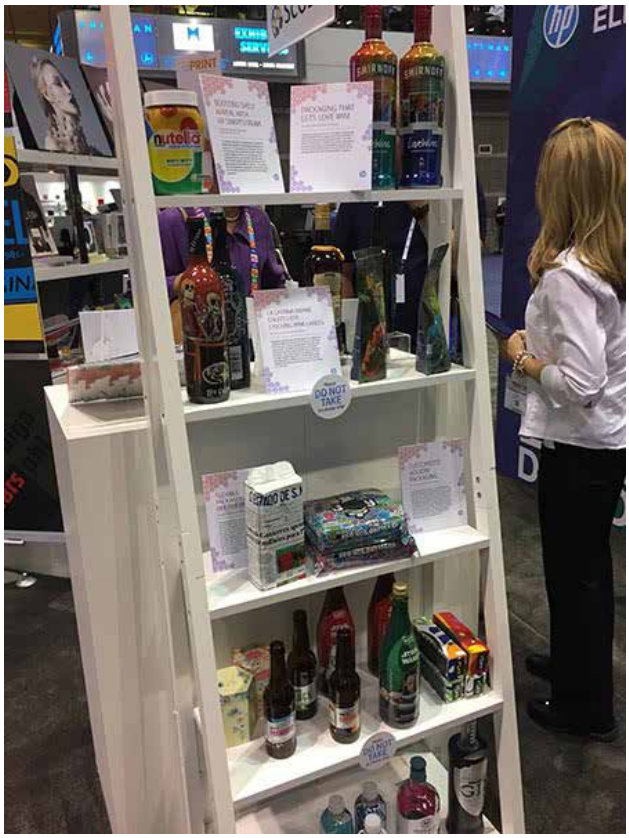

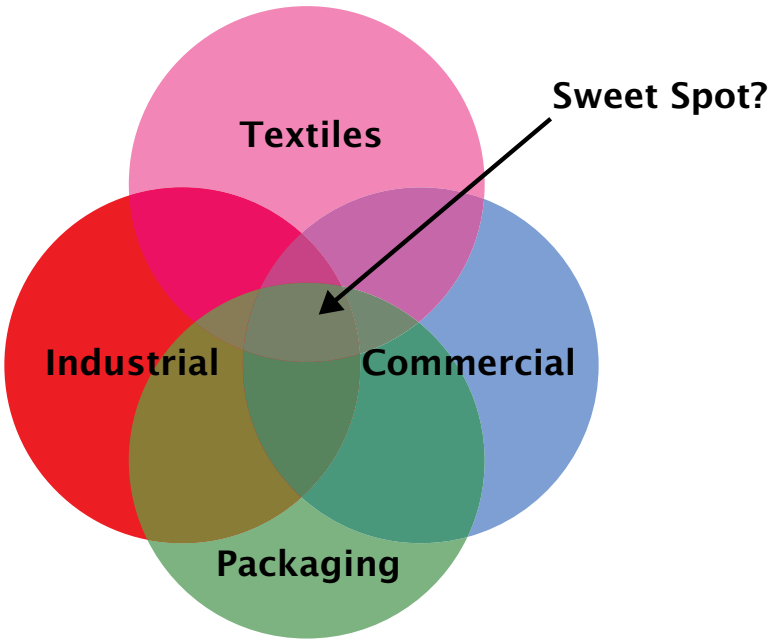

Printing Outlook 2019

The WhatTheyThink Overview of the Current State of the Printing Industry

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Printing Outlook 2019

WhatTheyThink's Overview of the Current Economic State of the Industry

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Introduction: Don't Stop the Presses

What has the *Washington Post* got against the printing industry? Check out this misleading lede from a February 8 story[1]:

> Stop the presses. As of this month, "printer" and "screen printer" are no longer official jobs — at least as far as the Labor Department's flagship release is concerned. The same goes for "printing support" jobs such as platemaking and prepress work.
>
> Each year, the Bureau of Labor Statistics takes stock of industries that have become too small to be counted as a separate category in the database accompanying its widely watched monthly report on U.S. non-farm payrolls.

Well, that's not *entirely* true. Let us explain.

The data that we report on WhatTheyThink.com and which comprise a large part of this report come from the Commerce Dept.'s Census Bureau and the Labor Dept.'s Bureau of Labor Statistics (BLS), the former of which publishes the quinquennial *Economic Census* and annual *County Business Patterns*, and the latter of which publishes monthly employment reports.

