes them from availing themselves of the large offset and flexo label printers. And when you combine digital label printing with the digital embellishments made possible by the MGI, Konica Minolta, and other systems, and it's such a lost opportunity.

Direct-to Shape/Object

Not that really *should* be warming, but when we talk about specialty printing, a lot of those specialty items are cylindrical. We're thinking of bottles and glassware—promotional drinkware, to name the overall category. Systems from companies such as Inkcups and Engineered Printing Solutions (EPS) offer digital inkjet printing direct to bottles and glasses. And Xerox recently launched a Direct-to-Object Printer designed produce customized souvenirs in a more or less retail environment (like a gift shop)—notebooks, water bottles, plastic wine glasses, and golf balls can be personalized with a name or pithy saying. The company demonstrated the machine last summer at the Rochester N.Y. International Jazz Festival (which Xerox sponsors), and by all (well, Xerox's) accounts, the machine was a hit, as attendees were taking smartphone videos and selfies of the machine printing their custom souvenirs.[39]

The Last ~~Wave~~ Word

We've probably milked the metaphor of The Third Wave as much as we should, and while disruptive technologies do come in waves, and while we are on the cusp of The Third Wave (voice, IoT, etc.), this won't be the last wave. If we have learned nothing else in the last 30 years as an industry, it's that we can't ignore larger technological trends—even if we hate them. Just as the Internet, mobile, and social (the prior waves) disrupted our industry and adversely affected the demand for what our industry produces, so, too, will subsequent waves. We should be prepared for this, and respond accordingly, by changing our businesses, by changing our

[39] Richard Romano, "The Shapes of Things to Come: Direct-to-Object Printing Bridges the Gap Between Industrial and Commercial," *SGIA Journal*, November/December 2017, https://www.sgia.org/journal/2017/sgia-journal-graphic-edition-novemberdecember-2017/shapes-things-come-direct-object.

mindsets, by understanding how print has changed and how we can adapt to those changes.

As far as the printing industry is concerned, 2017 was not a great year, but it was not as bad as it could have been. There are some exciting pockets of development in the industry, and no shortage of ways to develop new, appealing new print applications. We just have to be open to the idea of doing so.

If we do see strong economic growth in 2018, and hope springs eternal, remember that it may only stimulate the purchase of new communications technologies that will continue to displace print,—or at least print in the way we have been used to thinking of it. As we always say in this space, we need a creative and proactive printing industry that focuses and thrives on those changes. The restructuring of the industry continues, and it must be future-focused and directed by entrepreneurial business owners who fearlessly dive into the confusion ahead with interesting and compelling ideas.

In the meantime, WhatTheyThink looks forward to continuing to provide cutting-edge research, analysis, and commentary on these dynamic markets.

Appendix A: Methodology

The number of respondents in the Fall 2017 survey results is 247 WhatTheyThink printing executives. These were gathered from the total number of respondents, 308. The excluded respondents were from other industries and countries that were not the survey target. There were no non-response follow-ups, but non-response bias was judged by comparisons to other surveys and especially government statistical data. Respondents were gathered from WhatTheyThink's commercial printing subscribers, recruited through social media (Twitter, LinkedIn), and special appeals to the WTT Economics and Research newsletter readers. The results were weighted to 2015 County Business Patterns NAICS 323 (general commercial printers).

A couple of caveats when using these data. Since our respondent base was drawn solely from the WhatTheyThink subscriber base—and remember that WhatTheyThink is an online-only publication—the respondents were likely (and we say this not to sound self-aggrandizing) more technologically proficient than other printing company owners or managers who have less of an affinity for the Internet, and their business activity tends to be slightly healthier than the industry at large.

Questionnaire

Subject line: Your Professional Opinion Is Requested

WhatTheyThink is conducting a survey of printing and communications executives, like you, about their business outlook and the industry's print and service offerings.

We need your help. We are contacting selected key executives to assist us in this project, so every response is important.

Your responses will be kept confidential. We will not release your name or answers to anyone; your responses will be combined with all of the others in survey totals. This is strictly a research project. Responses will not be used to create sales leads for advertisers or dealers.

To thank you for your assistance, we will send you an executive summary of this project. At the end of the questions, you will have a choice to either download the book *The Third Wave* by Dr. Joe Webb and Richard Romano.

If you want to receive the summary report, please enter your email address in the last question of the survey.

Thank you again for your consideration and your help.

Kindest regards,

Eric Vessels

President, WhatTheyThink

1) What is the primary business at this location? (Choose only the one that is the highest portion of 2016 sales.) Select only the best single answer.

☐ Quick printing (mainly b&w digital printing and copying, offset duplicators)
☐ Mainly book printing
☐ Mainly commercial multicolor sheetfed or web offset
☐ Mainly digital color (high-volume, high-production, like iGen or HP Indigo)
☐ Mainly digital black & white (high-volume, like Docutech)
☐ Non-offset commercial (gravure, letterpress, flexo, etc.)
☐ Specialty printing and promotional items (envelopes, business cards, stationery,
☐ greeting cards, novelties, etc.)
☐ Wide-format/signage/display
☐ Prepress services
☐ Binding and finishing services
☐ Inplant printing department, corporate, government, education, or non-profit
☐ Newspaper publisher/printer, daily and non-daily newspapers
☐ Business forms/systems dealer
☐ Business forms printing
☐ Folding carton printing
☐ Other packaging (label & wrapper, flexible packaging, etc.)

