Printing Forecast 2017

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

Project Directors: Dr. Joe Webb and Richard Romano

WhatTheyThink?

CONFIDENTIAL

2038 Ford Parkway, #218
St. Paul, MN 55116
WhatTheyThink.com
Prepared by: Dr. Joe Webb, Richard Romano

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Introduction

GEORGE WASHINGTON: Winning was easy, young man, governing's harder.
ALEXANDER HAMILTON: They're being intransigent.
WASHINGTON: You have to find a compromise.
HAMILTON: But they don't have a plan, they just hate mine!
WASHINGTON: Convince them otherwise.

—"Cabinet Battle #1," from Lin-Manuel Miranda's *Hamilton*

Well, 2016 is mercifully coming to an end. Will 2017 be any better? And was 2016 *really* all that bad?

At both drupa and Graph Expo 2016—not to mention the SGIA Expo and other specialty printing shows—optimism abounded. There was a sense, as summer turned to fall, that the industry was back, baby, so let the good times roll.

And for a while, the data had *kind of* borne this out. Shipments-wise, the year got off to a pretty good start, but no one saw the dark clouds gathering. Then, things took a turn for the worse: the most recent printing shipments data (October 2016) show abysmal conditions, a plunge that the data had been hinting at since about mid-year.

Industry consolidation has been slowing, but is still ongoing, affecting some of the various data series we consider important, such as graphic arts industry employment.

In terms of technological trends, automation is the big one. Even if few shops actually have specific and exact plans to automate their processes, our Fall 2016 survey found "workflow automation" to be a top-of-mind issue for print businesses across the board.

Anyway, we'll get into all of that in more detail. Most of this report presents the results of our Fall 2016 WhatTheyThink Economics and Research Center survey responses of more than 400 print businesses. In the survey, we asked detailed questions about current and expected business conditions (revenues, jobs/orders, and profits), top business challenges, top business opportunities, and planned investments. (If you're a vendor and thinking of eagerly flipping to that section with the hope of upping your sales projections for 2017 or 2018, be forewarned: there is little indication that print businesses have particularly deep pockets for the foreseeable future.) We also asked whether commercial print businesses were looking to expand into new markets like wide-format, packaging, or even 3D printing, and about trade show and other event attendance plans for 2017.

We also offer the usual rundown of other industry data such as the latest shipments, profits, and establishment data, and our usual (and sometimes unusual) litany of general macroeconomic data to get a sense of where the economy has been and where it may go. And what would a forecast report be without an actual forecast? We provide a variety of economic forecasts using a number of different models, so there's bound to be one that suits your taste! Here's an interesting irony: we as an industry may *want* the economy to sink into recession, as there continues to be a negative statistical correlation between historical GDP growth and printing industry shipments—when GDP goes up, print shipments go down. (We explain later.)

We also run down some hot and cold trends, some that are in between, and one or two that we think should be hotter than they are.

How This Report Is Organized

Section 1 presents our 2016 survey data about current (2016) and expected (2017) business conditions. In our Fall 2016 survey, we dug a little deeper than just generic "business conditions" and asked 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 and opportunities, as well as planned investment categories.

Section 3 presents the results of our survey question asking if commercial print businesses are planning to get involved in any new product areas or technologies, such as wide-format printing, specialty printing, 3D printing, high-speed production inkjet, and so on.

Section 4 presents the results of our survey question about planned trade show and other industry event attendance in 2017.

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 provides Dr. Joe's take on what the incoming Administration means for the economy.

Section 8 offers what we see as the hot, cold, and lukewarm trends for 2017.

Section 9 presents our economic forecast(s) for 2017.

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

In October and November 2016, the 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 2016 business conditions
- expectations of 2017 business conditions compared to 2016

Additionally, instead of asking about generic "business conditions," we asked specially about:

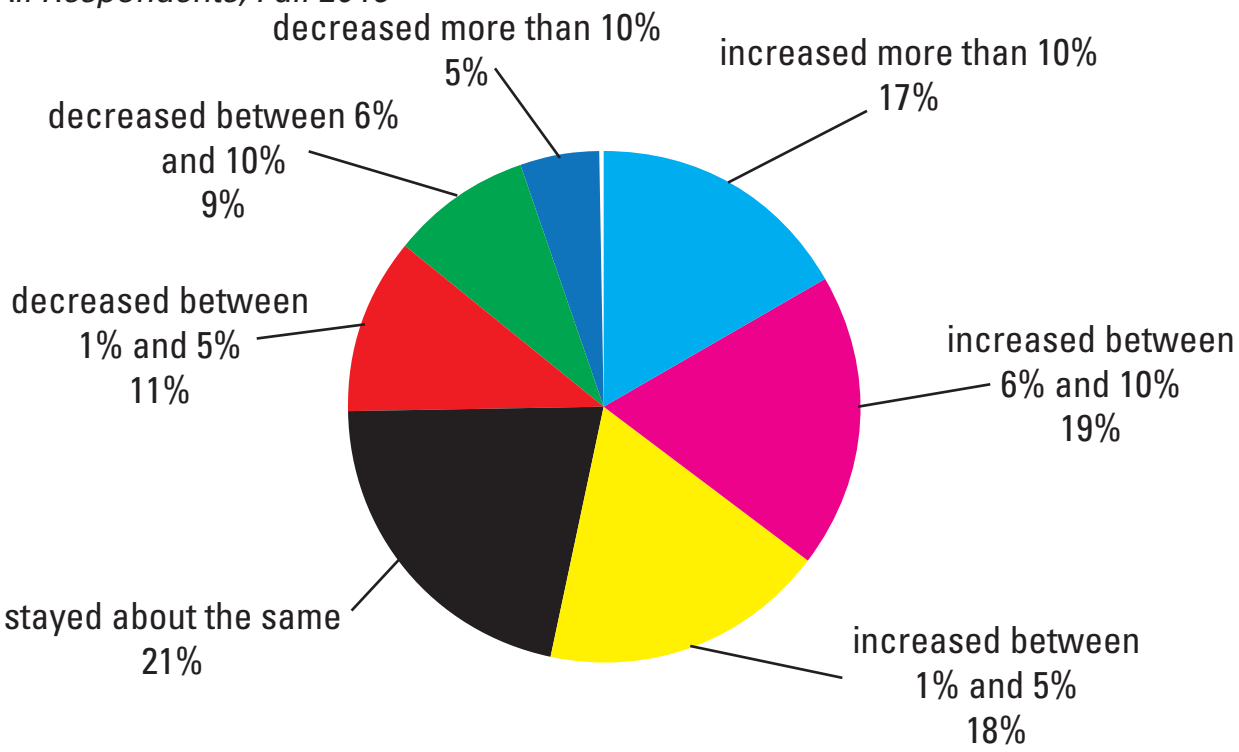
- revenues
- number of orders
- profits

In other research we have conducted, we have seen disparities in these three areas, and we were curious how the more general WhatTheyThink response base would report. Let's see how all this shook out.

Revenues

2016 Revenues

Figure 1. In terms of your 2016 revenues, how do they compare to 2015? All Respondents, Fall 2016



INCREASE 6+%	36%
DECREASE 6+%	14%
NET	21%

Table 1. In terms of your 2016 revenues, how do they compare to 2015? Small, Medium, and Large Print Businesses, Fall 2016

	Total	Small	Medium	Large
increased more than 10%	17%	23%	19%	14%
increased between 6% and 10%	19%	9%	17%	19%
increased between 1% and 5%	18%	9%	19%	19%
stayed about the same	21%	32%	18%	22%
decreased between 1% and 5%	11%	15%	11%	12%
decreased between 6% and 10%	9%	6%	9%	9%
decreased more than 10%	5%	7%	8%	5%
INCREASE 6+%	36%	32%	36%	33%
DECREASE 6+%	14%	12%	16%	14%
NET	21%	20%	20%	18%

In terms of revenues, business in 2016 has not been that bad. More than one-third of respondents (36%) said that revenues had increased by six percent or more compared to 2015, while only 14% said that they had decreased by six percent or more. In general, revenues got better as establishment size increased. (In Table 1 we break these data down by "small, medium, and large" establishments.[1] For a more detailed demographic breakdown, see Appendix B.)

Small Printers—For small printers, 41% reported some kind of increase in revenues, with one-fourth of them (23%) reporting a revenue increase of 10 percent or more. One-third of them (32%) said that revenues had stayed the same compared to 2015—more than the other two size breakdowns. Twenty-eight percent reported a decrease in revenues, although 15% said the decrease was very slight.

Medium Printers—More than one-half (55%) reported revenue increases over 2015, with one-fifth (19%) of them reporting an increase of 10 percent or more. Only 18% said revenues stayed the same, but 28% said revenues had decreased to some extent, with 11% saying the decrease had been slight.

Large Printers—Overall, 54% of these guys reported an increase in revenue in 2016, with only 14% reporting an increase of 10 percent or more, the lowest of the three size breakdowns. Almost one-fourth (22%) said revenues stayed the same, and another fourth (26%) reported some kind of decrease in revenues, although, again, 12% said the decrease was slight.

The robust health of the small shops compared to the other size categories (25% of 1–4-employee shops reported a revenue increase of 10 percent or more) is worth thinking about. It could represent a degree of response/survivor bias[2]. The healthiest companies tend to be the ones to participate surveys like ours, while at the same time small shops may not be adequately represented in our sample, which comes predominantly from the WhatTheyThink subscriber base. Our subscriber base tends to skew a little larger—medium and large businesses—so those numbers may be a bit more bankable.

If we look at the detailed breakdown (see Appendix B), 250-plus employee establishments did the best, revenue-wise, with 60% of them reporting an increase, and only 22% reporting a decrease (and none of that 10 percent or more). We can chalk up the health of this demographic group to downsizing and the elimination of weak plants. In some ways, this is a good thing; the winnowing of weak plants had led to a healthier cohort, but we are well aware of the severe pain involved in getting there.

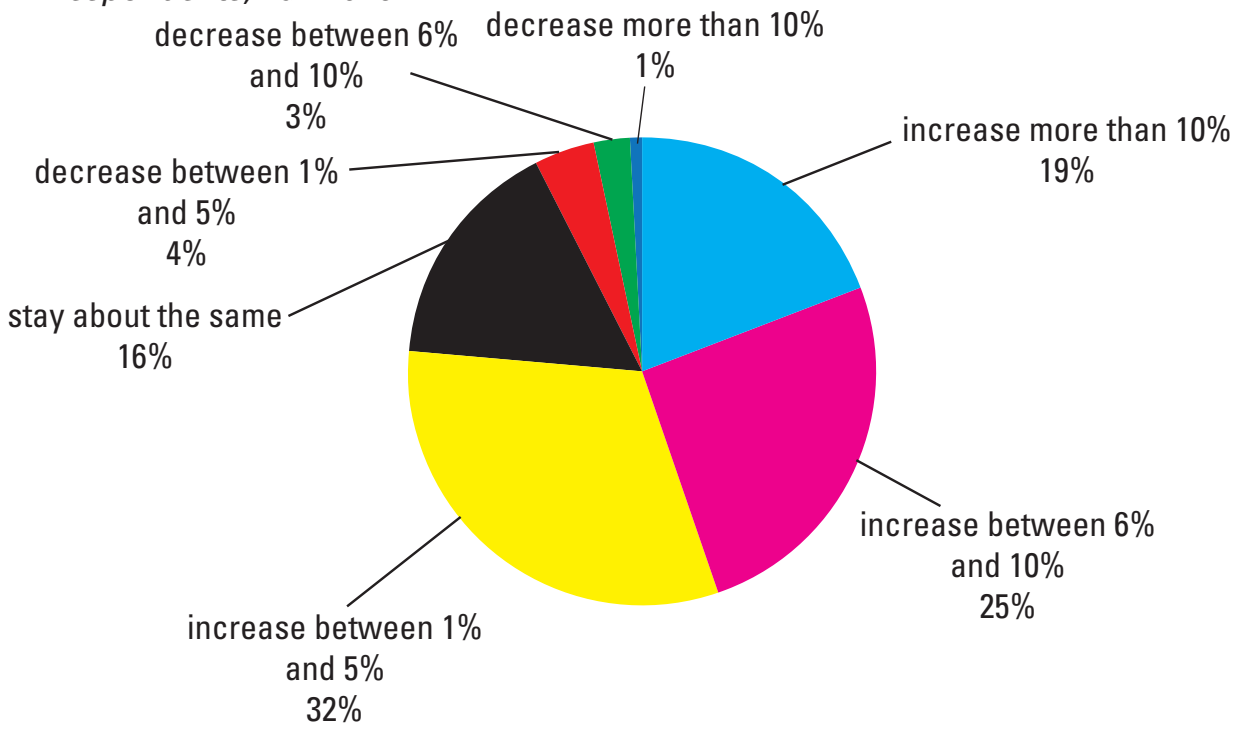
In the 20–49-employee range—kind of the sweet spot of the industry, and the group that marks the crossover of offset and digital capabilities, 58% reported an increase in revenues, more than one-fifth (21%) 10 percent or more. A scosh less than one-fourth (24%) reported a revenue decrease. These shops are large enough to have a diversified product and service mix, but they are not always able to handle small orders and specialty jobs. (We'll comment on this when we discuss jobs/orders below.)

Generally, the revenue situation is not all that bad, even if some of that revenue has been "inherited" from deceased printer brethren. At least that additional volume is being handled in more efficient plants, and adds to their profitability without adding a high level of fixed costs.

[1] "Small" printers are defined as those having 1–9 employees, "medium" 10–49, and "large" 50+.
[2] "Survivor Bias" refers to an important phenomenon that applies to today's printing industry very well. Weak companies leave the market by bankruptcy or surrender, and their volume of business goes to the surviving companies. This often means that aggregate industry shipments can decline while many of the remaining printers can report increased revenue. This is why it's very important to remember that the direction of an individual company can be vastly different than the total industry.

2017 Revenues

Figure 2. How do you expect your 2017 revenues to compare to 2016? All Respondents, Fall 2016



INCREASE 6+%	45%
DECREASE 6+%	3%
NET	42%

Table 2. How do you expect your 2017 revenues to compare to 2016? Small, Medium, and Large Print Businesses, Fall 2016

	Total	Small	Medium	Large
increase more than 10%	19%	36%	19%	16%
increase between 6% and 10%	25%	21%	29%	26%
increase between 1% and 5%	32%	18%	28%	39%
stay about the same	16%	13%	16%	15%
decrease between 1% and 5%	4%	7%	4%	3%
decrease between 6% and 10%	3%	1%	4%	2%
decrease more than 10%	1%	4%	1%	0%
INCREASE 6+%	45%	57%	48%	41%
DECREASE 6+%	3%	5%	5%	2%
NET	42%	52%	43%	39%

As for how print businesses expect 2017 revenues, as ever, optimism abounds. *Three-fourths* of print businesses (76%) expect to see an increase in revenues in 2017, with a full 45% anticipating an increase by six percent or more. Only 16% expect revenues to stay the same, and a scant 8% expect a decrease in revenues.

Small Printers—Small printers are the most pessimistic of the three size breakdowns. Seventy-five percent of small printers expect revenues to rise in 2017 (although 36% expect revenues to rise, roughly twice the rate of the other two size categories, so maybe we can best describe this group as bipolar). Anyway, 13% expect revenues to stay the same, and 12% expect them to decline, 4% by 10 percent or more.

Medium Printers—Seventy-six percent expect an increase in revenues, although most expect the rise to be modest. Sixteen percent expect revenues to stay about the same, and 9% expect them to decrease, and only 1% expect that decrease to be 10 percent or more.

Large Printers—A whopping 81% of large printers expects a revenue boost in 2017, although four out of 10 expect the increase to be five percent or less. Fifteen percent expect revenues to stay the same, and a mere 5% expects them to decrease, and none of them by six percent or more.

In these kinds of surveys, there is always a tendency for tremendous optimism, and that's not a bad thing. A healthy outlook means you're more likely to pursue new initiatives and invest in equipment and other resources. However, being overly pollyanna-ish isn't always the best approach either. Optimism mixed with a healthy dose of realism is, we think, the best mindset to have. For this reason we have often found that end-of-year surveys about the upcoming year are almost over-the-top in enthusiasm; mid-year surveys always show a more realistic perspective since half of the year is in the books.

Looking at some of the other data points, more than one-fourth (26%) of 5–9-employee shops expect revenues to stay the same, the largest demographic category to say this, followed only by 250-plus establishments (23%).

The 20–49-employee shops are slightly more optimistic than average; 78% expect an increase in revenues, and only 7% expect a decrease.

Although these types of "expectation" data are useful in gauging the mindset of the industry (in contrast, surveys we conducted in 2008 should have come with a canister of Prozac), the best gauge of the industry's business conditions is how they're doing now rather than how they say they will be doing. There probably won't be any major economic upheavals in 2017 (though we believe 2017 will feel chaotic, especially as it is reported in the news; after 2018 is anybody's guess), but there will likely be some more reduction of print volume as more individuals and businesses shift to electronic media.[3] Remember, strong economic activity increases the ability to invest in new communications technologies of the kind that increase digital media use at the expense of print. A stronger than expected economy can increase that displacement effect.

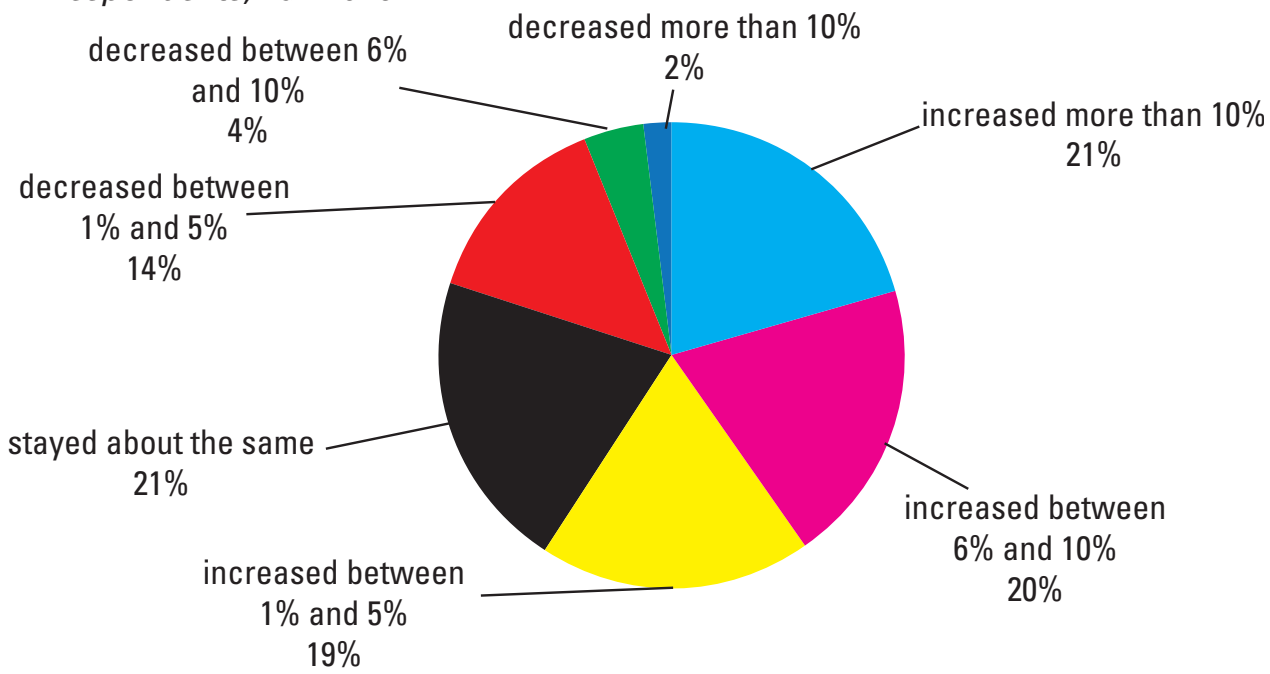
[3] As a harbinger of this, perhaps, in late November 2016, the New York State Department of Motor Vehicles sent a notice (by email) that it would be discontinuing paper-based reminders of vehicle registration and drivers' license renewals, except upon request. Transactional printing is not long for this world.

Number of Jobs/Orders

There is a curious disconnect between the number of jobs or orders and revenues, driven, as we shall see, largely by digital printing. First things first, though: how did the number of orders that print businesses receive compare to 2015, and how do they expect orders to stack up in 2017?

2016 Jobs/Orders

Figure 3. In terms of your 2016 jobs/orders, how do they compare to 2015? All Respondents, Fall 2016



INCREASE 6+%	40%
DECREASE 6+%	6%
NET	34%

Table 3. In terms of your 2016 jobs/orders, how do they compare to 2015? Small, Medium, and Large Print Businesses, Fall 2016

	Total	Small	Medium	Large
increased more than 10%	21%	18%	19%	19%
increased between 6% and 10%	20%	9%	18%	22%
increased between 1% and 5%	19%	15%	21%	21%
stayed about the same	21%	34%	23%	20%
decreased between 1% and 5%	14%	19%	12%	12%
decreased between 6% and 10%	4%	0%	5%	5%
decreased more than 10%	2%	4%	3%	0%
INCREASE 6+%	40%	28%	36%	41%
DECREASE 6+%	6%	4%	8%	5%
NET	34%	23%	29%	36%

Overall, six out of 10 print businesses reported that the number of jobs/orders increased in 2016 compared to 2015, with 41% saying that orders had increased by six percent or more. One-fifth (21%) said that orders had stayed about the same, and another one-fifth (20%) reported a decrease in orders, although 14% said that decrease was less than six percent.

Small Printers—More than half (52%) of small printers reported an increase in the number of jobs/orders, with 18% reporting an increase of 10 percent or more. One-third of them (34%) said that orders had stayed the same compared to 2015—like revenues, this was more than the other two size breakdowns. Twenty-three percent reported a decrease in orders, although 19% said the decrease was very slight.

Medium Printers—Fifty-eight percent of mid-size printers reported a degree of job/order increase over 2015, with 19% of them reporting an increase of 10 percent or more. Just under one-fourth (23%) said that the number of jobs/orders stayed the same, and 20% said orders had decreased to some extent, with 12% saying the decrease had been slight.

Large Printers—More than six out of 10 (62%) large printers reported increases in jobs/orders in 2016, with only 19% reporting an increase of 10 percent or more. One-fifth (20%) said orders stayed the same, and 17% reported a decrease in orders, with 12% saying the decrease was less than six percent and no one saying it was over 10 percent.

Elsewhere in the data, 62% of 50–99-employee establishments said that orders increased, while two-thirds (67%) of 250+-employee plants reported an increase in orders—29% saying the increase was 10 percent or more. The group that performed the worst in terms of orders was the 1–4-employee group—only 38% reported an increase, although 42% said that orders had stayed about the same and 21% reported a decrease in orders. So it's not awful. Fifty-eight percent of the 20–49-employee shops saw an increase in orders, while 22% reported a decrease.

It's interesting to compare jobs/orders and revenues, as there is a general tendency for orders to increase faster than revenues. This not a new phenomenon, nor is it really surprising. It's a consequence of the decline in run lengths—or, to be more precise, the increase in shorter-run jobs.[4] The challenge of digital short-run printing since Day 1 has been to aggregate enough small jobs to equal what used to be a long offset run and, more importantly, for the revenue generated by those smaller jobs to equal that generated by an offset run.

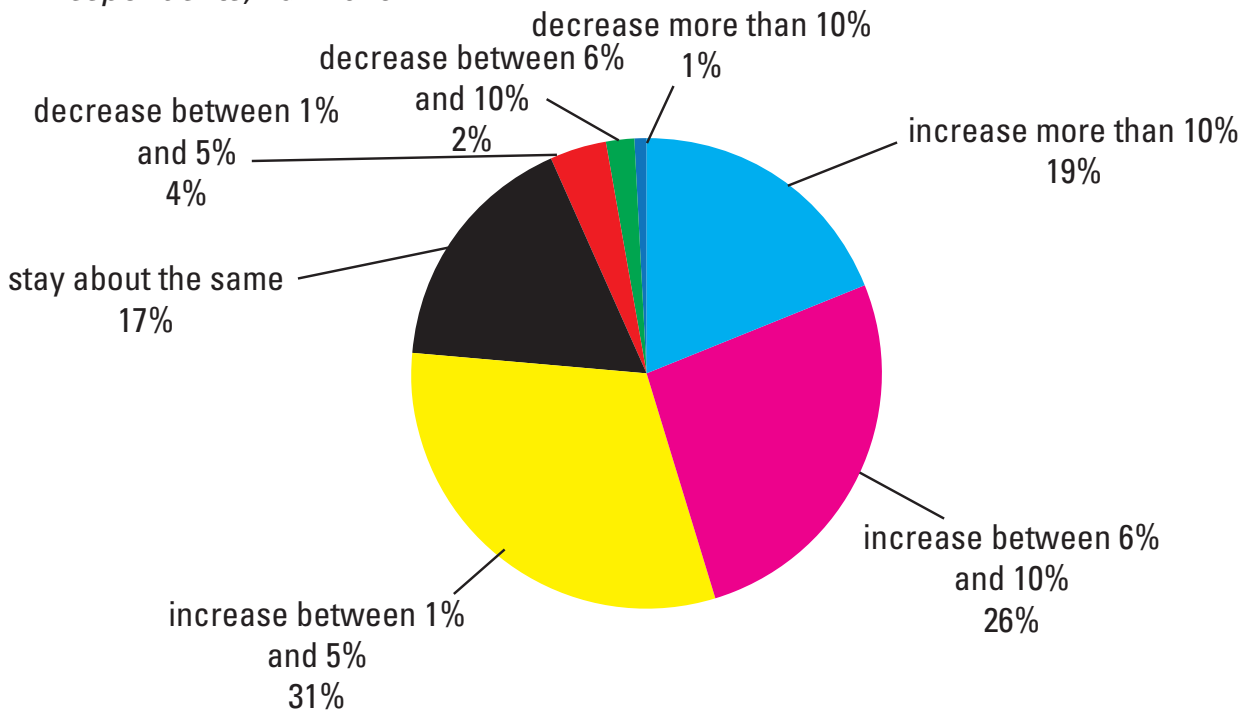
At the same time, there are more specialty products and projects (think personalized or customized print work, as well as what we normally think of as specialty printing such as pens, golf balls, and iPhone cases) and more services (even non-print) and this all changes the composition of the revenue pie.

An increase in smaller print jobs and thus smaller invoices is a characteristic of a switch from offset to digital. Smaller invoices means you need more jobs just to keep revenue flat!

[4] In the offset era, it was common to have over-runs on purpose because those were the cheapest copies in the run length because fixed costs of the job were already accounted for (in economics the lower unit costs with increased quantities is called "economies of scale"). Now, with downloadable PDFs and more sophisticated office printers, there is less concern about having a "safety stock" and running out of copies. Digital printing facilitates this kind of order-just-what-you-need-and-no-more use of print.

2017 Jobs/Orders

Figure 4. How do you expect your 2017 jobs/orders to compare to 2016? All Respondents, Fall 2016



INCREASE 6+%	45%
DECREASE 6+%	3%
NET	43%

Table 4. How do you expect your 2017 jobs/orders to compare to 2016? Small, Medium, and Large Print Businesses, Fall 2016

	Total	Small	Medium	Large
increase more than 10%	19%	29%	16%	18%
increase between 6% and 10%	26%	27%	24%	27%
increase between 1% and 5%	31%	10%	36%	35%
stay about the same	17%	18%	19%	15%
decrease between 1% and 5%	4%	11%	2%	2%
decrease between 6% and 10%	2%	3%	3%	1%
decrease more than 10%	1%	1%	0%	1%
INCREASE 6+%	45%	57%	41%	46%
DECREASE 6+%	3%	4%	3%	2%
NET	43%	52%	38%	44%

Once again, as with revenues, optimism abounds. Three-fourths (76%) of print businesses expect to see an increase in jobs/orders in 2017, although 31% expect that increase to be less than six percent. Only 17% expect orders to stay the same, and 7% expect a decrease.

Small Printers—Two-thirds (66%) of small printers expect orders to rise in 2017 (although 29% expect revenues to rise by 10 percent or more—again, like revenues, almost twice the rate of the other two size categories. Eighteen percent expect orders to stay the same, and 15% expect them to decline, although 11% say it will be less than six percent.

Medium Printers—Three-fourths (76%) expect an increase in jobs/orders, although most (36%) expect the rise to be modest. Nineteen percent expect orders to stay about the same, and a very scant 5% expect them to decrease, with no one expecting a decrease of 10 percent or more.

Large Printers—Eight out of 10 large printers expect orders to grow in 2017, although 35% expect the increase to be five percent or less. Fifteen percent expect orders to stay the same, and only 4% expects them to decrease.

We don't know what the 1–4-employee shops might be smoking, but a full one-third of them expect orders to grow by 10 percent or more. Perhaps the bulk of these survey respondents were based in Colorado. (Note that only 17% said that 2016 orders grow by that much.) Three-fourths of 20–49-employee shops expect an increase, although their enthusiasm is a bit more muted (18% expect the increase to be 10 percent or more).

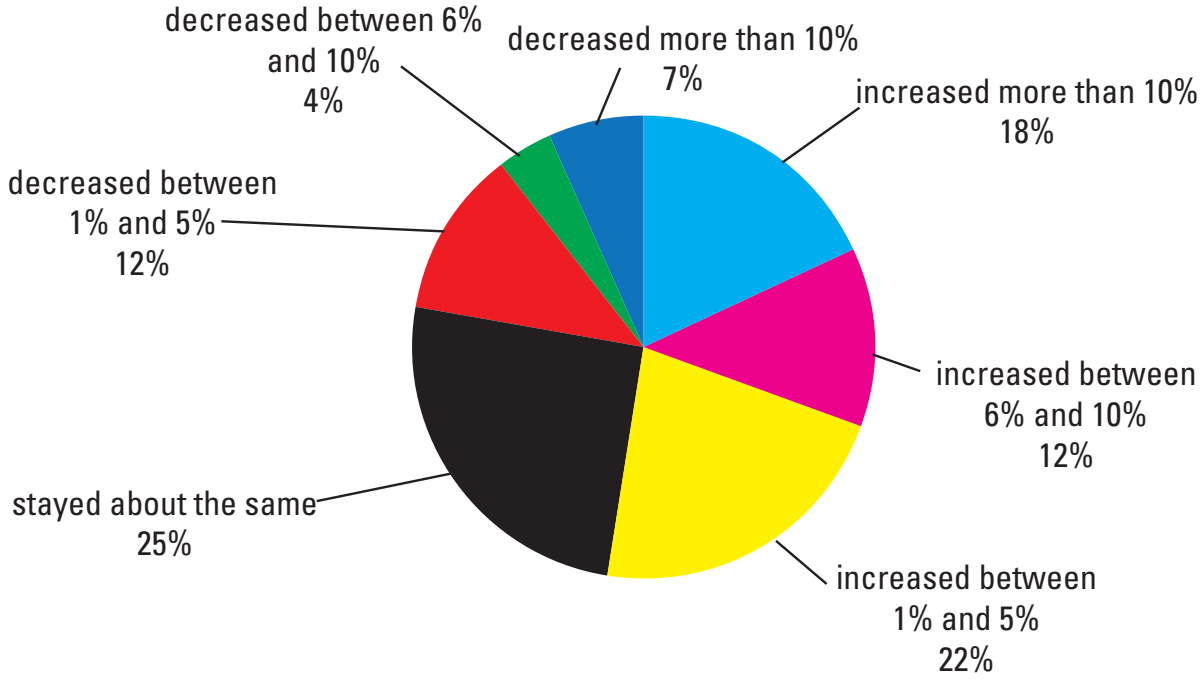
As we said, rosy predictions are generally good, but should be tempered with reality by those using this research, especially. Businesses selling capital equipment to printers, especially in this size category, should be careful about the expressed expectations because they can change very quickly when optimism is this high.

Profitability

Finally, we look at profits. How profitable have print businesses been in the past year? What are their expectations for 2017?

2016 Profits

Figure 5. In terms of your 2016 profitability, how did it compare to 2015? All Respondents, Fall 2016



INCREASE 6+%	31%
DECREASE 6+%	10%
NET	20%

Table 5. In terms of your 2016 profitability, how did it compare to 2015? Small, Medium, and Large Print Businesses, Fall 2016

	Total	Small	Medium	Large
increased more than 10%	18%	20%	19%	15%
increased between 6% and 10%	12%	12%	12%	12%
increased between 1% and 5%	22%	10%	22%	24%
stayed about the same	25%	47%	22%	25%
decreased between 1% and 5%	12%	4%	13%	14%
decreased between 6% and 10%	4%	2%	5%	4%
decreased more than 10%	7%	5%	7%	7%
INCREASE 6+%	31%	32%	31%	27%
DECREASE 6+%	10%	7%	12%	11%
NET	20%	25%	19%	16%

Here's where things get a little dicey. Only just over half (52%) of respondents saw profitability rise in 2016 vs. 2015, although 18% saw profits rise by 10 percent or more. One-fourth of establishments saw profitability stay the same, while nearly one-fourth (23%) saw profitability decline in 2016 vs. 2015. So despite increases in jobs/orders and even revenue, profitability remains elusive for many shops.

Small Printers—Less than half (42%) of small printers reported an increase in profits, although 20% reported an increase of 10 percent or more. Almost half again (47%) said that profits had stayed the same, but 11% reported that profits had decreased, although most of the decline was less than six percent.

Medium Printers—Medium printers did slightly better, with 53% reporting some kind of profit boost in 2016, with 19% of them reporting an increase of 10 percent or more. Twenty-two percent said that profits stayed the same, although one-fourth (25%) said profits had decreased to some extent, with 13% saying the decrease had been slight.

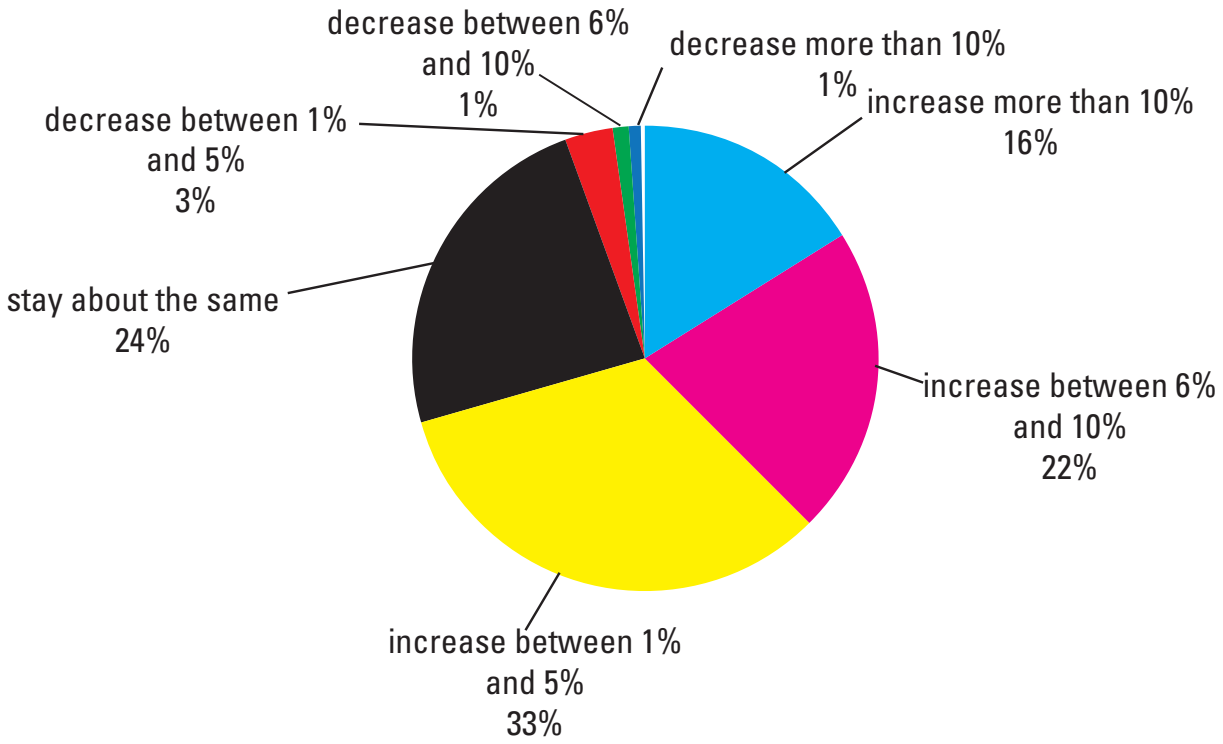
Large Printers—In terms of profits, large printers didn't have too much of an edge, certainly not over medium printers. Only a little over one-half (51%) of large printers reported a profit increase in 2016, with only 15% reporting an increase of 10 percent or more—the poorest of the three. One-fourth (25%) said profits stayed the same, and one-fourth again (25%) reported a decrease in profitability,[5] with 12% saying the decrease was less than six percent but 7% saying it was over 10 percent.

Drilling further down into the demographics, who is the most profitable cohort? The 5–9-employee shops—two-thirds (66%) reported an increase in profits in 2016, although 38% said the increase was under six percent. The 20–49-employee and 250+-employee groups also did well profit-wise (54% and 56%, respectively, reported a profit increase). The only real profit laggards were the 50–99-employee group: less than half (48%) saw a profit increase, and half of that (24%) was less than six percent. Still, the good news is that even though the profit increases were not huge, neither were the profit decreases.

[5] By the way, for those of you playing along at home, increase, decrease, and stay the same numbers may not add up exactly to 100% due to rounding.

2017 Profitability

Figure 6. How do you expect your 2017 profitability to compare to 2016? All Respondents, Fall 2016



INCREASE 6+%	38%
DECREASE 6+%	2%
NET	36%

Table 6. How do you expect your 2017 profitability to compare to 2016? Small, Medium, and Large Print Businesses, Fall 2016

	Total	Small	Medium	Large
increase more than 10%	16%	28%	17%	12%
increase between 6% and 10%	22%	21%	24%	18%
increase between 1% and 5%	33%	20%	30%	42%
stay about the same	24%	19%	22%	26%
decrease between 1% and 5%	3%	8%	5%	1%
decrease between 6% and 10%	1%	0%	2%	0%
decrease more than 10%	1%	5%	1%	1%
INCREASE 6+%	38%	48%	41%	30%
DECREASE 6+%	2%	5%	3%	1%
NET	36%	44%	38%	30%

And, as ever, hope springs eternal. Despite what we just saw, seven out of 10 (71%) expect profits to grow next year, although one-third say it will be by less than six percent. More than one-half (57%) of print businesses expect profits to remain the same, and 5% expect them to decrease.

Small Printers—Seven out of 10 (69%) small printers expect profits to rise in 2017 (and 28% expect revenues to rise by 10 percent or more—this is still quite above the other two size categories). Nineteen percent expect profits to stay the same, and 13% expect them to decline, although 5% say it will be more than 10 percent.

Medium Printers—Seventy-one percent of mid-size printers expect an increase in profitability in 2017, although 30% expect the rise to be modest. Just under one-fourth (22%) expect profits to stay about the same, and 8% expect them to decrease, with only 1% expecting a decrease of six percent or more.

Large Printers—Despite what we just saw regarding current profitability, 72% of large printers expect profits to grow in 2017, although 33% expect the increase to be less than six percent. One-fourth (26%) expect profits to stay the same, although only 2% expect them to decrease.

Again, the 1–4's lead the pack—30% think they're going to increase profits by more than 10 percent in 2017. Generally speaking, though, most of our survey respondents are anticipating a slight increase in profits, but even this optimism is below both revenues and orders.

Business Conditions Summary

For each size classification, we took the survey responses and calculated an average increase (there were no average decreases, but decreases were included in the formula) in revenues, jobs/orders, and profits, both for 2016 and 2017. So, for Table 7, we calculated[6] a 2.4% industry average increase in revenues, a 3.7% increase in orders, and a 2.5% increase in profits. Note that small printers had the highest average increase in both revenues and profits, while the large printers had the highest average increase in orders.

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

The alert among you may well wonder how these numbers gibe with other data (see Section 5) that show that the value of print shipments has gone down? This is the result of both consolidation and survivor effects. Print businesses have closed or have consolidated. So, if you have two companies that have merged and the new entity has a 2.4% increase in revenues, that's not really a lot; they could be considering the performance of the acquiring company and negating that of the acquired—and thus weaker—one. When weak companies are bought, they don't make a big contribution to shipments, since they're being sold because of their steadily decreasing revenues. So, overall revenues in the market have gone down.