If you're reading this report and follow WhatTheyThink data analysis, you are familiar with the North American Industrial Classification System (NAICS). NAICS 323 is Printing and Related Support Activities. When we report the value of print shipments and other data, it's for businesses classified in NAICS 323. Three-digit NAICS codes are further divided into specific sub-categories. As of the 2017 Economic Census, NAICS 323 is further broken down into:

- 32311 (Printing)
- 323111 (Commercial Printing, except Screen and Books)
- 323113 (Commercial Screen Printing)
- 323117 (Books Printing)
- 32312 (Support Activities for Printing—aka prepress and postpress services)

Two things to note about NAICS codes. The first is that they are selected by individual businesses (or businesses' accountants) when they fill out tax and other government forms. The second is that NAICS codes are always in flux as businesses and industries change with time, and these agencies decide after each Economic census which are worth keeping and which have gone past their sell-by date. This is only natural. If no business selects Buggy Whip Manufacturer, why should the government keep tracking that category?

So every five-year Economic Census triggers a NAICS revision, and in fact printing is no stranger to them. (Notice the gaps in the numbering in the above list.) Until the 2012 Economic Census, Support Activities for Printing (32312) had been further broken down into separate Prepress Services and Tradebinding. No more. Indeed, at one time, Color Separators and Platemakers each had their own NAICS code. As these businesses started to dwindle in number, the Census Bureau (and BLS) had a

[1] See https://www.washingtonpost.com/us-policy/2019/02/08/stop-presses-commercial-printers-other-vanishing-jobs-labor-department-cant-track-anymore/?utm_term=.43f252f50a46.

harder time tracking them since no one was reporting themselves as such. Trade Typographer used to have its own NAICS—until the advent of desktop publishing when trade typographers ditched their AM Varitypers for Aldus PageMaker and started reporting themselves as Graphic Designers. Our industry has always been changing, and we are not alone. Industries and markets are dynamic things; we should not be surprised, especially today, that the old classifications are no longer entirely relevant.

(It also bears mentioning that government agencies have always focused on large industries with large enterprises, and that industries dominated by small establishments—like print—have never received detailed attention, especially now that traditional print categories are such a small part of overall GDP. See Figure 16.)

We should clarify what the BLS is in fact doing—and the BLS's reasoning is a major theme in this present report. First of all, they are *not* eliminating "printer" from the NAICS system. NAICS 323 will still be tracked for the foreseeable future, as will other smaller NAICS printing categories. Some NAICS categories are indeed being discontinued—32311 (Commercial Printing), 323113 (Commercial Screen Printing), and 32312 (Support Activities for Printing)—but, as the BLS announced[2], *only* for the Current Employment Statistics (CES) series, at least for now.

This should also not be a surprise. After all, screen printers have been adding more and more digital equipment to tap into new markets and applications. So, would they continue to classify themselves as "screen printers"—or as something that better reflects what their businesses actually do? The trick for analysts and statisticians is to find out what that "something else" is. It's also possible that printers who listened to the analysts and became "marketing services providers" now classify themselves not in a manufacturing NAICS like 323, but in a services NAICS like 541. Remember, it's all about what these businesses consider themselves to be, not what we would like them to be. As the industry evolves—Industry 4.0 anyone?—and all the various parts of the industry converge, do these businesses report themselves as Commercial Printers, or do they call themselves something else?

The current NAICS system for printing is still in effect as of the 2017 Economic Census, but in 2022 we will see further NAICS consolidation. 'Twas ever thus.

Ultimately, there are still plenty of businesses doing printing—we just need to find out where they are and what they call themselves.

We Continue...

Having gotten that out of our system, we forge ahead.

2018 was a bit of a mixed bag for the printing industry, and perhaps the year in which things turned a corner—and for the better. The shipments data we report in Section 5 showed an industry on the rebound, marking the first time in a long time

[2] The official announcement is at https://www.bls.gov/web/empsit/cesbmart.htm.

that the value of print shipments exceeded those of the previous year—at least for some months. So there's that.

We also detect a change in tenor in some of our survey results; see Section 1. We have been doing these surveys for the better part (and even some not so great parts) of the past 20 years. We have come to expect certain responses and prevailing attitudes. Not this time. There were some distinct differences from he past, which perhaps suggests that the new print business leadership has a different set of attitudes and concerns—and often what we feel are the "true" topics the industry should be addressing. (In past reports we have often chided our survey respondents for focusing on the wrong things a lot of the time. We still do, to some extent, but not as often.)