☐ Print management company (like InnerWorkings)
☐ Independent print broker
☐ Graphic design, advertising agency, publishing
☐ Paper merchant/dealer, industry manufacturer/vendor/dealer/VAR
☐ Industry journalist, analyst, consultant
☐ Other, please specify _____

2) Where is this business located?
☐ USA
☐ Canada
☐ Mexico or Central or South America
☐ Europe
☐ Asia
☐ Africa
☐ Australia/Oceania

3) How many employees are at this specific location?
☐ 1-4
☐ 5-9
☐ 10-19
☐ 20-49
☐ 50-99
☐ 100-249
☐ 250-499
☐ 500+

4) In terms of your 2017 revenues at this location only, how do they compare to 2016?
☐ increased more than 10%
☐ increased between 6% and 10%
☐ increased between 1% and 5%
☐ stayed about the same
☐ decreased between 1% and 5%
☐ decreased between 6% and 10%
☐ decreased more than 10%

5) How do you expect your 2018 revenues at this location to compare to 2017?
☐ increase more than 10%
☐ increase between 6% and 10%
☐ increase between 1% and 5%
☐ stay about the same
☐ decrease between 1% and 5%
☐ decrease between 6% and 10%
☐ decrease more than 10%

6) In terms of your 2017 jobs/orders at this location only, how do they compare to 2016?
☐ increased more than 10%
☐ increased between 6% and 10%
☐ increased between 1% and 5%
☐ stayed about the same
☐ decreased between 1% and 5%
☐ decreased between 6% and 10%
☐ decreased more than 10%

7) How do you expect your 2018 jobs/orders at this location to compare to 2017?
☐ increase more than 10%
☐ increase between 6% and 10%
☐ increase between 1% and 5%
☐ stay about the same
☐ decrease between 1% and 5%
☐ decrease between 6% and 10%
☐ decrease more than 10%

8) In terms of your 2017 profitability, how did it compare to 2016?
☐ increased more than 10%
☐ increased between 6% and 10%
☐ increased between 1% and 5%
☐ stayed about the same
☐ decreased between 1% and 5%
☐ decreased between 6% and 10%
☐ decreased more than 10%

9) How do you expect your 2018 profitability to compare to 2017?
☐ increase more than 10%
☐ increase between 6% and 10%
☐ increase between 1% and 5%
☐ stay about the same
☐ decrease between 1% and 5%
☐ decrease between 6% and 10%
☐ decrease more than 10%

10) In the next 12 months, which of the following will be your biggest business challenges? (click all that apply)
☐ increasing plant productivity
☐ managing workflow automation
☐ competition from other print providers
☐ capabilities of sales personnel
☐ capabilities of production personnel
☐ understanding the needs of today's communications buyers

☐ consumables and supplies prices
☐ economic conditions
☐ financing costs of our equipment
☐ finding capital for investments
☐ need for employee training
☐ finding qualified sales personnel
☐ finding qualified production personnel
☐ increasing employee benefit costs
☐ profitably handling shorter runs
☐ deciding whether to keep or discard our offset equipment
☐ loss of print business to digital media
☐ pricing
☐ job tracking
☐ migrating production to the cloud
☐ migrating business functions to the cloud
☐ migrating customer service and sales to the cloud
☐ training employees to use cloud applications
☐ keeping up with technological changes
☐ owner/management retirement
☐ retirement of key production personnel
☐ selling our business
☐ adding/updating web-to-print/online storefront
☐ getting web-to-print to work on smartphones and other mobile devices
☐ adding wide-format equipment/services
☐ adding packaging printing equipment/services
☐ transitioning jobs from offset to high-speed digital printing equipment
☐ adding non-print media capabilities (web design, app development, social media management, etc.)
☐ competing against digital media agencies
☐ other, please specify _____

11) In the next 12 months, which of the following represent your best new business opportunities? (click all that apply)

☐ improving economic conditions
☐ customers outsourcing more work to us
☐ increasing sales through print brokers
☐ partnering with other print providers
☐ helping clients get their websites to work on mobile devices
☐ offering electronic/non-print services for customers (web design, app development, social media management, etc.)
☐ helping customers integrate print and non-print marketing campaigns
☐ using marketing automation for our business (like HubSpot, Eloqua, Marketo)
☐ selling marketing automation services to our customers
☐ adding additional offset printing equipment
☐ adding digital printing equipment
☐ customized, personalized, or variable-data printing jobs

☐ disposing of offset equipment to concentrate on digital printing
☐ broadening bindery/finishing equipment/services
☐ adding "digital enhancement" finishing technologies (like Scodix, Highcon, MGI)
☐ adding wide-format printing capabilities
☐ adding textile/fabric printing capabilities
☐ adding packaging printing capabilities
☐ adding digital label/wrapper printing capabilities
☐ broadening fulfillment, shipping, mailing capabilities
☐ automating production
☐ adding web-to-print/online storefront
☐ getting more customers using smartphones and other mobile devices
☐ migrating production to the cloud
☐ migrating business functions to the cloud
☐ migrating customer service and sales to the cloud
☐ training employees to use cloud applications
☐ acquiring another company
☐ selling our company
☐ hiring new salespeople
☐ video production services
☐ other, please specify _____

12) Which of the following investment items have you budgeted for and plan to acquire in the next 12 months? (click all that apply)

☐ additional space/new location
☐ color measurement equipment (densitometer, spectrophotometer)
☐ color management software
☐ computer-to-plate equipment
☐ finishing/bindery equipment for offset/analog production
☐ finishing/bindery equipment for digital production
☐ toner-based color digital press (like HP Indigo, Xerox iGen)
☐ high-speed production inkjet printing equipment (like HP PageWide, Canon Océ ColorStream/ImageStream)
☐ sheetfed offset press
☐ web offset press—new
☐ rebuilding our web offset press
☐ wide-format color printer (24 in.+)–solvent/eco-solvent (like Epson, Roland)
☐ wide-format color printer (24 in.+)–latex (like HP Latex)
☐ wide-format color printer (24 in.+)–flatbed UV (like EFI VUTEk, Canon Océ Arizona, HP Scitex)
☐ digital label printing equipment
☐ dye-sublimation printer (like Epson, Roland, Mimaki)
☐ packaging press/printer–corrugated
☐ packaging press/printer–folding carton
☐ packaging press/printer–flexible packaging
☐ prepress RIP for our wide-format printers
☐ prepress RIP for other devices

☐ Management Information System (MIS)
☐ Customer Relations Management (CRM) system
☐ workflow automation software
☐ we have no planned investments
☐ other, please specify

13) For each of the following capabilities, please indicate the extent to which to have looked at it or considered adding it (check the column that best applies):

	Interested in adding it, but we have no timetable for it	Actively considering and researching it	Added it in past 18–24 months	Have specific budget plans to add it in next 12–18 months	We considered it, is not appropriate for our business	Will outsource this work as needed	We have never considered it / don't know
print signage (not soft signage)							
digital/electronic signage							
textile printing for soft signage							
textile printing for garments/fashion							
digital label/wrapper printing							
specialty printing (like coffee mugs, golf balls, smartphone cases)							
packaging printing/converting							
3D printing							
Augmented Reality (AR) development							
event management							
other, please specify_____							

14) Are you considering hiring/adding staff in the next 12 months?
☐ yes
☐ no
☐ don't know

15) If yes, for what positions are you looking to hire? (Check all that apply)
☐ executive management
☐ inside sales representative
☐ outside sales representative

☐ marketing and market communications
☐ prepress
☐ production management
☐ press operator (offset or digital)
☐ postpress/bindery/finishing
☐ IT management
☐ IT/software programming
☐ graphic designer (for print)
☐ web design/development
☐ mobile app development
☐ other, please specify _____

17) If you would like a free summary of the report from this survey, and the link to download a free copy of *The Third Wave* by Dr. Joe Webb and Richard Romano, please enter your email address below:

_____

Thank you very much!