There is also a survivor bias component to this. Here is our boilerplate explanation of survivor bias. There are of course many printing companies that are doing well, some doing very well. We call these "profit leaders," and the components of their business conditions—the revenues, orders, and profits triumvirate—can rise even as the industry shrinks. We saw this throughout the past 20 years. These companies can skew industry demographics and market research data.[7] There are also companies that did so poorly that they went out of business (before their demise, they would be considered "profit laggards"). The downside of their going out of business—for us; they have their own downside to worry about—is that they are not around to complete our surveys and contribute to the survey sample.8 So those that are left skew the data to make the industry look like it is doing better than it really is. So we tend to be suspicious of extraordinarily rosy data.

Not that all optimistic data is useless; it just pays to cross-check one particular data set with other data from the survey, as well as third-party data sources, other kinds of research, and anecdotal and experiential evidence.

Looking to 2017 (speaking of optimistic data), we can calculate a 5.0% industry average increase in revenues, a 5.1% increase in orders, and a 4.4% increase in profits—increases almost twice that of 2016. Again, small printers are expecting to see the highest average increase in all three categories. We doubt that will happen, but we'd be quite happy to be proven wrong. Note that these are the respondents reporting these estimates; these are not our forecasts of the industry.

[6] The estimates were calculated using the mid-points of the percentage ranges, and used 12% for the "10% or more" category.
[7] If only these companies' executives were considerate enough to think of us researchers when they're growing their businesses....
[8] Would that there were a way to conduct a market research séance to communicate with these dead businesses.

Table 7. 2016 vs. 2015 Average Percentage Change in Revenues, Orders, and Profits
Small, Medium, and Large Print Businesses, Fall 2016

	Total	Small	Medium	Large
Revenues	2.4%	2.8%	2.4%	1.8%
Orders	3.7%	2.4%	3.3%	4.0%
Profits	2.5%	2.8%	2.4%	1.9%

Table 8. Expected 2017 vs. 2016 Average Percentage Change in Revenues, Orders, and Profits
Small, Medium, and Large Print Businesses, Fall 2016

	Total	Small	Medium	Large
Revenues	5.0%	4.5%	2.4%	1.9%
Orders	5.1%	5.4%	4.8%	5.3%
Profits	4.4%	4.9%	4.5%	4.1%

Note that these are the respondents reporting these estimates; these are not our forecasts of the industry. (For our forecasts, see Section 9.)

Going Forward

The next section looks at business challenges and 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

Figure 7. In the next 12 months, which of the following will be your biggest business challenges?
All Respondents, Fall 2016 (multiple responses permitted)

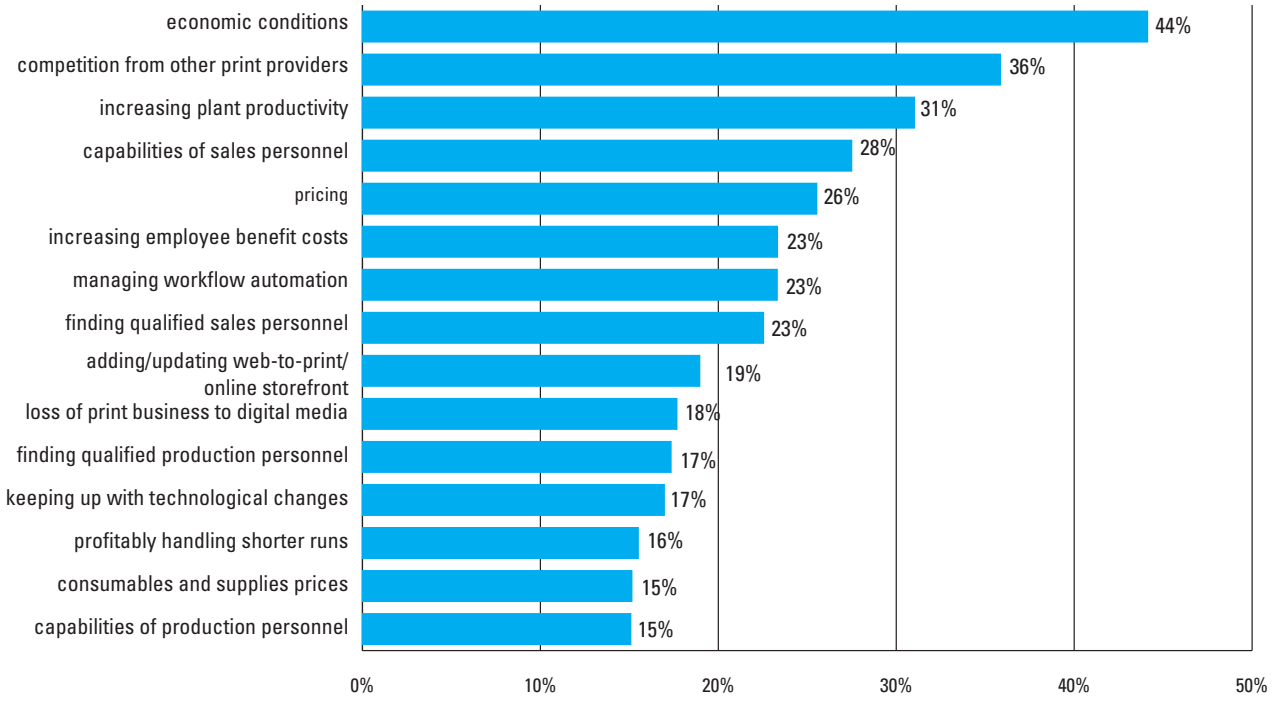


Table 9. In the next 12 months, which of the following will be your biggest business challenges?
Small, Medium, and Large Print Businesses, Fall 2016 (multiple responses permitted)

	Total	Small	Medium	Large
economic conditions	44%	48%	36%	30%
competition from other print providers	36%	38%	29%	36%
increasing plant productivity	31%	29%	35%	41%
capabilities of sales personnel	28%	22%	41%	38%
pricing	26%	23%	27%	40%
increasing employee benefit costs	23%	20%	31%	30%
managing workflow automation	23%	18%	36%	35%
finding qualified sales personnel	23%	17%	34%	38%
adding/updating web-to-print/online storefront	19%	20%	19%	6%
loss of print business to digital media	18%	18%	17%	12%
finding qualified production personnel	17%	14%	24%	34%
keeping up with technological changes	17%	18%	14%	17%
profitably handling shorter runs	16%	15%	16%	15%
consumables and supplies prices	15%	17%	10%	13%
capabilities of production personnel	15%	14%	18%	19%
adding non-print media capabilities (web design, app development, social media management, etc.)	13%	15%	9%	4%
deciding whether to keep or discard our offset equipment	10%	11%	8%	4%
adding wide-format equipment/services	9%	10%	9%	8%
finding capital for investments	9%	10%	9%	6%
selling our business	8%	9%	8%	1%
owner/management retirement	8%	9%	8%	4%
need for employee training	8%	4%	16%	16%
financing costs of our equipment	6%	8%	3%	2%
job tracking	6%	6%	7%	4%
transitioning jobs from offset to high-speed production inkjet	5%	6%	4%	4%
migrating customer service and sales to the cloud	5%	5%	5%	2%
getting web-to-print to work on smartphones and other mobile devices	5%	5%	4%	2%
other	4%	4%	7%	4%
retirement of key production personnel	4%	2%	9%	8%
migrating business functions to the cloud	3%	3%	4%	2%
training employees to use cloud applications	2%	1%	6%	1%
migrating production to the cloud	2%	1%	4%	1%
adding packaging printing equipment/services	1%	0%	4%	4%
none	0%	0%	0%	1%

What keeps print business owners and executives up at night?

Challenges can be very different depending on the size of the business. Take economic conditions (please!). It's interesting how, even though that current economic conditions aren't *really* that bad (but see Section 6), "economic conditions" tops the list of business challenges, selected by 44% of respondents. We saw this same concern in industry research we conducted in the early to mid-00s (in the wake of the 2001 recession-ette), after the lukewarm recovery from that lukewarm recession, and then as the Great Recession was brewing. In other words, the prevailing economy is *always* a worry; when things are bad, there is consternation about how long that badness will persist. When things are good, there's the fear that doom is right around the corner.

Economic conditions are not unimportant; having a good economy is certainly preferable to having a bad one. While a bad economy does force businesses to cut costs, and print is one of those costs that can be cut in favor of less expensive electronic media, a good economy isn't necessarily the industry's saving grace, as it can make investment in new technologies—like electronic media—more attractive.

It's telling that "economic conditions" was a bigger challenge for small shops than large ones; smaller companies may not have the ability to weather a strong economic storm the way a larger business can. Another wrinkle is that "economic conditions" can mean different things; the national economy may be a bigger issue for bigger printers, while a specific local economy may be more important to smaller printers. Even in economic booms, there are cities and regions that don't share in the prosperity.

And there is another factor: many print business owners have had an attribution problem. That is, they attribute a tough sales environment to the economy, when they are actually experiencing a shift in media use from print to digital such as social media. All data that we have seen from outside the printing industry show strong spending on digital media, especially mobile advertising and promotion.

The number two business challenge is "competition from other print providers," selected by 36% of respondents. For small printers, this competition can be office superstores like Staples, and for larger (but not the largest) printers it can be large printing establishments moving downmarket to capture more volume.

The number three business challenge is "increasing plant productivity," selected by 31% of respondents. This is all about the need to get jobs in and out as quickly as possible. Remember in Section 1 how orders keep going up faster than revenues and profits? Processing those jobs as fast as possible is one potential way to close the gap between jobs and revenues. The less time any given job stays in the shop, the more jobs can be processed.[9] It's also about meeting customer expectations; turnaround time has always been important, but customers are demanding faster and faster turn times. Printers have to meet these expectations, or customers will go elsewhere. Thus the need for automation and other productivity boosts.

The number four challenge is "capabilities of sales personnel," which is another perennial issue, especially for large shops. We've been skeptical that the salesperson is the problem, but print business owners have always felt that it was up to the sales force to drum up new

[9] Although it could also be the case that because of this arms race, revenues and therefore profits will never catch up to jobs.

business. While that's historically been true, and is still largely the case, the fact remains that in today's printing environment, the traditional sales process has morphed into something more akin to business development, which requires more of a team-based, consultative approach to sales rather than pounding the pavement and cold-calling. This is what the shift from "printing" to "marketing services" really means.

Rounding out the top five challenges is "pricing," selected by 26% of respondents. There are several aspects to this. The first is that digital printing upended traditional notions of pricing, especially where things like customization and personalization were concerned. New types of products and services also pose pricing conundra: how do you price wide-format or other kinds of specialty printing? More importantly, how do you price in such a way that you're covering your costs and making (ideally) a profit? At the same time, more competition means more pricing pressure. (As we'll see in Section 5, print is getting cheaper to buy than to produce, which makes things even more complicated.)

There are some interesting differences in the top challenges by establishment size.

Small Printers—The top five challenges are "economic conditions" (48%), "competition from other print providers" (38%), "increasing pant productivity" (29%), "pricing" (23%), and "capabilities of sales personnel" (22%). It's worth noting that in the smallest of shops the "sales personnel" may very well be the owner, which is why "finding qualified sales personnel" is so low for these shops (17%)—they think they're qualified!

Medium Printers—Here's where things get interesting. The number one challenge is "capabilities of sales personnel" (41%, 10 percentage points higher than average). Number two is "managing workflow automation," selected by 36%, the highest of the three size breakdowns. Automation is one area where these shops can "increase plant productivity" with which it is virtually tied (35%). "Economic conditions" is moderately important for these folks (36%, 12 points below small printers). "Finding qualified sales personnel" is also in the top five (34%), although usually what this means is "finding sales personnel with a 'book of business.'" So these shops are approaching their business challenges from two sides: the revenue side (boosting sales) and the cost side (automation).

Large Printers—At number one for large plants is "increasing plant productivity" selected by 41%, followed by "pricing" (40%, the highest of the three size breakdowns), "capabilities of sales personnel" and "finding qualified sales personnel" (tellingly tied at 38%), and "competition from other print providers (36%).

We cross-tabulated challenges with our economic conditions data, specifically those we can consider "leaders" (respondents who said that 2016 revenues had increased six percent or more) and "laggards" (2016 revenues decreased by six percent or more).

Here were the top five challenges for each:

Leaders:

- "increasing plant productivity" (56%)
- "managing workflow automation" (47%)
- "capabilities of sales personnel" (39%)

- "finding qualified sales personnel" (37%)
- "finding qualified production personnel" (35%)

Laggards:

- "capabilities of sales personnel" (46%)
- "economic conditions" (46%)
- "competition from other print providers" (42%)
- "finding qualified sales personnel" (42%)
- "pricing" (42%)

The top challenges of the laggards do sound like the laments of a struggling print business. The leaders seem intent on doing more; the laggards seem more intent on finding a means to survival.

Business Opportunities

Figure 8. In the next 12 months, which of the following represent your best new business opportunities?
All Respondents, Fall 2016 (multiple responses permitted)

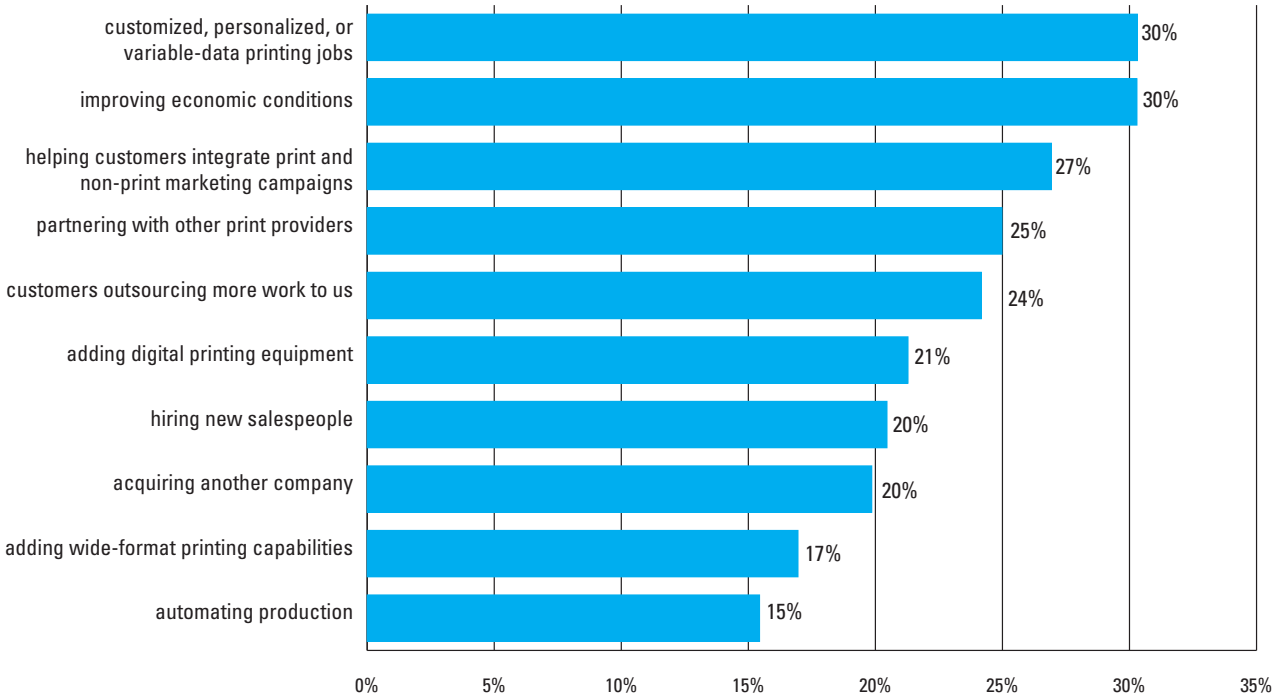


Table 10. In the next 12 months, which of the following represent your best new business opportunities?
Large, Medium, and Small Print Businesses, Fall 2016 (multiple responses permitted)

	Total	Small	Medium	Large
customized, personalized, or variable-data printing jobs	30%	31%	30%	23%
improving economic conditions	30%	32%	28%	22%
helping customers integrate print and non-print marketing campaigns	27%	26%	30%	29%
partnering with other print providers	25%	26%	23%	18%
customers outsourcing more work to us	24%	23%	27%	28%
adding digital printing equipment	21%	21%	19%	25%
hiring new salespeople	20%	15%	32%	34%
acquiring another company	20%	18%	22%	28%
adding wide-format printing capabilities	17%	16%	20%	16%
automating production	15%	13%	22%	21%
increasing sales through print brokers	12%	11%	17%	11%
broadening fulfillment, shipping, mailing capabilities	11%	9%	19%	14%
offering electronic/non-print services for customers (web design, app development, social media management, etc.)	11%	10%	14%	15%
broadening bindery/finishing equipment/services	11%	10%	11%	13%
adding web-to-print/online storefront	10%	9%	11%	9%
selling our company	8%	8%	11%	1%
adding packaging printing capabilities	8%	7%	9%	9%
other	6%	7%	7%	2%
disposing of offset equipment to concentrate on digital printing	5%	7%	2%	2%
using marketing automation for our business (like HubSpot, Eloqua)	5%	5%	5%	4%
getting more customers using smartphones/other mobile devices	5%	7%	1%	1%
selling marketing automation services to our customers	4%	2%	9%	12%
migrating business functions to the cloud	4%	4%	5%	2%
migrating production to the cloud	3%	4%	2%	1%
helping clients get their websites to work on mobile devices	3%	3%	5%	1%
adding additional offset printing equipment	3%	1%	8%	9%
adding textile/fabric printing capabilities	2%	1%	5%	2%
training employees to use cloud applications	1%	1%	3%	2%
migrating customer service and sales to the cloud	1%	0%	5%	2%
adding "digital enhancement" finishing technologies (like Scodix)	1%	0%	3%	4%
none	1%	1%	1%	1%

What do print businesses see as their best business opportunities in the next 12 months—and possibly beyond? Big shock: "improving economic conditions" is at the top of the list at 30%, although "customized, personalized, or variable-data printing jobs" is tied at 30%.[10]

Only slightly below those two opportunities, at 27% of respondents, is "helping customers integrate print and non-print marketing campaigns." That this is a substantial opportunity is a very good sign. (How best to accomplish this? "Marketing automation." Yet we note that "using marketing automation for our business" was only selected by 5% of respondents, suggesting that the term has yet to catch hold in the industry, although we've been trying to help it along.)

The number four opportunity, selected by one-fourth of respondents, is "partnering with other print providers," which is another good sign. Print businesses do this to expand product and service offerings without a large upfront investment.

Rounding out the top five is "customers outsourcing more work to us," selected by 24%. Printers see themselves has hopefully having a product and service mix that their customers don't have. After all, a lot of print volume was lost not just to electronic media but also to desktop and network printers. Commercial printers may also be hoping to get outsourced work from in-plants that may not have certain capabilities.

Small Printers—As we would expect, "improving economic conditions" is top of the list for small printers, selected by 32% of them, the highest of the three categories. A rising tide lifts all boats, right? Number two is better: "customized, personalized, or variable-data printing jobs" at 31%, the highest of three by one percentage point. Just over one-fourth (26%) see "partnering with other print providers" as a top opportunity, and the same amount see "helping customers integrate print and non-print marketing" as an opportunity. Twenty-three percent selected "customers outsourcing more work to us," another good sign.

Medium Printers—Slight change at the top: the number one opportunity for mid-size shops is "hiring new salespeople" at 32%. Given what we saw in the challenges section, this is not a big surprise. Number two is "customized, personalized, or variable-data printing jobs" (30%), a big opportunity as these folks increasingly go digital. "Helping customers integrate print and non-print marketing" was also selected by 30%. "Improving economic conditions" was less important for these shops than for the smaller shops, and was only picked by 28%. Mid-size printers are also sanguine about "customers outsourcing more work to us" (27%), perhaps expecting that some of that work will be of the customized and personalized variety.

Large Printers—Again, not surprisingly, top of the list for large printers is "hiring new salespeople" (34%, the highest among the three categories). Number two is "helping customers integrate print and non-print marketing" (29%). Tied at 28% are "customers outsourcing more work to us" and "acquiring another company." They see consolidating volume in fewer places as a strategy. Finally, one-fourth selected "adding digital printing equipment." The big sheetfed or web offset plants see moving downmarket to capture more volume as a strategy. This could also be the source of some of the "competition from other printers" challenge we saw among small and mid-size shops.

We also cross-tabulated opportunities with our economic conditions data, seeing what

[10] Microsoft Excel decided that "customized, personalized, or variable-data printing jobs" was the top opportunity, likely for alphabetical reasons.

"leaders" (respondents who said that 2016 revenues had increased six percent or more) and "laggards" (2016 revenues decreased by six percent or more) see as their top opportunities.

Here were the top five opportunities for each:

Leaders:

- "customers outsourcing more work to us" (43%)
- "hiring new salespeople" (37%)
- "acquiring another company" (34%)
- "helping customers integrate print and non-print marketing campaigns" (31%)
- "improving economic conditions" (27%)
- "automating production" (27%)

Laggards:

- "hiring new salespeople" (46%)
- "improving economic conditions" (30%)
- "customers outsourcing more work to us" (28%)
- "customized, personalized, or variable-data printing jobs" (28%)
- "helping customers integrate print and non-print marketing campaigns" (26%)

Aside from improving economic conditions, that is a respectable and generally actionable roster of initiatives for a print business that may be on the ropes.

Planned Investments

Figure 9. Which of the following investment items have you budgeted for and plan to acquire in the next 12 months?
All Respondents, Fall 2016 (multiple responses permitted)

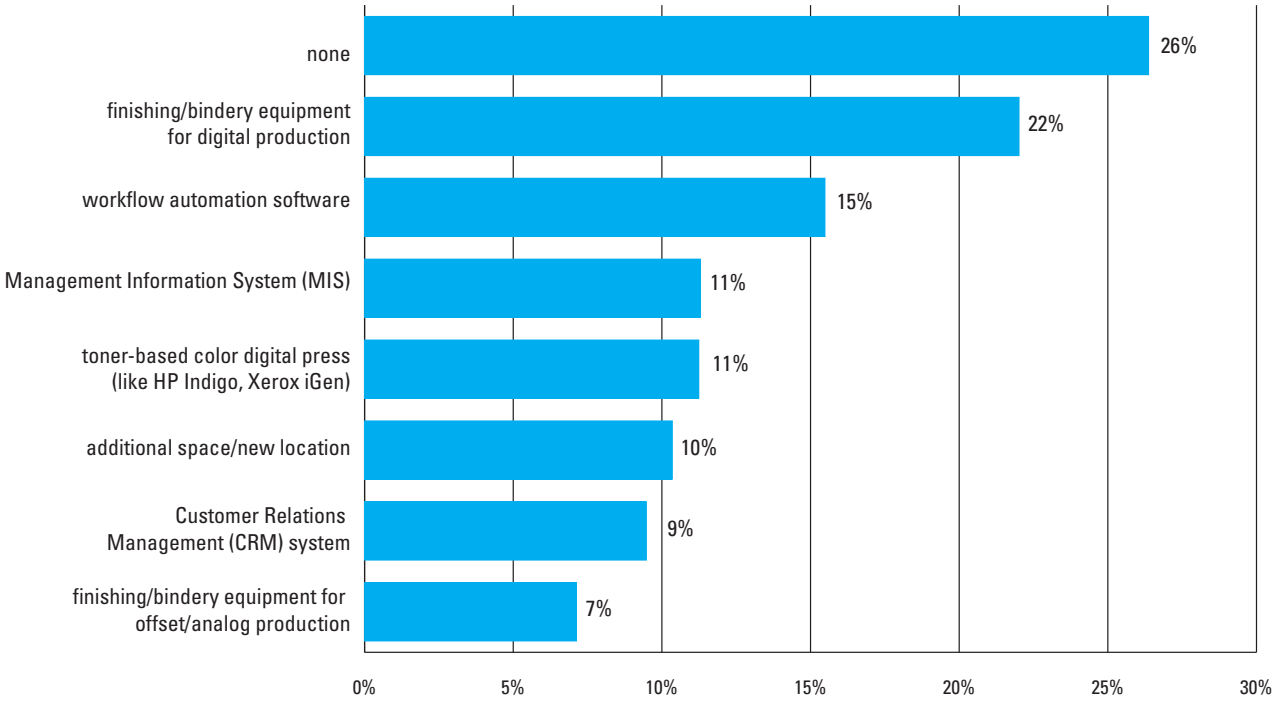


Table 11. Which of the following investment items have you budgeted for and plan to acquire in the next 12 months?
Small, Medium, and Large Print Businesses, Fall 2016 (multiple responses permitted)

	Total	Small	Medium	Large
none	26%	31%	16%	11%
finishing/bindery equipment for digital production	22%	21%	25%	23%
workflow automation software	15%	15%	15%	19%
Management Information System (MIS)	11%	10%	14%	15%
toner-based color digital press (like HP Indigo, Xerox iGen)	11%	8%	19%	16%
additional space/new location	10%	9%	14%	14%
Customer Relations Management (CRM) system	9%	9%	10%	11%
finishing/bindery equipment for offset/analog production	7%	7%	5%	16%
other	7%	7%	7%	4%
wide-format color printer (24 in.+)–latex (like HP Latex)	5%	5%	5%	4%
wide-format color printer (24 in.+)–flatbed UV (like EFI VUTEk, Canon Océ Arizona, HP Scitex)	4%	2%	9%	10%
sheetfed offset press (4 or more colors) new	4%	3%	4%	8%
prepress RIP for our wide-format printers	4%	4%	4%	2%
color measurement equipment (densitometer, spectrophotometer)	3%	3%	4%	7%
color management software	3%	3%	3%	7%
computer-to-plate equipment	3%	3%	4%	3%
wide-format color printer (24 in.+)–solvent/eco-solvent (like Epson, Roland)	2%	2%	3%	3%
sheetfed offset press (4 or more colors) used	2%	1%	6%	6%
dye-sublimation printer (like Epson, Roland, Mimaki)	2%	3%	2%	0%
high-speed production inkjet - continuous feed (like HP PageWide, Canon Océ ColorStream/ ImageStream)	2%	1%	2%	11%
prepress RIP for other devices	1%	1%	3%	2%
high-speed production inkjet - sheetfed (like Canon Océ i300, Xerox Brenva)	1%	1%	2%	6%
rebuilding our web offset press	1%	1%	1%	5%
packaging press/printer–folding carton	0%	0%	1%	1%
packaging press/printer–flexible packaging	0%	0%	0%	0%
packaging press/printer–corrugated	0%	0%	0%	1%

What have print businesses planned to buy in 2017? Unfortunately, not a lot, at least on the surface of things. The top response, selected by one-fourth of respondents, was "none." This came in at the top of the list because so many small plants selected it, but even 11% of large plants selected "none." Sometimes when you're acquiring a company, there's not a lot of money left over for additional equipment, but then again, companies often acquire others to acquire their equipment and capabilities.

The top actual item is "bindery equipment for digital production" (22%). Printers are realizing that integrating legacy binding equipment with new digital presses doesn't work particularly well. They are also seeing the need to take advantage of the new features of newer finishing equipment, chief among them varying levels of automation.

Software occupies the next two positions—"workflow automation" and "MIS," selected by 15% and 11%, respectively. Automation is a no-brainer, given what we have been seeing in the Challenges section, and companies are recognizing that MIS is important to help with, among other things, the pricing challenge. Helping to understand costs is key to understanding proper pricing. It's also vital to get real-time business metrics, and not wait until the end of the month, quarter, or even year to find out if you're making or losing money.

Tied at 11% is "toner-based digital press like HP Indigo." This is to capture that customized and personalized work they see as top opportunities. This also helps cope with the increase in short-run work. (There was also a spike in this investment in the 5–9- and 10–19-employee categories. It looks like the digital shift moving further downstream.)

Small Printers—The top "investment" was "none," selected by nearly one-third of small printers, twice that of the other size categories.[11] Number two is "bindery equipment for digital production" at 21%. (This investment was in the 20–26% range in all demographic categories.) "Workflow automation software" was selected by 15% of small printers, especially 1–9-employee shops. These shops need to boost productivity but don't have the resources to hire more people. Hence, automation. "MIS" and "CRM (Customer Relations Management)" round out the top five at 10% and 9%, respectively. The keys to profitability today may not be in bigger, better, faster hardware, but in better software, not only to manage production, but also improve sales and management.

Medium Printers—"Bindery equipment for digital production" is top of the list for mid-size shops at 25%, the highest of the three size categories. Number two, at a surprising high of 19%, is "toner-based digital press like HP Indigo." Number three is "none" selected by 16%. "Workflow automation software" is at 15%, and "additional space/new location" is at 14%. Maybe they are buying digital printing equipment and need to expand: 15% of 20–49-employee shops plan to invest in a "wide-format color printer (24 in.+)–flatbed UV (like EFI VUTEk, Canon Océ Arizona, HP Scitex), and those things are pretty big.

Large Printers—Yep, "finishing/bindery equipment for digital production" is number one (at 23%), and "workflow automation software" is number two (at 19%). Tied at 16% are "toner-based digital press like HP Indigo" and "finishing/bindery equipment for offset/analog production." These plants are still offset-centric and need to take advantage of the new automation features of modern binding equipment. Yet, they are quickly amassing

[11] Perhaps they're planning to invest in vaporware. But that would require the legendary Las Vegas computer show, COMDEX, to come back.

digital printing capabilities. As we saw at drupa, 2016 was a good year for digital press manufacturers and 2017 may turn out to be just as good. "MIS" is at 15%.

By the way, large printers are the only ones who have inkjet hopes. Eleven percent selected "high-speed production inkjet–continuous feed (like HP PageWide, Canon Océ ColorStream/ImageStream)," which was only selected by 1% and 2% of small and medium printers, respectively. Ten percent plan to invest in a flatbed UV wide-format printer (compared to 2% and 9% of small and medium printers, respectively. Those were the only inkjet items that were in double digits for any of the size categories.

What about our leaders and laggards?[12] Here is what they planned to buy in 2017:
Leaders:

- "finishing/bindery equipment for digital production" (33%)
- "workflow automation software" (30%)
- "Management Information System (MIS)" (25%)
- "additional space/new location" (24%)
- "toner-based color digital press (like HP Indigo, Xerox iGen)" (22%)

Laggards:

- "none" (35%)
- "finishing/bindery equipment for digital production" (24%)
- "finishing/bindery equipment for offset/analog production" (15%)
- "Management Information System (MIS)" (13%)
- "workflow automation software" (13%)

Investment rates for the laggards are roughly half those of leaders (and "none" was selected by only 4% of the leaders), which makes sense as these folks likely don't have much money for major investments.

It looks like no matter what happens, interest in finishing and bindery is high. This might be the effects of wages and employment benefit regulations, and concern about possible minimum wage legislation, where automating is a means of controlling costs and workforce retention problems.

[12] As in our Challenges and Opportunities sections, we cross-tabulated these responses with our economic conditions data, seeing what "leaders" (respondents who said that 2016 revenues had increased six percent or more) and "laggards" (2016 revenues decreased by six percent or more) see as their top investments.

3. New Product Areas

Figure 10. Do you plan to add any of the following capabilities in the next 12 months? All Respondents, Fall 2016 (multiple responses permitted)

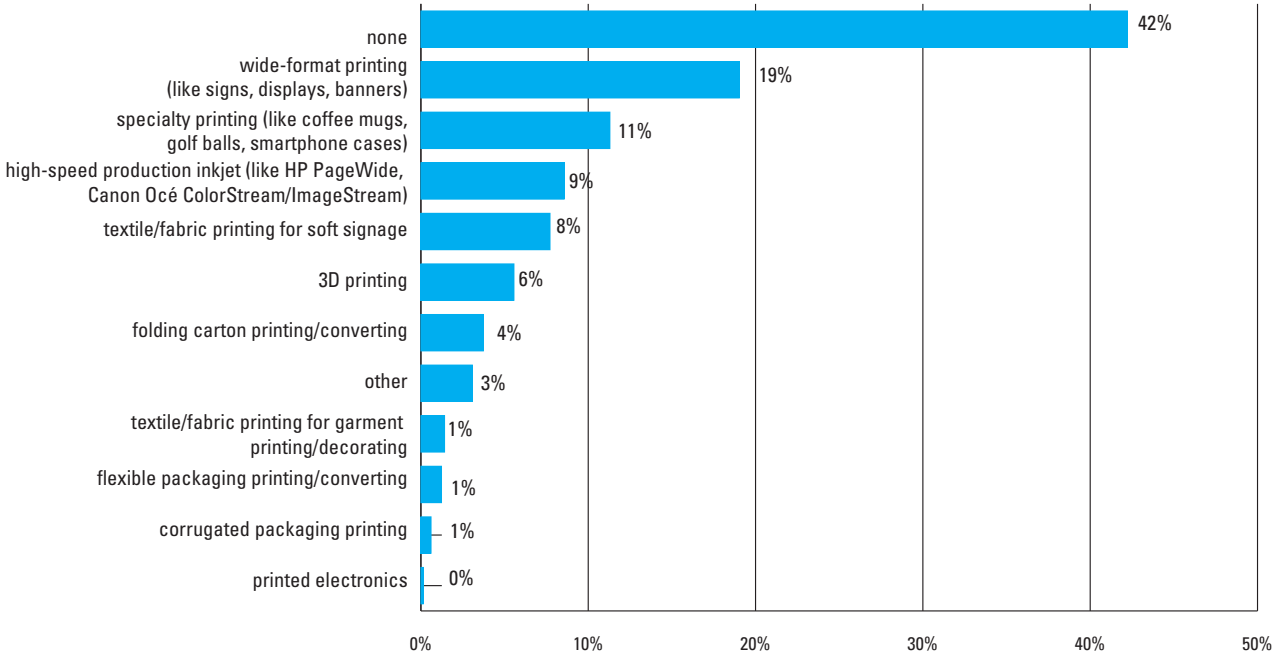


Table 12. Do you plan to add any of the following capabilities in the next 12 months? Small, Medium, and Large Print Businesses, Fall 2016 (multiple responses permitted)

	Total	Small	Medium	Large
none	42%	41%	46%	42%
wide-format printing (like signs, displays, banners)	19%	19%	21%	13%
specialty printing (like coffee mugs, golf balls, smartphone cases)	11%	11%	14%	4%
high-speed production inkjet (like HP PageWide, Canon Océ ColorStream/ImageStream)	9%	8%	9%	13%
textile/fabric printing for soft signage	8%	7%	11%	5%
3D printing	6%	6%	5%	2%
folding carton printing/converting	4%	4%	3%	6%
other	3%	4%	1%	3%
textile/fabric printing for garment printing/decorating	1%	0%	6%	1%
flexible packaging printing/converting	1%	1%	3%	2%
corrugated packaging printing	1%	0%	2%	1%
printed electronics	0%	0%	0%	1%

Much has been made of new technologies such as 3D printing, printed electronics, functional printing, even older-yet-new-to-commercial things like wide-format printing. Are any of these items of any interest to commercial printers today?

Well, not really. "None" was selected by 42%, although for some of these items it's likely they already do some of it. Still, one-fifth (19%) of respondents say they plan to add wide-format printing, and 11% plan to add specialty printing, but beyond that, there doesn't appear to be much interest in the rest of the items on the list.

For some of these technologies and capabilities, this is not surprising. For things like printed electronics and 3D printing, and even textile printing, it's not a simple matter of buying a piece of equipment and watching the work roll in. It involves having an understanding of the basic materials involved, as well as the market for what these processes produce and the customers who buy it. Even something like packaging can be a tough market to break into, simply because it's a different ecosystem than the one commercial print businesses usually inhabit. And printed electronics requires a background in engineering and working with circuit boards and conductive inks. It's not that it's impossible to understand, but it requires a level of due diligence—and perhaps even a separate company—to pursue successfully. We're reminded of the Monty Python sketch about the accountant who wants to become a lion tamer.[13] It can be a pretty big leap.

Let's look at these initiatives by plant size.

Small Printers—Surprisingly, at 41%, small printers were the least likely of the three to select none, even it is only by one percentage point. Nineteen percent look to add wide-format printing, and 11% look to add specialty printing. Eight percent said they were looking to add high-speed production inkjet (even 8% of 1–4-employee shops said this. Really? And seven percent look to add soft signage.

Medium Printers—Almost one-half (46%) selected "none," although one-fifth (21%) sad they are looking to add wide-format printing. (Remember this group was he most likely to be investing in wide-format equipment, at least of the UV flatbed variety.) Fourteen percent are looking at specialty printing, and 11% at soft signage.

Large Printers—Forty-two percent selected "none." These plants are the least likely to be getting into wide-format printing (13%), but the most likely to be getting into high-speed production inkjet, which makes more sense than the small printers. A lrger-than-average number (6%) selected folding carton printing/converting. Indeed, this group was the most likely to be looking at other kinds of packaging. And 1% selected printed electronics. Hmm.

What about out leaders and laggards?[14]

Leaders:

- "none" (44%)
- "wide-format printing (like signs, displays, banners)" (23%)

[13] Says the Vocational Guidance Counselor (John Cleese): "Of course, it's a bit of a jump isn't it? I mean, chartered accountancy to lion taming in one go. You don't think it might be better if you worked your way towards lion taming, say, via banking?"
[14] As in our Challenges, Opportunities, and Investments sections, we cross-tabulated these responses with our economic conditions data, seeing what new initiatives "leaders" (respondents who said that 2016 revenues had increased six percent or more) and "laggards" (2016 revenues decreased by six percent or more) might be pursuing.

- "textile/fabric printing for soft signage" (17%)
- "high-speed production inkjet (like HP PageWide, Canon Océ ColorStream/ ImageStream)" (14%)
- "specialty printing (like coffee mugs, golf balls, smartphone cases)" (12%)

Laggards:

- "none" (51%)
- "high-speed production inkjet (like HP PageWide, Canon Océ ColorStream/ ImageStream)" (16%)
- "wide-format printing (like signs, displays, banners)" (14%)
- "folding carton printing/converting" (12%)
- "flexible packaging printing/converting" (10%)

It's entirely possible that the leaders already have some of these capabilities, but wide-format and soft signage are their big new areas. As for the laggards, half of them have no interest in any of these, but these who do seem to think that inkjet, and to a lesser extent, packaging, will save them. We can only hope.

4. Industry Events and Trade Shows

Figure 11. Which of the following events are you planning to attend in 2017? All Respondents, Fall 2016 (multiple responses permitted)

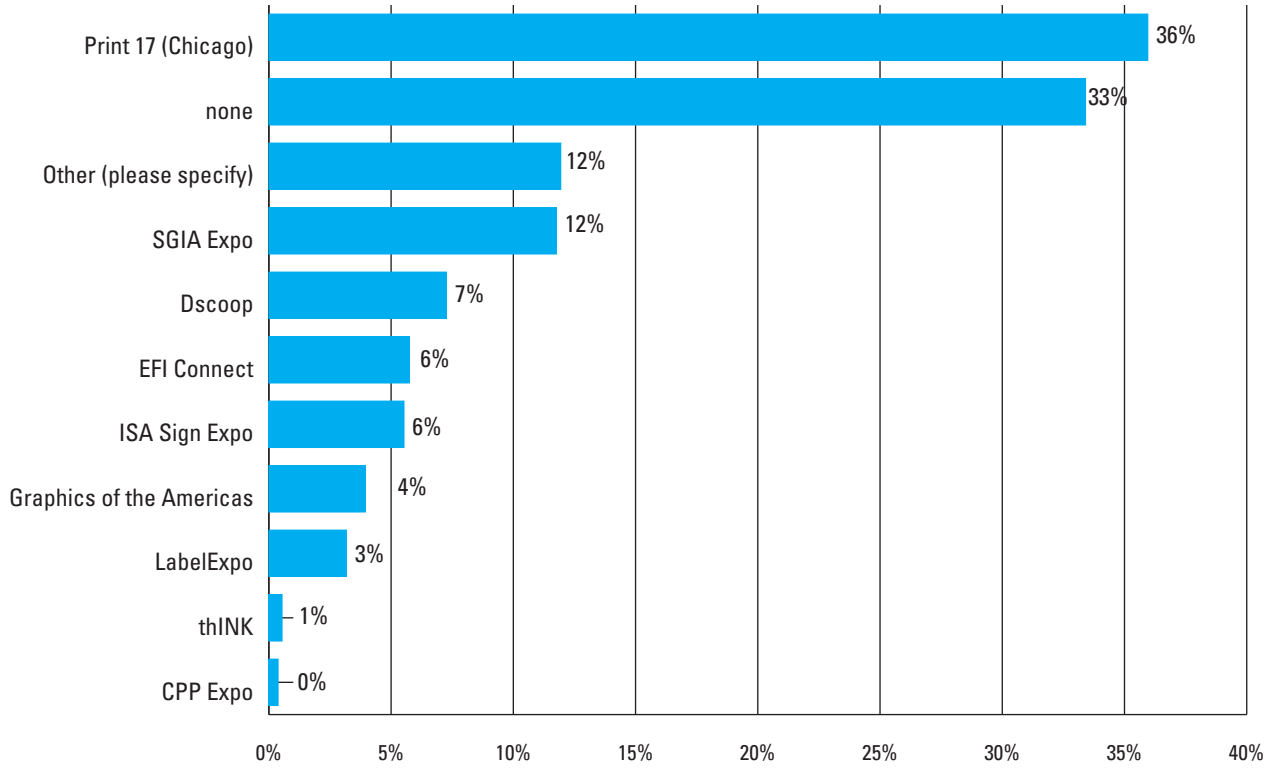


Table 13. Which of the following events are you planning to attend in 2017? Small, Medium, and Large Printers, Fall 2016 (multiple responses permitted)

	Total	Small	Medium	Large
Print 17 (Chicago)	36%	32%	45%	42%
none	33%	35%	32%	22%
other	12%	12%	15%	5%
SGIA Expo	12%	9%	19%	18%
Dscoop	7%	4%	12%	20%
EFI Connect	6%	4%	7%	16%
ISA Sign Expo	6%	6%	6%	3%
Graphics of the Americas	4%	4%	3%	3%
LabelExpo	3%	3%	3%	4%
thINK	1%	0%	1%	3%
CPP Expo	0%	0%	1%	1%

As the industry recovers from drupa, and breathes a sign of relief that Graph Expo's move to Orlando wasn't death on two legs, what will 2017's events look like? We asked in our survey about potential event attendance, both prominent industry trade shows as well as individual vendors' user group conferences, some of which have become as big as the major shows.