In the survey results that comprise the first portion of the present report, we look at 2018 business conditions and expected 2019 conditions; top business challenges and opportunities; top planned investments (such as they are); new product areas that printers are looking to expand into, and specific hiring plans for 2019.

When you look at the results of the survey, it's important to interpret them through the lens of survivor bias. See Appendix B for our detailed explanation of survivor bias.

How This Report Is Organized

Section 1 presents our Winter 2018–19 survey data about current (2018) and expected (2019) business conditions, specifically how print businesses fared *vis-à-vis* revenues, number of orders, and profits.

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

Section 3 presents the results of our survey question asking the extent to which commercial print businesses are looking to add new capabilities like wide-format printing, textile printing, specialty printing, 3D printing, and other new products and services.

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

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

Section 6 provides the latest general macroeconomic data. These data are important to put industry data into the proper macroeconomic context.

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

The survey methodology is detailed in Appendix A. Our—we admit, rather entertaining—explanation of survivor bias is presented in Appendix B.

1. Business Conditions

From December 2018 to February 2019, WhatTheyThink's Business Outlook Survey asked print business executives and owners about:

- perceptions of 2018 business conditions compared to 2017
- expectations of 2019 business conditions compared to 2018

Specifically, we asked about:

- revenues
- number of orders
- profits

Let's dive in.

Revenues

2018 Revenues

In terms of revenues, business in 2018 has been perceived by our survey respondents as pretty good; 42% said that revenues had increased by six percent or more compared to 2017 (up a few percentage points from last year's survey), while only 4% said that they had *de*creased by six percent or more, substantially down from last year. Fifteen percent of respondents said that revenues for 2018 stayed roughly the same compared to 2017.

We calculated an average change of +3.8% in revenues from 2017 to 2018.[3] We also adjusted the average change in revenues for inflation, backing -1.6% out of the average change in revenues.[4] Adjusted for inflation, revenues grew +2.2%.

[3] For an explanation of how we made this calculation, see the Business Conditions Summary at the end of this section.

[4] Based on current CPI (https://www.bls.gov/news.release/pdf/cpi.pdf).

Figure 1. In terms of your 2018 *revenues*, how do they compare to 2017?
All Respondents, Winter 2018–2019
Average Change: +3.8%
Average Change Adjusted for Inflation: +2.2%