Appendix B: Complete WhatTheyThink ERC Survey Results by Detailed Employee Size

Business Conditions

2017 Revenues

Table 32. In terms of your 2017 *revenues*, how do they compare to 2016?
Responses by Employee Size, Fall 2017

	1–4 empl.	5–9 empl.	10–19 empl.	20–49 empl.	50–99 empl.	100–249 empl.	250+ empl.	Total
increased more than 10%	25%	19%	22%	19%	20%	16%	8%	22%
increased between 6% and 10%	19%	17%	7%	12%	24%	18%	16%	16%
increased between 1% and 5%	19%	14%	10%	20%	18%	26%	20%	17%
stayed about the same	12%	14%	15%	14%	11%	16%	32%	13%
decreased between 1% and 5%	6%	17%	29%	15%	11%	18%	24%	13%
decreased between 6% and 10%	12%	11%	15%	15%	9%	6%	0%	12%
decreased more than 10%	6%	8%	2%	5%	7%	2%	0%	6%
Average change	3.1%	1.7%	1.2%	1.5%	2.9%	2.8%	2.1%	2.4%

2018 Revenues

Table 33. How do you expect your 2018 *revenues* to compare to 2017?
Responses by Employee Size, Fall 2017

	1–4 empl.	5–9 empl.	10–19 empl.	20–49 empl.	50–99 empl.	100–249 empl.	250+ empl.	Total
Increase more than 10%	38%	28%	17%	19%	18%	14%	4%	29%
increase between 6% and 10%	12%	19%	37%	27%	33%	34%	12%	20%
increase between 1% and 5%	31%	22%	23%	24%	25%	28%	40%	27%
stay about the same	19%	22%	17%	14%	16%	20%	32%	19%
decrease between 1% and 5%	0%	8%	3%	12%	4%	2%	12%	4%
decrease between 6% and 10%	0%	0%	0%	3%	2%	2%	0%	0%
decrease more than 10%	0%	0%	3%	2%	2%	0%	0%	1%
Average change	6.4%	5.3%	5.4%	4.3%	5.1%	5.0%	2.3%	5.7%

2017 Jobs/Orders

Table 34. In terms of your 2017 *jobs/orders*, how do they compare to 2016? Responses by Employee Size, Fall 2017

	1–4 empl.	5–9 empl.	10–19 empl.	20–49 empl.	50–99 empl.	100–249 empl.	250+ empl.	Total
increased more than 10%	19%	19%	20%	17%	22%	22%	17%	19%
increased between 6% and 10%	12%	11%	12%	22%	29%	6%	8%	14%
increased between 1% and 5%	31%	17%	8%	20%	18%	42%	29%	24%
stayed about the same	19%	22%	25%	14%	15%	24%	17%	20%
decreased between 1% and 5%	6%	17%	22%	14%	7%	4%	17%	11%
decreased between 6% and 10%	12%	6%	10%	12%	4%	2%	8%	10%
decreased more than 10%	0%	8%	3%	2%	5%	0%	4%	2%
Average change	3.0%	1.8%	1.8%	2.8%	4.3%	4.1%	1.9%	2.7%

2018 Jobs/Orders

Table 35. How do you expect your 2018 *jobs/orders* to compare to 2017? Responses by Employee Size, Fall 2017

	1–4 empl.	5–9 empl.	10–19 empl.	20–49 empl.	50–99 empl.	100–249 empl.	250+ empl.	Total
Increase more than 10%	27%	17%	23%	17%	20%	20%	13%	23%
increase between 6% and 10%	20%	25%	17%	24%	31%	16%	21%	21%
increase between 1% and 5%	27%	28%	37%	32%	28%	40%	33%	29%
stay about the same	27%	22%	15%	19%	11%	20%	33%	23%
decrease between 1% and 5%	0%	6%	5%	2%	6%	2%	0%	2%
decrease between 6% and 10%	0%	3%	0%	3%	2%	2%	0%	1%
decrease more than 10%	0%	0%	3%	3%	2%	0%	0%	1%
Average change	5.6%	4.4%	4.8%	4.2%	5.3%	4.7%	4.2%	5.1%

2017 Profits

Table 36. In terms of your 2017 *profitability*, how did it compare to 2016?
Responses by Employee Size, Fall 2017

	1–4 empl.	5–9 empl.	10–19 empl.	20–49 empl.	50–99 empl.	100–249 empl.	250+ empl.	Total
increased more than 10%	33%	17%	25%	16%	22%	17%	9%	26%
increased between 6% and 10%	7%	25%	12%	7%	17%	13%	18%	12%
increased between 1% and 5%	27%	11%	25%	11%	24%	15%	27%	21%
stayed about the same	13%	25%	15%	32%	19%	21%	23%	18%
decreased between 1% and 5%	0%	8%	12%	14%	9%	15%	18%	6%
decreased between 6% and 10%	13%	6%	5%	9%	4%	15%	0%	10%
decreased more than 10%	7%	8%	5%	12%	6%	6%	5%	7%
Average change	3.5%	2.6%	3.4%	0.2%	3.5%	1.1%	2.2%	2.9%

2018 Profits

Table 37. How do you expect your 2018 *profitability* to compare to 2017?
Responses by Employee Size, Fall 2017

	1–4 empl.	5–9 empl.	10–19 empl.	20–49 empl.	50–99 empl.	100–249 empl.	250+ empl.	Total
Increase more than 10%	27%	17%	8%	16%	22%	15%	15%	20%
increase between 6% and 10%	13%	19%	30%	21%	24%	27%	15%	18%
increase between 1% and 5%	7%	25%	40%	38%	41%	35%	40%	20%
stay about the same	53%	28%	15%	11%	7%	21%	30%	36%
decrease between 1% and 5%	0%	11%	5%	7%	4%	0%	0%	4%
decrease between 6% and 10%	0%	0%	0%	5%	2%	2%	0%	1%
decrease more than 10%	0%	0%	3%	2%	0%	0%	0%	1%
Average change	4.5%	4.0%	4.1%	3.9%	5.6%	4.8%	4.2%	4.3%