One-third (33%) of survey respondents said they are not going to any shows in 2017. We've long been concerned that not enough print industry executives and owners go to at least the big shows—and don't know what to do while they're there.

The most important upcoming show is Print 17, and 36% of respondents say they pan to attend. After that, planned attendance drops considerably. Twelve percent said they plan to attend the SGIA Expo, 7% said they planned to attend Dscoop, 6% said they'd attend EFI Connect, and another 6% said they'd attend the ISA Sign Expo.

Twelve percent chose "other," and the most common write-in response was the National Print Ownership Association (NPOA) Owners Conference.

There were a few highlights by establishment size:

Small Printers—Least likely to attend any shows (35% said "none"), but 32% are at least headed to Print 17. "Other" (typically NPOA) came in at 12%, and SGIA at 9%.

Medium Printers—Forty-five percent are headed to Chicago, 19% to SGIA, and 12% to Dscoop. "Other" (NPOA) was highest among this size category: 15%. One-third (32%) are staying home all year.

Large Printers—These are the most likely to attend *some* industry event (22% said "none"), even if it's just Print 17 (42%). They are also far more interested in Dscoop (20%), SGIA Expo (18%), and EFI Connect (16%).

And our leaders and laggards?[15]

Leaders:

- Print 17 (Chicago) (58%)
- SGIA Expo (33%)
- EFI Connect (24%)
- None (23%)
- Dscoop (19%)

Laggards:

- None (35%)
- Print 17 (Chicago) (33%)
- Dscoop (27%)

[15] As in the previous four sections, we cross-tabulated these responses with our economic conditions data, seeing what trade shows "leaders" (respondents who said that 2016 revenues had increased six percent or more) and "laggards" (2016 revenues decreased by six percent or more) might be attending.

- SGIA Expo (21%)
- EFI Connect (8%)

It's encouraging that there is not too much discrepancy between the leaders and laggards when it comes to trade show attendance at the big shows. It's possible the laggards are looking to get ideas so they can become leaders. Not that events are the be-all and end-all of industry education, but those who know how to get the most out of a show—a good mix of sessions, show floor prowling, and networking—can come away with good ideas for growing business.

It's becoming more and more important for exhibitors to make the most of the shows in terms of the non-attendees. Just because someone does not attend one of the shows does not mean they are not interested in the product introductions and the news generated there. Shows remain a focal point of attention. With today's digital media, not attending does not mean you can't be aware of what happens there. Inability to attend is not always a financial issue, but a management one. So many print businesses are running too lean in their management and can't get away from their facilities.

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

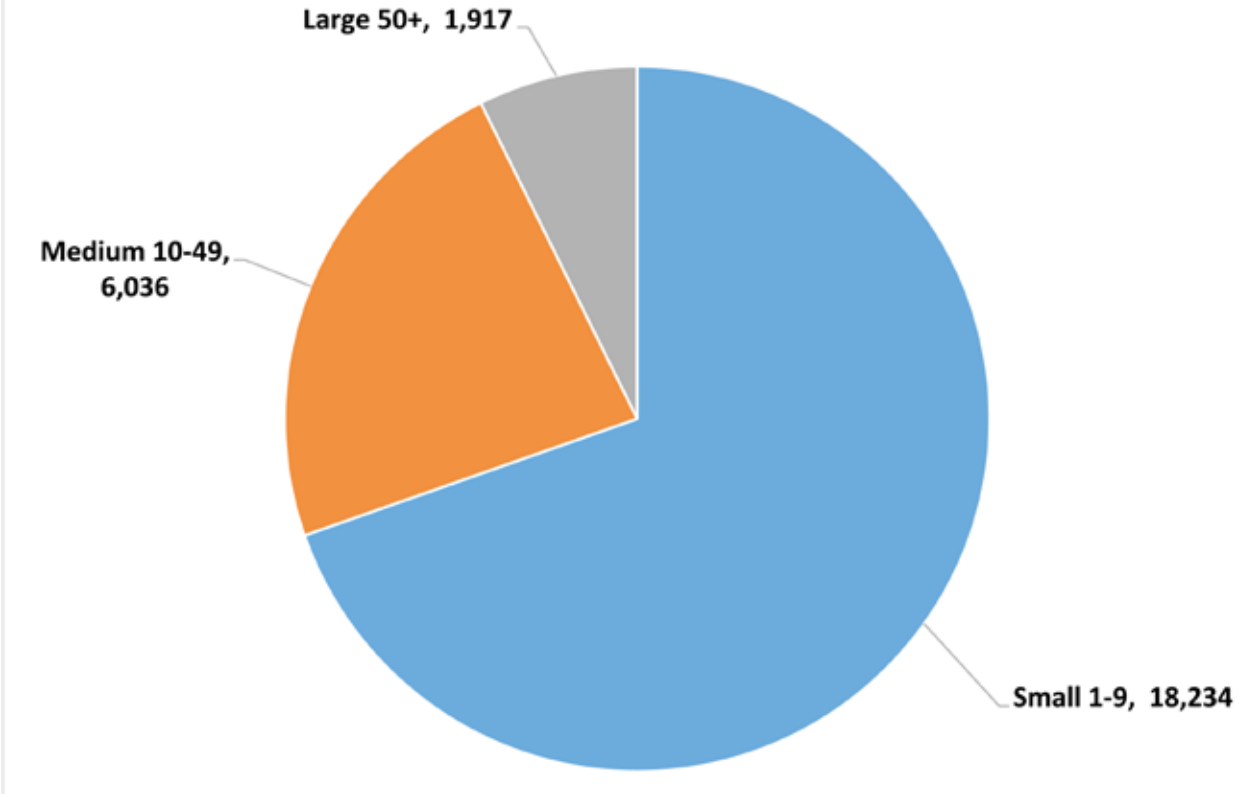
Remember, these are aggregate industry data, a combination of winners and losers and everything in between. When you see the trends, it's a baseline or an average that often reflects mediocrity. Keep a good perspective: there are many profitable, healthy, and growing companies that are performing exceptionally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

Printing Establishments

The composition of the printing industry today—NAICS 323[16]—is predominantly small businesses. Indeed, 70% of the 26,187 establishments counted in 2014 were those that had under 10 employees. One-fourth (23%) of industry establishments 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.

[16] "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."

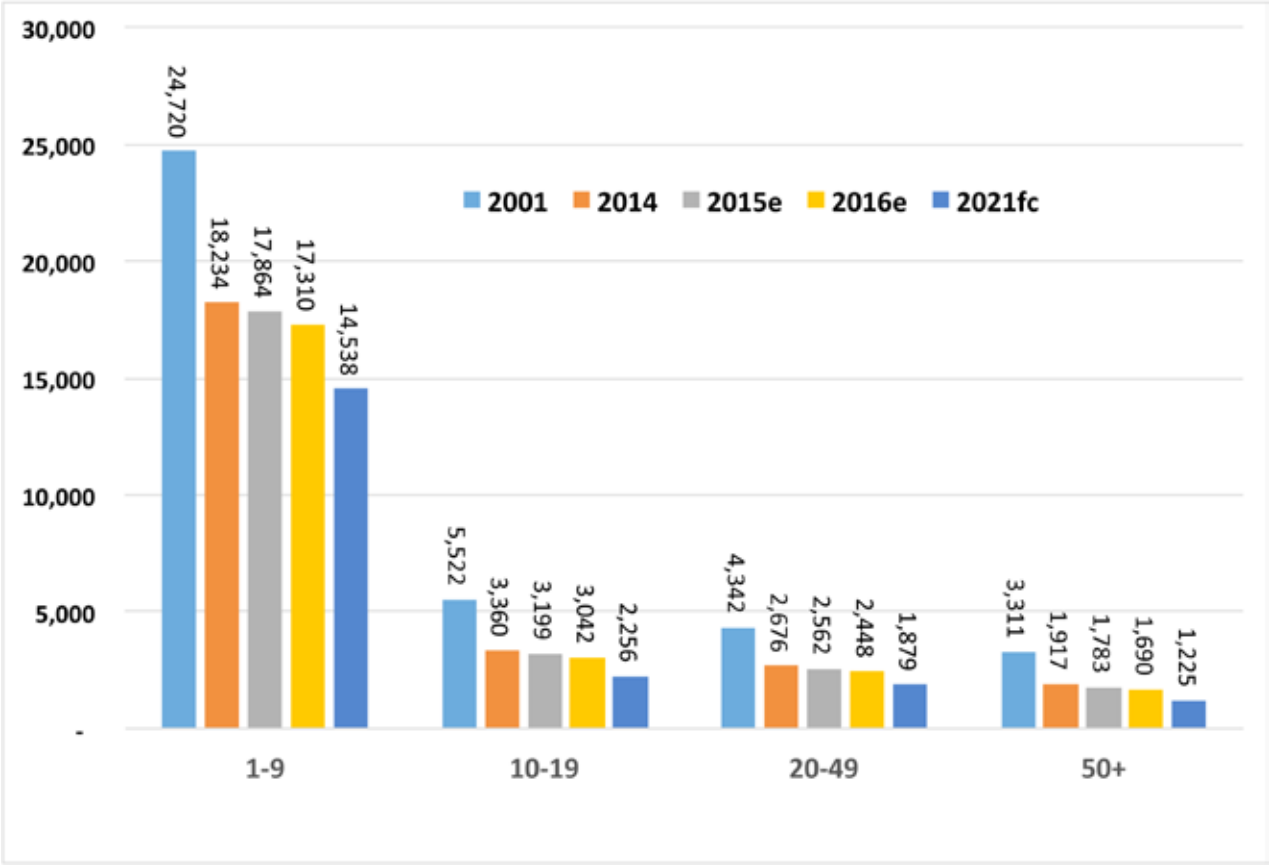
Figure 12. U.S. Commercial Printing Establishments by Size, 2014



In the past 12 years, the overall number of printing establishments has declined by almost one-third; in 2001, there were 37,895 establishments in NAICS 323; in 2014 (the last year for which we have hard data), that number has dropped to 26,187. For 2016, we estimate a further decline to 24,490. Projecting out to 2021 (five years hence), we forecast a total establishment count of 19,898. Remember, data is not destiny, but we find very little evidence that there will be a major resurgence in print demand that will fuel a return to the glory days. The next five years will likely look like the past five years: no major industry carnage, but no substantial growth either.

As we always say, the number of establishments in any given industry or market expands and contracts to reflect the demand for what those businesses produce. It's no surprise that we have seen demand for various printed materials decline over this period, and as a result, establishments have declined accordingly. Some industry experts have called this "right-sizing"—markets and industries seek their own level, like water. Are we close to the right size? We're getting there, and Figure 13 shows that the decline in establishments is slowing down but not stopping. Yet.

Figure 13. Change In U.S. Commercial Printing Establishments By Size, 2001–2021



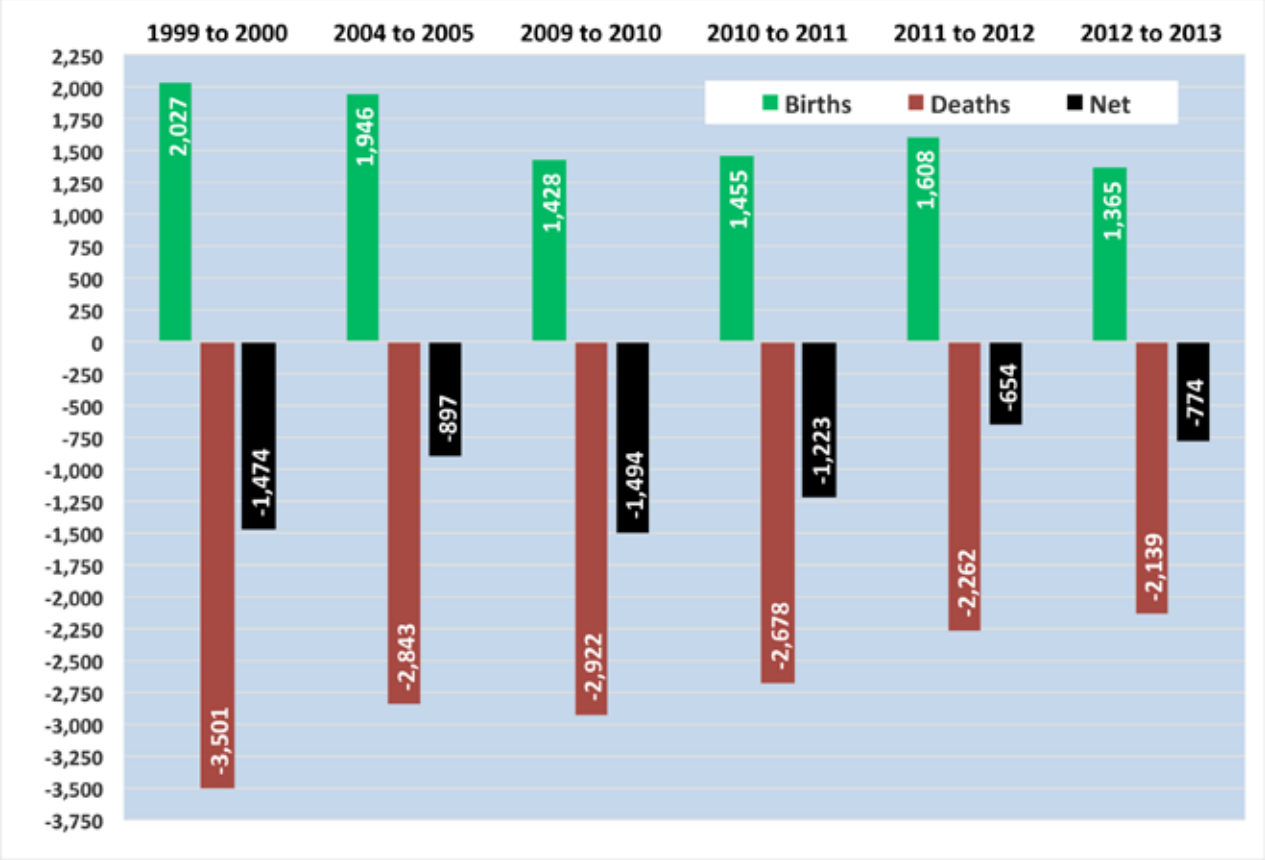
Births/Deaths

We can look at industry birth and death data in more detail to get a sense of how the industry is stabilizing. In the years from 1999 to 2013 (the most recent year for which we have data), establishment "deaths" have been generally reducing—but then so have births. The death rate has outpaced the birth rate, but the annual net loss of establishments is also—generally—slowing. It will be a few more years (2020?) before we reach something like an equilibrium.

These are not always new businesses or dead ones, but businesses that are changing 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 find it is cheaper to close and then open as a single new business, without dealing with the legalities and details of a merger or an acquisition.

The key number to track is the net change every year. The end of the recession was the biggest net loss of establishments in recent years, and that figure has been shrinking, and is a smaller percentage of establishments than it has been in the recent past. The path to a more efficient industry is good, but it would be nice to see an influx of new entrepreneurial capital and the number of establishments outpacing the closures. That is unlikely.

Figure 14. Printing Industry Establishment Births/Deaths, 1999–2013



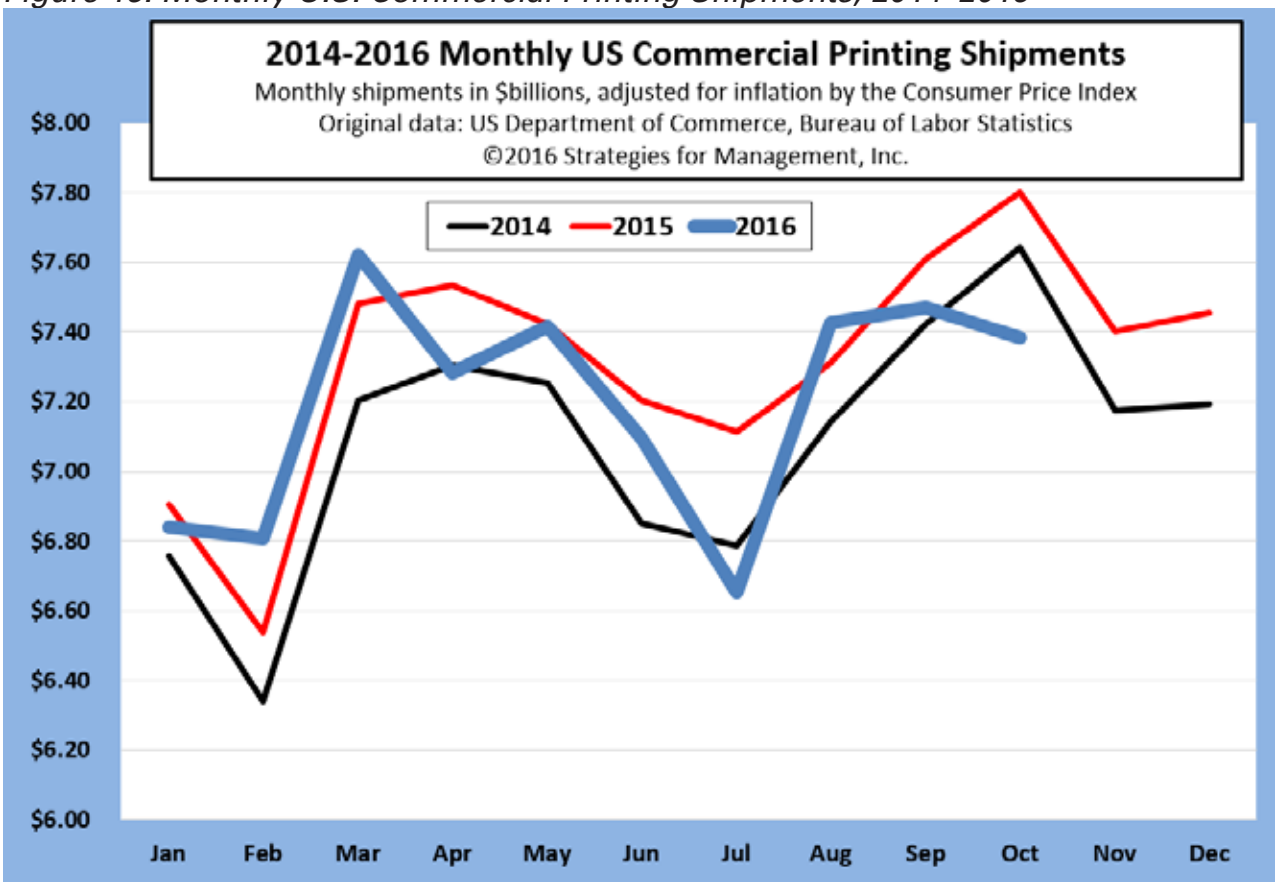
Printing Industry Shipments

The year started out okay, but somewhere along the line—around August—things took a bad turn, with October shipments coming in at $7.4 billion, down -5.2% from October 2015 and -2.8% from 2014. October had usually been the high point of the year. Not anymore. That said, July—usually a trough month—was especially troughy this year, seeing the worst printing shipments data since February 2015.

When looking at a year-to-date comparison with last year (Figure 16), the high points earlier this year helped mask the recent damage and make the inflation-adjust January–October figures for 2016 only slightly below 2016, with January–October 2016 shipments down only -1.3% compared to January-October 2015.

Looking ahead (Figure 17), we are currently expecting 2016 shipments to come in at $85.7 billion, down 2.4% from 2015 and down 41.5% from 2000. We are currently forecasting that 2017 and 2018 shipments will continue a slight downward trend, coming in at $83.5 billion and $81.4 billion, respectively. Compared to 1995, that's— no, sorry, we can't do it. It's just too depressing to calculate. If you're morbidly curious, you can do the math.

Figure 15. Monthly U.S. Commercial Printing Shipments, 2014–2016



Of concern in the newest data for October 2016 is how it came in below both 2015 and 2014. This has been the year for mobile marketing getting significant share of the advertising budget. Also, e-commerce has continued its strong growth of 15% or more per year, and the combination with mobile technologies is in process of changing retailing and all market communications.

Figure 16. Year-to-Date U.S. Commercial Printing Shipments, 2015 vs. 2016

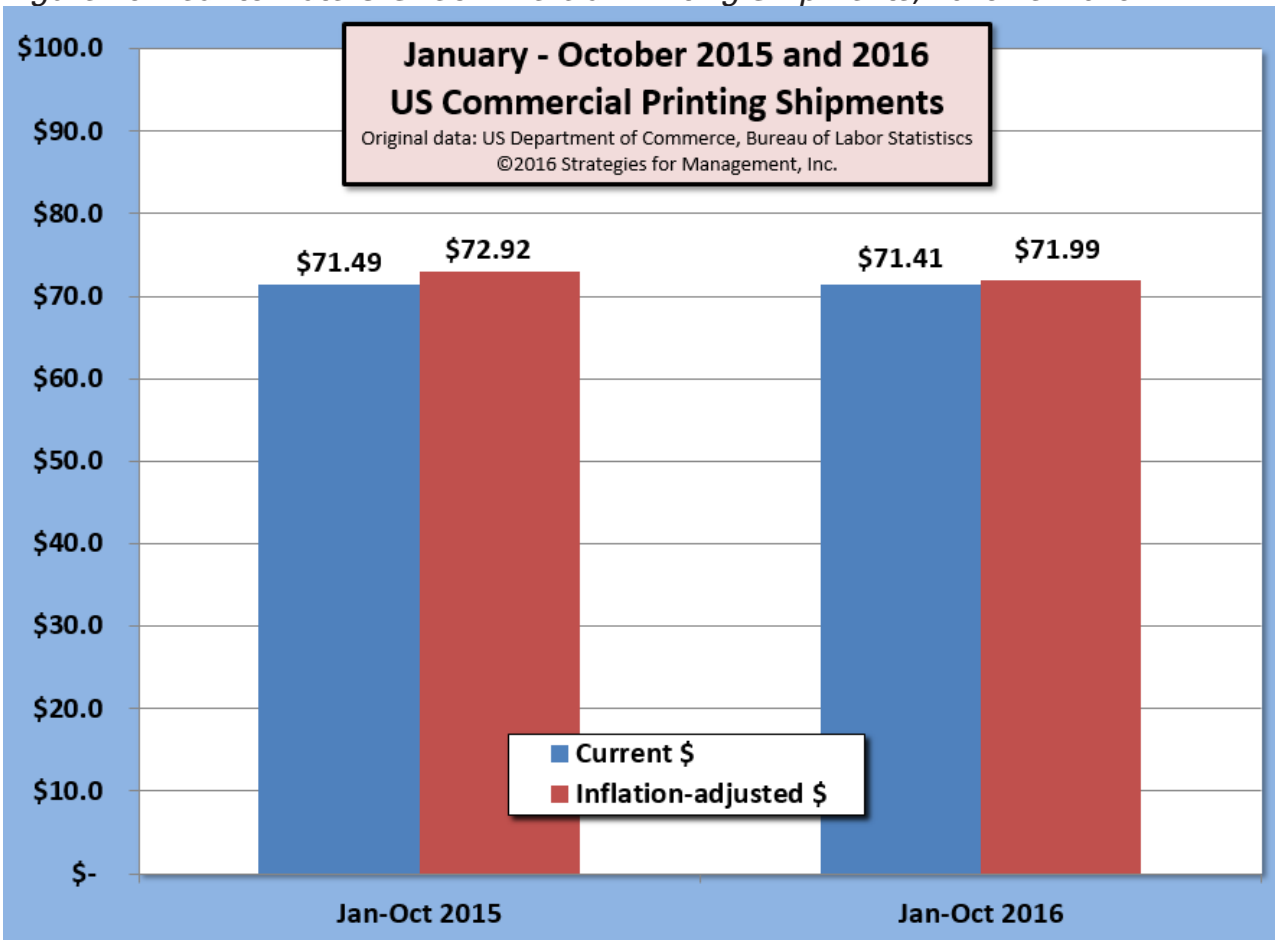
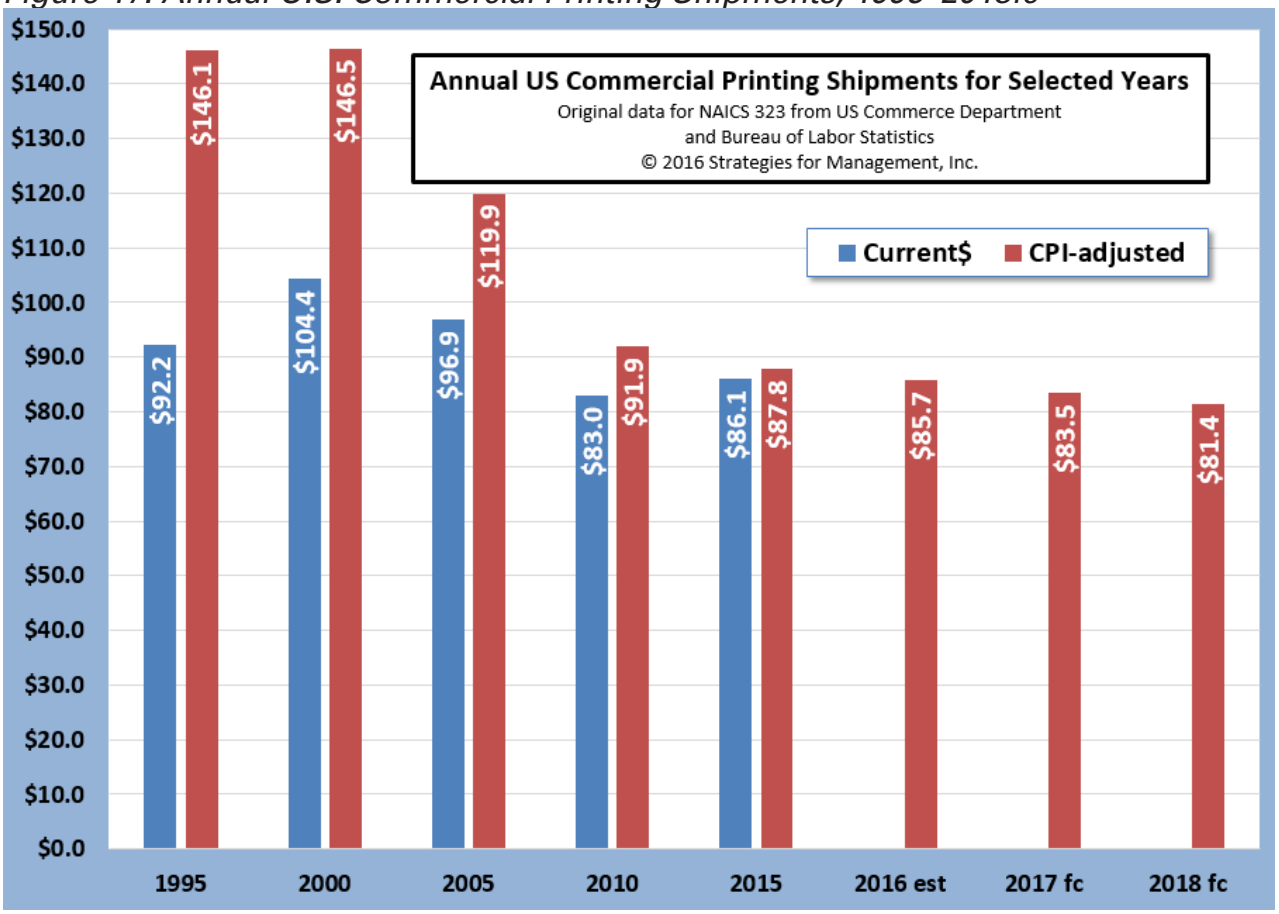


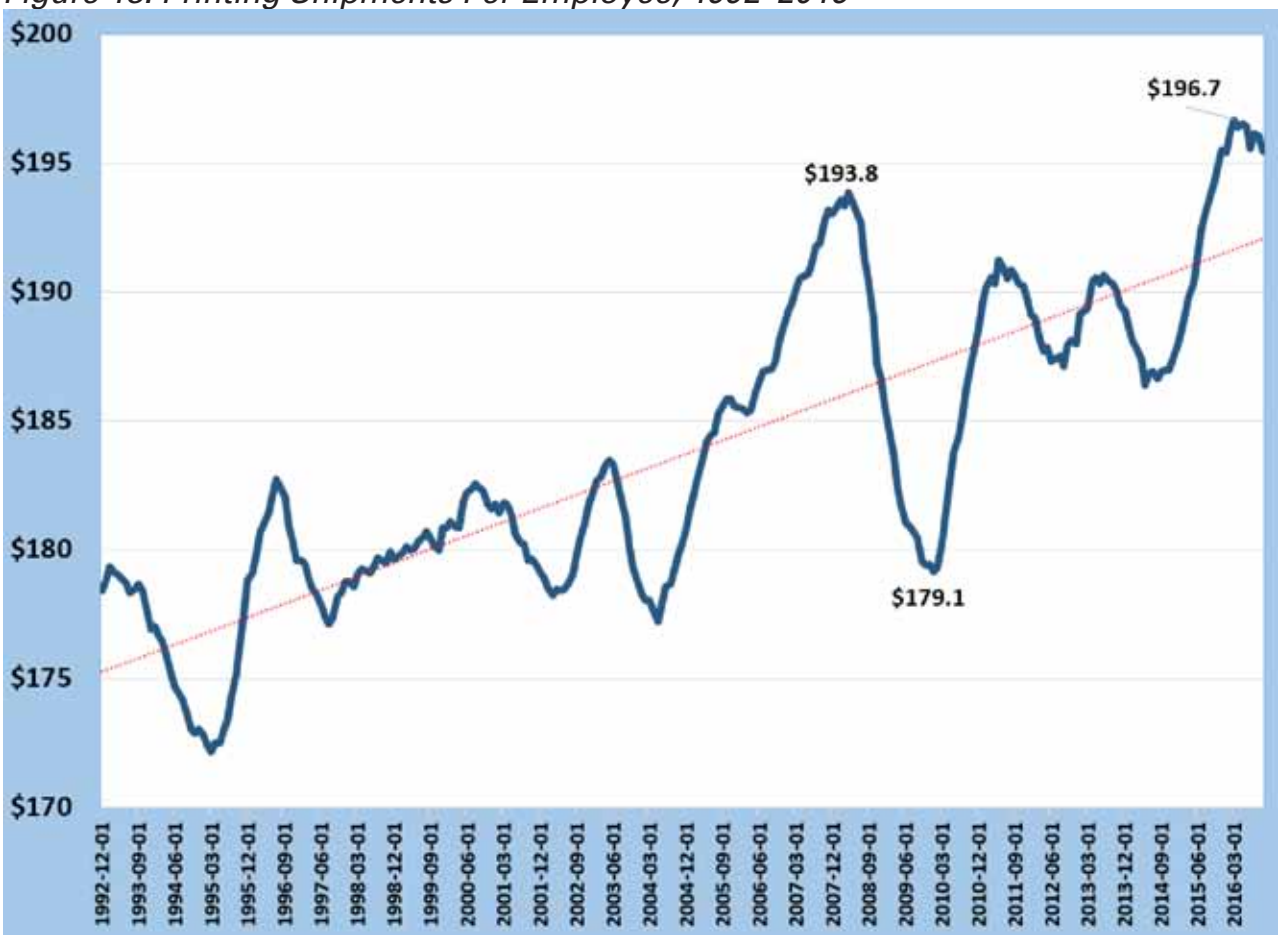
Figure 17. Annual U.S. Commercial Printing Shipments, 1995–2018fc



Shipments Per Employee

Industry consolidation has created a bumpy but unprecedented and impressive move higher for inflation-adjusted shipments per employee. Though this measure has backed down a little recently, it is down only very slightly from its recent historical high. The weakest companies that pull down the average revenue per employee have left the market, and their volume has been absorbed by the remaining businesses or been acquired by them on a "tuck-in" or other basis. Profits data have always shown that companies with similar revenues but fewer employees are better managed and more profitable. The consolidation of the industry has led to greater efficiency, but not necessarily greater profits. This trend has to continue; the fact that it has not resulted in a significant increase in profits means that the consolidation lags behind the marketplace. Aggressive consolidation is still needed in the industry, not for an elimination of press capacity as some had proposed for decades, but for a concentration and growth in the capital for new investment. The best consolidation opens new markets and allows the production of new products. The worst is the consolidation where companies merge to get by with doing the same things at a better cost. That better cost will not last for long.

Figure 18. Printing Shipments Per Employee, 1992–2016



In Appendix C, we provide detailed value of shipments data for both paper and printing NAICS categories from the Annual Survey of Manufactures (ASM).

Graphic Arts Employment

In general, from November 2015 to November 2016, all printing employment was down by just under 3%. It's tempting to attribute this to automation, but the big drop is in "printing less production," which includes predominantly administrative positions; this is down about 7,500 workers since last year. This is mainly the result of consolidation and downsizing. For production workers, things have been a little steadier.

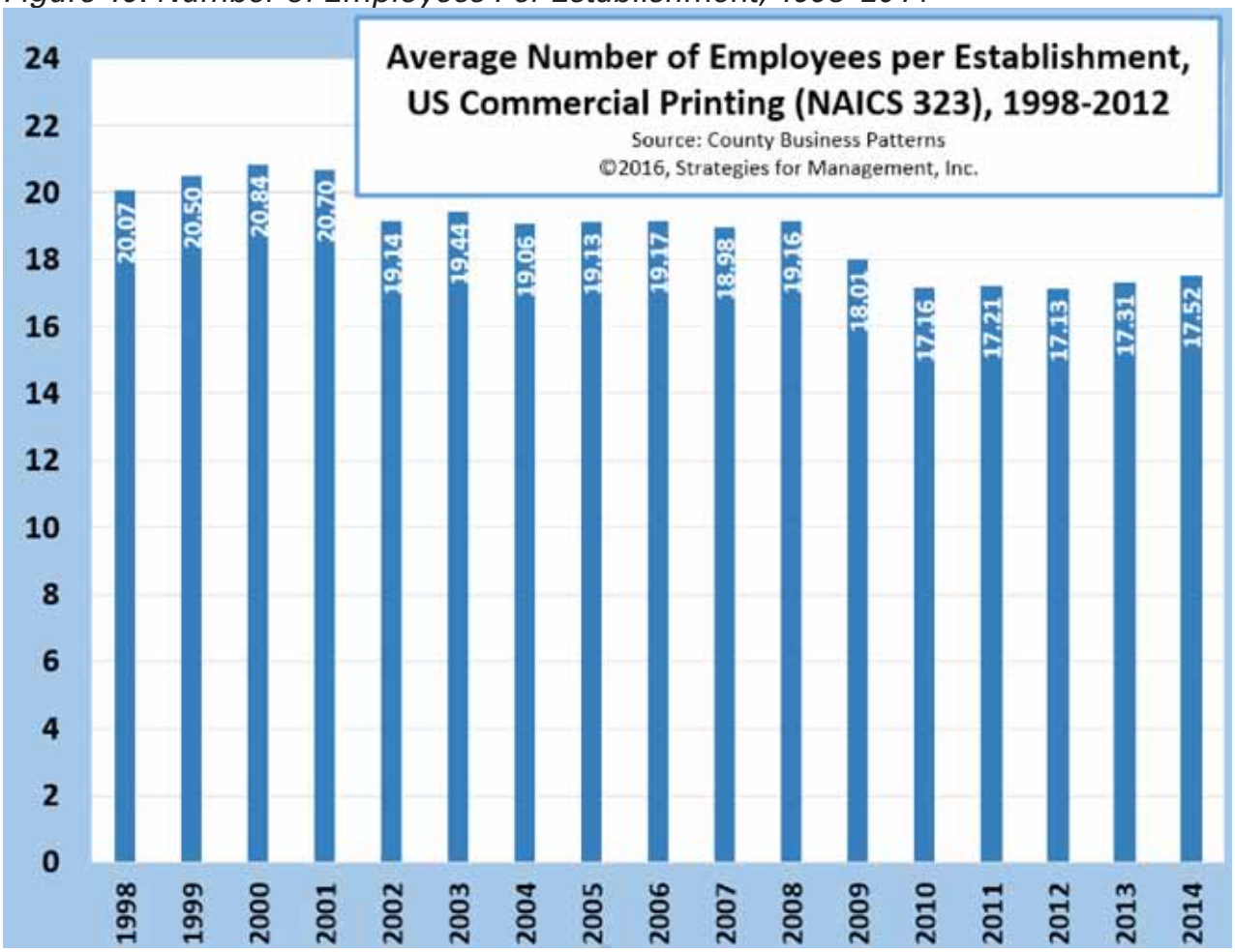
Graphic design might be showing some signs of austerity measures when it comes to new projects. On the creative side, public relations and agencies are up. This is all indicative of the ongoing shift in media allocation.

Table 14. Graphic Arts Employment, 2015 vs. 2016

Employment in thousands of workers	October 2015	October 2016	Y/Y Change	Nov. 2015	Nov. 2016	Y/Y Change
Printing, all	449.0	439.1	-2.2%	451.3	438.3	-2.9%
Printing, production	308.3	306.0	-0.7%	311.3	305.9	-1.7%
Printing, less production	140.7	133.1	-5.4%	140.0	132.4	-5.4%
Publishing	725.7	725.9	0.0%	726.1	726.2	0.0%
Periodicals	97.0	93.0	-4.1%	96.0		
Newspapers	187.8	179.0	-4.7%	188.8		
Publishing ex-newspapers	537.9	546.9	1.7%	537.3		
Graphic design	66.9	66.6	-0.4%	67.1		
Public relations	57.2	58.0	1.4%	56.9		
Ad agencies, includes PR	491.2	498.9	1.6%	493.0		
Ad agencies, less PR	434.0	440.9	1.6%	436.1		
Agency (incl PR) + design	558.1	565.5	1.3%	560.1		
Direct mail advertising	46.4	46.3	-0.2%	46.4		

From 2001 to about 2007, the average number of employees per establishment had been declining, although not by an awful lot. Since 2009, the average number of employees seems to have stabilized at around 17 to 18. This is down from about 20 or more at the turn of the century when there were remnants of traditional film-based prepress remaining and very little digital printing equipment in the market.

Figure 19. Number of Employees Per Establishment, 1998–2014



Printing Industry Capacity Utilization

Capacity utilization is a traditional, yet increasingly anachronistic economic indicator for the industry. It is more important for individual companies, but in aggregate it doesn't really tell us much. Even at the individual level, it is 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.