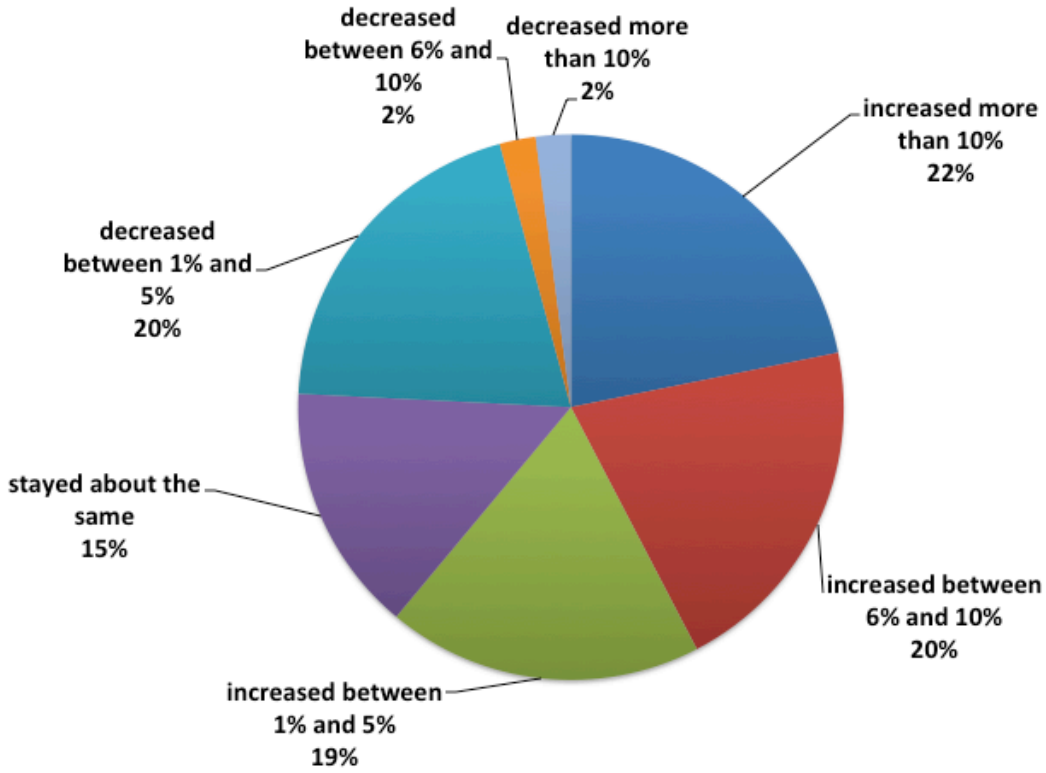


Table 1. In terms of your 2018 *revenues*, how do they compare to 2017?
Respondents by establishment size, Winter 2018–2019

	1–9 employees	10–19 employees	20–49 employees	50+ employees	All Respondents
increased more than 10%	21%	25%	22%	23%	22%
increased between 6% and 10%	22%	13%	22%	23%	21%
increased between 1% and 5%	19%	8%	22%	29%	19%
stayed about the same	15%	17%	13%	10%	15%
decreased between 1% and 5%	21%	29%	9%	9%	20%
decreased between 6% and 10%	0%	4%	13%	4%	2%
decreased more than 10%	2%	4%	0%	2%	2%
Average change	4.0%	2.5%	3.7%	4.6%	3.8%
Average adjusted for inflation	2.4%	0.9%	2.1%	3.0%	2.2%

If we look at survey results by establishment size, we find—as we often do—that the strongest businesses are those at the low end (1–9 employees) and the high end (50+ employees), with the mid-size shops experiencing middling revenue growth.

For 1–9-employee shops, 43% said that revenues had increased six percent or more from 2017 to 2018 while only 2% said they had *de*creased six percent or more. More

than one-half (55%) reported revenues staying roughly the same, or experiencing a minimal increase or decrease. The average revenue change for these folks was +4.0% before inflation.

For 10–19-employee shops, on the other hand, 44% (up from 38%) said that revenues had increased six percent or more, although 13% (up from 8%) said they had decreased six percent or more. More than one-half (54%) reported revenues staying roughly the same, or experiencing a minimal increase or decrease (but do note that 29% said revenues decreased between one and five percent; this is unchanged from last year). The average revenue change for these folks was +2.5% before inflation.

The 20–49-employee shops had it a little but better: 31% said that revenues had increased six percent or more while 20% said they had decreased six percent or more. Forty-four percent reported that revenues stayed roughly the same, or experiencing a minimal increase or decrease. The average revenue change for these folks was +3.7% before inflation.

For 50–99-employee shops, 46% (up two percentage points from last year) said that revenues had increased six percent or more while only 6% (down from 16%) said they had decreased six percent or more. Still, 48% (up from 44%) reported that revenues stayed roughly the same, or experienced a minimal increase or decrease. The average revenue change for these folks was +4.6% before inflation.