Business Conditions Summary

Table 38. 2017 vs. 2016 average % change in revenues, orders, and profits
All Responses by Employee Size, Fall 20167

	1–4 empl.	5–9 empl.	10–19 empl.	20–49 empl.	50–99 empl.	100–249 empl.	250+ empl.	Total
Revenues	3.1%	1.7%	1.2%	1.5%	2.9%	2.8%	2.1%	2.4%
Jobs	3.0%	1.8%	1.8%	2.8%	4.3%	4.1%	1.9%	2.7%
Profits	3.5%	2.6%	3.4%	0.2%	3.5%	1.1%	2.2%	2.9%

Table 39. Expected 2018 vs. 2017 average % change in revenues, orders, and profits
All Responses by Employee Size, Fall 2017

	1–4 empl.	5–9 empl.	10–19 empl.	20–49 empl.	50–99 empl.	100–249 empl.	250+ empl.	Total
Revenues	6.4%	5.3%	5.4%	4.3%	5.1%	5.0%	2.3%	5.7%
Jobs	5.6%	4.4%	4.8%	4.2%	5.3%	4.7%	4.2%	5.1%
Profits	4.5%	4.0%	4.1%	3.9%	5.6%	4.8%	4.2%	4.3%

Business Challenges

Table 40. In the next 12 months, which of the following will be your biggest *business challenges*?
Responses by Employee Size, Fall 2017 *(multiple responses permitted)*

	1–4 empl.	5–9 empl.	10–19 empl.	20–49 empl.	50–99 empl.	100–249 empl.	250+ empl.	Total
pricing	56%	28%	26%	40%	40%	39%	24%	44%
increasing plant productivity	31%	31%	24%	50%	47%	55%	41%	33%
competition from other print providers	31%	33%	36%	33%	40%	41%	14%	33%
capabilities of sales personnel	25%	28%	33%	43%	47%	43%	35%	30%
finding qualified sales personnel	25%	19%	31%	42%	46%	47%	17%	28%
increasing employee benefit costs	31%	19%	10%	30%	24%	31%	14%	25%
economic conditions	31%	19%	14%	30%	15%	20%	10%	25%
finding qualified production personnel	25%	17%	29%	27%	46%	33%	41%	25%
managing workflow automation	19%	22%	31%	42%	42%	41%	21%	25%
loss of print business to digital media	31%	17%	17%	17%	7%	8%	17%	23%
profitably handling shorter runs	31%	11%	14%	8%	31%	16%	17%	22%
capabilities of production personnel	19%	22%	26%	13%	16%	24%	21%	20%
adding/updating web-to-print/online storefront	19%	22%	14%	12%	20%	18%	10%	18%
adding non-print media capabilities (web design, app development, social media management, etc.)	25%	11%	10%	5%	13%	6%	3%	17%
need for employee training	13%	19%	19%	18%	27%	28%	24%	16%
deciding whether to keep or discard our offset equipment	19%	17%	12%	10%	7%	2%	3%	16%
keeping up with technological changes	13%	17%	19%	20%	26%	12%	14%	15%
understanding the needs of today's communications buyers	13%	19%	12%	13%	15%	16%	14%	14%
competing against digital media agencies	19%	6%	10%	3%	11%	8%	3%	13%
selling our business	13%	8%	12%	5%	2%	0%	0%	10%
job tracking	13%	6%	5%	7%	9%	10%	7%	9%
owner/management retirement	6%	11%	19%	8%	9%	8%	0%	9%
getting web-to-print to work on smartphones and other mobile devices	13%	6%	5%	7%	2%	10%	0%	9%
consumables and supplies prices	13%	0%	7%	5%	13%	20%	7%	9%
adding wide-format equipment/services	6%	6%	7%	7%	9%	2%	7%	6%
adding packaging printing equipment/services	6%	3%	2%	2%	7%	4%	3%	5%
transitioning jobs from offset to high-speed digital printing equipment	0%	11%	7%	5%	13%	12%	3%	5%
retirement of key production personnel	0%	8%	10%	5%	11%	12%	14%	4%

	1–4 empl.	5–9 empl.	10–19 empl.	20–49 empl.	50–99 empl.	100–249 empl.	250+ empl.	Total
finding capital for investments	0%	6%	7%	8%	15%	2%	10%	4%
migrating customer service and sales to the cloud	0%	0%	14%	5%	2%	2%	0%	3%
migrating business functions to the cloud	0%	3%	10%	3%	6%	2%	3%	2%
migrating production to the cloud	0%	6%	5%	2%	0%	0%	0%	2%
training employees to use cloud applications	0%	0%	7%	3%	0%	2%	3%	1%
financing costs of our equipment	0%	0%	7%	0%	6%	2%	3%	1%

Business Opportunities

Table 41. In the next 12 months, which of the following represent your best *new business opportunities*?
Responses by Employee Size, Fall 2017 *(multiple responses permitted)*