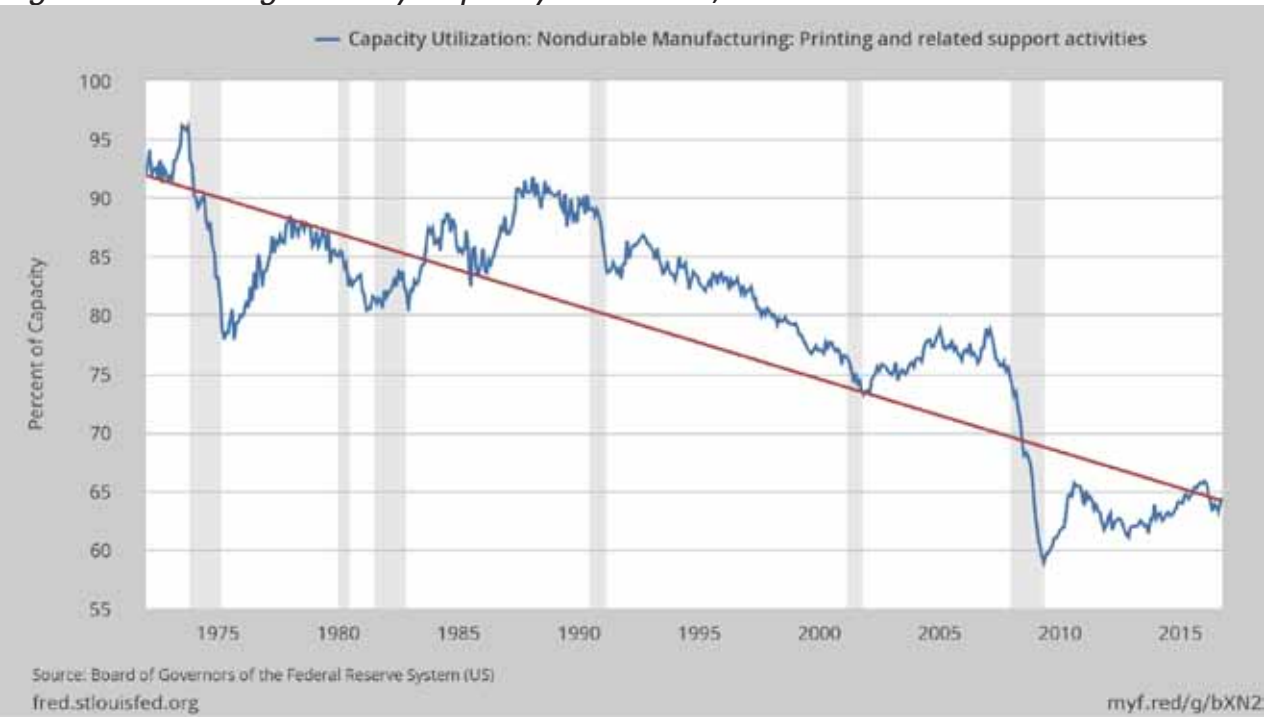
First of all, what is capacity utilization? It is a measure of the proportion of potential output that a company or industry actually produces. It's designed to identify how much "slack" there is, or the extent to which production could be increased without incurring additional costs, such as having to buy more equipment, hire new employees, ands so on. In other words, are the presses running as much as they could be? If you are 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.

For example, it is supposed to help determine the point at which unit costs rise. For example, if ABC Printing produces 10,000 business cards at a cost of $0.05 per card (yes, that's pricey for business cards), and if they worked out that they could print 15,000 business cards without that per-card cost rising above $0.05, the capacity utilization rate is then calculated to be 66% (10,000 ÷ 15,000).

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. The quality control movement of the 1980s taught us how important that is; skillful workers can reduce unproductive utilization and increase profits. Automation can also serve that function.

Data for the chart below come from the Federal Reserve and are published monthly. The biggest drop in utilization was in the 1980s, when the value of printed goods rose because of cost reductions from digital prepress and the growth of process color printing, which had greater ROI than black and white. So profits were good even though utilization was going down. The calculation of breakeven for individual equipment, departments, and the entire business are much more important than that of capacity utilization. What's even more important? Making your clients more productive and profitable because of what your company does for them.

Figure 20. Printing Industry Capacity Utilization, 1975–2016



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? After all, 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 software, in the case of creatives).

Figure 21. Percent Change In the PPI for Commercial Offset Printing, 2007–2016

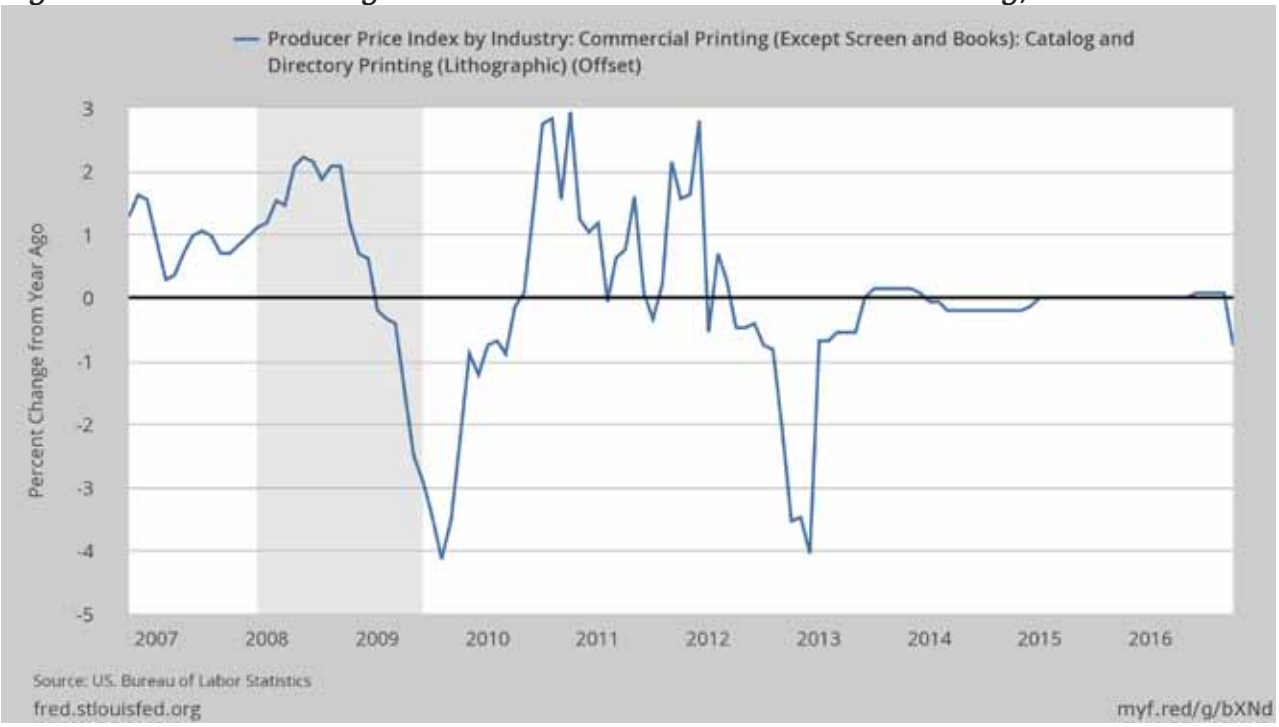


Figure 22. Percent Change In the PPI for Digital Printing, 2007–2016

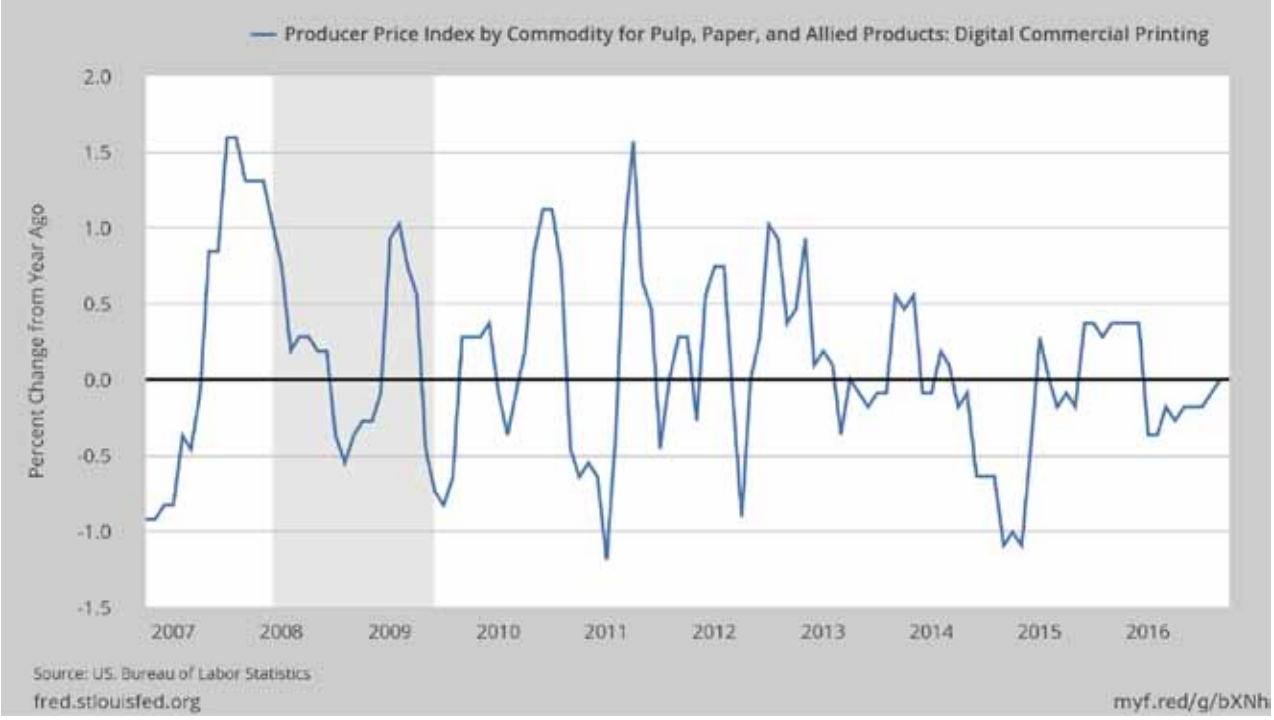


Figure 23. Percent Change In the PPI for Other Commercial Printing, 2007–2016

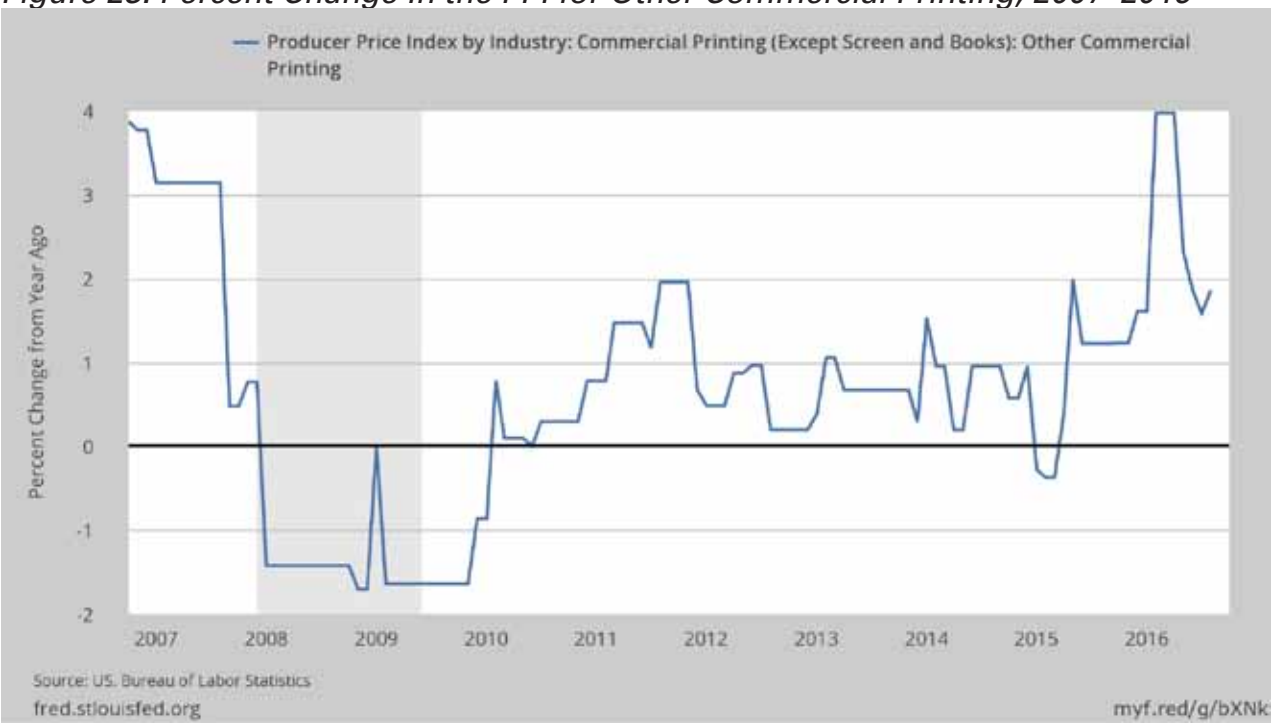


Figure 24. Percent Change In the CPI vs. PPI for Commercial Offset and Digital Printing, 2007–2016

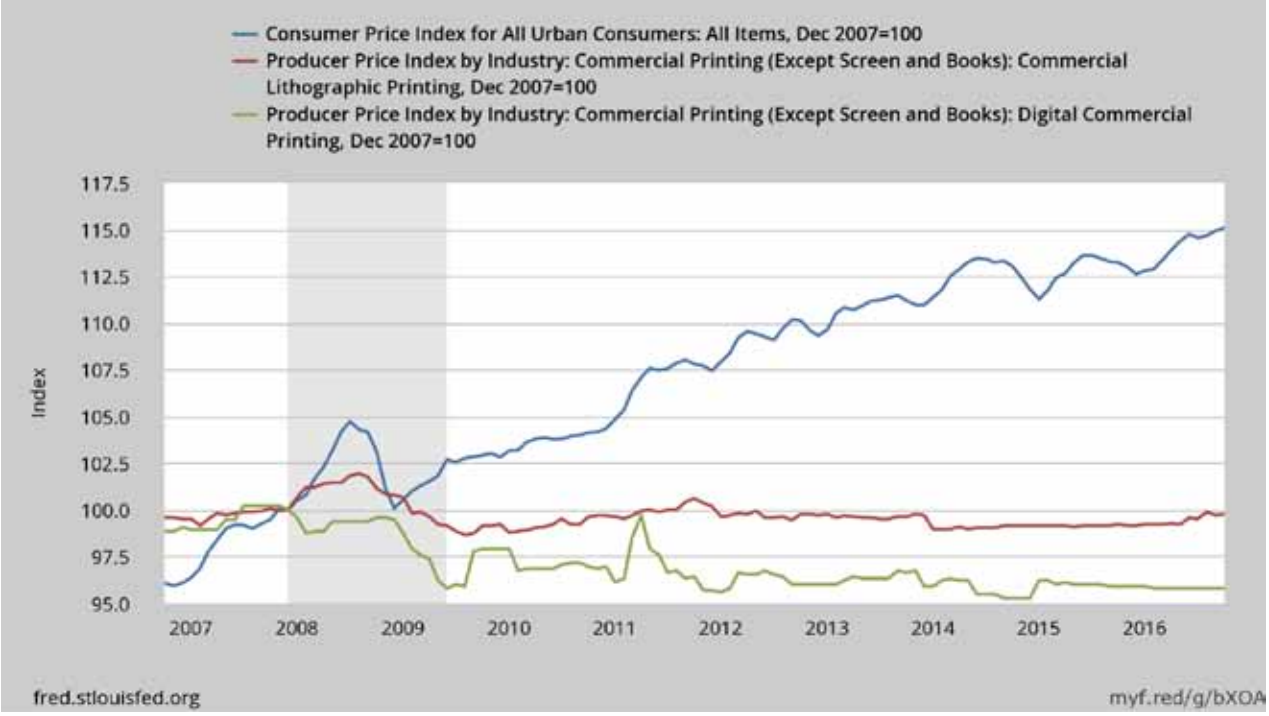


Figure 25 shows the change in the Producer Price Index for various print process categories.

Figure 25. Percent Change In PPI for Selected Print Processs Categories, 2008–2016

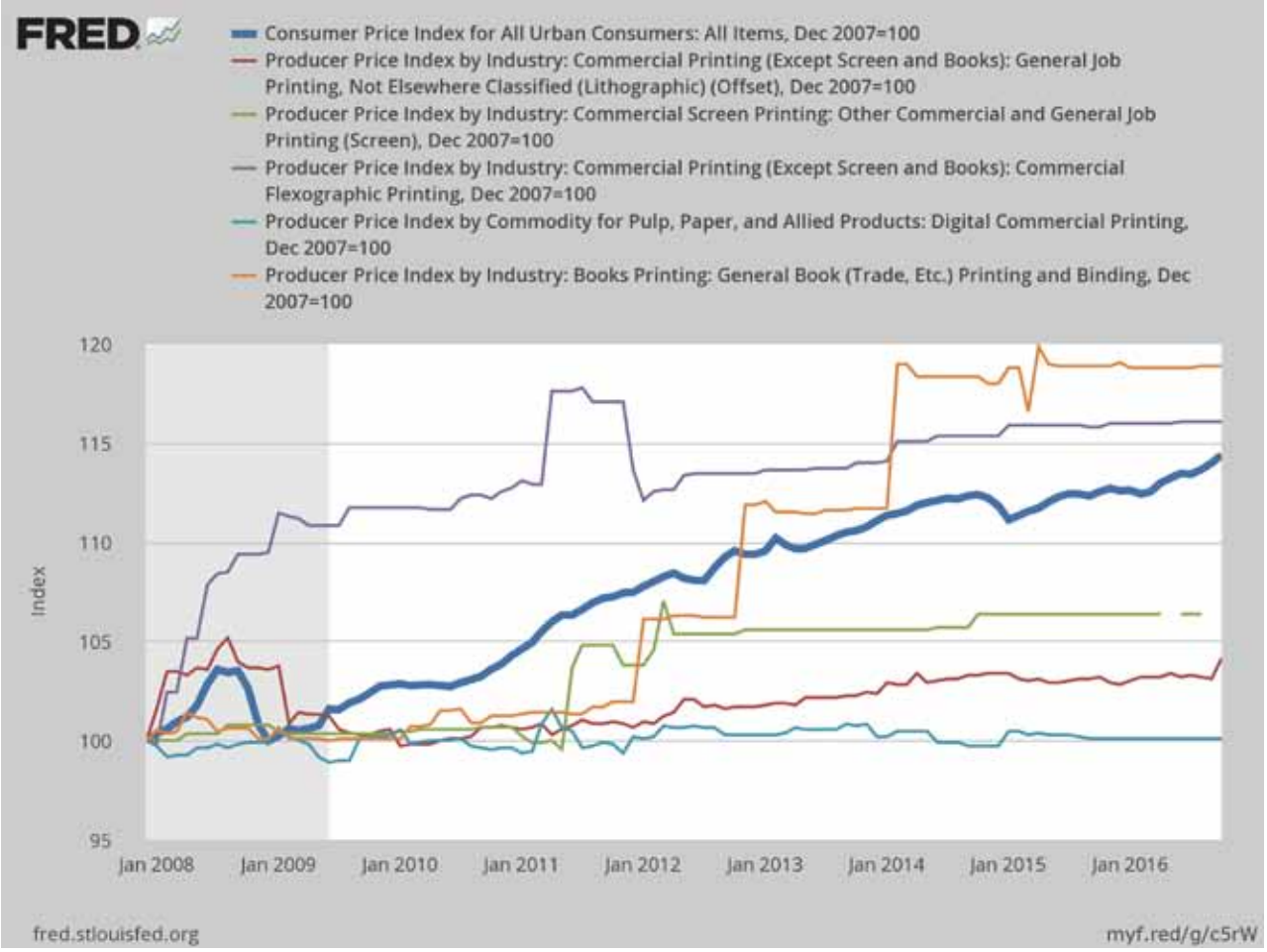
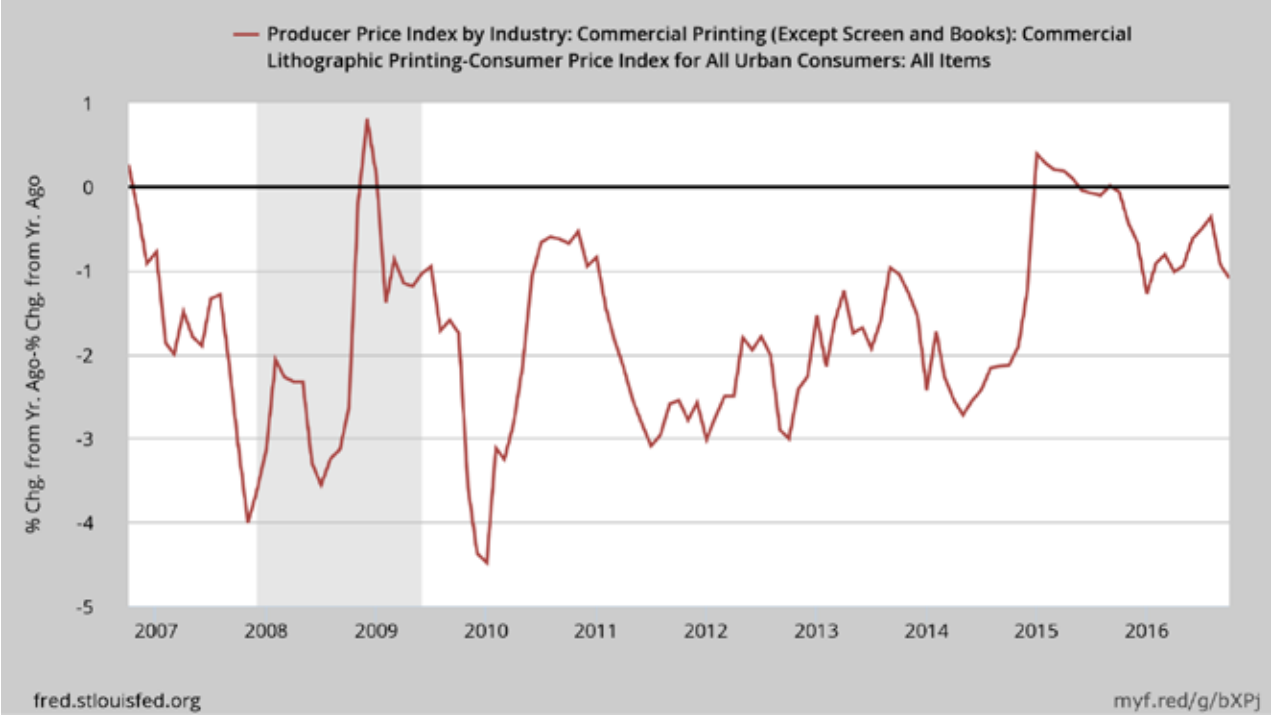


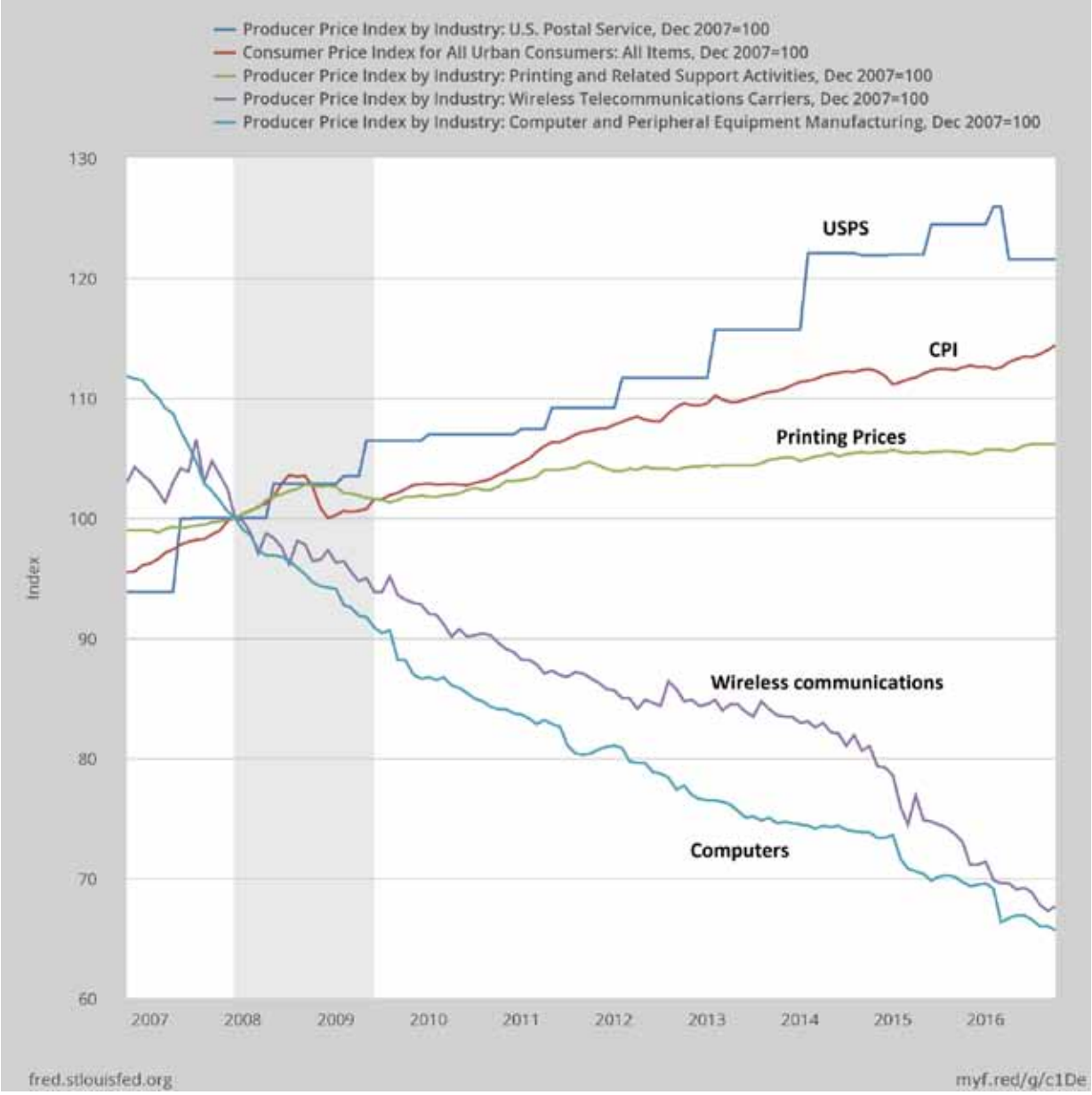
Figure 26 represents the shortfall that printing prices have had against the Consumer Price Index. In other words, print is getting cheaper every day because its price lags general inflation. This is a severe constraint on printing businesses because they have to make up that difference elsewhere in 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 26. Net Annual Decline In Printing Prices vs. CPI, 2007–2016



Here's something interesting. If you look at the red CPI line in Figure 27, the USPS line is above it, and the printing prices line is below it. They are at a seemingly equal distance from the CPI line, so it could be said that the postal service is glomming the same amount of revenue that printers can no longer charge. Essentially, it's a transfer to the postal service. That's really simplistic, and there are of course other reasons that printing prices are not increasing. It's curious, though. Print customers have a budget, and over the years, distribution costs have been constraining print prices, forcing print quantities to decline and page counts to shrink, and reduced print frequencies. The decreases in competitive technologies, in this chart with the surrogates of wireless communications and computers, shows how great the disparity of communications costs are for print and digital media. Print is getting squeezed from both sides.

Figure 27. Percent Change In the CPI vs. PPI for Printing Prices, Postal Costs, Wireless Communications, and Computers, 2007–2016



Industry Profits

Commercial printing profits rebounded to $3.93 billion on a four-quarter inflation-adjusted moving total basis. The disastrous third quarter of 2015 was dropped from the calculation and replaced by a healthier third quarter of 2016. Excluding that terrible quarter which had massive writedowns by large printers, profits were actually subdued in 2016's July-to-September third quarter. Profits for small and medium-size printers, those with less than $25 million in assets, fell from 7.05% in Q3 2015 to 4.34% for Q3 2016. Weak businesses have departed from the market, and are no longer a drag on industry profits, but profits may be slowing down for the remaining businesses.

Figure 28. Printing Industry Shipments vs. Profits, Q4 1995–Q1 2016

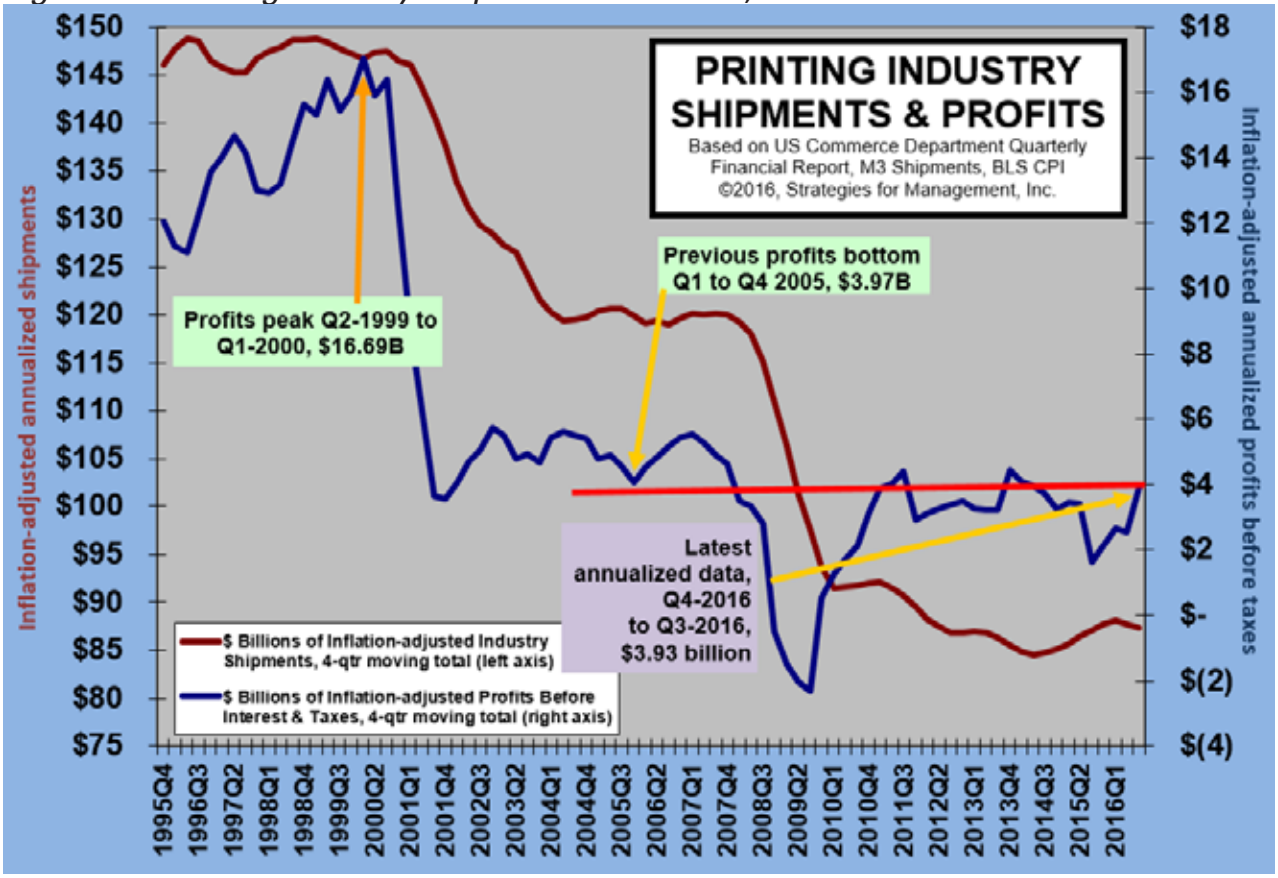


Table 15. Printing Profits By Assets, Q2 2015–Q3 2016

Net Income Before Taxes	2015Q2	2015Q3	2015Q4	2016Q1	2016Q2	2016Q3	Simple average, last six quarters
All commercial printers	**4.99%**	**-2.64%**	**3.51%**	**6.31%**	**4.61%**	**3.69%**	**3.41%**
<$25 million in assets	6.74%	7.05%	3.88%	10.50%	9.36%	4.34%	6.98%
>$25 million in assets	3.49%	-10.80%	3.17%	2.08%	-0.05%	3.05%	***0.16%***

NOTES: Approximate breakpoint for $25 million is 100 employees; Q3-2015 had a large amount 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, 2016.

Data analysis ©2016, Strategies for Management, Inc.

Industry Capital Expenditures

We said it last year, and we'll say it again: the days of investment in big, expensive equipment are, for the most part, over. Hardware investments are giving way to software investments, and even hardware investments are shifting away from heavy metal to digital equipment, as well as ancillary equipment such as binding and finishing.

Even at that, as we saw in Section 2, print businesses don't have many major investment plans. Binding/finishing equipment (especially that compatible with digital presses) and software (especially automation and MIS) were top investment categories. The drive toward increased productivity (via automation) is what's driving a lot of this;[17] modern finishing equipment comes with automation features and other capabilities that help maximize shop throughput. And software acts as the brain that coordinates it all.

We also saw that toner-based digital presses were a moderately hot item, as digital continues its penetration both upmarket and downmarket. Offset isn't going away entirely, but most printers have come to recognize that short-run digital is where the action is.

And production inkjet? Our own planned investment data showed that only 11% of large printers (and, specifically, 14% of 100–249- and 22% of 250+-employee plants) planned to invest in high-speed production inkjet. Interest in this equipment declines precipitously as shop size decreases, so for now this is a technology solely for the big guys. This makes sense, as these are basically web presses[18] and thus appeal to plants that would have been doing heatset or nonheatset offset web printing but need all the perks that digital offers (short-run, customization, personalization).

As consolidation continues, acquiring companies can pick up the capabilities they are lacking via the acquisition itself without needing to buy any new equipment per se. In fact, that's often why these acquisitions take place.

Still, the elephant in the room is, as we saw in Section 1, the fact that many shops simply don't have the money for major investments. Consolidation does not always create capital needed for new investments because of the funds needed to make the acquisition or the merger. While tuck-ins are "pay as you go" contracts, these do not create a surge of capital. For this reason, financing, especially leases, will remain important in the industry. All of this underscores that financial condition can be a forceful competitive weapon among printers, and the gap between industry profit leaders and all the rest is likely to widen.

[17] It could be said that productivity was always the impetus for investments; you don't just buy stuff and have it hang around idle. But where in the past "productivity" was more or less synonymous with "capacity," or the ability to handle more volume, today productivity is more akin to speed.
[18] Canon Solutions America, Fujifilm, and Xerox have sheetfed production inkjet presses.

Figure 29. U.S. Commercial Printing Capital Expenditures as a Percentage of Revenues, 1967–2014

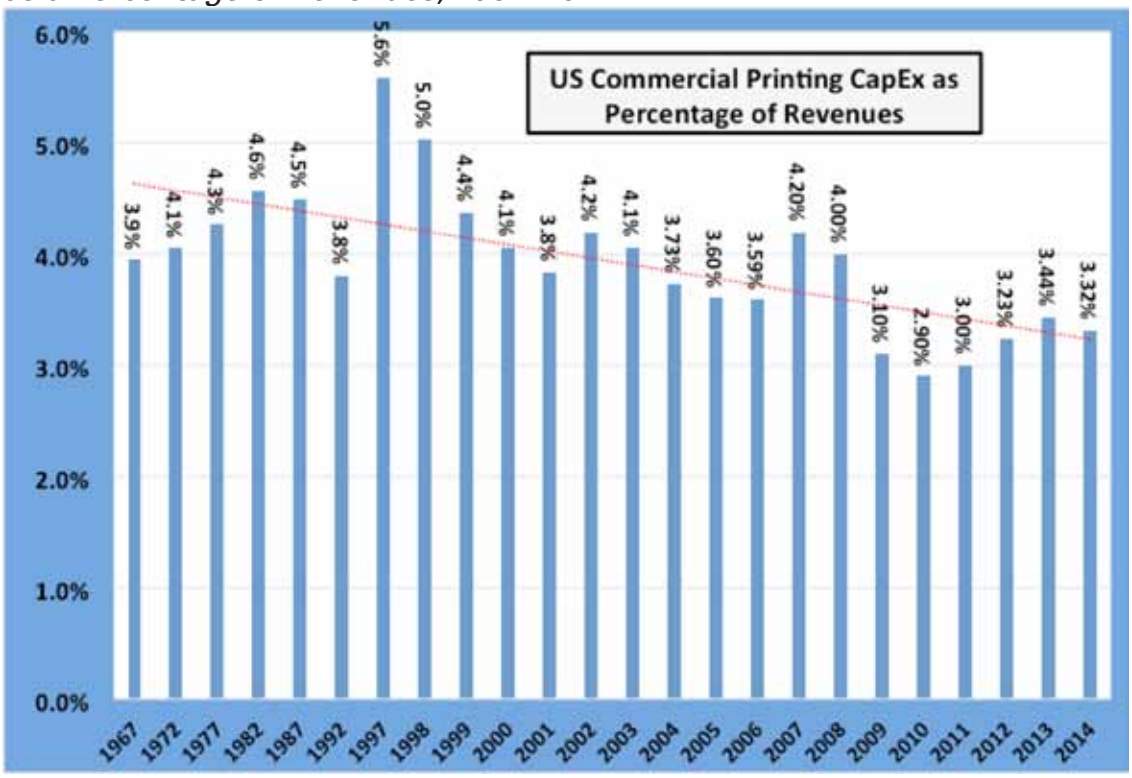
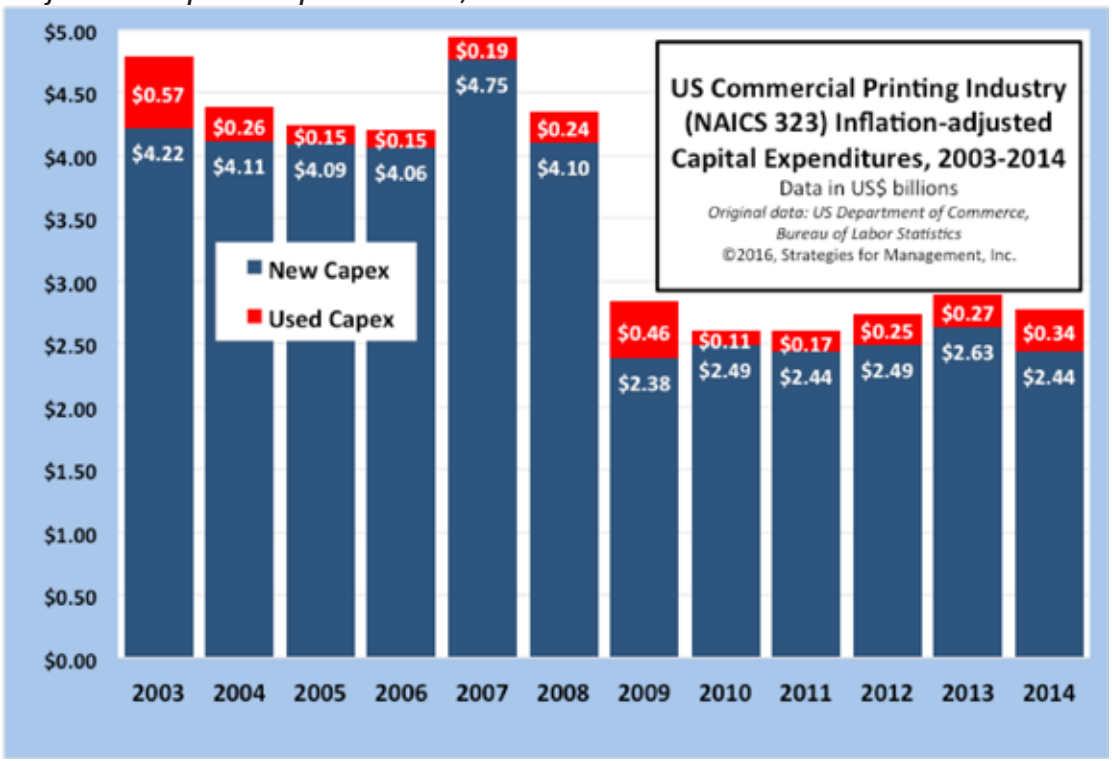


Figure 30. U.S. Commercial Printing Industry Inflation Adjusted Capital Expenditures, 2003–2014



Publishing and Advertising

The loss of the "mainstream" printing business is clearly seen in the declining fortunes of the publishing business. Though newspaper publishers have little effect on commercial printing (except for non-dailies that use the services of nonheatset web commercial printers), it is a means of judging the use of print by consumers.