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

2018 Revenues

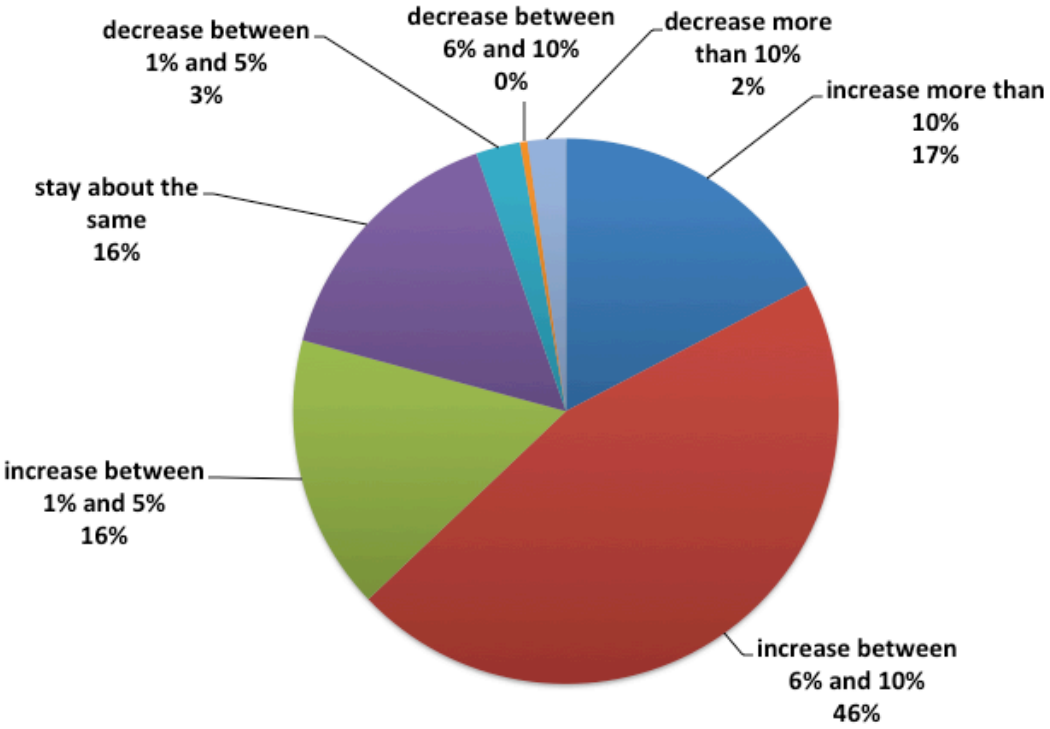
Asking about anticipated business conditions is always asking for trouble. Even during economic downturns we find a lot of optimism, some of which is likely unwarranted. Not that we should complain; anyone with a completely negative perception of their business conditions is not likely going to be experiencing massive growth. Optimism is, in many cases, a sign of a healthy business; those that are truly in trouble would certainly not be this positive unless there was some serious drug-taking going on (which we do not advocate), so here we can say that even somewhat unwarranted optimism is a good sign. It's also a good indicator of survivor bias.

Almost two-thirds (63%, up from 49% in last year's survey) of respondents expect revenues to increase by six percent or more in 2019. Only 2% of respondents expect revenues to decrease by six percent or more.

Overall, just over one-third (35%) expect revenues to hold steady, with minimal increase or decrease.

Looking at the expected average change in revenues, establishments expect a 5.8% change in 2019. If we adjust for inflation, that's looking more like a 4.2% change.

Figure 2. How do you expect your 2019 *revenues* to compare to 2018?
All Respondents, Winter 2018–2019
Average Change: +5.8%
Average Change Adjusted for Inflation: +4.2%



For 1–9-employee shops, 69% (up from 50% in the previous year) expect revenues to increase six percent or more from 2018 to 2019 while 2% expect revenues to decrease six percent or more. Three out of 10 businesses expect revenues to stay roughly the same, or undergo a minimal increase or decrease. These businesses expect an average revenue growth of 6.1% pre-inflation.

For 10–19-employee shops, on the other hand, 46% (down from 54%) expect revenues increase six percent or more, although virtually no one expects them to decrease six percent or more. More than one-half (54%, about the same as last year) expect revenues to stay roughly the same or see a minimal increase or decrease in 2019. These businesses expect an average revenue growth of 5.0% pre-inflation.

Fifty-seven percent (up from 46%) of 20–49-employee expect revenues to increase six percent or more while 13% (up from 5%) expect them to decrease six percent or more. Three out of 10 expect revenues to stay roughly the same. These businesses expect an average revenue growth of 4.5% pre-inflation.

For 50+-employee shops, 49% (down two percentage points) expect revenues to increase six percent or more and while virtually no one expects a similar decrease. One-half (51%) expect revenues to stay about the same. These businesses expect an average revenue growth of 6.0% pre-inflation.

Table 2. How do you expect your 2019 *revenues* to compare to 2018?
Respondents by establishment size, Winter 2018–2019

	1–9 employees	10–19 employees	20–49 employees	50+ employees	All Respondents
increase more than 10%	17%	13%	22%	28%	17%
increase between 6% and 10%	52%	33%	35%	21%	46%
increase between 1% and 5%	11%	33%	22%	34%	16%
stay about the same	17%	17%	4%	13%	15%
decrease between 1% and 5%	2%	4%	4%	4%	3%
decrease between 6% and 10%	0%	0%	4%	0%	0%
decrease more than 10%	2%	0%	9%	0%	2%
Average change	6.1%	5.0%	4.5%	6.0%	5.8%
Average change adjusted for inflation	4.5%	3.4%	2.9%	4.4%	4.2%

Last year, we found that optimism had been a bit tempered for 2018, but as we'll see when we look at printing shipments for 2018 (see Section 5), business was better than expected. So the increase in optimism for 2019 is not entirely unwarranted.