	1–4 empl.	5–9 empl.	10–19 empl.	20–49 empl.	50–99 empl.	100–249 empl.	250+ empl.	Total
improving economic conditions	56%	19%	36%	25%	42%	24%	14%	41%
helping customers integrate print and non-print marketing campaigns	38%	17%	19%	13%	29%	26%	28%	28%
customized, personalized, or variable-data printing jobs	31%	22%	19%	28%	38%	20%	21%	27%
customers outsourcing more work to us	25%	31%	29%	23%	38%	29%	28%	27%
acquiring another company	31%	19%	10%	27%	20%	33%	7%	25%
broadening bindery/finishing equipment/services	31%	11%	21%	12%	20%	18%	10%	23%
automating production	25%	8%	19%	22%	24%	31%	28%	21%
hiring new salespeople	13%	19%	24%	32%	36%	26%	14%	19%
offering electronic/non-print services for customers (web design, app development, social media management, etc.)	25%	8%	7%	5%	26%	16%	24%	17%
adding digital printing equipment	6%	33%	26%	20%	24%	24%	14%	17%
broadening fulfillment, shipping, mailing capabilities	19%	3%	14%	18%	31%	22%	17%	16%
partnering with other print providers	19%	11%	12%	15%	16%	6%	14%	16%
adding web-to-print/online storefront	6%	17%	19%	12%	15%	10%	7%	11%
disposing of offset equipment to concentrate on digital printing	13%	14%	10%	0%	4%	4%	0%	10%
adding wide-format printing capabilities	6%	19%	12%	10%	11%	4%	0%	10%
increasing sales through print brokers	6%	19%	7%	10%	11%	4%	0%	9%
selling our company	13%	3%	10%	10%	4%	0%	0%	9%
helping clients get their websites to work on mobile devices	13%	3%	2%	2%	4%	6%	7%	8%
adding additional offset printing equipment	6%	0%	2%	2%	4%	10%	3%	4%
adding digital label/wrapper printing capabilities	6%	0%	2%	2%	0%	2%	0%	4%
using marketing automation for our business (like HubSpot, Eloqua, Marketo)	0%	6%	10%	5%	4%	10%	7%	3%
selling marketing automation services to our customers	0%	3%	7%	8%	2%	20%	7%	3%
adding packaging printing capabilities	0%	3%	2%	7%	11%	8%	0%	2%
adding textile/fabric printing capabilities	0%	6%	2%	3%	4%	4%	0%	2%
adding "digital enhancement" finishing technologies (like	0%	0%	5%	8%	6%	4%	7%	2%

	1–4 empl.	5–9 empl.	10–19 empl.	20–49 empl.	50–99 empl.	100–249 empl.	250+ empl.	Total
Scodix, Highcon, MGI)								
getting more customers using smartphones and other mobile devices	0%	8%	0%	2%	0%	0%	0%	2%
migrating business functions to the cloud	0%	3%	5%	3%	6%	2%	0%	2%
training employees to use cloud applications	0%	3%	5%	2%	0%	0%	3%	1%
migrating customer service and sales to the cloud	0%	0%	5%	5%	0%	2%	0%	1%
video production services	0%	0%	0%	3%	0%	4%	0%	0%
migrating production to the cloud	0%	0%	0%	2%	2%	4%	0%	0%

Planned Investments

Table 42. Which of the following *investment items* have you budgeted for and plan to acquire in the next 12 months?
Responses by Employee Size, Fall 2017 *(multiple responses permitted)*

	1–4 empl.	5–9 empl.	10–19 empl.	20–49 empl.	50–99 empl.	100–249 empl.	250+ empl.	Total
finishing/bindery equipment for digital production	31%	14%	31%	22%	18%	8%	10%	26%
we have no planned investments	25%	28%	12%	13%	11%	6%	10%	21%
workflow automation software	13%	6%	26%	32%	16%	18%	14%	15%
Management Information System (MIS)	6%	11%	12%	20%	9%	16%	14%	10%
wide-format color printer (24 in.+)–solvent/eco-solvent (like Epson, Roland)	13%	8%	2%	2%	0%	2%	7%	8%
finishing/bindery equipment for offset/analog production	6%	3%	12%	7%	22%	8%	10%	7%
toner-based color digital press (like HP Indigo, Xerox iGen)	6%	11%	5%	5%	6%	12%	7%	7%
Customer Relations Management (CRM) system	6%	3%	7%	3%	4%	10%	10%	5%
color measurement equipment (densitometer, spectrophotometer)	6%	3%	2%	8%	6%	6%	7%	5%
dye-sublimation printer (like Epson, Roland, Mimaki)	6%	8%	0%	0%	6%	2%	0%	5%
color management software	6%	0%	2%	5%	6%	0%	0%	4%
additional space/new location	0%	6%	2%	10%	16%	16%	10%	4%
prepress RIP for our wide-format printers	6%	0%	0%	2%	0%	0%	3%	3%
wide-format color printer (24 in.+)–flatbed UV (like EFI VUTEk, Canon Océ Arizona, HP Scitex)	0%	6%	10%	3%	4%	4%	3%	3%
high-speed production inkjet printing equipment (like HP PageWide, Canon Océ ColorStream/ImageStream)	0%	0%	0%	8%	9%	14%	21%	2%
sheetfed offset press	0%	0%	7%	3%	4%	10%	3%	2%
wide-format color printer (24 in.+)–latex (like HP Latex)	0%	0%	5%	3%	4%	2%	3%	1%
computer-to-plate equipment	0%	3%	0%	2%	4%	6%	0%	1%
digital label printing equipment	0%	3%	0%	2%	2%	2%	0%	1%
prepress RIP for other devices	0%	0%	2%	2%	0%	2%	3%	1%
packaging press/printer–flexible packaging	0%	3%	0%	0%	0%	0%	0%	1%
rebuilding our web offset press	0%	0%	0%	0%	2%	2%	0%	0%
web offset press—new	0%	0%	0%	0%	0%	0%	0%	0%
packaging press/printer–corrugated	0%	0%	0%	0%	0%	0%	0%	0%
packaging press/printer–folding carton	0%	0%	0%	0%	0%	0%	0%	0%

Hiring

Table 43. Are you considering hiring/adding staff in the next 12 months?
Responses by Employee Size, Fall 2017

	1–4 empl.	5–9 empl.	10–19 empl.	20–49 empl.	50–99 empl.	100–249 empl.	250+ empl.	Total
Yes	54%	42%	63%	58%	73%	76%	80%	64%
No	46%	30%	24%	21%	12%	7%	15%	19%
Don't Know	0%	27%	13%	21%	16%	17%	5%	16%

Table 44. If yes, for what positions are you looking to hire?
Respondents considering hiring in 2018 by Employee Size, Fall 2017 ***(multiple responses permitted)***

	1–4 empl.	5–9 empl.	10–19 empl.	20–49 empl.	50–99 empl.	100–249 empl.	250+ empl.	Total
executive management	0%	7%	5%	11%	14%	5%	5%	6%
inside sales representative	6%	7%	14%	13%	6%	6%	3%	9%
outside sales representative	5%	5%	10%	11%	9%	6%	5%	8%
marketing and market communications	13%	9%	20%	7%	3%	7%	3%	11%
prepress	14%	15%	3%	12%	7%	6%	3%	10%
production management	4%	6%	13%	3%	7%	7%	16%	7%
press operator (offset or digital)	9%	7%	3%	8%	10%	5%	11%	8%
postpress/bindery/finishing	10%	5%	6%	11%	7%	5%	12%	8%
IT management	0%	11%	8%	5%	8%	10%	7%	6%
IT/software programming	0%	9%	3%	7%	9%	7%	15%	5%
graphic designer (for print)	23%	5%	12%	3%	4%	12%	3%	11%
web design/development	14%	15%	3%	5%	9%	9%	3%	9%
mobile app development	0%	0%	0%	5%	7%	15%	13%	3%

Appendix C: ASM Value of Shipments

The table below provides value of shipments by NAICS (322 and 323, paper and print, respectively) from the Annual Survey of Manufactures (ASM), inflation-adjusted to 2017. The 2012 data are from the Economic Census. For clarity, we included only the most recent five years for which we had data.