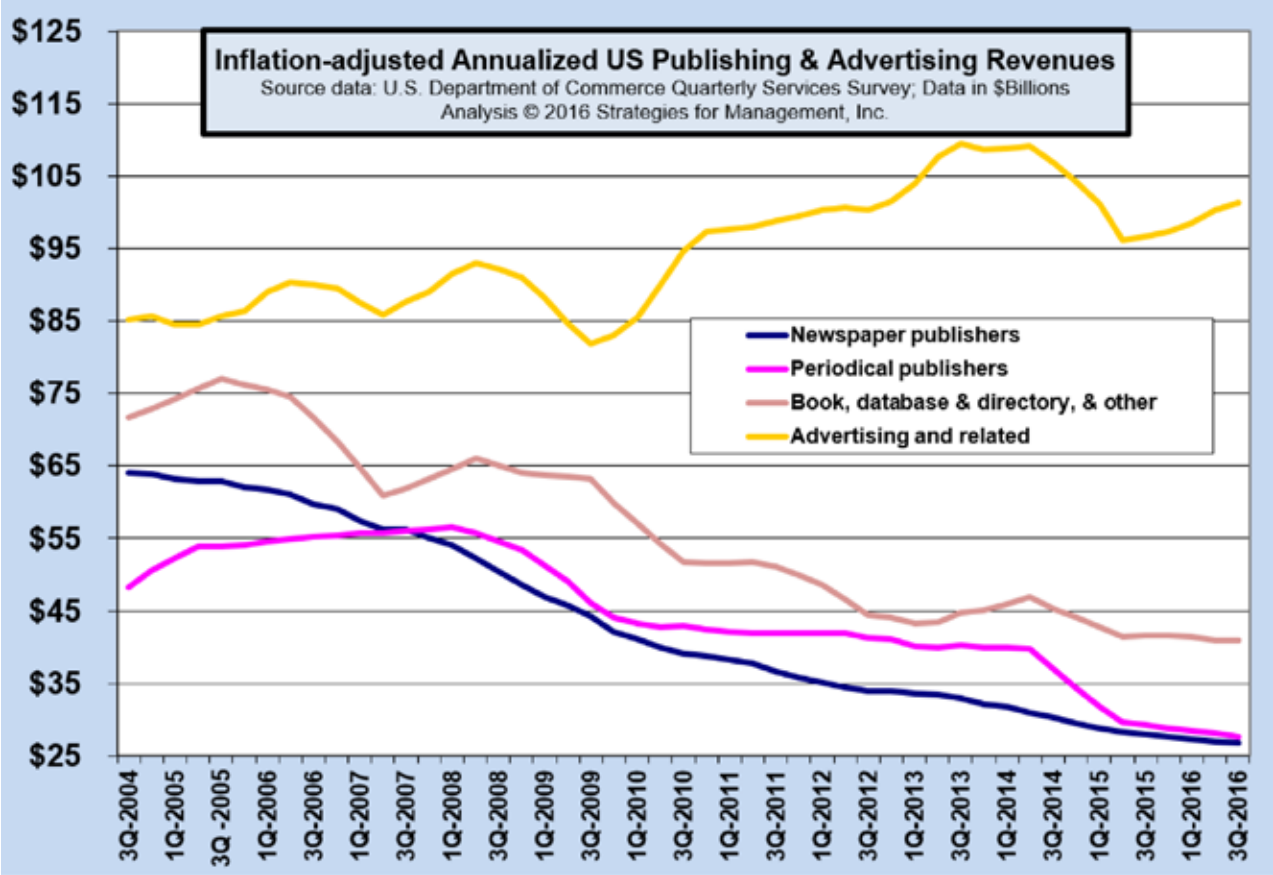
On an inflation-adjusted basis, the publishing industry was nearly $65 billion 12 years ago, and is now about $26 billion—and there seems to be no bottom in sight, just a slow contraction of dailies that become non-dailies, and some that become strictly online properties. The newspaper story is not just one of format preference, but of advertising alternatives being considered better. So many of the revenue generators for newspaper publishers have been replaced. The enormously lucrative classified ads are gone (Craigslist and others), movie advertising (Fandango and others), newspaper inserts (coupon sites and e-marketing), even television listings (TiVo and cable/satellite channel directories). Newspapers have endured the torture of a thousand cuts, and have not endured that well.

Magazine publishers, on the other hand, were mainly space advertising and mailing list rentals. Their revenues took a big hit in 2014, the first sign of the switch to mobile access, but a culmination of advertising alternatives and the effects of advertisers being active in digital media and using inbound marketing techniques.

Book publishers are another matter, relying on sales of actual books, not advertising, for their revenues. The book business is not what it used to be, and it's not just e-books that have upset their revenue models, but also the other forms of entertainment, amusement, and information that are now available on tablets and smartphones that have muscled into the time originally devoted to reading or accessing books.

The bright spot on the print procurement side of the aisle is advertising. Though advertising agency revenues fell from 2014 to mid-2015, they are picking up again. Elsewhere in this report we have mentioned that by many measures some sectors of the economy have been sending recession signals, and that decline may have been for that reason. But advertising agencies are still grappling with the changes in media, especially with media that do not require the purchase of printed space or broadcast time. Ad agencies have proven to be flexible and have taken the lead in developing new media advertising and promotion formats. That does not mean that they have solved the challenges once and for all. Media are constantly changing and the situation will be constantly dynamic as digital media are in the products of technological change, and that can take them anywhere.

Figure 31. Inflation-Adjusted Annualized U.S. Publishing & Advertising Revenues, 3Q 2004–3Q 2016

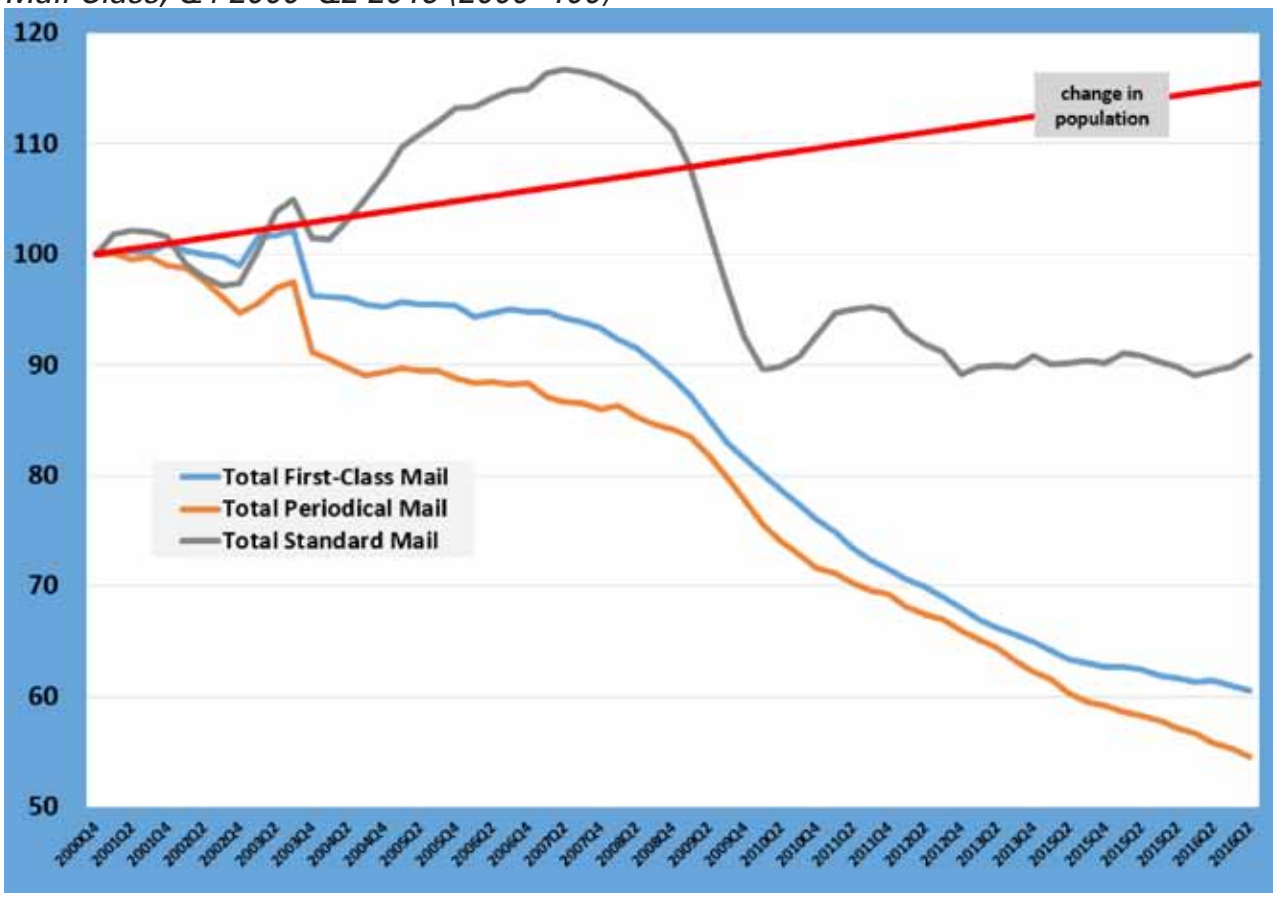


The Post Office

From pre-printing to post-printing... According to the latest USPS data, the volume of both first class mail and periodicals (magazines and catalogs) are at their lowest ebb ever—or at least since 2000. On the somewhat brighter side, standard mail (defined by the USPS as flyers, circulars, advertising, newsletters, bulletins, catalogs, or other printed pieces that are less than 16 ounces and have a minimum quantity of 200 pieces or 50 pounds) is holding steady, although not when compared to population growth. There had been a big ballooning of standard mail prior to the recession (mainly banks and mortgage companies selling equity loans and refinancing programs, and credit card solicitations) followed by the predictable plummeting, and while volume of standard mail has not rebounded to pre-recession levels, it at least hasn't troughed to the extent that other kinds of mail has.

If there is a bright spot to the USPS, it is parcels. With the growth of ecommerce, shipping of items has picked up, with total package volume increasing from 3.3 billion pieces in 2008 to 4.5 billion in 2015.[19] Even when items are shipped via DHL or another carrier, often the "last mile" delivery is carried out by the USPS.

Figure 32. Index of the Number of USPS Pieces By Mail Class, Q4 2000–Q2 2016 (2000=100)

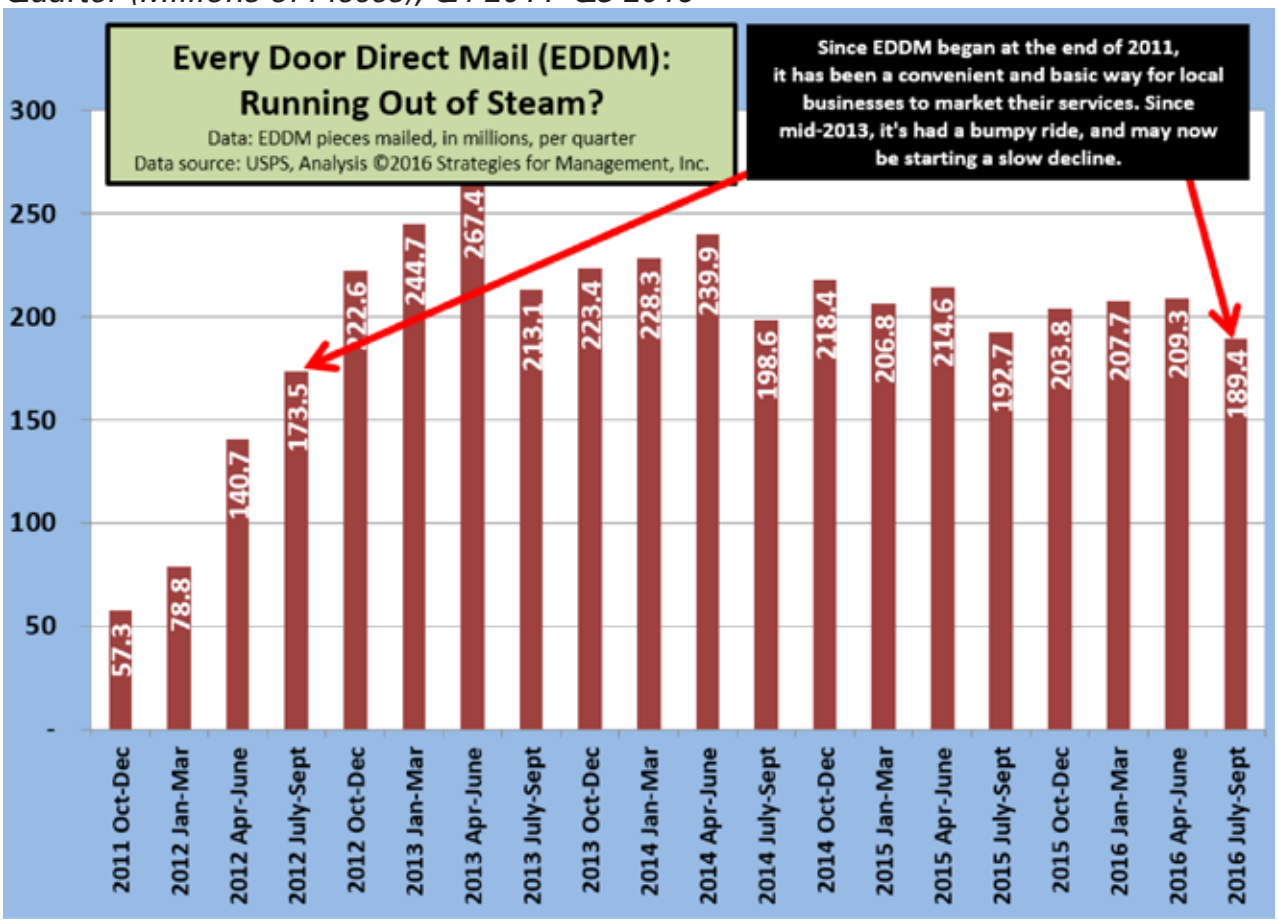


[19] This total volume includes Priority Mail, Priority Mail Express, First-Class Packages, Package Services, Parcel Return Service and Parcel Select. https://about.usps.com/who-we-are/postal-facts/decade-of-facts-and-figures.htm.

Closing the Door On Every Door Direct Mail?

Alas, poor 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. The last two years have seen it level out, but it appears, starting in Q3 of 2016, that it may be on the way out. We can't help but wonder why. Maybe no one has heard of it? Maybe businesses have a preference for using their own mailing lists? Maybe small local businesses don't use print at all, unlike larger marketers, preferring to rely on social media and other electronic means? It's probably some combination of all those factors. Which is a shame, really.[20]

Figure 33. Number of Every Door Direct Mail Pieces Per Quarter (Millions of Pieces), Q4 2011–Q3 2016



[20] Especially for those among us who feel that Facebook can't die fast enough.

6. Prevailing Macroeconomic Conditions

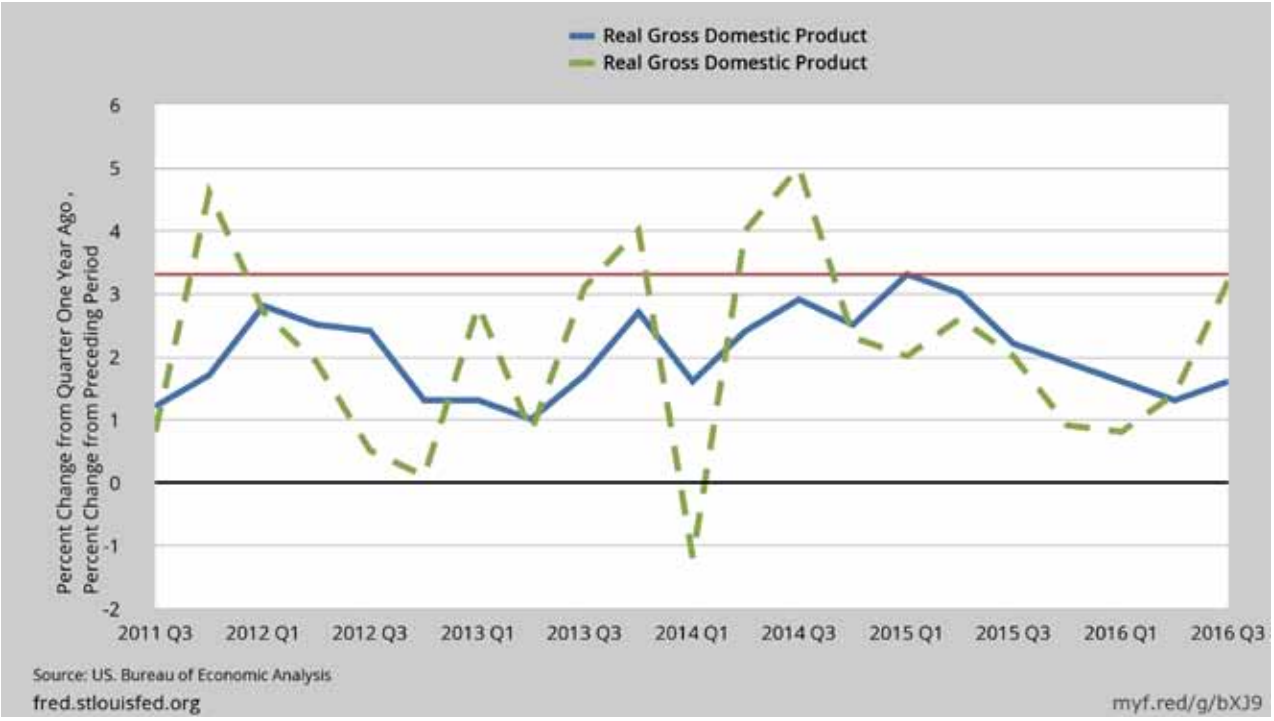
In this section, we pull out to get a larger sense of the general economy.

GDP

In Figure 34 below, the blue line is the year-to-year GDP, which shows that the economy has been hovering in the 2% range for the past five years. The dotted green line shows how the quarter-to-quarter growth rates have changed. The red line is the post-World War II average for GDP.

The economy has had great difficulty climbing back up to its average since the end of the recession in June 2009. The sluggishness of the economy has been a problem lately in terms of business investment and profits. Slow economic times tend to lead companies into cost-cutting and financial engineering, which has been encouraged by extremely low interest rates. What we mean by "financial engineering" are things like changing the debt structure of corporations, participating in buybacks of stock, and the like. None of these things produce many new products, but they do make the profitability of corporations look better. (For more on this, see Figure 43, S&P 500 Sales Per Share, below.)

Figure 34. Percent Year-Over-Year Change In Real GDP (Blue Line) vs. Quarter-to-Quarter (Green Line), Q3 2011–Q3 2016



In Figure 35 below, we put a red line at the 2.5% level. Any time that it's been close to this, we've had a recession, except lately. This raises the question of whether it's better to have a dramatic, plunging recession or a more drawn-out slow period. The advantage to the former, despite its unpleasantness at the time, is said to be that businesses adjust and reallocate resources more quickly, although that didn't seem to be the case after the last dramatic, plunging recession, or we wouldn't now be in a long, drawn-out slow period.

Still, when things are slow but not awful, assets are never reallocated, there's no risk-taking and investment, and you have a level of stagnation, or companies sitting on cash that they don't quite know what to do with, which is certainly the case today. The reason the assets are not relocated is the false signals that the marketplace sends to decision-makers. They always seem in reach of better growth that would give them the confidence to invest, and always near the precipice of failure. So capital just sits and costs are adjusted, but no decisive actions are taken. It's written up to "the new normal" and they just muddle on.

Those assets that are not being used well need to be liquidated, so capital can be reallocated for better purposes. There is some of this going on in Silicon Valley, but much of what they are doing for customers is reducing costs, which doesn't help other aspects of the economy, because those cost reductions are not being directed to new purposes. So this chart is one of the warning signs that the economy may not be as healthy as we think.

Figure 35. Percent Change In Real GDP, Year Over Year, 1975–2015

GDP Less Inventories

It's important to look at GDP data with and without the distortion of changes in inventories. One of the problems the economy has had has been the inability of businesses to forecast future conditions. There is upward bias to be optimistic and a lot of the economic models that investment bankers and professional economists use have overforecast the market considerably because many of these models do not take into account the nature of incentives such as tax rates in the creation of new capital. The models also do not take into account the negative effects of financial engineering on a longterm basis.

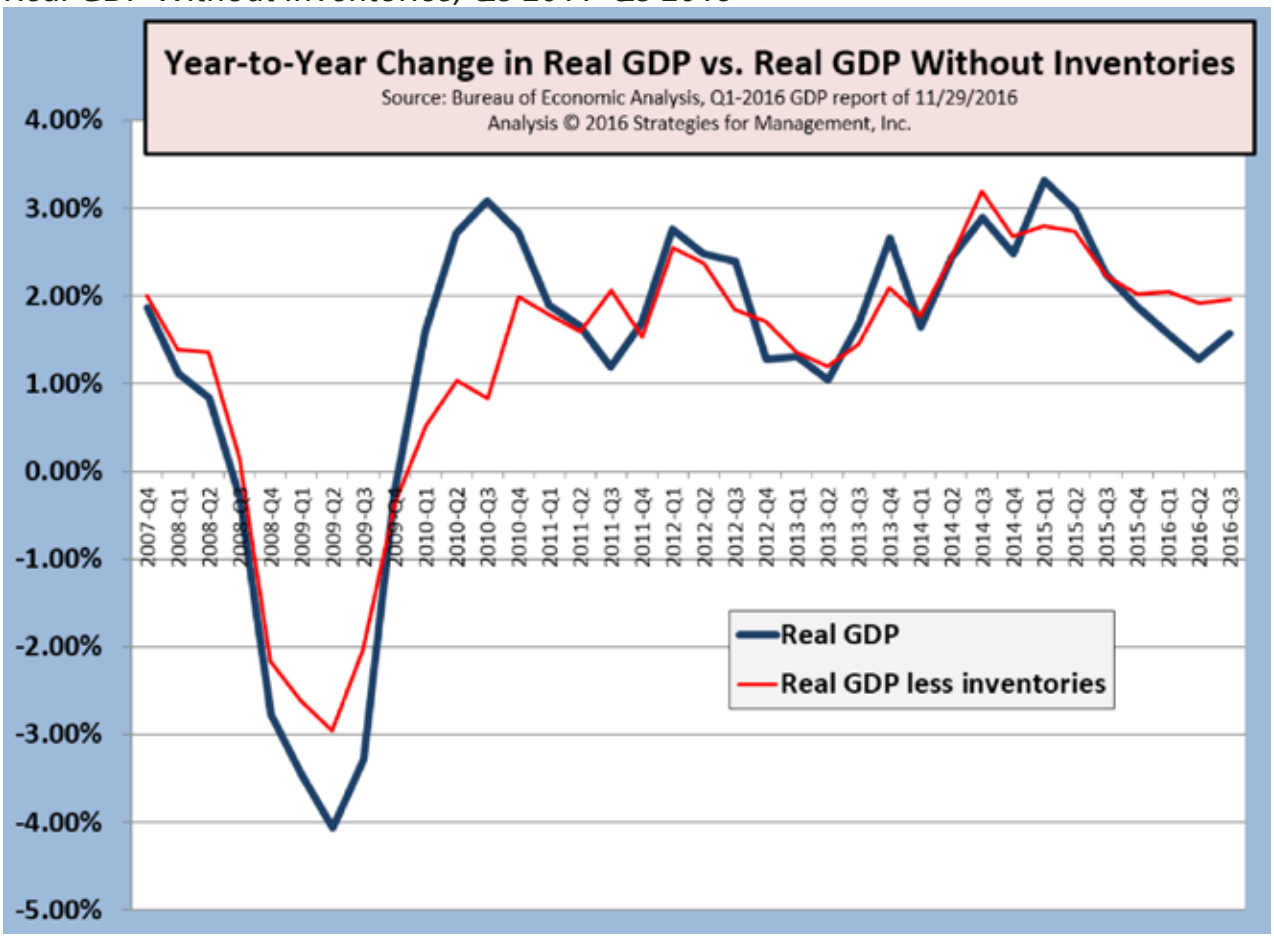
One of the ways we can see this is if the net inventory number in the GDP report is high or low. Theoretically, net inventories should be zero, because every business would be able to precisely match production with demand. However, since that is impossible, there are occasional changes in net inventories 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 tell that a few quarters after the fact.

In effect, net inventories tend to distort the way we look at the economy, so it's good to subtract that number to look at the underlying GDP figures. In Figure 36 below, the red line shows that economy is slow. Figure 34 above showed the variation on a quarter-to-quarter basis and smoothed things out year-to-year. When we take out inventories, there are times when there is greater predictability about business conditions. In this case, from the fourth quarter of 2011 through the end of 2015, the real GDP and GDP less inventories were actually fairly close, but you can see the difference at other times. Businesses were in better shape predicting what future demand was going to look like. Since 2015, a lot of the business indicators have turned negative, such as industrial production, factory orders, and durable goods (see below).

The part of the economy that has been holding up GDP has been personal consumption, or the actions of consumers. Even in those cases, traditional retailers have been doing badly while ecommerce has been doing well. But the business side of GDP (vs. consumer) has not been doing well.

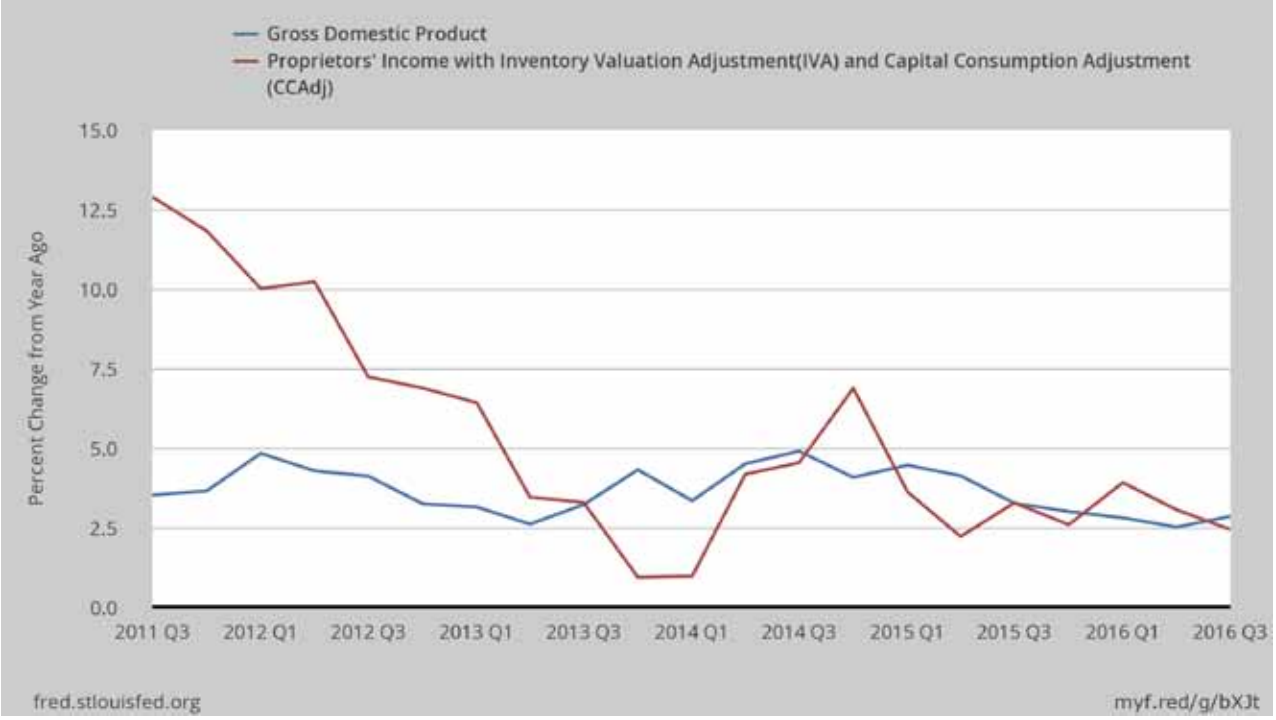
Figure 36. Percent Year-Over-Year Change In Real GDP vs. Real GDP Without Inventories, Q3 2011–Q3 2016



Proprietors' Income

The figure below shows the percentage change in proprietors' income for 2011 to 2016 compared to current dollar GDP. 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. Small business activity levels are not as smooth as overall GDP as the chart shows a more volatile year-over-year performance. Proprietors' income is often seen as a surrogate for small business. It's been tracking low relative to GDP and been below GDP for a lot of 2015. This, however, is prior to inflation adjustment; proprietors' income growth is probably really in the range of 0.75%, which is not particularly good.

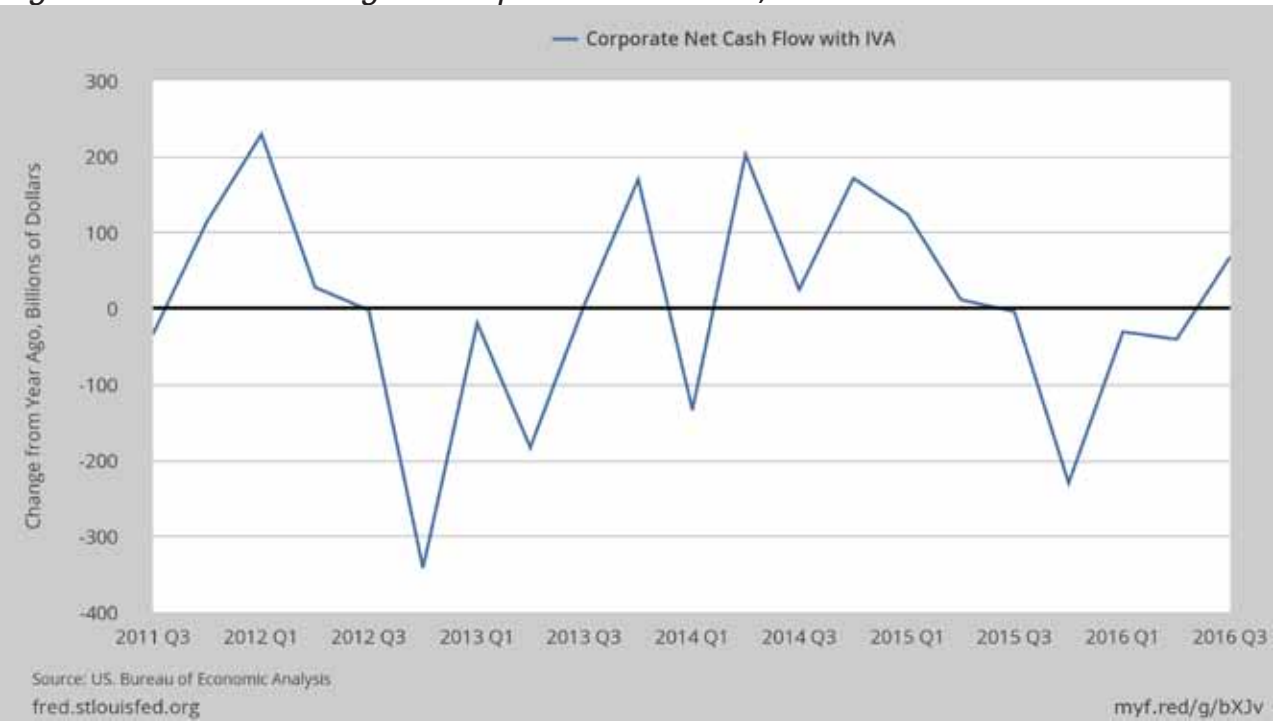
Figure 37. Percent Change In Proprietors' Income vs. GDP, Q3 2011–Q3 2016



Corporate Cash Flow

Likewise, corporate cash flow growth has been inconsistent for the majority of this decade, but has been on a general upward trajectory for the past year and a half. It is still below the post-recession peaks. There was a contraction in 2015, and it looks like it recently started to improve compared to 2015, but it's still not a lot to write home about. Another sign of a stagnant economy.

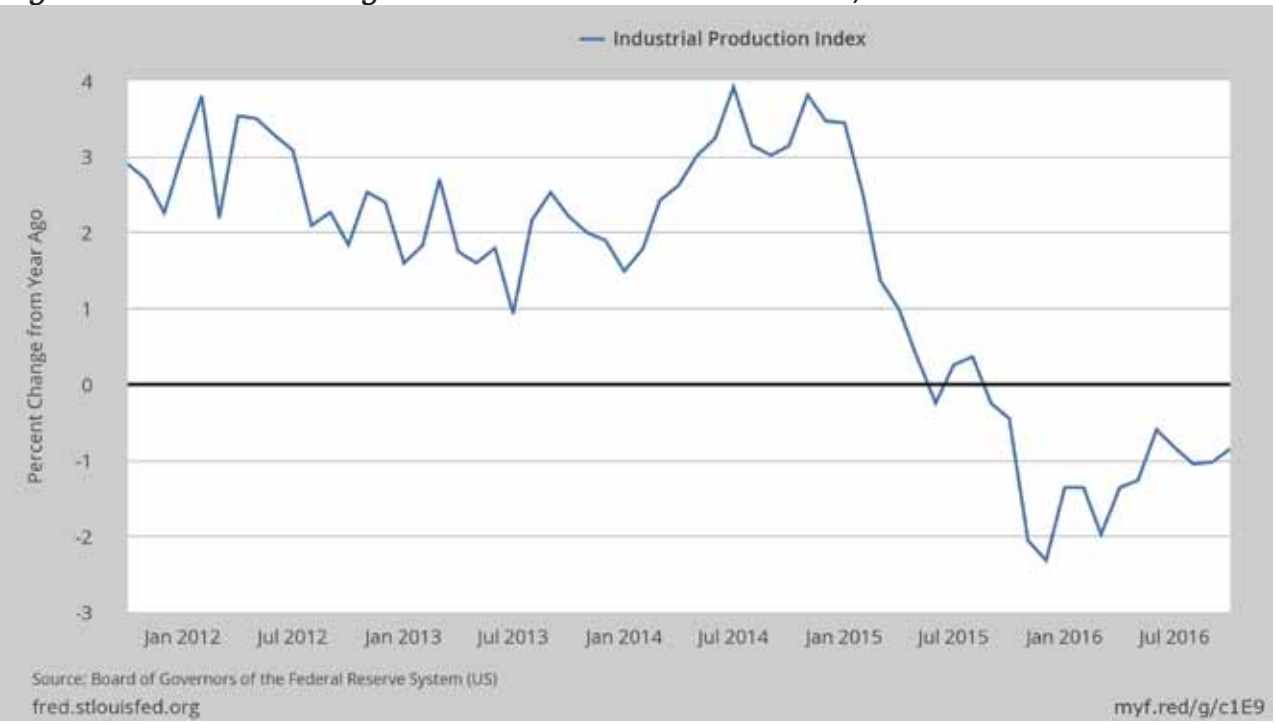
Figure 38. Percent Change In Corporate Cash Flow, Q3 2011–Q3 2016



Industrial Production Index

If we look at the industrial production index, this is in recession territory. That this index could be down for 13 to 15 months is pretty bearish. This is a surprise in light of how good the GDP data has been—it makes economists wonder if GDP is accurately reflecting the marketplace. Or maybe it represents a growing shift away from a manufacturing to a service-based economy?

Figure 39. Percent Change in Industrial Production Index, 2012–2016



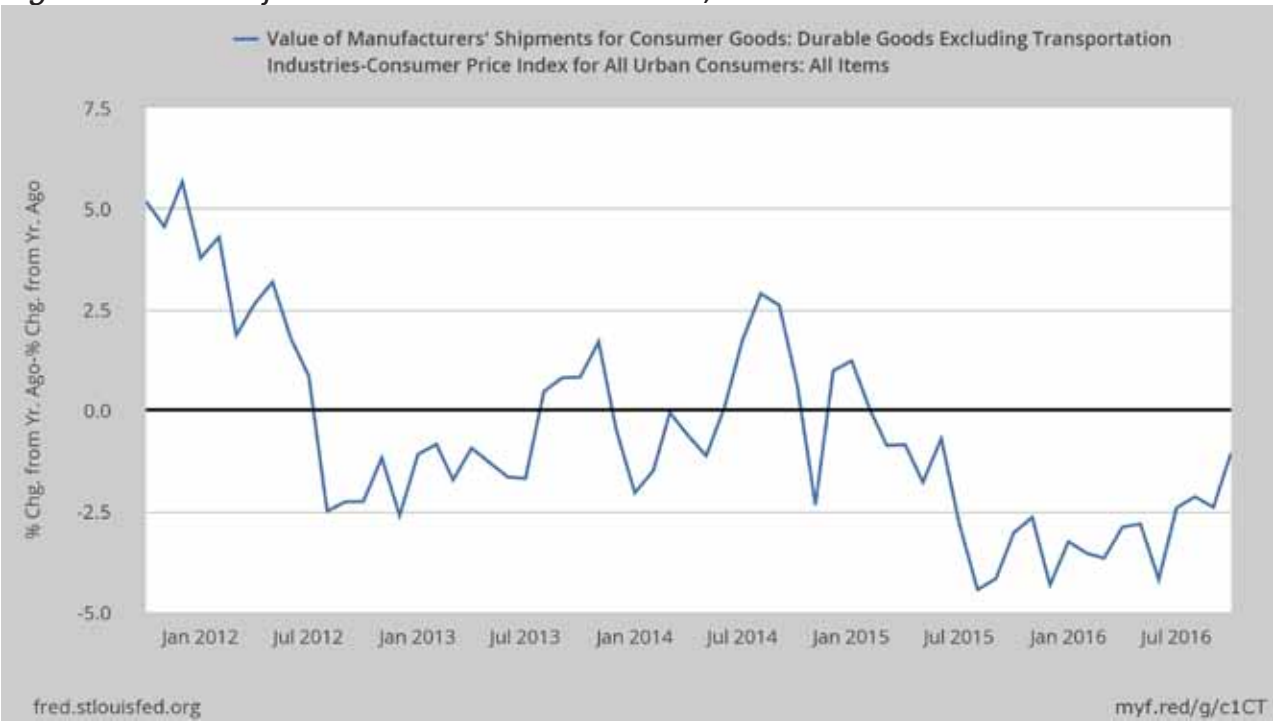
Indexed to 2012, the IPI hit the pre-recession level in 2015, and has been declining ever since. It is possible that economists will end up dating the start of a recession to the end of 2014 or middle of 2015, which would mean we've been in a recession for a very long time without anyone declaring one.

Figure 40. Industrial Production Index, 2007–2016

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 down for a long time, with only occasional peaks. Indeed, the value of shipments of durable goods been down basically since February 2015—that's a long time.

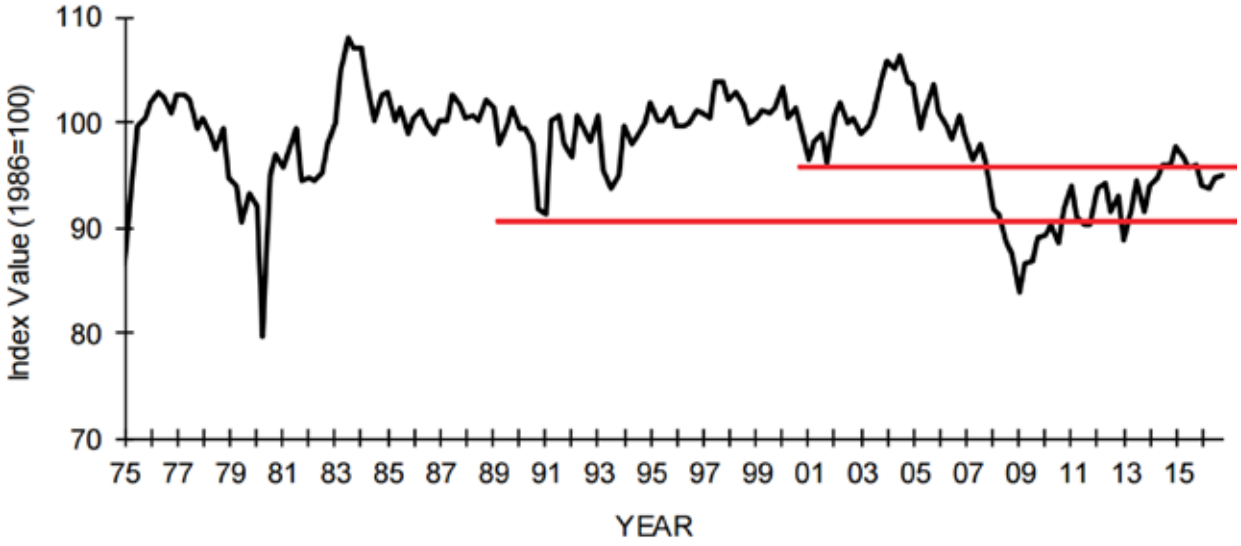
Figure 41. CPI-Adjusted Durable Goods Orders, 2012–2016



NFIB Small Business Index

Based on the annual survey from the National Federation of Independent Businesses (NFIB), the small business economy has been stuck between the 1990s recession and the 2002 recession for quite a while. There was a slight peak in 2014, but dropped immediately thereafter, although it is up just a tad in 2016. For small businesses, it's been a tough slog for a while.