Number of Jobs/Orders

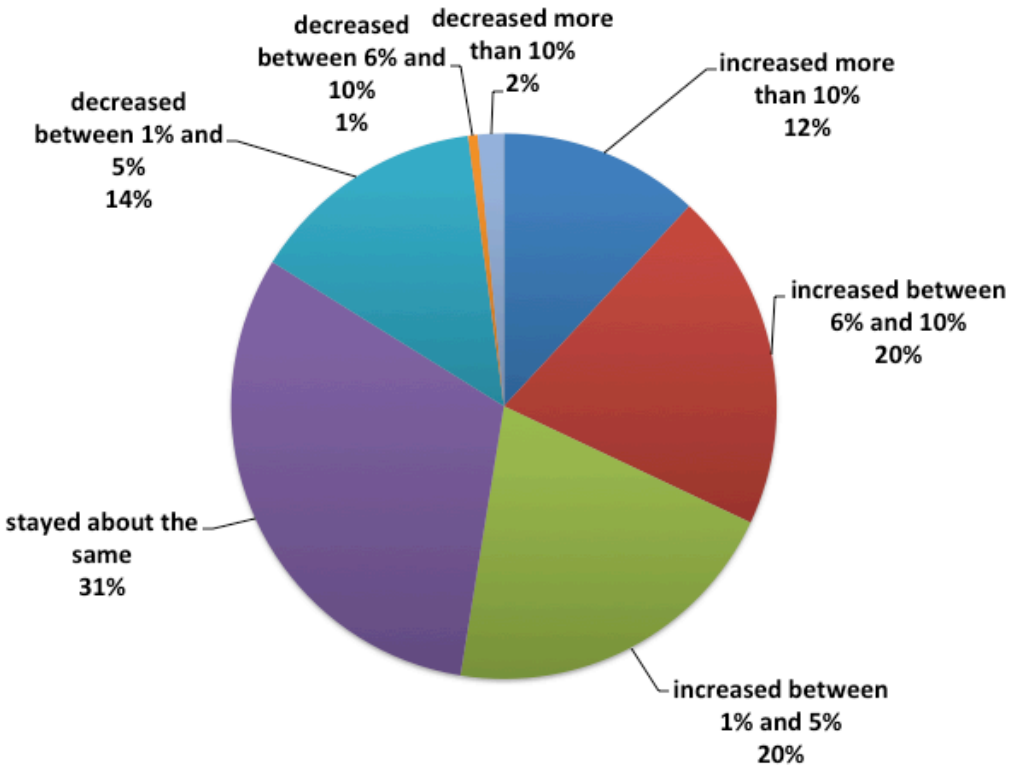
We remarked in past survey reports that there tends to be a bit of a disconnect between the number of jobs/orders and revenues.

2018 Jobs/Orders

Jobs/orders in 2018 were generally up over 2017; while 32% of print businesses (down one tick from last year) reported that jobs increased six percent or more from 2017, only 3% (down from 12%) reported that jobs/orders had decreased by six percent or more over 2017. For the majority (65%), jobs/orders were generally unchanged from 2017.

Thus we find the average change in jobs/orders from 2017 to 2018 was 3.0%—unchanged from 2016 to 2017. Comparing changes in jobs to changes in revenues, we continue to see that the number of jobs is outstripping revenues. This is digital printing in action, specifically, short-run printing. After all, a "job" or "order" can be a single, one-off wide-format print, or it can be a 10,000-sheet offset run. Anything that generates an invoice is a job or an order. Aggregating sufficient jobs like the former (or any short-run work) has been a perennial challenge—as has been charging enough to yield enough revenue to make those short-run jobs equivalent to a longer-run job—see where "pricing" comes in on our list of top business challenges in the next section.

Figure 3. In terms of your 2018 *jobs/orders*, how do they compare to 2017?
All Respondents, Winter 2018–2019
Average Change: +3.0%



For 1–9-employee shops, 28% (down from 31% the previous year) said that jobs/orders had increased six percent or more from 2016 to 2017 while only 2% (down from 19%) said they had decreased six percent or more. More than seven out of 10 (71%) reported jobs/orders staying roughly the same, or experiencing a minimal increase or decrease. The average job/order change for these businesses was +2.6%.