Table 45. Value of Shipments of Selected Paper and Print Products ($ Million), 2012–2016

NAICS	Industry	2012	2013	2014	2015	2016
322110	Pulp mills	$8,087,461	$8,145,966	$8,229,090	$7,780,058	$7,102,003
3221101	Special alpha and dissolving woodpulp (sulfite and sulfate for chemical conversion, papermaking, and other uses)	$6,753,654	$6,928,879	$7,401,727	$7,129,220	$0
3221103	Sulfate woodpulp, including soda	$0	$0	$0	$0	$0
3221105	Sulfite and other woodpulp	$0	$0	$0	$0	$0
3221107	Pulp, other than wood, and pulp mill byproducts, nec	$1,328,773	$1,196,728	$811,819	$665,235	$572,138
322110W	Pulp mill products, nsk, total	$5,034	$20,359	$15,544	$15,336	$39,220,682
322121	Paper, except newsprint, mills	$44,654,072	$45,393,271	$44,372,090	$41,718,229	$39,220,682
3221211	Clay coated printing and converting paper	$0	$0	$0	$0	$0
3221213	Uncoated freesheet paper (containing not more than 10 percent mechanical fiber)	$0	$0	$0	$0	$0
3221215	Bleached bristols, excluding cotton fiber index and bogus (weight more than 150 grams per sq meter)	$20,818,132	$21,649,655	$20,467,128	$19,612,607	$18,208,127
3221217	Cotton fiber paper (containing 25 percent or more cotton or similar fibers) and thin paper	$0	$0	$0	$0	$0
3221219	Unbleached kraft (not less than 80 percent) packaging and industrial converting paper	$0	$0	$0	$0	$0
322121A	Packaging and industrial converting paper, except unbleached kraft	$0	$0	$0	$0	$0
322121C	Special industrial paper, except specialty packaging, including absorbent, battery separator, electrical papers, etc	$0	$0	$0	$0	$0
322121E	Construction paper	$0	$0	$0	$0	$0
322121G	Tissue paper and other machine creped paper	$0	$0	$0	$0	$0
322121J	Sanitary napkins and tampons (made in paper mills)	$0	$0	$0	$0	$0
322121L	Disposable diapers (usually containing pulp or cellulose fibers), and similar disposable products (made in paper mills)	$0	$0	$0	$0	$0
322121N	Sanitary tissue paper products (made in paper mills)	$20,041,117	$0	$17,849,618	$0	$0
322121W	Paper (except newsprint) mill products, nsk, total	$0	$0	$0	$0	$0
322122	Newsprint mills	$3,229,386	$2,354,442	$1,888,210	$1,684,846	$1,492,327
3221221	Newsprint	$2,226,590	$1,606,880	$1,153,874	$1,002,544	$885,663
3221223	Uncoated groundwood paper (containing more than 10 percent mechanical fiber)	$0	$0	$734,336	$682,302	$606,352
322122W	Newsprint mill products, nsk, total	$0	$1,960	$4,555	$0	$0
322130	Paperboard mills	$29,986,974	$30,754,239	$31,424,108	$30,738,607	$29,073,542

NAICS	Industry	2012	2013	2014	2015	2016
3221301	Unbleached kraft packaging and industrial converting paperboard (80 percent or more virgin woodpulp)	$14,421,226	$13,905,012	$14,406,389	$14,580,759	$13,514,289
3221303	Bleached packaging and industrial converting paperboard (80 percent or more virgin bleached woodpulp)	$5,510,487	$5,083,965	$5,148,840	$4,784,443	$4,635,104
3221305	Semichemical paperboard, including corrugating medium (75 percent or more virgin woodpulp)	$1,669,742	$2,357,220	$2,715,769	$2,595,519	$2,465,468
3221307	Recycled paperboard	$8,288,121	$9,320,745	$9,044,804	$8,692,920	$8,592,321
3221309	Wet machine board, including binders' board and shoe board	$-	$-	$-	$0	$0
322130W	Paperboard mill products, nsk, total	$-	$-	$-	$0	$0
322211	Corrugated and solid fiber boxes	$33,865,389	$36,681,849	$38,830,128	$37,989,527	$37,942,664
3222110	Corrugated and solid fiber boxes, including pallets	$33,865,389	$36,681,849	$38,436,211	$37,989,527	$37,942,664
322212	Folding paperboard boxes	$13,291,858	$14,419,395	$14,509,254	$13,974,651	$14,230,854
3222120	Folding paperboard boxes, packaging, and packaging components	$13,291,858	$14,419,395	$14,509,254	$13,987,318	$14,230,854
322213	Setup paperboard boxes	$1,200,101	$775,268	$775,047	$709,796	$698,083
322214	Fiber cans, tubes, drums, and similar products	$0	$0	$0	$0	$0
3222141	Paperboard fiber drums with ends of any material	$350,937	$310,214	$320,656	$307,367	$304,198
3222143	Fiber cans, tubes, and similar fiber products	$1,760,940	$1,766,387	$1,731,277	$1,745,506	$1,776,042
322214W	Fiber cans, tubes, drums, and similar products, nsk, total	$0	$0	$0	$0	$0
322215	Nonfolding sanitary food containers	$0	$0	$0	$0	$0
3222151	Milk and milk type paperboard cartons, including juice, beverage, and other products	$874,084	$833,082	$0	$0	$0
3222153	Cups and liquid tight paper and paperboard containers	$1,701,923	$1,764,865	$1,862,388	$1,943,756	$1,921,743
3222155	Other sanitary paper and paperboard food containers, boards, and trays, nec, except folding	$1,857,079	$1,940,453	$2,037,652	$2,077,163	$2,163,814
322215W	Nonfolding sanitary food containers, nsk, total	$0	$0	$0	$0	$0
322221	Coated and laminated packaging paper and plastics film	$0	$0	$0	$0	$0
3222211	Single web paper, coated rolls and sheets, including waxed, for flexible packaging uses	$1,301,045	$1,341,441	$1,518,659	$1,581,226	$1,558,578
3222213	Multiweb laminated rolls and sheets, except foil and film film, for flexible packaging uses	$1,100,790	$1,116,495	$916,462	$904,525	$820,922