Figure 42. NFIB Small Business Economic Satisfaction Index, 1975–2015

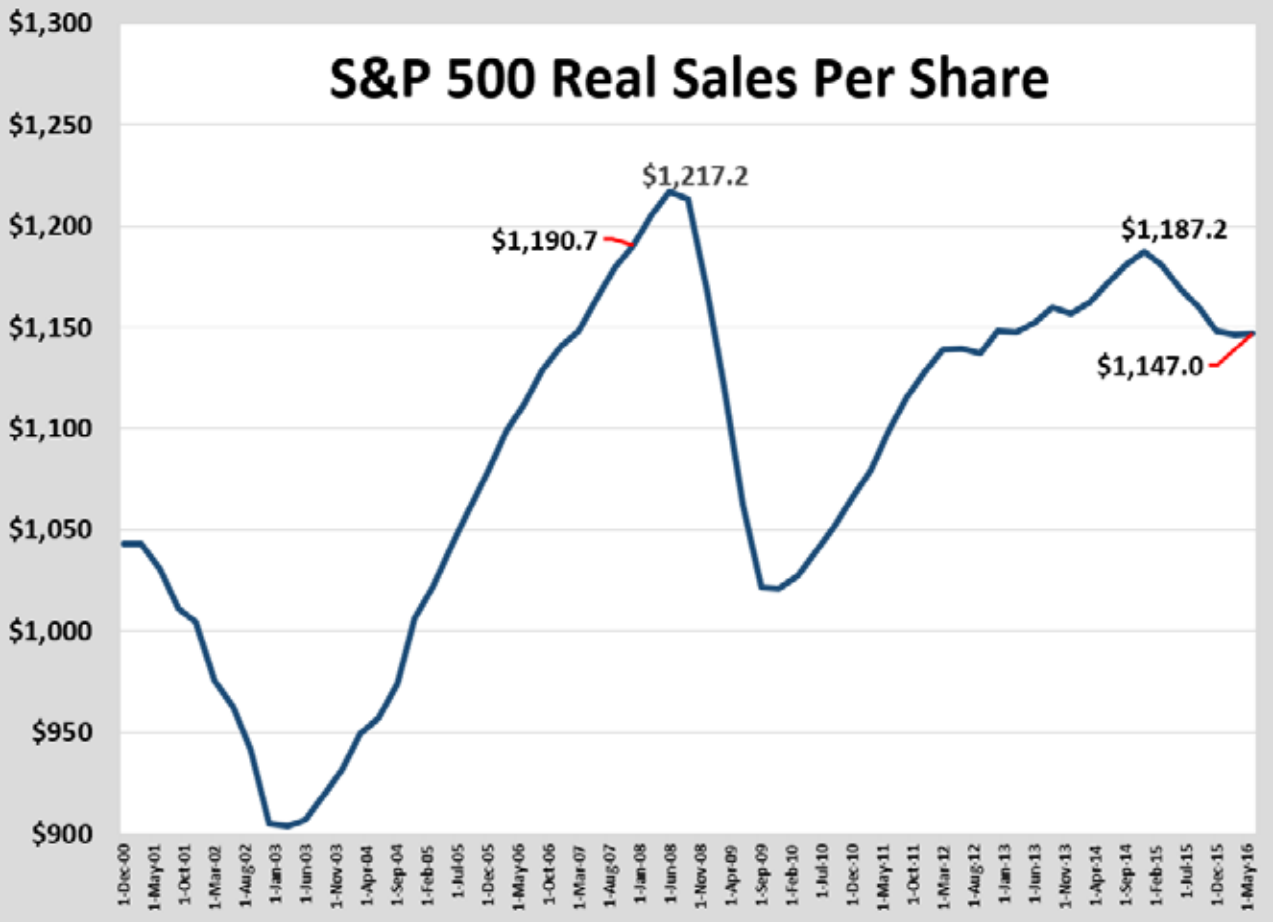


S&P 500 Real Sales Per Share

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.

How are businesses showing more profits? You could have the Fed create a TINA (There Is No Alternative) situation, where the only financial category that has a viable return is stocks, but stocks must have profits to sustain their value. Much of the interest has been in financial engineering which makes the bottom line look better as companies refinance themselves, but the top line doesn't get better. The top line is what contributes to GDP, but is not showing any strong activity. In other words, at some point companies need organic growth. They need to start making and selling stuff.

Figure 43. S&P 500 Real Sales Per Share, 2000–2016

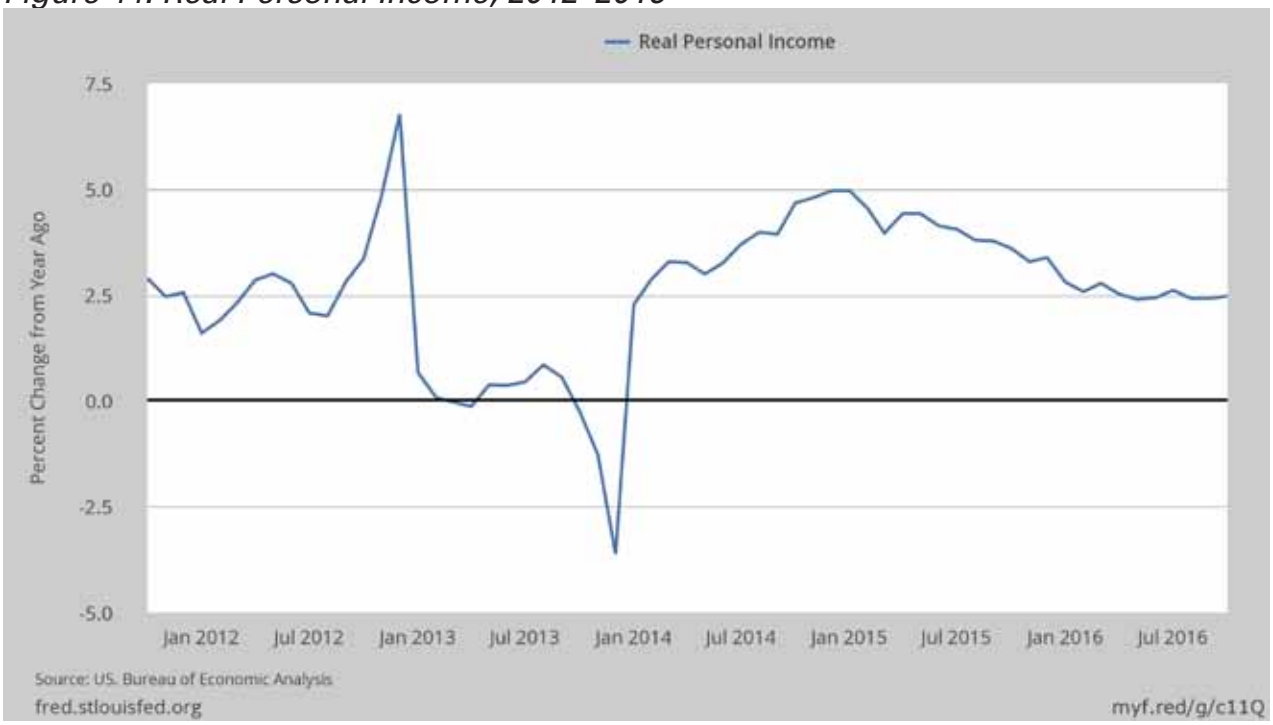


Personal Income

Real Personal Income

Change in real personal income has been holding up at 2½% which is not a good level, but better than a lot of other indicators. It was at 5% as recently as the end of 2014 and has been slowly decreasing since. If you factor in the increase in benefit costs, actual income might be going down.

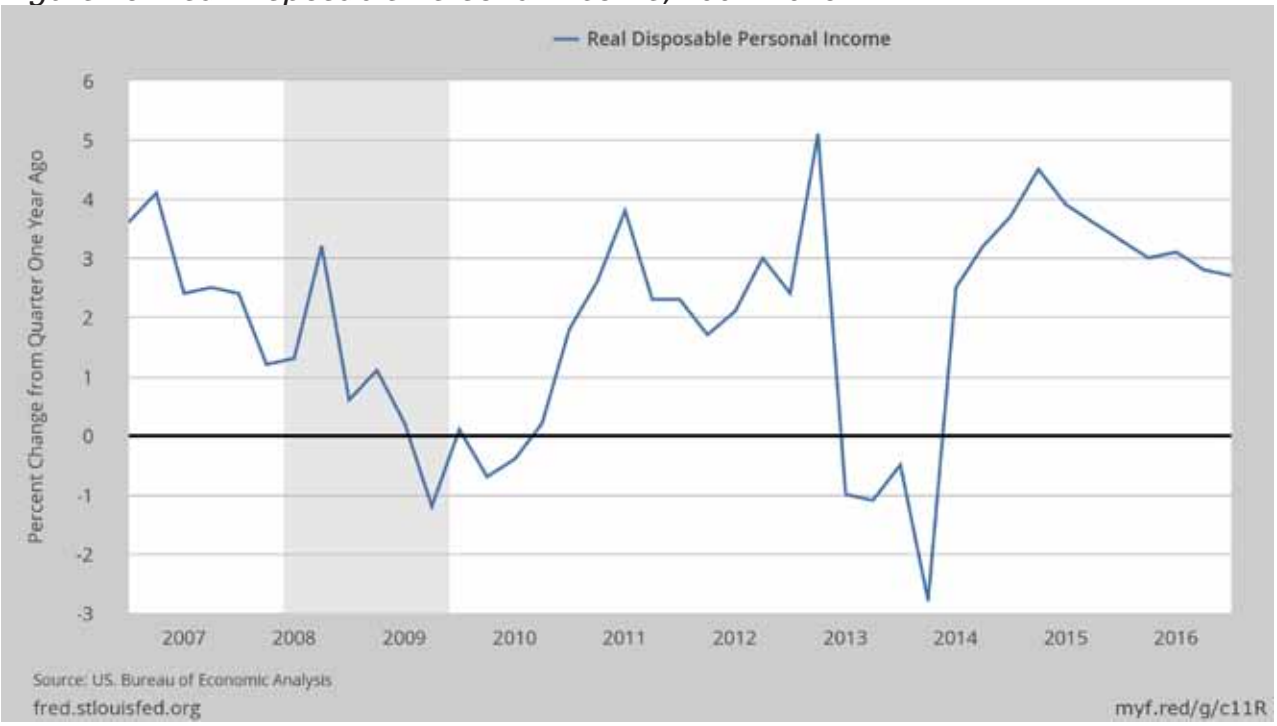
Figure 44. Real Personal Income, 2012–2016



Real Disposable Personal Income

Disposable income is real personal income after taxes. Between 2013 and 2014, you see an adjustment for the implementation of the Affordable Care Act as small businesses and others changed the time of their recognition of income so that there was less tax on it. Real disposable income has been declining since the end of 2014.

Figure 45. Real Disposable Personal Income, 2007–2016



Consumer Confidence

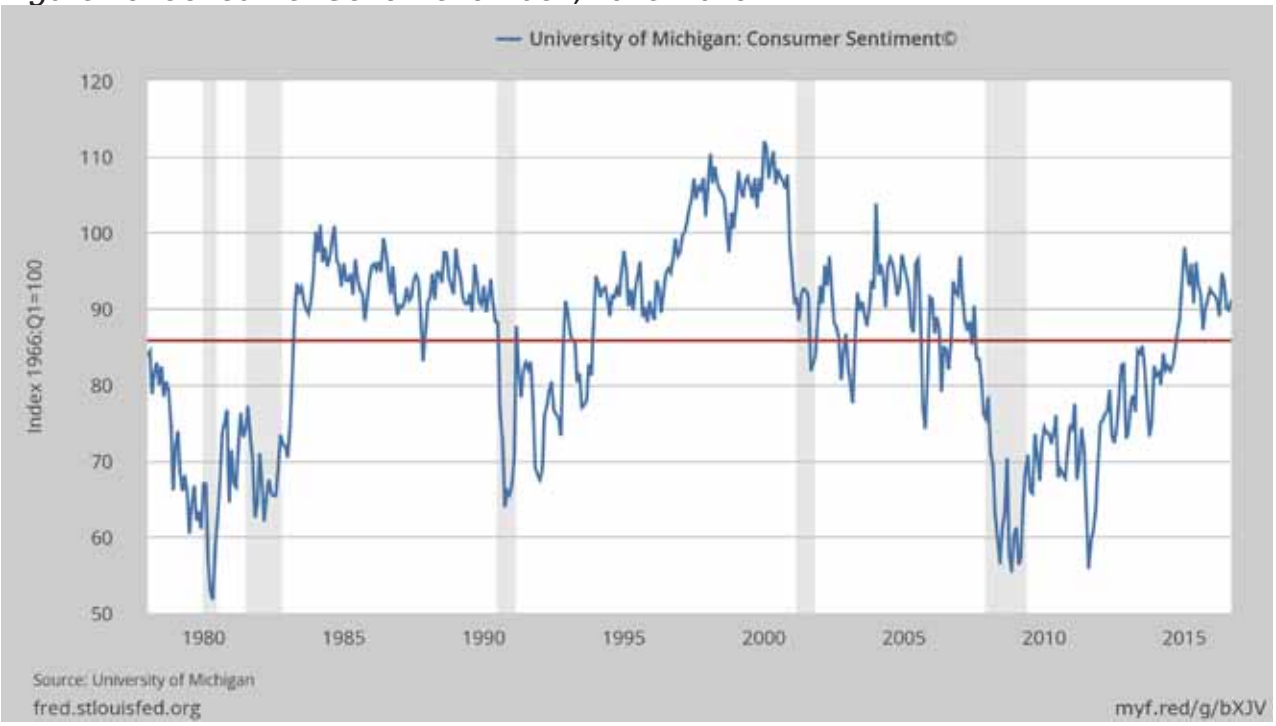
Consumer Sentiment Index

The initial reaction of consumers to the results of the Presidential election was to express greater optimism about their personal finances as well as improved prospects for the national economy, for some reason. The post-election gain in the Sentiment Index was +8.2 points above the November pre-election reading, pushing the Index +6.6 points higher for the entire month above the October reading. The post-election boost in optimism was widespread, with gains recorded among all income and age subgroups and across all regions of the country. The upsurge in favorable economic prospects is not surprising given the President-elect's ostensibly populist appeal, and it was perhaps exaggerated by what most considered a surprising victory—as well as by a widespread sense of relief that the long, national nightmare of the election (and its television commercials) had finally ended.

To be sure, no surge in economic expectations can long be sustained without actual improvements in economic conditions. Presidential honeymoons represent a period in which the promise of gains holds sway over actual economic conditions. Presidential honeymoons, however, can quickly end if they are unaccompanied by prospects that economic conditions will actually improve in the future. The President-elect, like most past PEOTUSes, appears to appreciate the importance of his first hundred days; the rub will be whether his economic policies will resonate with the nation's consumers. The data indicate that consumer spending will advance by 2.5% in 2017. We shall see.

If you look at consumer sentiment after the various recessions, the severe drop following the most recent recession is not as bad as that following the 1980 recession, but has lingered longer than other times. (Comparatively speaking, the 1990 and 2000 recessions didn't generate as much of a drop in consumer sentiment.) It's only recently that consumer sentiment has been picking up. Since business conditions not picked up, this could be a sign that personal consumption is holding up.

Figure 46. Consumer Sentiment Index, 1978–2016



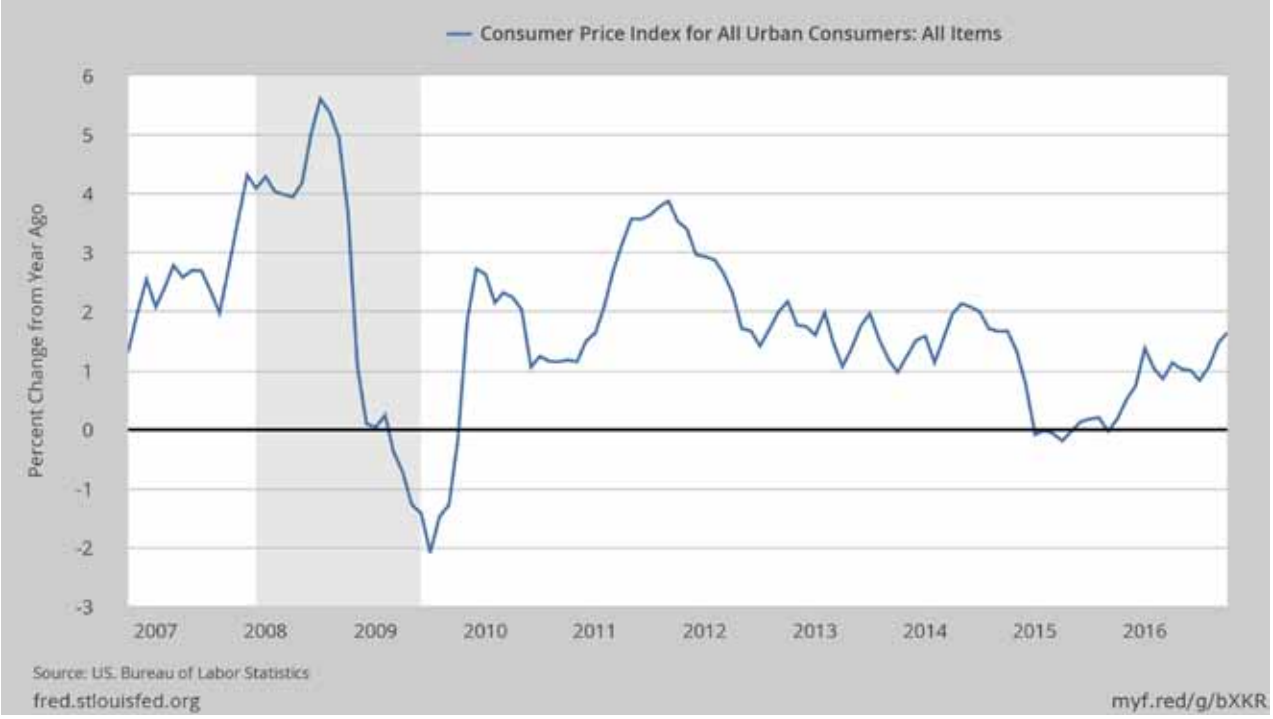
Consumer Price Index

Depending on what economists measure or how they define it, inflation is either non-existent or a major problem.[21] The Fed has been playing footsie with raising interest rates, but as of this writing (early December 2016) has declined to do so. That may change in the near future.

The figure below shows the percent change in the Consumer Price Index from 2007 to 2016. The calculation method of the CPI has changed over the years, and there is concern that it is now understated. There are some measures using old-style versions of the CPI calculation that say it's actually closer to 9%, but about 25 years ago, changes were made to the calculation to minimize the value of inflation adjustment of government transfer payments like Social Security and others to minimize the effect on deficit. Ostensibly, the changes were made to show the declining costs and increased capabilities of technology products, something the economists call "hedonic adjustments."

The Fed has been trying to get the inflation measure it uses to 2%, the cutoff point at which they see the need to raise interest rates, but they can't get it there just yet. It's not necessarily a target they *should* be looking at, but there it is. If the inflation gauge is rigged to underestimate inflation, then they are pushing on a string, and the desired rigging can't be unrigged!

Figure 47. Percent Change In CPI, 2006–2016



[21] George Bernard Shaw once said, "If all the economists were laid end to end, they'd never reach a conclusion." There is a variation that goes, "If all the economists were laid end to end, it would be a good thing."

In Figure 48 below, we go off on a bit of tangent, and show the change in CPI for meat, poultry, fish, and eggs—food, basically (not including vegans, perhaps). Some economists have been pointing out how much the price of food has dropped over the past year, and that is the expectation of food-related businesses that they should create more inventory. The reduced prices account for that. However, food products can't have much of a backlog of inventory, for the same reason you can't keep milk in your refrigerator for longer than a certain period of time. Where these businesses err is in deciding how much to plant or cattle (for example) to raise.

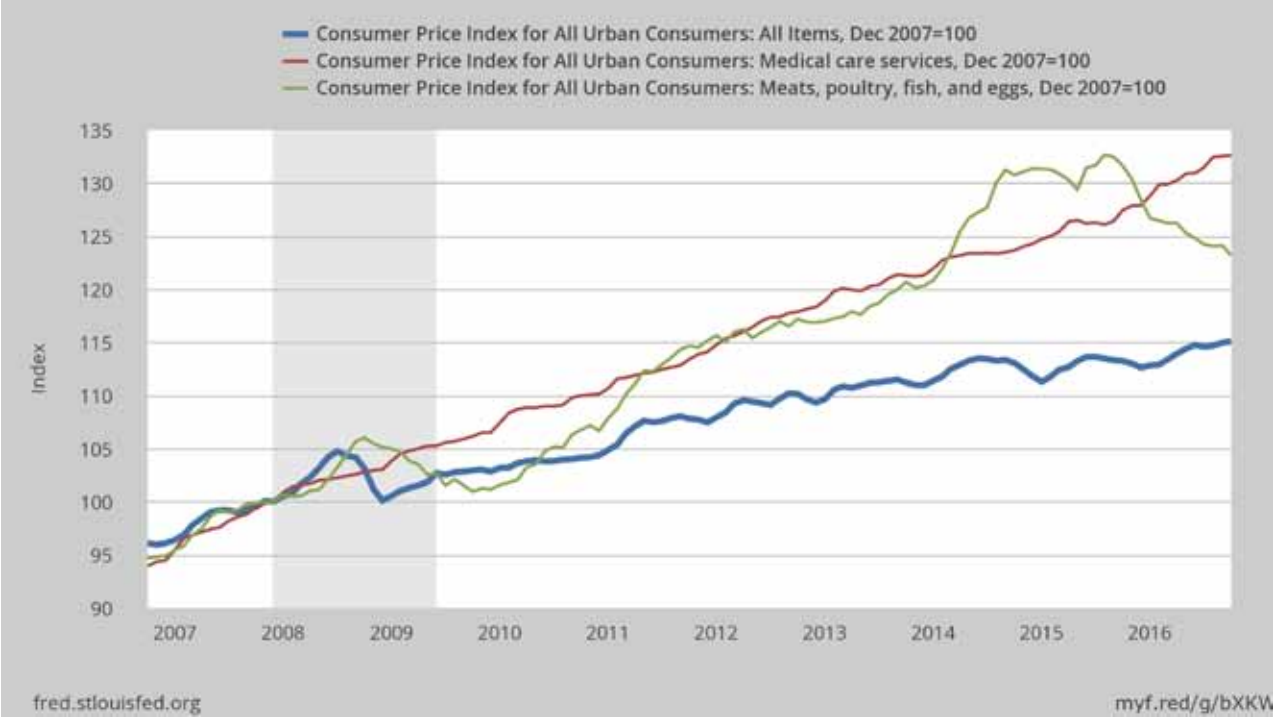
Note that the red line is the cost of medical care. It's never really fallen all that much, although it's never spiked substantially either. This is a sign of the effects of subsidies that go into medical care services and lack of competition in that market. The costs of medical care services do not fluctuate the way other goods do, where people have choice of purchases. In other words, medical services are not a "free market" in the way we like to think of a free market.

As you would expect, the lower a person's income, the higher the percentage of it that goes to pay for medical services and food. This is a key problem for poor and lower-middle income workers, and one of the reasons that dissatisfaction with economy has tended to come from workers with low and lower-middle incomes.

In Figure 49, we index these same items to the start of the recession to get a different perspective on inflation. Even though the price of food has gone down, everything else has gone up. The thick blue line is CPI, and since December 2007, prices are up 15%. Even though, as we mentioned, food prices have come down, they are still 23% higher than they were at the beginning of the recession. There is still an index point gap between food and general inflation. And medical services have gone up by 33% in this period, which is twice the rate of inflation.

Figure 48. Percent Change In CPI for Selected Items, 2007–2016

Figure 49. CPI for Selected Items Indexed to Start of the Recession, 2007–2016



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, and has been up and down for the past year. This is a sign of a potentially improving employment market, representing a slight amount of pressure to raise wages because of employee shortages. This is most likely a recognition of the cost of adding an additional worker. If your current workers are productive, you minimize expenses by paying them more which reduces turnover and boosts their skill and experience levels. Still, until a clear trendline emerges, however, we'll remain at best cautiously optimistic.

Figure 50. Employment Cost Index, 2002–2016

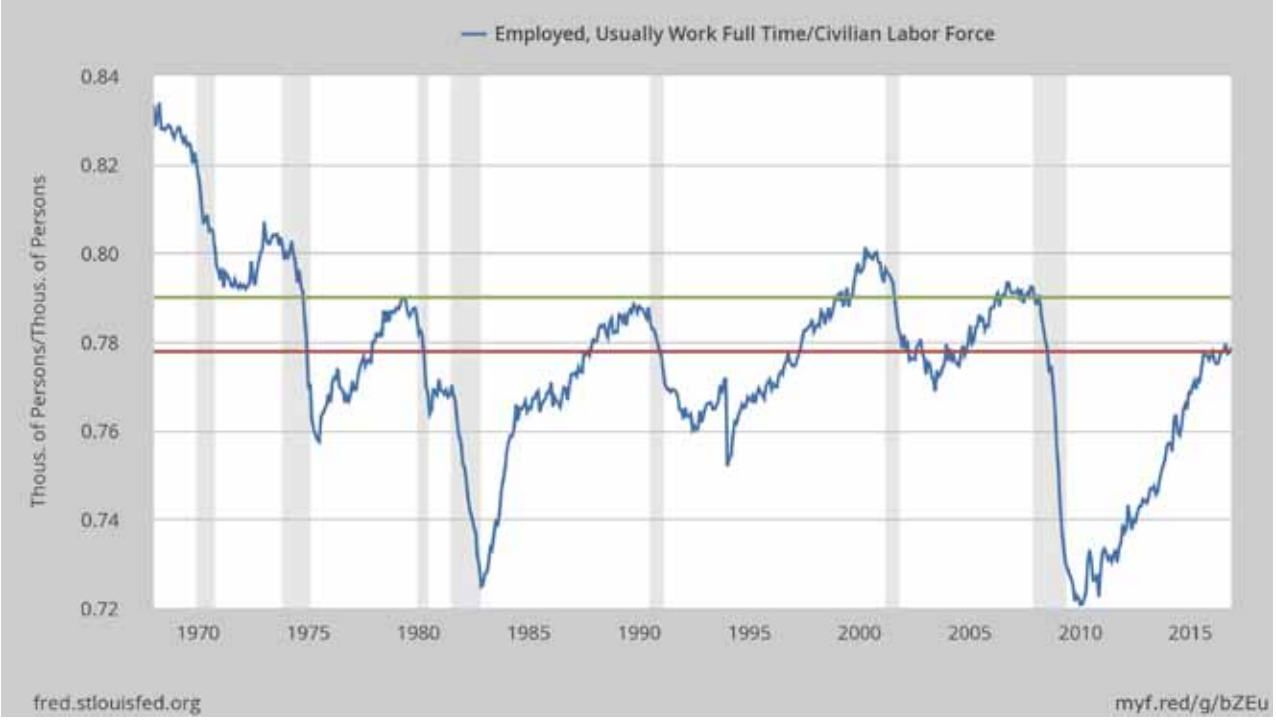
Employment and Unemployment

Full-Time Employment

The number of persons who usually work full-time is finally ahead of where it was at the beginning of the recession. However, since then the labor market has grown, so it's lagging where it was. One way to see that is Figure 52, which tracks those who are work full-time divided by the civilian labor force. The green line is the level it was prior to the 2007 recession, and we track it back to the 1970s. The level the economy was at just prior to the recession matches other times when the economy came out of recession and was improving. However, this ratio has not returned to that level yet, and it's taking a very long time to get there. Over the past year it has been flattening out. The pre-recession level was at 79%, and we're just below that at 78%, which works out to about a million and a half workers.

Figure 51. Number of Employed Full Time, 2008–2016

Figure 52. Full-Time Employed As a Percentage of the Workforce, 1970–2015



Part-Time Employment

Part of the decline in full-time employed has been because more workers are working part-time. Some of them are forced into it by dint of not being able to find full-time work, but many choose to work part-time, either because they are close to retirement or, at the other end of the spectrum, they are in school or just starting families. Why the recent spurt of part-timers? For many, the ACA has eliminated the need to get a full-time job solely to get health insurance. By the way, the spike in the 1990s was due to a redefinition of what "part-time" was.

Figure 53. Part-Time Employed As a Percentage of the Workforce, 1970–2015

Multiple Jobholders

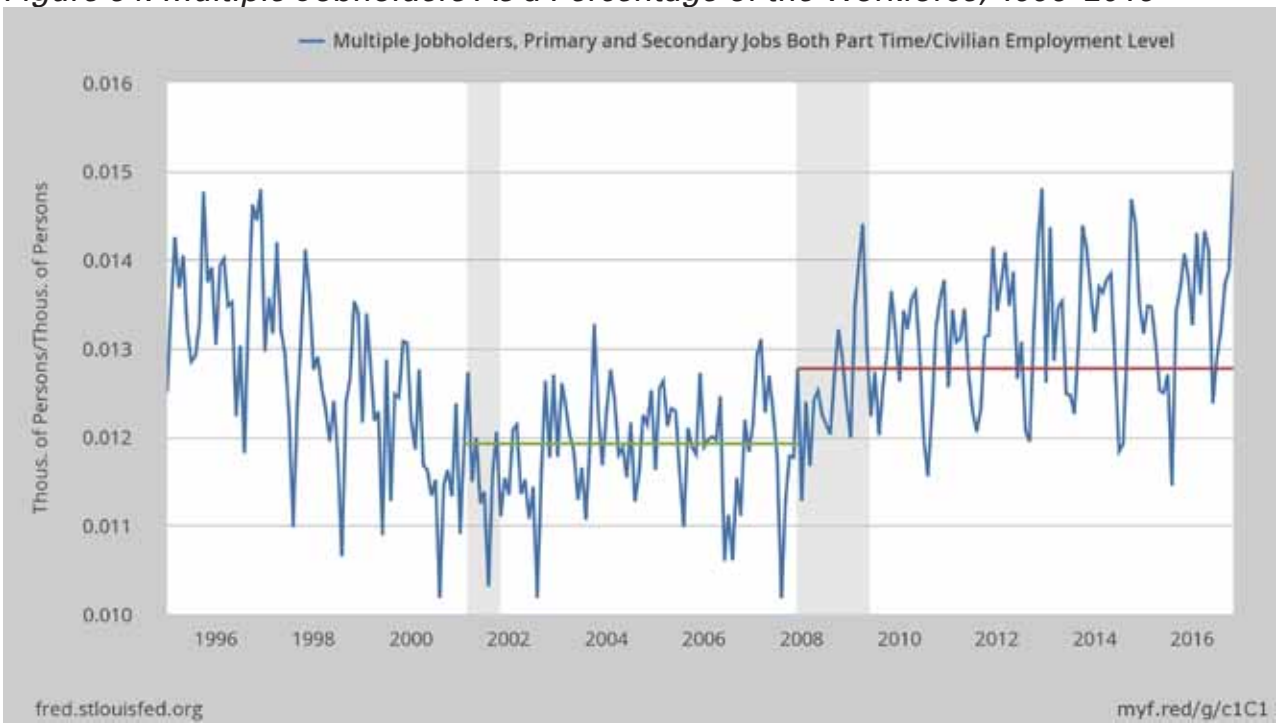
Now, of course, many people, unable to find a full-time job, and needing to have more than a part-time job, sometimes have more than one part-time job. Ya gotta do what ya gotta do. The number of multiple jobholders has been peaking since the recession, and has only grown since the end of the recession.

Mind you, as with part-time work in general, some of this is by choice, and it doesn't mean that people are flying from one part-time job in the morning to another in the afternoon or evening, with no rest or respite. It could be one job during the week and another on weekends, or different jobs on different days of the week. Regardless, some people like this because of the flexibility it offers, even if some are driven to it out of necessity.

Notice that the last observation takes this up to 1.5% of the workforce, which is somewhere around two million workers.

Another consequence of this data is that it indicates that the payroll survey, the one that's always touted in the news headlines, double counts these folks, while in the household survey, they are only counted once.

Figure 54. Multiple Jobholders As a Percentage of the Workforce, 1996–2016



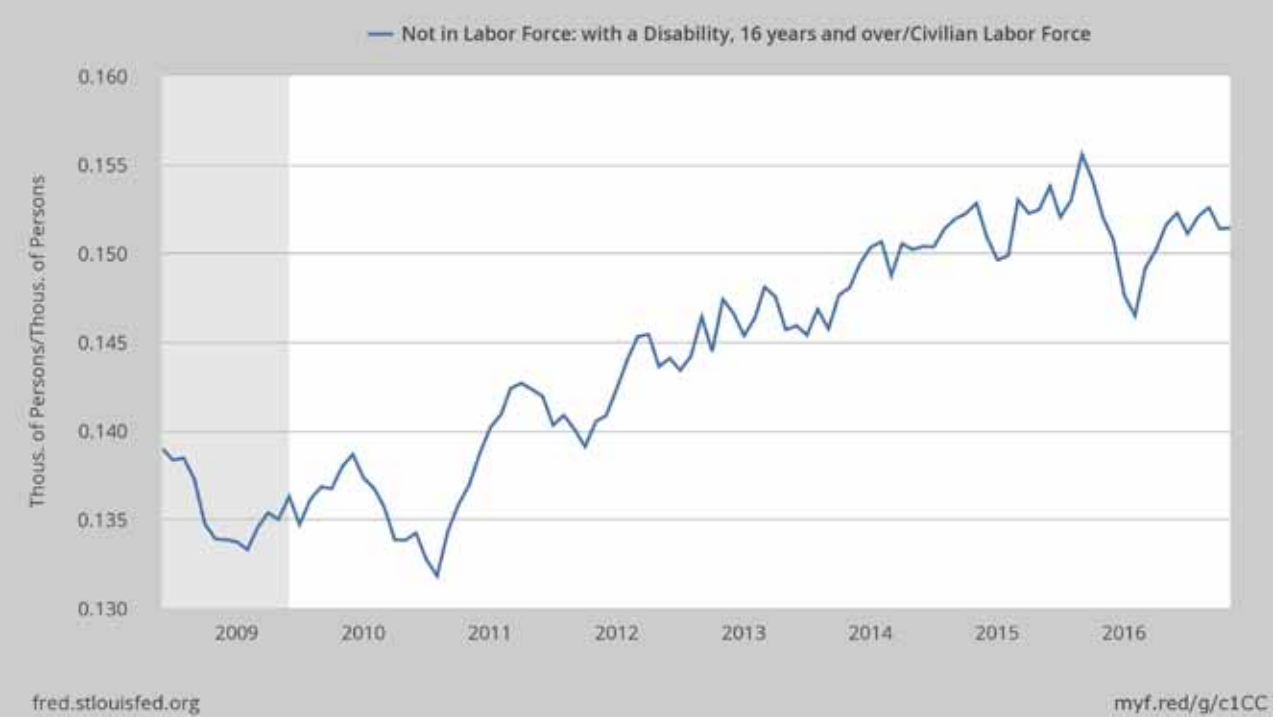
Disability

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 an office job in the same business or at least the same basic industry. 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 55 just don't tell us.

But, when options are fewer, there can be a tendency to collect disability, especially as it has become easier to qualify for. If someone is in their late 50s and not yet eligible for Social Security, disability payments can fill in those gap years. There are hurdles to qualifying for disability, of course, but the enforcement in recent years has tended to be lax. One of the requirements is usually an assessment of difficulty in performing the same job in the same industry for that worker. In strong economies the incentives to change jobs and change industries are more attractive.

It is also a trade-off of income security vs. going in and out of jobs. It becomes murky trying to figure out why the number is rising, but it's clear that something has changed. Thanks to the many insurance programs, not just the ACA, workers have had access to health care for years, and the knowledge of orthopedics and physical therapy have greatly improved. There are OSHA regulations requiring protective equipment and ergonomic-focused working conditions and procedures. Yet, the number of workers on disability is going up. It's possible it's simply due to an aging population and an aging workforce; the older you get, the "easier" it is to be considered disabled just as a matter of aging. So the rise in disability seems to involve a greater range of factors than being injured as a result of working conditions.

Figure 55. Not In Labor Force Due to Disability As a Percentage of the Workforce, 2009–2016



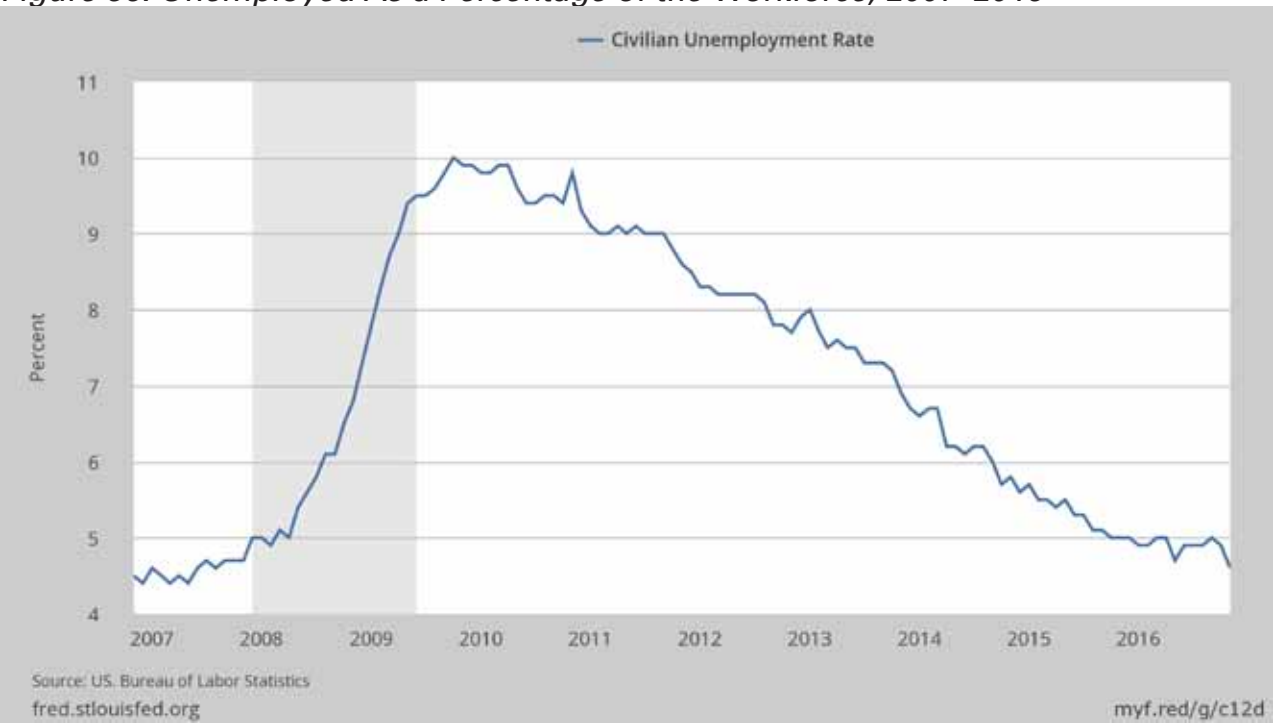
Unemployment Rate

In the last employment report at the time of this analysis, the headline unemployment rate is down to 4.6%, which on the surface of things sounds pretty good, but most of that decrease is being driven by people leaving the workforce. In early December's report, the workforce shrunk by 226,000 people, and the number who were not in the labor force increased by 446,000—a pretty massive increase.

The household survey reported an increase of 160,000 jobs, but the labor force went down by 226,000, enough to make the unemployment rate seem like it was really good.[22] In the prior month, jobs were down 43,000, which means that over the last two months, the number of new jobs in the household survey was 117,000, which is not very good.

The household survey has averaged 220,000 jobs per month for the past year, but has been pretty bad lately. There is a sense conveyed by this measure that the economy has slipped or is slipping into a recession.