NAICS	Industry	2012	2013	2014	2015	2016
322221W	Coated and laminated packaging paper and plastics film, nsk, total	$0	$0	$0	$0	$0
322222	Coated and laminated paper	$0	$0	$0	$0	$0
3222221	Printing paper, coated at establishments other than where paper was produced	$1,669,902	$1,667,579	$1,397,274	$1,210,408	$1,124,204
3222223	Gummed products	$270,284	$262,935	$218,205	$228,340	$229,323
3222225	Pressure sensitive products	$6,738,221	$6,504,298	$6,582,349	$7,223,450	$6,796,555
3222226	Wallcoverings	$401,135	$418,833	$312,734	$258,973	$290,465
3222227	Gift wrap paper	$185,095	$176,731	$196,020	$173,905	$170,667
3222229	Other coated and processed papers, nec, except for packaging uses	$2,700,497	$2,841,100	$2,819,808	$2,873,191	$2,812,329
322222W	Coated and laminated paper, nsk, total	$0	$0	$0	$0	$0
322223	Plastics, foil, and coated paper bags	$0	$0	$0	$0	$0
3222231	Specialty bags, pouches, and liners, coated single web paper	$334,504	$293,948	$339,334	$389,391	$381,413
3222233	Specialty bags, pouches, and liners, multiweb laminations and foil, except film film	$563,928	$534,390	$789,378	$798,867	$853,877
322223W	Plastics, foil, and coated paper bags, nsk, total	$0	$0	$0	$0	$0
322224	Uncoated paper and multiwall bags	$0	$0	$0	$0	$0
3222241	Uncoated single web paper grocers' bags and sacks and variety and shopping bags	$1,357,699	$1,351,161	$1,192,637	$1,117,496	$1,119,547
3222243	Shipping sacks and multiwall bags, all materials except textiles	$1,256,235	$1,422,875	$1,153,598	$1,063,972	$994,191
322224W	Uncoated paper and multiwall bags, nsk, total	$0	$0	$0	$0	$0
322225	Laminated aluminum foil for flexible packaging uses	$1,674,815	$1,635,905	$1,570,439	$1,548,947	$1,463,688
322226	Surface coated paperboard	$0	$0	$0	$0	$0
322231	Die-cut paper office supplies manufacturing	$0	$0	$0	$0	$0
3222311	Die cut paper and paperboard office supplies	$1,067,843	$1,027,338	$861,345	$809,694	$757,200
3222313	Paper supplies for business machines and other miscellaneous unprinted paper office supplies, nec .. 2001..	$1,976,025	$1,901,411	$1,908,210	$1,932,107	$1,867,339
322231W	Die cut paper and paperboard office supplies, nsk, total	$0	$0	$0	$0	$0
322232	Envelopes	$0	$0	$0	$0	$0
3222320	Envelopes, commercial, all types and materials	$2,831,264	$2,717,076	$2,624,135	$2,422,148	$2,316,780
322233	Stationery, tablet, and related products	$7,058,868	$6,815,924	$6,226,718	$0	$0
3222331	Stationery	$301,478	$361,941	$297,816	$303,542	$287,535
3222333	Tablets, pads, and related products	$629,292	$548,660	$424,880	$340,430	$342,110

NAICS	Industry	2012	2013	2014	2015	2016
322233W	Stationery, tablets, and related products, nsk, total	$252,965	$259,499	$264,912	$285,955	$248,224
322291	Sanitary paper products	$12,509,588	$12,136,729	$12,075,853	$12,010,380	$11,399,074
3222911	Sanitary napkins and tampons (not made in paper mills)	$0	$0	$0	$0	$0
3222913	Disposable diapers (usually containing pulp or cellulose fibers) and similar disposable products (not made in paper mills)	$6,923,936	$6,616,883	$7,086,752	$6,996,358	$6,345,586
3222915	Sanitary tissue paper products (not made in paper mills)	$5,127,619	$5,127,860	$4,580,324	$4,655,436	$4,688,646
322291W	Sanitary paper products, nsk, total	$458,032	$391,987	$408,777	$358,586	$364,842
322299	Other converted paper products	$5,399,315	$5,553,426	$4,690,886	$4,881,373	$4,976,368
3222991	Molded pulp goods, including egg cartons, florist pots, food trays, etc	$616,440	$705,806	$636,696	$831,204	$757,507
3222993	Other converted paper and paperboard products, nec	$3,791,996	$3,882,031	$4,690,886	$3,381,039	$3,510,246
322299W	All other converted paper products, nsk, total	$990,879	$965,590	$680,891	$669,129	$708,616
323110	Commercial lithographic printing	$0	$0	$0	$0	$0
323111	Commercial printing (except screen and books)	$67,597,650	$66,599,983	$65,494,831	$63,944,450	$64,372,889
3231101	Magazine and periodical printing (lithographic) (offset)	$4,775,696	$4,643,152	$4,586,331	$4,151,614	$4,081,881
3231103	Label and wrapper printing (lithographic) (offset)	$2,961,215	$2,880,946	$2,703,877	$2,506,968	$2,501,864
3231105	Catalog and directory printing (lithographic) (offset)	$3,665,547	$3,449,966	$3,501,550	$3,179,503	$3,049,143
3231107	Financial and legal printing (lithographic) (offset)	$2,050,307	$1,957,365	$2,133,680	$2,011,708	$2,027,947
3231109	Advertising printing (lithographic) (offset)	$13,528,050	$12,778,136	$11,465,983	$10,622,012	$10,449,808
323110B	Other general job printing, nec (lithographic) (offset)	$6,561,625	$7,088,141	$8,083,902	$8,396,060	$8,684,604
323110W	Commercial lithographic printing, nsk, total	$0	$0	$0	$0	$0
323111	Commercial gravure printing	$0	$0	$0	$0	$0
3231111	Magazine and periodical printing (gravure)	$398,391	$402,507	$505,205	$419,217	$407,813
3231113	Label and wrapper printing (gravure)	$854,781	$904,766	$872,447	$840,898	$844,843
3231115	Catalog and directory printing (gravure)	$-	$772,814	$698,226	$576,698	$528,000
3231117	Advertising printing (gravure)	$701,336	$729,214	$610,933	$467,767	$425,621
3231119	Business stationery and all other printing (gravure)	$0	$0	$0	$0	$0
323111W	Commercial gravure printing, nsk, total	$350,699	$434,300	$451,338	$618,910	$0
323112	Commercial flexographic printing	$0	$0	$0	$0	$0
3231121	Label and wrapper printing (flexographic)	$6,302,314	$6,426,881	$6,398,745	$6,566,899	$6,577,001

NAICS	Industry	2012	2013	2014	2015	2016
3231123	Flexographic printing, nec (excluding labels and wrappers)	$1,636,161	$1,586,534	$1,631,365	$1,646,725	$1,665,641
323112W	Commercial flexographic printing, nsk, total	$0	$0	$0	$0	$0
323113	Commercial screen printing	$7,309,028	$7,200,890	$7,481,602	$7,234,778	$7,373,949
3231132	Label printing (screen)	$548,176	$528,012	$551,169	$585,046	$586,052
3231131	Screen printing, except on textiles	$2,143,685	$2,148,471	$1,984,088	$1,908,441	$1,901,509
3231133	Screen printing on garments, apparel accessories, and other fabric articles	$3,444,433	$3,547,053	$3,812,668	$3,569,551	$3,643,700
323113W	Commercial screen printing, nsk, total	$1,172,734	$1,159,241	$1,173,609	$1,171,742	$1,242,688
323114	Quick printing	$1,393,411	$1,400,385	$945,693	$1,098,281	$1,627,668
323115	Digital printing	$9,221,239	$9,275,917	$9,077,962	$9,169,720	$9,741,748
323116	Manifold business form printing	$0	$0	$0	$0	$0
3231161	Unit set forms, loose or bound	$777,776	$680,920	$702,323	$741,184	$743,686
3231163	Manifold books and pegboard accounting systems	$0	$0	$0	$0	$0
3231165	Custom continuous business forms	$1,245,867	$1,092,014	$1,003,785	$944,365	$918,505
3231167	Stock continuous business forms	$0	$0	$0	$0	$0
3231169	Checkbooks (including inserts and refills, but excluding those in continuous form and die cut)	$1,404,066	$1,761,697	$1,723,330	$1,710,371	$1,673,191
323116W	Manifold business form printing, nsk, total	$0	$0	$0	$0	$0
323117	Book printing	$4,679,845	$4,600,080	$4,455,491	$4,241,148	$4,424,226
3231171	Textbook printing and binding	$824,787	$815,764	$889,249	$843,759	$809,789
3231173	Technical, scientific, and professional book printing and binding	$488,970	$454,175	$424,381	$486,336	$472,494
3231175	Religious book printing and binding	$311,931	$311,770	$317,274	$336,075	$336,399
3231177	General book (trade, etc.) printing and binding	$1,388,291	$1,360,188	$1,444,299	$1,351,164	$1,485,060
3231179	Other book printing and binding, nec	$909,059	$897,251	$739,415	$636,166	$698,139
323117A	Books, printing only, not bound	$248,287	$244,529	$197,067	$162,165	$164,583
323117C	Pamphlet printing and binding or printing only (excluding advertising pamphlets)	$209,983	$205,394	$199,667	$185,167	$193,471
323117W	Book printing, nsk, total	$298,537	$311,011	$244,139	$240,317	$264,292
323118	Blankbooks and looseleaf binders and devices	$0	$0	$0	$0	$0
3231181	Blankbook making, except checkbooks	$0	$0	$319,771	$289,710	$0
3231183	Looseleaf binders, devices, and forms, including those used for time planners organizers, appointment books, photo albums, scrap books, etc	$666,247	$566,073	$327,325	$327,458	$0
323118W	Blankbooks and looseleaf binders and devices, nsk, total	$459,584	$362,775	$334,009	$0	$0
323119	Other commercial printing	$0	$0	$0	$0	$0

NAICS	Industry	2012	2013	2014	2015	2016
3231191	Magazine and periodical printing (letterpress)	$0	$0	$0	$0	$0
3231193	Label and wrapper printing (letterpress)	$315,932	$247,140	$232,849	$213,432	$216,355
3231195	Catalog and directory printing (letterpress)	$0	$0	$0	$0	$0
3231197	Financial and legal printing (letterpress)	$0	$0	$0	$0	$0
3231199	Advertising printing (letterpress)	$0	$0	$0	$0	$0
323119B	Other general job printing (letterpress)	$555,250	$547,863	$564,343	$576,316	$576,242
323119E	Engraving (printing)	$148,319	$157,062	$131,877	$94,951	$70,295
323119J	All other commercial printing	$249,036	$245,831	$294,866	$0	$0
323119W	Other commercial printing, nsk, total	$0	$0	$0	$0	$0
323120	Support activities for printing	$4,479,997	$4,481,983	$4,175,767	$3,852,814	$3,801,360
323121	Tradebinding and related work	$0	$0	$0	$0	$0
3231211	Edition, library, and other hardcover bookbinding	$209,474	$211,801	$205,153	$212,306	$210,639
3231215	Softcover/pamphlet/sample/other binding (printed elsewhere)	$490,332	$520,878	$499,477	$488,712	$460,043
3231217	Misc. binding/postpress work incl. foil stamping/die-cutting/etc.	$746,928	$697,074	$704,656	$0	$0
3231213	Other book and pamphlet binding, and related binding and post press work, nec	$0	$0	$0	$0	$0
323121W	Tradebinding and related work, nsk, total	$0	$0	$0	$0	$0
323122	Prepress services	$0	$0	$0	$0	$0
3231221	Prepress services, except platemaking (including film, assembled flats, color separations, typesetting, imagesetting, etc.)	$1,512,218	$1,531,613	$1,386,948	$1,203,188	$1,177,189
3231223	Printing plates, prepared for printing, excluding blank plates	$991,523	$1,009,218	$942,795	$912,065	$882,038
323122W	Prepress services, nsk, total	$529,521	$511,398	$412,887	$307,939	$318,364