Figure 56. Unemployed As a Percentage of the Workforce, 2007–2016

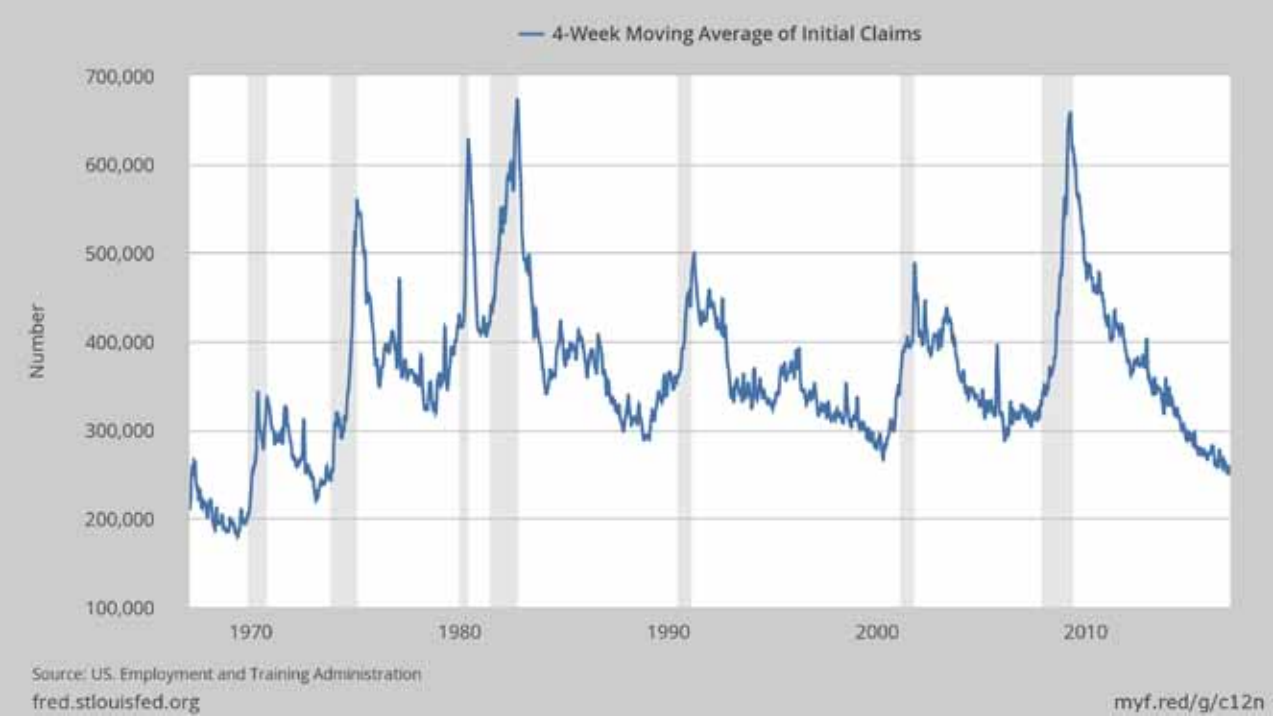


[22] Employment data are gleaned from two surveys: the payroll ("a monthly survey of approximately 146,000 businesses and government agencies representing approximately 623,000 worksites throughout the United States") and the household ("a monthly sample survey of 60,000 eligible households"). The household survey captures workers that the payroll does not, such as self-employed, those working in private households, agricultural workers, and so on. The household survey is what is used to calculate the unemployment rate. (See http://www.bls.gov/bls/empsitquickguide.htm.)

Initial Jobless Claims

Initial jobless claims have dropped rather dramatically, but hasn't really been a good indicator for a long time. (The 1983 recession was a peak for initial jobless claims, but the workforce was smaller then, and in today's workforce terms would be a gargantuan figure.) More and more workers qualify for unemployment insurance, so something else is going on. It could be that companies release workers before they quality for unemployment. Or it could be that they're leaving the workforce of their own accord, such as by retiring.

Figure 57. Initial Jobless Claims, Four-Week Moving Average, 1970–2010



Employment-to-Population Ratio

Problems with the employment picture are shown in the civilian employment-to-population ratio, which has been slowly improving, but is still far below where it should be. If we look at the employment-to-population ratio for prime-age workers (25 to 54 years old), it's a little bit better, suggesting that at least some of the workforce exiting is the retirement of the Baby Boomers. Still, it is quite a bit below the pre-recession peak.

Figure 58. Employment-to-Population Ratio, 2007–2016

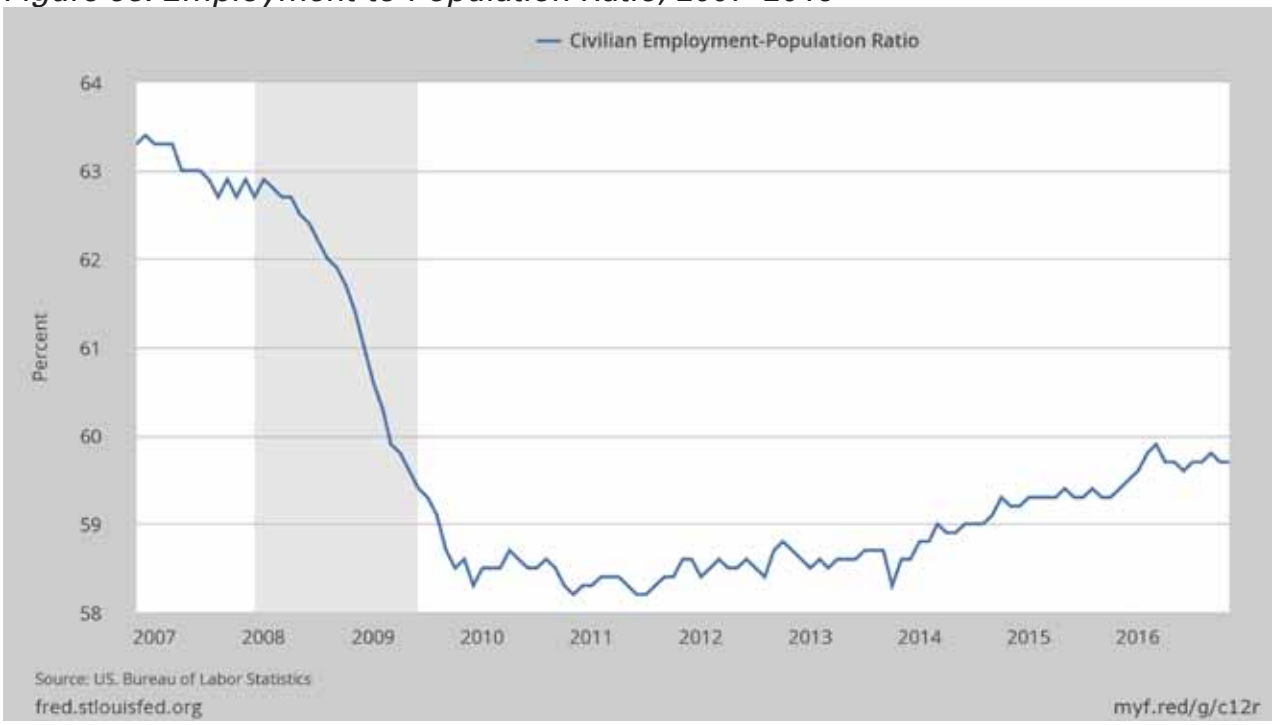


Figure 59. Employment-to-Population Ratio for 25 to 54-Year-Old Workers, 2007–2016

Labor Force Participation Rate

One of the biggest concerns is labor force participation rate, which has now fallen to late 1970s level. After the 2007 recession, it was at 66%, and is now down to around 62%. Things look a little but better for prime-age workers, but at 82% is still a couple of percentage points below the pre-recession peak.

Figure 60. Labor Force Participation Rate, 1950–2016

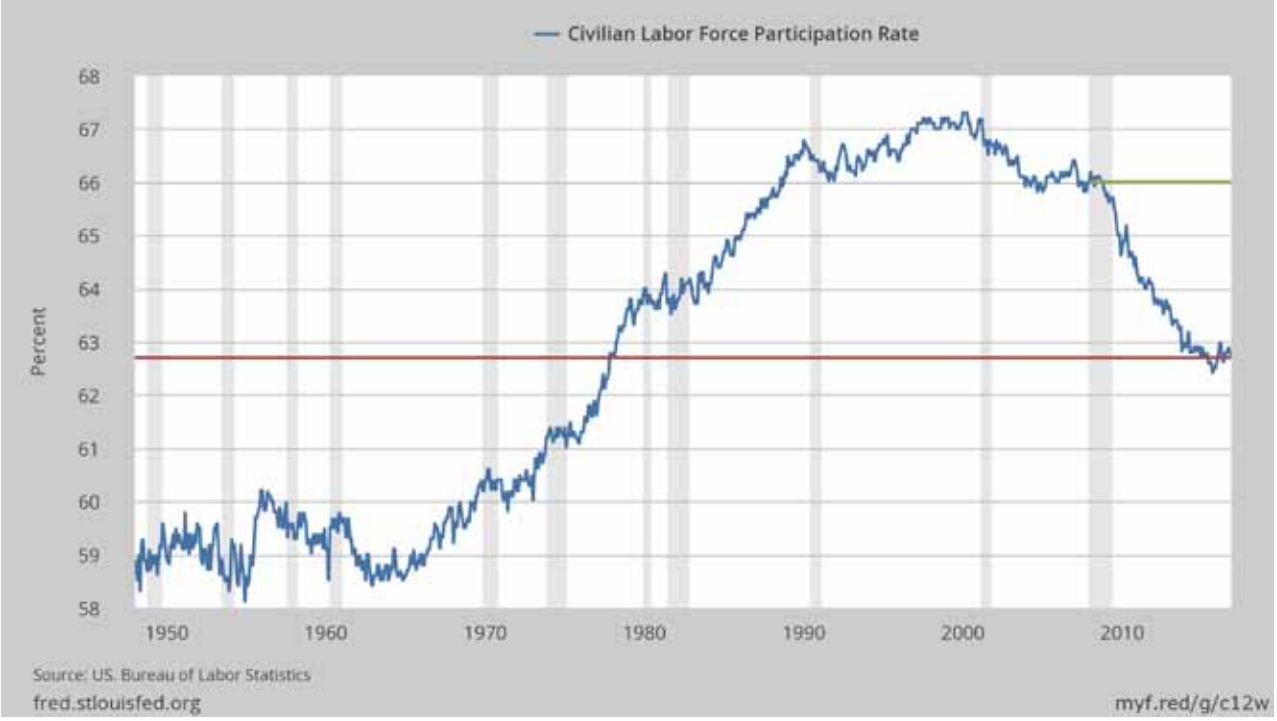


Figure 61. Labor Force Participation Rate for 25 to 54-Year-Old Workers, 1950–2016

Not In Labor Force

In terms of those who are not in the labor force, we have not seen these levels since the 1970s. The red line is the beginning of 2007 recession. This rate has been increasing at a pretty steady pace.

Figure 62. Not In Labor Force, 1980–2015

Self-Employment

The number of self-employed workers has been declining since the years before the recession. Although this wasn't a very big chunk of the workforce to begin with, and the y-axis scale makes this look a but more dramatic than it probably is, it is a worrying trend. Some of this could be technological; at one time you could make a pretty good living as a freelance web designer; now with SquareSpace, Wordpress, Wix, and other simplified DIY tools, individuals and businesses who want a basic website don't need any special skills like knowing HTML or even Dreamweaver. Only large businesses that need special site features beyond what is possible using basic DIY tools may have a great demand for web designers. (Graphic design in general has been moving in that direction for a while, with "outsource-to-the-lowest-bidder" sites for design becoming common, much to the dismay of professional designers.) Mobile app development is also trending this way.

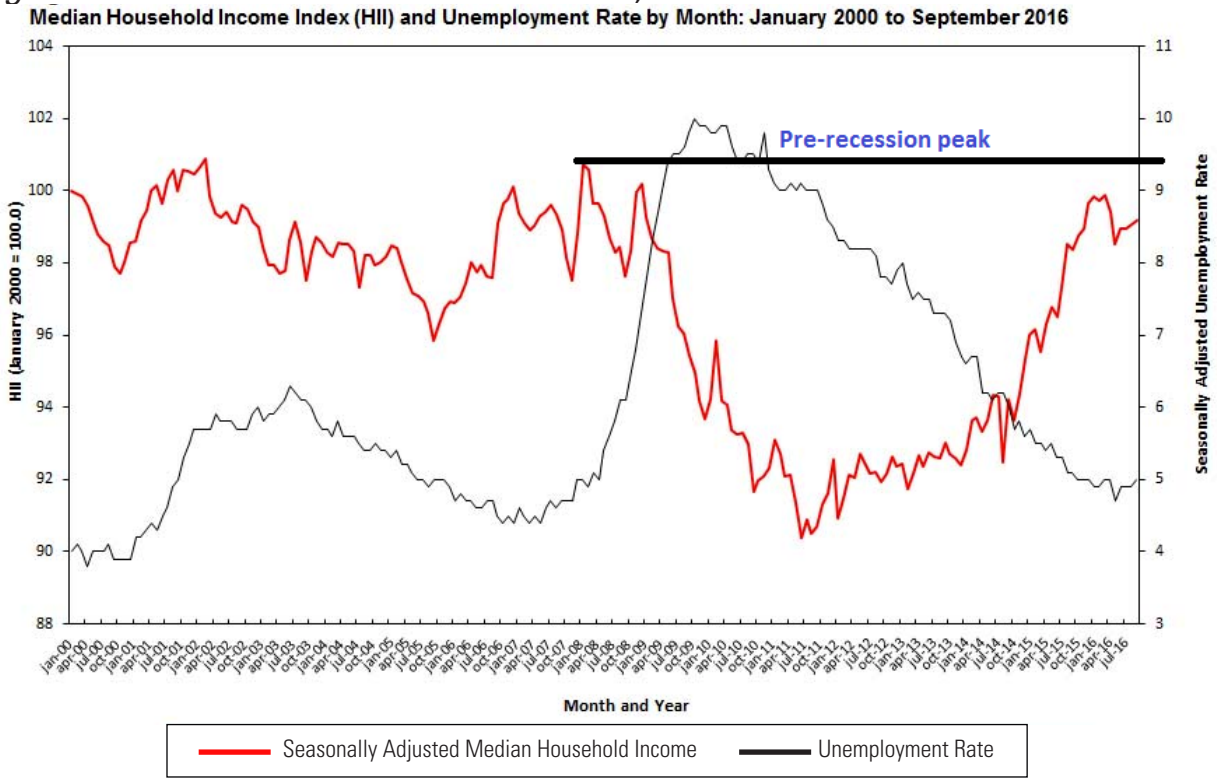
One wonders if technology—which greatly enabled the self-employed a decade or more ago—is now impeding them by gradually eroding the kinds of things you can make a productive business doing.

Figure 63. Self-Employed As a Percentage of the Workforce, 2007–2016

Median Household Income Index

Sentier Research provides a calculation from Census data of median household income. Like most of the indicators we have been looking at, it has not reached pre-recession levels. It was worse three or four years ago, but has improved, although savings are not providing any kind of return. Food prices, as we saw, are coming down, but if incomes are down, food is technically getting more expensive. So if inflation is zero, but your income goes down, it will have the same net effect as inflation because goods are harder to afford.

Figure 64. Median Household Income Index, 2000–2016



Source: Sentier Research

ERC Recovery Indicators

Since we began these recovery indicators back at the end of the last decade, getting them to move in lockstep has been like trying to get cats to walk in a straight line.

The NASDAQ did very well after the election. Since last year, the NASDAQ is up 4.6%, ISM non-manufacturing new orders are down 8.1% from last year. Manufacturing new orders is at 53 in our latest reading, up 8.4% from last year. This may show that some manufacturing is getting better, but it is not consistent with the Fed's manufacturing figures. Proprietors' income for Q4 was up slightly.

Table 16. ERC Recovery Indicators, 12/05/2016

Dr. Joe's Key Recovery Indicators as of 12/05/2016	NASDAQ Composite	ISM Non-Mfg New Orders	ISM Non-Mfg Imports	ISM Mfg New Orders	ISM Mfg Imports	Proprietors' income ($billions)
Recession Start 12/2007	2661.0	52.3	50.5	47.4	48.0	$985.5
Prior Reading	5105.6	57.7	53.0	52.1	52.0	$1,407.8
Latest Data	5379.9	57.0	54.0	53.0	50.5	$1,422.8
Change Since Prior Reading	5.4%	-1.2%	1.9%	1.7%	-2.9%	1.1%
Change Since Recession Start	102.2%	9.0%	6.9%	11.8%	5.2%	44.4%
Data release used	12/2	12/5	12/5	12/1	12/1	Q3 prelim

NOTE: NASDAQ and Proprietors' Income in the table are not inflation-adjusted. To be at December 2007 equivalents in today's dollars, the NASDAQ must be approximately 3063; it is now +75.6% above that level. The Proprietors Income CPI-adjusted level at the start of the recession was approximately $1134.4, and is now +25.4% above its Q4-2007 level.

7. Dr. Joe's Macroeconomic Forecast

Here is Dr. Joe's take on what the incoming Administration's plans might mean for the economy

Taxes, Regulation, and GDP

The GDP forecast made in this chapter assumes the passage of the Trump corporate tax plan and most of the income tax plan. Obviously, Congressional action is needed for all of these, and the earliest many of these will be implemented is for calendar 2018.

Key parts of tax plan include a slight lowering of rates, a doubling of the standard deduction to $30,000 for joint filers (lowering tax compliance costs), reducing deductions for deductions' sake (resulting in more renters), and a phase out of many deductions except mortgage and charitable contributions. The biggest tax on workers is still the Social Security and Medicare combination, taking more than 15% of the first dollar earned (half is "paid" by employer, but the employee pays for that by their productivity). The personal exemption was meant to counterbalance the Social Security tax and other effects; other exemptions will be eliminated, which is the main reason for the doubling of the standard deduction.

What is not getting enough press coverage is the elimination of the Alternative Minimum Tax, a significant cause of "tax flight" from high-tax cities and states and a deterrent to productive investment. It's often the cause of a surprise tax payment and penalties by successful and career-rising workers.

There will also be new child care tax-free savings accounts, matched by Federal government for low earners.

The corporate rate cut will reduce interest in "Double Irish," "Dutch Sandwich," "Singapore Sling," and other escapes from US global taxation; it will be easiest to implement in Congress, and the fastest way to increase revenues. The law will include repatriation at a reduced rate for money kept overseas. It is assumed that most all of this money will return to the US, but we suspect that is being overestimated. Some of it will likely stay where it is to finance operations in markets that are growing faster than the US in population and income growth, especially India.

Any plans for Schedule S and other corporate forms common to small business that are paid at personal tax rates are not clear at this time.

Tax Cuts

Tax cuts have always worked to stimulate the economy if they are considered permanent by workers, and they stimulate savings and investment. Many presidents have successfully implemented tax cuts with excellent results, such as Coolidge (increased revenues,

growth, and tax law compliance), Kennedy (passed posthumously, increased growth rate and employment; later dismantled by Johnson and Nixon), Reagan (increased growth rate, savings, and employment, and the investment in new capital increased productivity, allowing interest rates to return to normal market levels), and Clinton (capital gains rate cut increased growth rate, savings, and employment, and eliminated budget deficits). Reagan's and Clinton's second-term growth rates were in +4.3 to 4.5% range; Kennedy was +5.0%, Johnson was +5.4% (twice Eisenhower's GDP).

High tax rates prevent the formation of new capital and the investment in new businesses because tax avoidance has a higher net return and lower risk profile than other economic activities. The result is that "old money" stays trapped in trusts and tax-favored structures and new businesses and new workers are discouraged in terms of entrepreneurial activities and savings.

The downside is that increased revenues take time to accrue, usually 12 to 18 months at best, and can create political panic in the meantime. Only during the Clinton/Gingrich/Gramm/Rudman era was there fiscal restraint once new, higher revenues arrived to create annual budget surpluses and control of public debt. Coolidge had great freedom of action to set departmental budgets, which is impossible now, and there were no entitlement programs or Social Security.

A big constraint on making government more efficient is use of the "current services baseline" that ensures government expenditures rise with inflation, which reduces interest in productivity and innovation in the sector. No changes to the budget process are foreseen

Infrastructure spending will have limited impact, though it will be highly visible; much will be focused on municipalities with jawboning or legislated incentives promoting repatriated corporate funds to be invested there. Trump will be Truman-like as Truman built his pre-presidential career on identifying failed and poorly managed government projects, demanding better performance, No current government project can be built as quickly as FDR-era projects were; infrastructure spending did not solve the Great Depression.

2017 and 2018 are likely to be chaotic, and it will be difficult to discern true business conditions. The Trump presidency has confounded the mainstream media news sources who have been negative about his election and skeptical about his plans. Reagan faced similar obstacles, and even through his two terms there was always skepticism about the nature and duration of the recovery. Trump is a provocateur, who fights back via Twitter and social media. If this continues after Inauguration Day, the "fog of economic war" will make some business owners confused and uncertain about their decisions. How long this will take to sort out can have a profound negative effect on the economy until clear Congressional actions are taken. Trump the dealmaker will use infrastructure spending as the carrot to reach across the aisle, but essentially as a third-party candidate, even while in office, will find he has to reach in both directions.

The old line about "not wanting to see the sausage while it's made" will describe 2017 well.

Economic Expectations

Despite all of these warnings and caveats, we still make forecasts.

Growth Rates

- 2017 GDP growth +2.5%, +3.0% toward end of year
- 2018 +3.5%, first year of new tax legislation
- 2019 +4.5%, growth "catch up" from prior years
- 2020 +3.75%, economy matures
- 2021 +3.0%, economy settles in

Unemployment Rate

- Beginning of 2017: 4.7%
- End 2017: 5.1%
- Mid-2018: 5.25%
- Mid-2019: 4.75%
- Mid-2020: 4.5%

See further comments below.

Fed Rates

- Mid-2017: 1%
- Mid-2018: 1.5%
- Mid-2019: 2.25%

Interest Rates and Deficit

The Fed

Trump will soon pick three Federal Reserve members for vacant seats and term expirations. Janet Yellen's term as Chair expires in 2018, and will probably leave the Fed even though her Fed Board appointment ends in 2024. There will likely be two additional appointments at that time.

The Fed will be the biggest beneficiary of a recovery, assuming one develops, and they can unwind their balance sheet of its QE activities, raise interest rates to reward savers

again, and can implement a "rules-based" policy that follows market interest rates rather than trying to lead them.

Government Spending

Trump is a Keynesian at heart, and a believer in "effective" government spending to counter negative economic conditions. Deficit hawks will find much to campaign over, especially in the 2018 Congressional midterm election cycle; this is already in the calculus for the President-elect to attempt a fast start to initiatives.

Getting the economy going again will get greater priority than debt control or reduction, and both sides of the Congressional aisle will take a great liking to infrastructure spending projects and low borrowing rates as an advantage.

Monetary crisis risks will rise significantly, but that does not mean that there will be one. Long-term bond rates could move substantially higher as a risk premium for future inflation. That inflation may not come if productivity from new investment takes hold.

In terms of government debt, the Federal Reserve will be under great pressure from Congress and the Executive branch to keep interest rates low; for each 1% rise in rates, the annual deficit grows by $200 billion. This means that relationship with the Fed may become more politically charged.

Unemployment

The unemployment rate no longer reflects marketplace conditions because of the increased size and growth of people leaving the workforce in the "not in labor force" population.

The retirement of Baby Boom workers plays a role in this increase, but this is the healthiest and wealthiest cohort of retirees in history, with incentives to delay collecting Social Security for increased future payments (a delay to age 70 increases payments to recipients by about 8% higher than they would otherwise receive). The number of workers over 65 years old grew by 75% since the beginning of the recession, growing from 2.4 million to 4.2 million. Some increase is natural, as the age to collect Social Security has been increasing by law. Workers living longer, using income to increase savings for longer lifespans, and to stay engaged in work for many social and community benefits. Low interest rates have kept older workers in the workforce as they make up for loss in interest and investment income from CDs and bonds.

Growth from the Trump plan is likely to increase the unemployment rate as workers leave the sidelines to seek jobs. The rise in the rate will be natural in all economic recoveries. The increase in the rate despite growing employment and incomes could become a political topic, even though it is a little quirk in the calculation of the rate that everyone knows about. It could take many years before the unemployment rate becomes a simple and reliable economic measure again.

Regulation Relief

Business regulation increased significantly in the Bush 43 and Obama administrations, at virtually the same rate of growth in each. The biggest increase in regulation effect was the passage of the ACA, becoming a significant factor in hiring, human resources, and small business planning.

Economists do a very poor job of measuring and forecasting the effects of regulation because they do static and not dynamic analysis, and do not understand practical entrepreneurial risk judgments, especially those of small businesses. ACA costs were mainly hidden from government measures, such as inflation data, which only measures fees for services, and did not appear in inflation data such as the CPI.

Trump policies are claimed to add one regulation and delete two, an opportunity for bureaucratic sleight of hand. Thanks to this Beltway logic one could envison that a bureaucrat would desire to "create a department of regulation reduction" and issue new guidelines for reductions.

Small business will benefit most from regulatory relief, but aside from reconfiguration of the ACA, may not see many benefits for a while, as regulatory relief will first be applied to manufacturing and energy sectors. Look for a "Grace Commission" to seek out burdensome regulations.

8. Industry Trends for 2017

Here are what we see as some of the hot—and not so hot—trends for 2017.

Hot Items

Automation

We saw that "managing workflow automation" was a significant challenge and opportunity for our survey respondents, and automation software was near the top of the planned investment list. The most important factor in today' printing environment is maximizing productivity and job throughput. Jobs need to get from intake and prepress to finishing and fulfillment as fast as possible and with as few "touches" as possible. This is not just to minimize errors (no one has ever been a fan of remakes, but they have become even more lethal today) but also to speed turnaround time, as customers are asking for ever-faster turn times—sometimes even same-day. Playing a role in this is also to increase the number of jobs that can be processed; as we said in Section 1, the challenge of digital printing is to amass many short-run jobs to equal what would have been a long-run offset job.

Think about it like an author having to sell many short stories to equal the income they could get for a novel.

The way to accomplish this is through automation. What do we mean by :automation"? A file comes in via a web-to-print portal or some other electronic means, it is automatically scanned by preflighting software to make sure the technical specs are correct. If so, it is shunted into prepress. At this stage it is imposed, and depending what software you are using, you can even set up your finishing options at the prepress stage. It then gets RIPed, sent to press, then to finishing, where bar codes can automatically set up the finishing equipment. All the puny human has to do is physically load printed sheets into the finishing equipment, then send them on to fulfillment or shipping.

Obviously, that's an idealized view of an automated workflow, and as we all know when it comes to anything technological, the potential exists for some Charlie Chaplin/*Modern Times*-like experiences. But generally these kinds of workflows, when set up properly, do work. We're going to be seeing a lot more of them.

Binding/Finishing

Time was, print shops bought their printing equipment, be it offset or digital, and then some time later, bought binding and finishing equipment. The latter purchase wasn't an afterthought per se, but tended to be bought in isolation from the rest of the production process. However, in order to maximize the productivity we have been taking about, printers are starting to recognize that it's best to consider both the printing and finishing equipment simultaneously, to buy both at the same time. It involves knowing exactly what it is you want to produce and acquiring an integrated system that will produce it in as efficient a way as possible.

We are also seeing a shift from inline to nearline finishing. While it may seem more productive to have printing and finishing physically connected, somewhat counterintuitively, it's not actually the more efficient approach. Press speeds may not be as fast as finishing speeds—or vice versa—so the whole system can only operate as fast as the slowest element. It also allows one finishing device to service output from different presses.

Integrating Print/Non-Print

We were pleasantly surprised to see how much of an opportunity our survey respondents saw integrating the print and non-print elements of a customer's marketing plan. "Finally!" we said to ourselves as we were going through the data. His is what being a "marketing services provider" really means, even if that term has passed its sell-by date. We've always been sanguine about the idea of printers handling an increasing amount of non-print marketing-related work, and it's good to see that they're starting to come around to this same conclusion. (But see "Marketing Automation" below)

Items That Are Warming

The Digital Shift

The transition from offset (or other analog printing) to digital is nothing really new; we've been tracking it since the 1990s, but this movement has been accelerating over the past several years. Shorter run lengths, customization and personalization, and faster turnaround time shave been the driving factors behind the digital shift, and the one major change we are seeing now is that it is happening in virtually all corners of the industry. Even packaging now has been subject to the digital shift, with shorter runs, more targeted packaging, etc., becoming more and more the norm. We've commented elsewhere that aggregating enough small digital jobs to equal what would have been a long offset run, and that challenge will persist.

As our data show, toner-based digital is still the de facto technology that firms are using to cope with this shift, and the Indigos (et al.) are moving steadily downmarket to smaller shops. Despite all the hoopla surrounding production inkjet, it is still far from mainstream. It will likely make some gains in 2017 (see below), particularly among large printers, but for small and medium printers toner will still remain the go-to digital printing technology.

Replacing Print: The Next Generation

Another trend we have been tracking since the 1990s is the transition from print to electronic media. It's no secret that this has been the primary source of the industry's woes since around 1998. It's tempting to think that by this point, most of the damage has been done and, yes, it's true that many applications have been "digitized." But it seems likely that there is another wave to come. It's a generational thing. Transactional documents in particular are likely to go away, simply because people have, in general, become comfortable with electronic statements, bills, and other documents. The institutions know this, which is why every time you log onto a your bank's Amex's website, you're besieged with entreaties to "go paperless." National Grid, the utility provider, even charges $1.24 for "billing services."

(Yes, you have to pay to get a bill!) It's probably not going to be long before banks, credit card companies, and others start routinely charging a fee for a paper statement or invoice or, like the New York State DMV (as we commented in Section 1), simply stop offering them except by special request. This will substantially slash the volume of transactional documents.

It's not difficult to see other kinds of printed matter disappearing. Just to name one example: printed maps. To get a sense of what other printed materials may be on the wane, take a look at what some of the most-used mobile apps are, and if they replace a print application.

Production Inkjet

The takeover of the industry of production inkjet has been forecast for the past several years, and while it's slowly 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.

Production inkjet is an area that is evolving so rapidly that what's true today may not be true in six months time. It wasn't that long ago that inkjet-compatible paper grades were severely limited, but today, paper mills are pumping out more and more inkjet grades, while press manufacturers are adding pre- and post-printing treatments to make virtually any paper grade inkjet-ready. Quality of output has improved substantially, so that's not the limitation it once was.

So what is holding inkjet back? Most probably, it is printers simply not seeing a need for it, or, if they do see a need, they're still skittish about pulling the trigger. As our survey found, only 5% of all print businesses see "disposing of offset equipment to concentrate on digital printing as a business opportunity, and only 10% wrestle with "deciding whether to keep or discard our offset equipment" as a business challenge. So e have probably reached a plateau point where those companies that saw opportunities in digital have already made the shift, while the remainder have yet to see the need. That will likely change.

Transactional and book printing have been the top applications for production inkjet, and companies not in those spaces have perceived little need. However, as new capabilities have made inkjet suitable for more and more print applications, like direct mail, more printers will understand the opportunities that digital printing—and inkjet in particular—can offer.

Packaging

Last summer's drupa 2016 could be considered a packaging drupa, or at the very least a corrugated drupa, with myriad digital corrugated presses announced. Is there a hitherto untapped market for digital packaging? Well, only 8% of our survey respondents saw "adding packaging printing capabilities" as a business opportunity, and even fewer (1%) said they were planning to move into corrugated packaging production (see Section 3), so while there *could* be a big push into packaging, commercial printers don't see it yet.

Likely, the equipment announcements are targeted to those businesses that already produce analog packaging and need—again—the advantages of digital printing (short runs, customization). As we said earlier, 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.

Textile Printing

Only 8% of our respondents saw "adding textile printing capabilities" as a new business opportunity, and the bulk of that is for soft signage. Soft signage is another of those items that have been a slowly building application, although mostly for specialty graphics shops rather than general commercial printers.

Like packaging, ink-on-fabric has different production requirements than ink on paper, and while the printing part of the workflow isn't the most complicated in the world, understanding other elements of textile production—sewing, seaming, and other finishing—is a bit different than what commercial shops are used to. Not that it's rocket science, but it does take a dedicated effort and a fair amount of education, as well as acquiring the right skills to pull it off.

Items That *Should* Be Warming

The Cloud

In last year's survey—and our Forecast 2016 report—we had asked a detailed series of question about the extent to which print businesses had been migrating various elements to the cloud, and we found that the cloud was on very few shops' radar. Even when it is, it's really only for things like the Adobe Creative Cloud or file transfer like Dropbox. Has anything changed in the past year?

Not really. Less than 5% of respondents this year saw any opportunity in migrating either business functions, production, or customer service and sales to the cloud. They also did not see any of these things as business challenges, which is a good indication that they are scarcely even aware of the cloud.

It's our belief that they will likely have to go cloud eventually; it's not difficult to see that it's the way software delivery is going, and it's really only a matter of time before all software is sold as a cloud-based service rather than as an on-premises installable program.

The alternative, for those companies that resist the cloud, will be to rely on legacy software (and, if new hardware is incompatible with old software, relaying on legacy computers as well) that will only get more and more out of date, and will hamper overall productivity. For businesses that see increasing productivity as something of prime importance, migrating parts, or all, of the business to the cloud is one way to accomplish this. The trick is getting them to understand that.

Marketing Automation

Likewise, we saw that managing both print and non-print parts of customers' campaigns is a top business opportunity, but few are aware that marketing automation is a highly efficient and effective way of accomplishing that. Likely, it's just an unfamiliarity with the term (it's possible people are still using the legacy phrase "cross media") as well as the

services that exist to facilitate it (Marketo, HubSpot, etc.).

Being conversant in marketing automation is one primary way to prove to chief marketing officers that print and print businesses are perfectly relevant to their communications efforts. It's important to speak the language these folks use.

9. WhatTheyThink's 2017 Commercial Printing Forecast

Ah, economic forecasting. As William Kenneth Galbraith said, "The only function of economic forecasting is to make astrology look respectable."

Our usual caveat to these forecasts is that the best that any forecasting model can do is predict the past. That's what extrapolation is. You're taking data about what has already happened and assuming the same thing will happen again, albeit with some alterations based on other assumptions you plug into the model. Then, you make a judgment about how to forecast from there. There are too many forecasters that just rely on statistical models alone.

We forecast out five years, but what will happen in those five years will likely not be what happened in the previous five years. When we did a forecast in 2006, we had already seen how the Internet in general changed society as well as the demand for print, but we had no real idea that social media, smartphones, apps, and everything else—all of which were launched in the five years after 2006—would have the impact that they did.

It's not just technology, but macroeconomic conditions, executive decisions within individual companies, and a host of other factors that can alter reality from what a model predicts.

Then there are the models themselves, and the data we plug into them. The problem is that we no longer have reliable data about large chunks of our own industry. The only source of data we have, on a regular basis, are government data, it only includes NAICS 323 (general commercial printing), and does not include inplants, printing by newspaper publishers, signmaking, or packaging other than labels. A lot of areas that are growing are not included in this data series. Then we have the "marketing services provider" situation. When someone (usually an accountant) files business tax forms with the government, they pick whatever NAICS code they think is appropriate. We assume that everyone who is a printer picks a 323 NAICS. But they may think of themself as something else, perhaps a service-based NAICS like 541. No one receiving these forms verifies the NAICS code and sends a letter back saying, "Uh, buddy, you're really a printer. Go back to 323." How many businesses are we missing in this way? It could be quite a few, but enough to make a difference? Possibly.

That all said, we will here offer a range of forecasts, and then narrow them down to those we think will best reflect reality.

GDP Growth-Based Forecasts

Here are some models of printing industry shipments just given GDP-based growth rates. Using GDP as the basis for a forecast requires a few adjustments, so we offer four scenarios that attempt to take some of these things into account: one assuming 2.0% GDP growth, one assuming 2.5% GDP growth, one assuming 3.0%, and one assuming 4.0%.

The catch with using this kind of forecast is that, depending where you start—1992, 2000, or 2009—you can end up in some dramatically different places. If we start at 2000, and include some horrifically bad years for the printing industry, as well as the recession, we'll end up forecasting a perhaps unrealistically small industry in 2021. On the other hand, if we remove anomalously bad years and start at 2009, when both industry and economic recoveries were on the rise, we can end up in a happier place in 2021, but it could be just as unrealistic.

We could include both anomalously good and anomalously bad years for both printing and the economy, and in our case, we started in Q4 1992, which is a mix of very good and very bad years. That gets us closer to a realistic forecast, but since bad times can outweigh good times (ain't it always the way?), we still may be a ways off.

In the three scenarios below, we offer a mix of start times, and GDP growth rates. Everyone has their own innate bull- or bearishness (as we know from the 2017 expectations in Section 1). We also offer a fourth forecast based on a static growth rate.

We offer these scenarios so you can "choose your poison." Just remember, if you adjust your plans using a 4.0% growth model, and 4.0% growth doesn't happen, you could be in trouble. On the other hand, if you plan based on 2.0% growth, and the economy does much better than that, you'll be in better shape, obviously, but you may have avoided taking advantage of some opportunities you would have taken if you had been more optimistic. We all have our own capacity for risk-taking.

Table 17. Three Printing Shipment Scenarios

Scenario One	All $ in US billions, Q3 2016 value	Growth Rate	Real GDP	REGRESSION MODEL USED Q4-1992 to current	Q4-2001 to current	Q4-2005 to current
	2017	2.50%	$19,244	$82.70	$71.26	$72.63
	2018	3.50%	$19,917	$76.88	$62.91	$64.84
	2019	4.50%	$20,814	$69.15	$51.80	$54.48
	2020	3.75%	$21,594	$62.41	$42.13	$45.46
	2021	3.00%	$22,242	$56.82	$34.10	$37.97

Scenario Two	All $ in US billions, Q3 2016 value	Growth Rate	Real GDP	REGRESSION MODEL USED Q4-1992 to current	Q4-2001 to current	Q4-2005 to current
	2017	2.50%	$19,244	$82.70	$71.26	$72.63
	2018	3.00%	$19,821	$77.71	$64.10	$65.95
	2019	2.25%	$20,267	$73.86	$58.57	$60.80
	2020	1.75%	$20,622	$70.80	$54.18	$56.70
	2021	1.00%	$20,828	$69.02	$51.62	$54.31

Scenario Three	All $ in US billions, Q3 2016 value	Growth Rate	Real GDP	REGRESSION MODEL USED Q4-1992 to current	Q4-2001 to current	Q4-2005 to current
	2017	2.50%	$19,244	$82.70	$71.26	$72.63
	2018	3.25%	$19,869	$77.30	$63.50	$65.40
	2019	4.00%	$20,664	$70.44	$53.65	$56.21
	2020	4.25%	$21,542	$62.86	$42.77	$46.06
	2021	4.25%	$22,458	$54.96	$31.42	$35.47

Table 18. Printing Shipments GDP Model Forecast Using Static Growth Rate

All $ in US billions, Q3 2016 value	GDP Model Forecast Using Static Growth Rate Q4-1992 to current data series			
	2.0%	2.5%	3.0%	4.0%
2017	$83.5	$82.7	$81.9	$80.3
2018	$80.2	$78.5	$76.9	$73.5
2019	$76.8	$74.3	$71.7	$66.5
2020	$73.4	$69.9	$66.4	$59.2
2021	$69.9	$65.5	$60.9	$51.6

Table 19. Regression Models for Printing Shipments

	Data set starting with...		
GDP models for commercial printing	Q4-1992 to current	Q4-2001 to current	Q4-2005 to current
r-squared	75.2%	70.5%	41.9%
Slope	-0.9%	-1.2%	-1.2%
Intercept	$248,758,594,958	$309,762,349,837	$295,103,131,913

You may have noticed something about all these forecasts. Whichever way you slice it, the faster GDP grows, the faster print will decline. Ain't that a kick in the teeth?

The problem with these kinds of growth models is that they don't know anything other than how sets of data relate to each other. They don't know anything about technology that enables or impedes print growth, they don't know anything about print business management decisions, they don't know anything about media trends, and they don't even know anything about the economy, other than that it may grow a given percentage.

Is it a useful forecasting model, then? *Comme çi comme ça*. It has its pluses and its minuses, and it has actually gotten better than it had been.

Which is why we have our own...

The WhatTheyThink ERC Forecast

In light of the foregoing, we simplified our usual ERC forecast table to include just Conservative, Aggressive, and SFM/WTT.

The *Conservative* forecast gives more weight and is more sensitive to recent data compared to the Aggressive forecast. As a result, it predicts more flatness, as the model tends and expects an $83.4 billion industry in 2017 and a decline to only $76.4 billion in 2021. The *Aggressive* forecast looks further back in time to better industry days and, given more recent inputs, is more pessimistic, like people who can't handle modernity and long for better days. As result, it anticipates a $65.1 billion industry in 2021 and a dismal $39.5 billion industry in 2021. (And just ask it about 2026—$2.6 billion! Yikes!)

We also present the Strategies for Management/WTT ERC forecast, using Dr. Joe's "secret sauce" that takes into account good times, bad times (you know we had our share), as well as likely trends that will impact industry growth over the next five years. Dr. Joe is slightly more optimistic than the Conservative forecast (anticipating an $83.5 billion industry in 2017), although they soon part ways, and Dr. Joe expects a $72.5 billion industry five years hence.

Table 20. Forecast Models and WTT Forecast

2016: $86.3B	Conservative	Aggressive	SFM/WTT
2017	$83.4	$65.1	$83.5
2018	$81.5	$59.0	$81.4
2019	$79.8	$52.7	$79.0
2020	$78.1	$46.2	$76.0
2021	$76.4	$39.5	$72.5
2026 ?	$52.2	$2.6	*definitely NOT $2.6B!*

The Last Word

As far as the printing industry is concerned, 2016 was generally not as bleak as we have seen in past years. Yes, damning it with faint praise. 2017 will likely continue along the same trajectory. Modest levels of consolidation will continue, but there will be no major contractions. Our survey respondents were less sanguine than we would have expected about expanding into different types of product and service offerings, but it's possible they have done this already. We'll have to tweak next year's survey to better capture this. The recognition by printers of the need to embrace both print and non-print is also encouraging.

It's no longer true to say that the nature of print as a communication medium is changing. It already *has* changed. The industry has come understand the ways that it has changed and is largely adapting. The old mainstream printing business is gone, and now it's a collection of specialties and niches, with opportunistic uses of print to enhance multichannel multiformat projects. That adaptation is not universal, but enough to keep us all viable.

It is important to remember that strong economic growth stimulates 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. That economic growth will create an even more cluttered communications marketplace, and marketers, businesses, and organizations will need innovative ways to cut through that clutter in a way that engages their audience. We need a creative and proactive printing industry that focuses on and thrives with 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 2016 survey results is 444 WhatTheyThink printing executives. These were gathered from the total number of respondents, 678. 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 2014 County Business Patterns NAICS 323 (general commercial printers). Also used forecast of 2015 and 2016 based on demographic models.

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 *This Point Forward* by Dr. Joe Webb and Richard Romano or their new special report *Cloud Production: Path to Profitability*.

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 <u>at this specific location</u>?
1-4
5-9
10-19
20-49
50-99
100-249
250-499
500+

4) In terms of your 2016 revenues at this location only, how do they compare to 2015?
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 2017 revenues at this location to compare to 2016?
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 2016 jobs/orders at this location only, how do they compare to 2015?
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 2017 jobs/orders at this location to compare to 2016?
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 2016 profitability, how did it compare to 2015?
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 2017 profitability to compare to 2016?
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
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 production inkjet equipment
adding non-print media capabilities (web design, app development, social media management, etc.)
none
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
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
none
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)
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
none
other, please specify_____

13) Do you plan to add any of the following capabilities in the next 12 months? (click all that apply)
high-speed production inkjet (like HP PageWide, Canon Océ ColorStream/ImageStream)
wide-format printing (like signs, displays, banners)
textile/fabric printing for soft signage
textile/fabric printing for garment printing/decorating

specialty printing (like coffee mugs, golf balls, smartphone cases)
corrugated packaging printing
folding carton printing/converting
flexible packaging printing/converting
3D printing
printed electronics
other, please specify_____

14) Which of the following events are you planning to attend in 2017? (click all that apply)
EFI Connect
Dscoop
Graphics of the Americas
ISA Sign Expo
SGIA Expo
Print 17 (Chicago)
LabelExpo
CPP Expo
other, please specify_____

15) As our thanks for completing this survey, which free gift would you prefer:
a free copy of *This Point Forward* by Dr. Joe Webb and Richard Romano
the special report *Cloud Production: Path to Profitability*

16) To receive your free gift, please enter your e-mail address below:
_____

Thank you very much!

Appendix B: Complete WhatTheyThink Survey Results

Business Conditions

2016 Revenues

Table 21. In terms of your 2016 revenues, how do they compare to 2015? Responses by Employee Size, Fall 2016

	Total	1–4 empl.	5–9 empl.	10–19 empl.	20–49 empl.	50–99 empl.	100–249 empl.	250+ empl.
increased more than 10%	17%	25%	16%	18%	21%	14%	15%	14%
increased between 6% and 10%	19%	4%	23%	13%	21%	16%	22%	23%
increased between 1% and 5%	18%	8%	12%	21%	16%	18%	19%	23%
stayed about the same	21%	33%	28%	18%	18%	24%	20%	18%
decreased between 1% and 5%	11%	17%	9%	15%	6%	12%	11%	14%
decreased between 6% and 10%	9%	4%	9%	7%	11%	11%	8%	8%
decreased more than 10%	5%	8%	2%	8%	7%	6%	5%	0%
INCREASE 6+%	36%	29%	40%	31%	42%	29%	36%	37%
DECREASE 6+%	14%	13%	12%	15%	18%	17%	13%	8%
NET	21%	17%	28%	16%	24%	13%	24%	29%

2017 Revenues

Table 22. How do you expect your 2017 revenues to compare to 2016? Responses by Employee Size, Fall 2016

	Total	1–4 empl.	5–9 empl.	10–19 empl.	20–49 empl.	50–99 empl.	100–249 empl.	250+ empl.
increase more than 10%	19%	38%	33%	18%	20%	13%	21%	12%
increase between 6% and 10%	25%	21%	21%	31%	26%	26%	27%	20%
increase between 1% and 5%	32%	21%	12%	25%	32%	38%	42%	34%
stay about the same	16%	8%	26%	16%	15%	18%	7%	23%
decrease between 1% and 5%	4%	8%	2%	2%	6%	3%	1%	9%
decrease between 6% and 10%	3%	0%	5%	7%	1%	2%	2%	2%
decrease more than 10%	1%	4%	2%	2%	0%	0%	0%	0%
INCREASE 6+%	45%	58%	53%	49%	46%	39%	48%	32%
DECREASE 6+%	3%	4%	7%	8%	1%	2%	2%	2%
NET	42%	54%	47%	41%	45%	37%	45%	31%

2016 Jobs/Orders

Table 23. In terms of your 2016 jobs/orders, how do they compare to 2015? Responses by Employee Size, Fall 2016

	Total	1–4 empl.	5–9 empl.	10–19 empl.	20–49 empl.	50–99 empl.	100–249 empl.	250+ empl.
increased more than 10%	21%	17%	23%	15%	24%	18%	17%	29%
increased between 6% and 10%	20%	8%	12%	11%	25%	22%	23%	21%
increased between 1% and 5%	19%	13%	21%	31%	9%	22%	20%	17%
stayed about the same	21%	42%	14%	25%	20%	19%	23%	14%
decreased between 1% and 5%	14%	17%	26%	11%	13%	11%	14%	14%
decreased between 6% and 10%	4%	0%	0%	5%	5%	7%	1%	5%
decreased more than 10%	2%	4%	5%	2%	4%	0%	1%	0%
INCREASE 6+%	40%	25%	35%	26%	49%	40%	41%	49%
DECREASE 6+%	6%	4%	5%	7%	9%	7%	2%	5%
NET	34%	21%	30%	20%	40%	33%	38%	44%

2017 Jobs/Orders

Table 24. How do you expect your 2017 jobs/orders to compare to 2016? Responses by Employee Size, Fall 2016

	Total	1–4 empl.	5–9 empl.	10–19 empl.	20–49 empl.	50–99 empl.	100–249 empl.	250+ empl.
increase more than 10%	19%	33%	19%	15%	18%	15%	24%	19%
increase between 6% and 10%	26%	25%	33%	21%	28%	29%	27%	19%
increase between 1% and 5%	31%	8%	14%	43%	28%	33%	39%	33%
stay about the same	17%	17%	21%	18%	20%	19%	9%	14%
decrease between 1% and 5%	4%	13%	7%	0%	4%	1%	1%	11%
decrease between 6% and 10%	2%	4%	0%	3%	2%	2%	0%	3%
decrease more than 10%	1%	0%	5%	0%	0%	1%	0%	0%
INCREASE 6+%	45%	58%	52%	36%	46%	44%	51%	38%
DECREASE 6+%	3%	4%	5%	3%	2%	3%	0%	3%
NET	43%	54%	48%	33%	44%	41%	51%	35%

2016 Profits

Table 25. In terms of your 2016 profitability, how did it compare to 2015? Responses by Employee Size, Fall 2016

	Total	1–4 empl.	5–9 empl.	10–19 empl.	20–49 empl.	50–99 empl.	100–249 empl.	250+ empl.
increased more than 10%	18%	21%	18%	16%	22%	12%	17%	25%
increased between 6% and 10%	12%	13%	10%	10%	15%	12%	11%	15%
increased between 1% and 5%	22%	0%	38%	26%	17%	24%	25%	16%
stayed about the same	25%	58%	15%	21%	22%	24%	23%	33%
decreased between 1% and 5%	12%	4%	5%	15%	10%	14%	14%	11%
decreased between 6% and 10%	4%	0%	8%	7%	4%	5%	2%	0%
decreased more than 10%	7%	4%	8%	5%	9%	9%	7%	0%
INCREASE 6+%	31%	33%	28%	26%	37%	24%	28%	39%
DECREASE 6+%	10%	4%	15%	11%	13%	14%	10%	0%
NET	20%	29%	13%	15%	24%	10%	18%	39%

2017 Profits

Table 26. How do you expect your 2017 profitability to compare to 2016? Responses by Employee Size, Fall 2016

	Total	1–4 empl.	5–9 empl.	10–19 empl.	20–49 empl.	50–99 empl.	100–249 empl.	250+ empl.
increase more than 10%	16%	30%	20%	13%	21%	10%	14%	15%
increase between 6% and 10%	22%	17%	30%	23%	25%	16%	22%	18%
increase between 1% and 5%	33%	22%	15%	33%	26%	43%	41%	34%
stay about the same	24%	17%	25%	25%	18%	28%	23%	28%
decrease between 1% and 5%	3%	9%	5%	3%	6%	1%	0%	5%
decrease between 6% and 10%	1%	0%	0%	2%	3%	0%	0%	0%
decrease more than 10%	1%	4%	5%	2%	0%	1%	0%	0%
INCREASE 6+%	38%	48%	50%	36%	46%	26%	36%	33%
DECREASE 6+%	2%	4%	5%	3%	3%	1%	0%	0%
NET	36%	43%	45%	33%	43%	25%	36%	33%

Business Conditions Summary

Table 27. 2016 vs. 2015 Average % Change in Revenues, Orders, and Profits
All Responses by Employee Size, Fall 2016

	Total	1–4 empl.	5–9 empl.	10–19 empl.	20–49 empl.	50–99 empl.	100–249 empl.	250+ empl.
Revenues	2.4%	1.8%	2.9%	2.0%	2.9%	1.5%	2.6%	3.2%
Orders	3.7%	2.1%	3.1%	2.8%	4.0%	3.8%	4.0%	4.9%
Profits	2.5%	3.0%	2.4%	2.0%	2.7%	1.2%	2.2%	4.4%

Table 28. Expected 2017 vs. 2016 Average % Change in Revenues, Orders, and Profits
All Responses by Employee Size, Fall 2016

	Total	1–4 empl.	5–9 empl.	10–19 empl.	20–49 empl.	50–99 empl.	100–249 empl.	250+ empl.
Revenues	5.0%	6.2%	5.4%	4.7%	5.3%	4.6%	5.8%	3.8%
Orders	5.1%	5.7%	4.7%	4.6%	5.1%	4.8%	6.2%	4.3%
Profits	4.4%	5.0%	4.6%	4.0%	5.0%	3.7%	4.8%	4.2%

Business Challenges

Table 29. In the next 12 months, which of the following will be your biggest business challenges?
Responses by Employee Size, Fall 2016 (multiple responses permitted)

	Total	1–4 empl.	5–9 empl.	10–19 empl.	20–49 empl.	50–99 empl.	100–249 empl.	250+ empl.
increasing plant productivity	31%	29%	28%	31%	39%	38%	47%	35%
managing workflow automation	23%	17%	21%	36%	37%	35%	35%	35%
competition from other print providers	36%	42%	28%	33%	25%	41%	30%	34%
capabilities of sales personnel	28%	21%	26%	41%	40%	38%	43%	26%
capabilities of production personnel	15%	13%	16%	21%	15%	19%	22%	15%
consumables and supplies prices	15%	21%	7%	11%	8%	15%	10%	11%
economic conditions	44%	54%	33%	43%	27%	29%	31%	34%
financing costs of our equipment	6%	8%	7%	0%	7%	1%	3%	2%
finding capital for investments	9%	8%	14%	8%	10%	6%	6%	5%
need for employee training	8%	0%	14%	16%	16%	9%	25%	23%
finding qualified sales personnel	23%	13%	30%	31%	37%	42%	36%	23%
finding qualified production personnel	17%	13%	16%	20%	29%	29%	38%	42%
increasing employee benefit costs	23%	21%	19%	33%	28%	26%	36%	29%
profitably handling shorter runs	16%	17%	12%	16%	16%	15%	18%	8%
deciding whether to keep or discard our offset equipment	10%	13%	7%	10%	5%	4%	2%	5%
loss of print business to digital media	18%	17%	23%	18%	16%	17%	7%	6%
pricing	26%	21%	30%	28%	27%	37%	47%	35%
job tracking	6%	4%	9%	10%	4%	3%	5%	8%
migrating production to the cloud	2%	0%	5%	3%	4%	1%	0%	0%
migrating business functions to the cloud	3%	0%	9%	5%	2%	2%	2%	3%
migrating customer service and sales to the cloud	5%	4%	7%	5%	4%	3%	2%	0%
training employees to use cloud applications	2%	0%	5%	7%	6%	2%	0%	0%
keeping up with technological changes	17%	17%	21%	13%	16%	17%	18%	12%
owner/management retirement	8%	8%	9%	8%	8%	6%	0%	3%
retirement of key production personnel	4%	0%	7%	11%	5%	8%	8%	9%
selling our business	8%	8%	12%	10%	5%	1%	2%	0%

	Total	1–4 empl.	5–9 empl.	10–19 empl.	20–49 empl.	50–99 empl.	100–249 empl.	250+ empl.
adding/updating web-to-print/ online storefront	19%	17%	30%	21%	16%	4%	9%	6%
getting web-to-print to work on smartphones and other mobile devices	5%	4%	7%	3%	5%	2%	2%	3%
adding wide-format equipment/ services	9%	8%	14%	10%	7%	8%	8%	5%
adding packaging printing equipment/services	1%	0%	0%	5%	3%	3%	6%	3%
transitioning jobs from offset to high-speed production inkjet equipment	5%	8%	0%	3%	4%	2%	5%	12%
adding non-print media capabilities (web design, app development, social media management, etc.)	13%	17%	9%	8%	9%	4%	5%	5%
none	0%	0%	0%	0%	1%	1%	0%	2%
other	4%	4%	2%	10%	4%	0%	8%	9%

Business Opportunities

Table 30. In the next 12 months, which of the following represent your best new business opportunities?
Responses by Employee Size, Fall 2016 (multiple responses permitted)

	Total	1–4 empl.	5–9 empl.	10–19 empl.	20–49 empl.	50–99 empl.	100–249 empl.	250+ empl.
improving economic conditions	30%	38%	16%	28%	29%	23%	22%	18%
customers outsourcing more work to us	24%	21%	28%	25%	31%	26%	30%	28%
increasing sales through print brokers	12%	13%	7%	23%	9%	13%	10%	9%
partnering with other print providers	25%	33%	7%	28%	18%	19%	17%	15%
helping clients get their websites to work on mobile devices	3%	0%	9%	7%	4%	0%	2%	3%
offering electronic/non-print services for customers (web design, app development, social media management, etc.)	11%	8%	14%	13%	15%	11%	23%	14%
helping customers integrate print and non-print marketing campaigns	27%	25%	28%	31%	28%	24%	35%	34%

	Total	1–4 empl.	5–9 empl.	10–19 empl.	20–49 empl.	50–99 empl.	100–249 empl.	250+ empl.
using marketing automation for our business (like HubSpot, Eloqua, Marketo)	5%	4%	7%	3%	8%	2%	8%	5%
selling marketing automation services to our customers	4%	0%	7%	8%	10%	8%	18%	12%
adding additional offset printing equipment	3%	0%	2%	10%	5%	7%	14%	6%
adding digital printing equipment	21%	21%	23%	23%	15%	22%	27%	34%
customized, personalized, or variable-data printing jobs	30%	33%	26%	34%	24%	22%	25%	23%
disposing of offset equipment to concentrate on digital printing	5%	8%	2%	2%	2%	3%	0%	2%
broadening bindery/finishing equipment/services	11%	13%	5%	11%	11%	11%	18%	6%
adding "digital enhancement" finishing technologies (like Scodix, Highcon, MGI)	1%	0%	0%	3%	3%	4%	5%	2%
adding wide-format printing capabilities	17%	13%	26%	20%	21%	20%	11%	8%
adding textile/fabric printing capabilities	2%	0%	2%	8%	1%	2%	1%	8%
adding packaging printing capabilities	8%	8%	2%	11%	7%	7%	11%	9%
broadening fulfillment, shipping, mailing capabilities	11%	8%	9%	15%	24%	9%	23%	12%
automating production	15%	13%	14%	20%	24%	17%	26%	22%
adding web-to-print/online storefront	10%	4%	23%	10%	13%	7%	13%	5%
getting more customers using smartphones and other mobile devices	5%	8%	2%	2%	0%	1%	1%	2%
migrating production to the cloud	3%	4%	2%	3%	1%	1%	1%	0%
migrating business functions to the cloud	4%	4%	2%	7%	3%	2%	1%	2%
migrating customer service and sales to the cloud	1%	0%	0%	7%	2%	1%	3%	0%
training employees to use cloud applications	1%	0%	2%	2%	4%	2%	2%	2%
acquiring another company	20%	17%	23%	21%	22%	24%	33%	29%
selling our company	8%	8%	7%	11%	10%	1%	1%	2%
hiring new salespeople	20%	13%	23%	26%	38%	36%	36%	22%
none	1%	0%	2%	2%	1%	2%	0%	0%
other	6%	8%	2%	8%	5%	1%	2%	2%

Planned Investments

Table 31. Which of the following investment items have you budgeted for and plan to acquire in the next 12 months?
Responses by Employee Size, Fall 2016 (multiple responses permitted)

	Total	1–4 empl.	5–9 empl.	10–19 empl.	20–49 empl.	50–99 empl.	100–249 empl.	250+ empl.
additional space/new location	10%	8%	9%	18%	10%	14%	16%	14%
color measurement equipment (densitometer, spectrophotometer)	3%	4%	0%	5%	2%	3%	13%	8%
color management software	3%	4%	0%	3%	3%	5%	9%	11%
computer-to-plate equipment	3%	0%	12%	5%	3%	3%	5%	2%
finishing/bindery equipment for offset/analog production	7%	8%	2%	3%	8%	7%	31%	14%
finishing/bindery equipment for digital production	22%	21%	21%	26%	24%	23%	24%	20%
toner-based color digital press (like HP Indigo, Xerox iGen)	11%	4%	19%	21%	17%	16%	18%	14%
high-speed production inkjet - continuous feed (like HP PageWide, Canon Océ ColorStream/ImageStream)	2%	0%	2%	2%	3%	7%	14%	22%
high-speed production inkjet - sheetfed (like Canon Océ i300, Xerox Brenva)	1%	0%	2%	2%	2%	4%	9%	5%
sheetfed offset press (4 or more colors) new	4%	4%	0%	5%	2%	5%	10%	11%
sheetfed offset press (4 or more colors) used	2%	0%	2%	8%	3%	4%	8%	8%
rebuilding our web offset press	1%	0%	2%	2%	0%	3%	6%	8%
wide-format color printer (24 in.+)–solvent/eco-solvent (like Epson, Roland)	2%	0%	7%	3%	3%	3%	3%	2%
wide-format color printer (24 in.+)–latex (like HP Latex)	5%	4%	7%	7%	4%	3%	6%	3%
wide-format color printer (24 in.+)–flatbed UV (like EFI VUTEk, Canon Océ Arizona, HP Scitex)	4%	0%	7%	5%	15%	13%	9%	3%
dye-sublimation printer (like Epson, Roland, Mimaki)	2%	0%	9%	2%	2%	0%	0%	2%
packaging press/printer–corrugated	0%	0%	0%	0%	0%	1%	0%	0%

	Total	1–4 empl.	5–9 empl.	10–19 empl.	20–49 empl.	50–99 empl.	100–249 empl.	250+ empl.
packaging press/printer–folding carton	0%	0%	0%	0%	2%	1%	0%	3%
packaging press/printer–flexible packaging	0%	0%	0%	0%	1%	0%	0%	3%
prepress RIP for our wide-format printers	4%	4%	2%	3%	4%	2%	1%	2%
prepress RIP for other devices	1%	0%	2%	5%	1%	3%	2%	0%
Management Information System (MIS)	11%	8%	14%	13%	16%	15%	17%	14%
Customer Relations Management (CRM) system	9%	8%	12%	8%	12%	9%	11%	14%
workflow automation software	15%	17%	12%	10%	21%	17%	23%	18%
none	26%	33%	26%	15%	18%	15%	8%	6%
other	7%	8%	5%	8%	5%	5%	2%	6%

New Product Areas

Table 32. Do you plan to add any of the following capabilities in the next 12 months? Responses by Employee Size, Fall 2016 (multiple responses permitted)

	Total	1–4 empl.	5–9 empl.	10–19 empl.	20–49 empl.	50–99 empl.	100–249 empl.	250+ empl.
high-speed production inkjet (like HP PageWide, Canon Océ ColorStream/ImageStream)	9%	8%	7%	7%	12%	9%	15%	23%
wide-format printing (like signs, displays, banners)	19%	17%	26%	25%	16%	18%	8%	9%
textile/fabric printing for soft signage	8%	4%	14%	15%	7%	6%	3%	8%
textile/fabric printing for garment printing/decorating	1%	0%	0%	10%	1%	1%	1%	2%
specialty printing (like coffee mugs, golf balls, smartphone cases)	11%	13%	7%	16%	12%	4%	5%	5%
corrugated packaging printing	1%	0%	0%	2%	3%	1%	1%	3%
folding carton printing/converting	4%	4%	2%	2%	5%	4%	9%	6%
flexible packaging printing/ converting	1%	0%	2%	3%	2%	2%	2%	5%
3D printing	6%	8%	0%	5%	5%	3%	1%	3%
printed electronics	0%	0%	0%	0%	1%	0%	0%	5%
none	42%	42%	40%	46%	46%	45%	40%	29%
other	3%	4%	2%	2%	1%	1%	6%	2%

Industry Events and Trade Shows

Table 33. Which of the following events are you planning to attend in 2017? Responses by Employee Size, Fall 2016 (multiple responses permitted)

	Total	1–4 empl.	5–9 empl.	10–19 empl.	20–49 empl.	50–99 empl.	100–249 empl.	250+ empl.
EFI Connect	6%	4%	5%	7%	7%	14%	20%	15%
Dscoop	7%	4%	5%	5%	21%	18%	26%	14%
thINK	1%	0%	0%	0%	3%	1%	5%	9%
Graphics of the Americas	4%	4%	5%	3%	3%	3%	2%	5%
ISA Sign Expo	6%	4%	9%	7%	6%	4%	0%	6%
SGIA Expo	12%	4%	21%	15%	25%	17%	19%	15%
Print 17 (Chicago)	36%	33%	30%	36%	55%	38%	50%	38%
LabelExpo	3%	4%	0%	3%	3%	2%	6%	11%
CPP Expo	0%	0%	0%	2%	1%	0%	2%	2%
none	33%	38%	28%	43%	20%	28%	13%	22%
other	12%	8%	21%	18%	11%	4%	6%	6%

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 2016. The 2012 data are from the Economic Census. For clarity, we included only the most recent five years for which we had data.

Table 34. Value of Shipments of Selected Paper and Print Products ($ Million), 2010–2014

NAICS	Industry	2010	2011	2012	2013	2014
322110	Pulp mills	$6,689,212	$7,393,562	$7,824,151	$7,880,751	$7,809,321
3221101	Special alpha and dissolving woodpulp (sulfite and sulfate for chemical conversion, papermaking, and other uses)	$5,296,414	$6,085,997	$6,533,770	$6,703,290	$6,648,498
3221103	Sulfate woodpulp, including soda	$-	$-	$-	$-	$-
3221105	Sulfite and other woodpulp	$-	$-	$-	$-	$-
3221107	Pulp, other than wood, and pulp mill byproducts, nec	$1,384,210	$1,297,070	$1,285,511	$1,157,765	$1,137,336
322110W	Pulp mill products, nsk, total	$1,558	$-	$4,870	$19,696	$23,488
322121	Paper, except newsprint, mills	$46,491,556	$45,811,483	$43,200,234	$43,915,366	$42,085,372
3221211	Clay coated printing and converting paper	$-	$-	$-	$-	$-
3221213	Uncoated freesheet paper (containing not more than 10 percent mechanical fiber)	$-	$-	$-	$-	$-
3221215	Bleached bristols, excluding cotton fiber index and bogus (weight more than 150 grams per sq meter)	$-	$-	$20,140,339	$20,944,790	$20,004,567
3221217	Cotton fiber paper (containing 25 percent or more cotton or similar fibers) and thin paper	$-	$-	$-	$-	$-
3221219	Unbleached kraft (not less than 80 percent) packaging and industrial converting paper	$-	$-	$-	$-	$-
322121A	Packaging and industrial converting paper, except unbleached kraft	$-	$-	$-	$-	$-
322121C	Special industrial paper, except specialty packaging, including absorbent, battery separator, electrical papers, etc	$-	$-	$-	$-	$-

NAICS	Industry	2010	2011	2012	2013	2014
322121E	Construction paper	$-	$-	$-	$-	$-
322121G	Tissue paper and other machine creped paper	$-	$-	$-	$-	$-
322121J	Sanitary napkins and tampons (made in paper mills)	$-	$-	$-	$-	$-
322121L	Disposable diapers (usually containing pulp or cellulose fibers), and similar disposable products (made in paper mills)	$-	$-	$-	$-	$-
322121N	Sanitary tissue paper products (made in paper mills)	$-	$-	$19,388,622	$-	$17,268,473
322121W	Paper (except newsprint) mill products, nsk, total	$-	$-	$-	$-	$-
322122	Newsprint mills	$2,978,394	$3,088,123	$3,124,244	$2,277,787	$1,935,044
3221221	Newsprint	$1,679,908	$1,757,444	$2,154,097	$1,554,564	$1,301,583
3221223	Uncoated groundwood paper (containing more than 10 percent mechanical fiber)	$-	$-	$-	$-	$-
322122W	Newsprint mill products, nsk, total	$-	$-	$-	$1,896	$4,407
322130	Paperboard mills	$29,060,430	$29,461,848	$29,010,664	$29,752,948	$30,308,477
3221301	Unbleached kraft packaging and industrial converting paperboard (80 percent or more virgin woodpulp)	$13,854,246	$13,924,882	$13,951,703	$13,452,295	$13,752,624
3221303	Bleached packaging and industrial converting paperboard (80 percent or more virgin bleached woodpulp)	$5,158,753	$5,282,459	$5,331,078	$4,918,442	$4,969,895
3221305	Semichemical paperboard, including corrugating medium (75 percent or more virgin woodpulp)	$-	$-	$1,615,379	$2,280,474	$2,547,401
3221307	Recycled paperboard	$7,889,510	$7,969,047	$8,018,278	$9,017,282	$8,922,468
3221309	Wet machine board, including binders' board and shoe board	$-	$-	$-	$-	$-
322130W	Paperboard mill products, nsk, total	$43,568	$45,436	$-	$-	$-
322211	Corrugated and solid fiber boxes	$33,232,115	$34,047,830	$32,762,806	$35,487,568	$36,838,080
3222110	Corrugated and solid fiber boxes, including pallets	$33,232,115	$34,047,830	$32,762,806	$35,487,568	$36,838,080
322212	Folding paperboard boxes	$11,745,375	$11,457,217	$12,859,104	$13,949,931	$14,115,135
3222120	Folding paperboard boxes, packaging, and packaging components	$11,745,375	$11,457,217	$12,859,104	$13,949,931	$14,115,135
322213	Setup paperboard boxes	$655,327	$646,937	$1,161,028	$750,027	$842,971

NAICS	Industry	2010	2011	2012	2013	2014
322214	Fiber cans, tubes, drums, and similar products	$2,252,195	$2,255,587	$1,703,608	$1,708,878	$1,644,514
3222141	Paperboard fiber drums with ends of any material	$299,352	$306,805	$339,511	$300,114	$278,289
3222143	Fiber cans, tubes, and similar fiber products	$1,874,082	$1,868,913	$-	$-	$-
322214W	Fiber cans, tubes, drums, and similar products, nsk, total	$4,004,280	$-	$-	$-	$-
322215	Nonfolding sanitary food containers	$4,014,852	$3,978,360	$-	$-	$-
3222151	Milk and milk type paperboard cartons, including juice, beverage, and other products	$893,680	$869,111	$845,626	$805,959	$-
3222153	Cups and liquid tight paper and paperboard containers	$1,427,911	$1,457,906	$1,646,512	$1,707,405	$1,729,656
3222155	Other sanitary paper and paperboard food containers, boards, and trays, nec, except folding	$1,664,431	$1,634,536	$1,796,616	$1,877,277	$1,997,019
322215W	Nonfolding sanitary food containers, nsk, total	$18,258	$16,807	$-	$-	$-
322221	Coated and laminated packaging paper and plastics film	$1,694,513	$1,756,937	$-	$-	$-
3222211	Single web paper, coated rolls and sheets, including waxed, for flexible packaging uses	$-	$-	$1,258,686	$1,297,766	$1,476,978
3222213	Multiweb laminated rolls and sheets, except foil and film film, for flexible packaging uses	$860,209	$900,581	$1,064,951	$1,080,144	$886,624
322221W	Coated and laminated packaging paper and plastics film, nsk, total	$127,575	$126,753	$-	$-	$-
322222	Coated and laminated paper	$13,054,821	$12,708,977	$-	$-	$-
3222221	Printing paper, coated at establishments other than where paper was produced	$1,662,000	$1,586,158	$1,615,534	$1,613,286	$1,631,605
3222223	Gummed products	$320,264	$318,630	$261,484	$254,375	$211,101
3222225	Pressure sensitive products	$6,927,974	$6,767,559	$6,518,839	$6,292,533	$6,433,674
3222226	Wallcoverings	$378,223	$381,033	$388,075	$405,197	$302,552
3222227	Gift wrap paper	$139,735	$143,079	$179,069	$170,977	$150,934
3222229	Other coated and processed papers, nec, except for packaging uses	$-	$-	$2,612,575	$2,748,600	$2,844,490
322222W	Coated and laminated paper, nsk, total	$-	$-	$-	$-	$-

NAICS	Industry	2010	2011	2012	2013	2014
322223	Plastics, foil, and coated paper bags	$1,032,568	$-	$-	$-	$-
3222231	Specialty bags, pouches, and liners, coated single web paper	$254,138	$-	$323,613	$284,377	$328,286
3222233	Specialty bags, pouches, and liners, multiweb laminations and foil, except film film	$785,889	$800,977	$545,568	$516,991	$781,601
322223W	Plastics, foil, and coated paper bags, nsk, total	$29,969	$-	$-	$-	$-
322224	Uncoated paper and multiwall bags	$2,255,548	$2,334,404	$-	$-	$-
3222241	Uncoated single web paper grocers' bags and sacks and variety and shopping bags	$965,994	$1,033,544	$1,313,495	$1,307,170	$1,236,765
3222243	Shipping sacks and multiwall bags, all materials except textiles	$1,253,376	$1,263,003	$1,215,335	$1,376,549	$1,088,651
322224W	Uncoated paper and multiwall bags, nsk, total	$36,178	$37,857	$-	$-	$-
322225	Laminated aluminum foil for flexible packaging uses	$1,525,355	$1,542,142	$1,620,287	$1,582,643	$1,482,175
322226	Surface coated paperboard	$1,082,102	$1,089,622	$-	$-	$-
322231	Die-cut paper office supplies manufacturing	$2,991,620	$2,999,128	$-	$-	$-
3222311	Die cut paper and paperboard office supplies	$863,659	$848,312	$1,033,077	$993,890	$888,823
3222313	Paper supplies for business machines and other miscellaneous unprinted paper office supplies, nec .. 2001..	$2,005,669	$2,044,054	$1,911,690	$1,839,505	$1,751,031
322231W	Die cut paper and paperboard office supplies, nsk, total	$-	$-	$-	$-	$-
322232	Envelopes	$2,582,412	$2,708,239	$2,739,085	$2,628,614	$2,426,048
3222320	Envelopes, commercial, all types and materials	$2,582,412	$2,708,239	$2,739,085	$2,628,614	$2,426,048
322233	Stationery, tablet, and related products	$1,044,615	$877,411	$6,829,047	$6,594,012	$6,023,990
3222331	Stationery	$300,653	$309,133	$291,663	$350,157	$288,317
3222333	Tablets, pads, and related products	$647,773	$487,669	$608,804	$530,796	$413,485
322233W	Stationery, tablets, and related products, nsk, total	$96,189	$80,609	$244,729	$251,051	$256,287
322291	Sanitary paper products	$10,690,665	$11,049,674	$12,102,303	$11,741,584	$11,721,050
3222911	Sanitary napkins and tampons (not made in paper mills)	$-	$-	$-	$-	$-

NAICS	Industry	2010	2011	2012	2013	2014
3222913	Disposable diapers (usually containing pulp or cellulose fibers) and similar disposable products (not made in paper mills)	$6,366,698	$6,339,581	$6,698,508	$6,401,452	$7,054,506
3222915	Sanitary tissue paper products (not made in paper mills)	$4,084,147	$4,450,796	$4,960,675	$4,960,909	$4,260,386
322291W	Sanitary paper products, nsk, total	$252,368	$245,106	$443,120	$379,225	$406,158
322299	Other converted paper products	$4,640,938	$4,490,951	$5,223,525	$5,372,619	$5,525,685
3222991	Molded pulp goods, including egg cartons, florist pots, food trays, etc	$507,418	$535,036	$596,370	$682,826	$634,130
3222993	Other converted paper and paperboard products, nec	$3,689,676	$3,575,785	$3,668,537	$3,755,641	$4,232,850
322299W	All other converted paper products, nsk, total	$-	$-	$958,618	$934,152	$658,706
323110	Commercial lithographic printing	$41,042,982	$39,753,971	$-	$-	$-
323111	Commercial printing (except screen and books)	$-	$-	$65,396,819	$64,431,634	$64,454,097
3231101	Magazine and periodical printing (lithographic) (offset)	$6,377,197	$5,826,875	$4,620,210	$4,491,981	$4,644,810
3231103	Label and wrapper printing (lithographic) (offset)	$2,588,529	$2,700,797	$2,864,804	$2,787,149	$2,815,732
3231105	Catalog and directory printing (lithographic) (offset)	$3,965,185	$3,910,768	$3,546,204	$3,337,643	$3,315,793
3231107	Financial and legal printing (lithographic) (offset)	$2,029,064	$2,031,656	$1,983,553	$1,893,638	$2,047,622
3231109	Advertising printing (lithographic) (offset)	$13,026,983	$12,618,488	$13,087,607	$12,362,108	$11,481,588
323110B	Other general job printing, nec (lithographic) (offset)	$8,467,217	$8,336,838	$6,347,993	$6,857,366	$7,278,819
323110W	Commercial lithographic printing, nsk, total	$4,593,515	$4,328,550	$-	$-	$-
323111	Commercial gravure printing	$3,029,576	$2,998,086	$-	$-	$-
3231111	Magazine and periodical printing (gravure)	$409,301	$-	$385,421	$389,402	$385,454
3231113	Label and wrapper printing (gravure)	$756,442	$764,556	$826,951	$875,309	$864,028
3231115	Catalog and directory printing (gravure)	$772,066	$-	$-	$747,653	$759,435
3231117	Advertising printing (gravure)	$521,378	$523,511	$678,502	$705,472	$742,453
3231119	Business stationery and all other printing (gravure)	$385,090	$408,729	$-	$-	$-

NAICS	Industry	2010	2011	2012	2013	2014
323111W	Commercial gravure printing, nsk, total	$185,301	$188,068	$339,281	$420,160	$400,720
323112	Commercial flexographic printing	$7,737,922	$7,915,678	$-	$-	$-
3231121	Label and wrapper printing (flexographic)	$6,037,694	$6,215,271	$6,097,124	$6,217,636	$6,494,748
3231123	Flexographic printing, nec (excluding labels and wrappers)	$1,429,239	$1,438,151	$1,582,892	$1,534,880	$1,530,831
323112W	Commercial flexographic printing, nsk, total	$270,989	$262,256	$-	$-	$-
323113	Commercial screen printing	$7,333,642	$7,188,193	$7,071,063	$6,966,445	$7,341,106
3231132	Label printing (screen)	$568,453	$603,514	$530,329	$510,821	$542,700
3231131	Screen printing, except on textiles	$3,249,405	$3,317,101	$2,073,891	$2,078,522	$1,962,756
3231133	Screen printing on garments, apparel accessories, and other fabric articles	$2,143,581	$2,032,363	$3,332,290	$3,431,569	$3,688,536
323113W	Commercial screen printing, nsk, total	$1,372,204	$1,235,214	$1,134,552	$1,121,499	$1,147,114
323114	Quick printing	$2,454,359	$2,422,959	$1,348,044	$1,354,792	$1,056,732
323115	Digital printing	$7,394,695	$7,560,068	$8,921,016	$8,973,914	$8,818,048
323116	Manifold business form printing	$3,865,731	$3,450,262	$-	$-	$-
3231161	Unit set forms, loose or bound	$1,134,985	$1,077,555	$752,454	$658,751	$687,521
3231163	Manifold books and pegboard accounting systems	$52,051	$54,722	$-	$-	$-
3231165	Custom continuous business forms	$1,009,894	$1,052,399	$1,205,305	$1,056,461	$1,072,288
3231167	Stock continuous business forms	$333,084	$-	$-	$-	$-
3231169	Checkbooks (including inserts and refills, but excluding those in continuous form and die cut)	$920,608	$-	$1,358,353	$1,704,340	$1,589,402
323116W	Manifold business form printing, nsk, total	$438,340	$-	$-	$-	$-
323117	Book printing	$4,868,806	$4,726,840	$4,527,479	$4,450,311	$4,576,536
3231171	Textbook printing and binding	$842,232	$819,074	$797,934	$789,204	$758,553
3231173	Technical, scientific, and professional book printing and binding	$530,726	$527,597	$473,050	$439,388	$418,968
3231175	Religious book printing and binding	$332,034	$316,822	$301,775	$301,619	$308,192
3231177	General book (trade, etc.) printing and binding	$1,621,382	$1,528,976	$1,343,092	$1,315,903	$1,453,295
3231179	Other book printing and binding, nec	$827,447	$857,335	$879,462	$868,039	$946,995
323117A	Books, printing only, not bound	$188,948	$170,087	$240,203	$236,568	$233,032

NAICS	Industry	2010	2011	2012	2013	2014
323117C	Pamphlet printing and binding or printing only (excluding advertising pamphlets)	$225,379	$209,114	$203,146	$198,707	$170,661
323117W	Book printing, nsk, total	$306,639	$297,832	$288,817	$300,885	$286,839
323118	Blankbooks and looseleaf binders and devices	$1,067,553	$1,014,035	$-	$-	$-
3231181	Blankbook making, except checkbooks	$183,205	$168,425	$-	$-	$-
3231183	Looseleaf binders, devices, and forms, including those used for time planners organizers, appointment books, photo albums, scrap books, etc	$818,036	$801,903	$644,556	$547,643	$342,908
323118W	Blankbooks and looseleaf binders and devices, nsk, total	$66,312	$-	$444,621	$350,964	$323,135
323119	Other commercial printing	$1,985,178	$1,857,618	$-	$-	$-
3231191	Magazine and periodical printing (letterpress)	$-	$-	$-	$-	$-
3231193	Label and wrapper printing (letterpress)	$308,987	$309,417	$305,646	$239,094	$207,529
3231195	Catalog and directory printing (letterpress)	$-	$-	$-	$-	$-
3231197	Financial and legal printing (letterpress)	$-	$-	$-	$-	$-
3231199	Advertising printing (letterpress)	$72,189	$58,883	$-	$-	$-
323119B	Other general job printing (letterpress)	$787,052	$729,002	$537,172	$530,025	$603,973
323119E	Engraving (printing)	$124,521	$116,082	$143,490	$151,949	$148,128
323119J	All other commercial printing	$285,368	$248,032	$240,928	$237,827	$285,266
323119W	Other commercial printing, nsk, total	$407,062	$396,201	$-	$-	$-
323120	Support activities for printing	$-	$-	$4,334,138	$4,336,059	$4,093,120
323121	Tradebinding and related work	$1,910,418	$1,807,275	$-	$-	$-
3231211	Edition, library, and other hardcover bookbinding	$234,182	$211,012	$202,654	$204,905	$198,614
3231215	Softcover/pamphlet/sample/ other binding (printed elsewhere)	$523,429	$516,667	$474,368	$503,919	$483,646
3231217	Misc. binding/postpress work incl. foil stamping/die-cutting/etc.	$861,294	$805,044	$722,610	$674,379	$681,714
3231213	Other book and pamphlet binding, and related binding and post press work, nec	$-	$-	$-	$-	$-
323121W	Tradebinding and related work, nsk, total	$291,515	$274,553	$-	$-	$-

NAICS	Industry	2010	2011	2012	2013	2014
323122	Prepress services	$2,812,482	$2,748,424	$-	$-	$-
3231221	Prepress services, except platemaking (including film, assembled flats, color separations, typesetting, imagesetting, etc.)	$1,820,737	$1,788,446	$1,462,984	$1,481,747	$1,367,917
3231223	Printing plates, prepared for printing, excluding blank plates	$666,716	$641,146	$959,242	$976,360	$960,436
323122W	Prepress services, nsk, total	$325,027	$318,832	$512,281	$494,748	$400,792