For 10–19-employee shops, 38% (up from 32%) said that jobs/orders had increased six percent or more while 4% (down from 13%) said they had decreased six percent or more. More than one-half (55%—unchanged from the previous year) reported jobs/orders staying roughly the same, or experiencing a minimal increase or decrease. The average job/order change for these businesses was +3.1%.

The 20–49-employee shops had it a little bit better: 46% (up from 39%) said that jobs/orders had increased six percent or more while virtually no one (down from 14%) said they had decreased six percent or more. More than one-half (55%, up from 48%) reported that jobs/orders stayed roughly the same, or experienced a minimal increase or decrease. The average job/order change for these businesses was +4.7%.

For 50+-employee shops, 46% (down from 51%) said that jobs/orders had increased six percent or more while only 2% (down from 9%) said they had decreased six percent or more. More than one-half (52%, up from 40%) reported that jobs/orders stayed roughly the same, or experienced a minimal increase or decrease.

Table 3. In terms of your 2018 *jobs/orders*, how do they compare to 2017? Respondents by establishment size, Winter 2018–2019

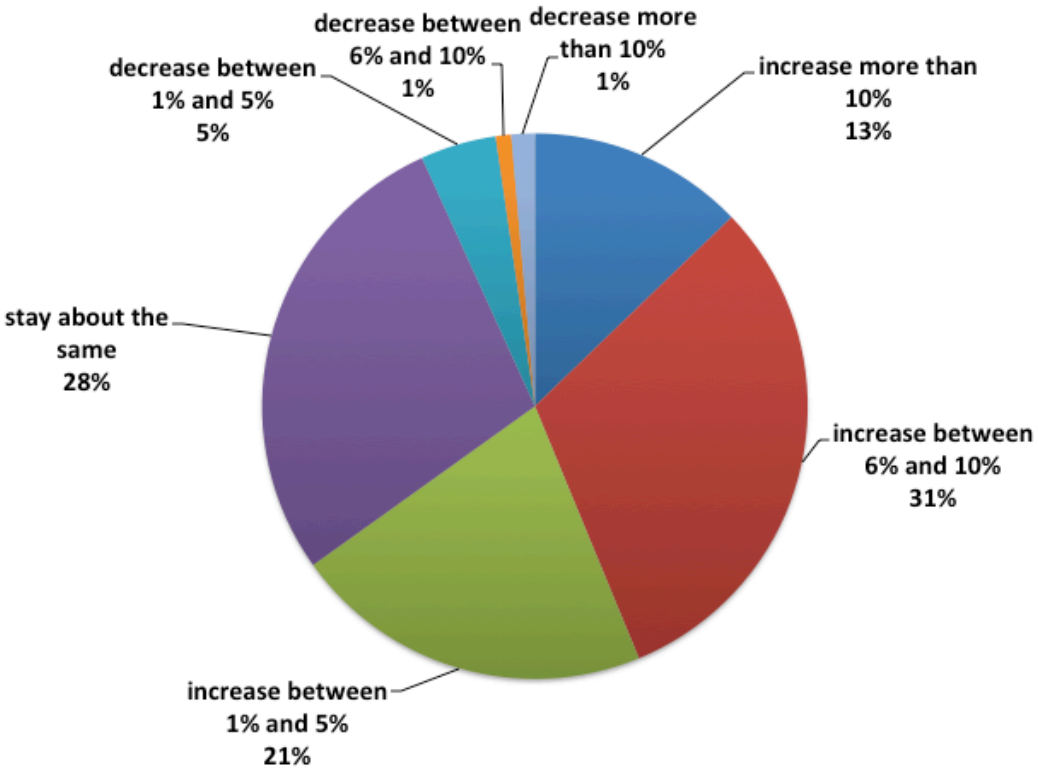
	1–9 employees	10–19 employees	20–49 employees	50+ employees	All Respondents
increased more than 10%	9%	17%	23%	21%	12%
increased between 6% and 10%	19%	21%	23%	25%	20%
increased between 1% and 5%	22%	17%	18%	20%	21%
stayed about the same	36%	17%	23%	22%	31%
decreased between 1% and 5%	13%	25%	14%	10%	14%
decreased between 6% and 10%	0%	4%	0%	0%	1%
decreased more than 10%	2%	0%	0%	2%	2%
Average change	2.6%	3.1%	4.7%	4.5%	3.0%

2019 Jobs/Orders

Do print businesses see jobs/orders continuing to grow? Unlike revenues, yes, but not dramatically; 44% (unchanged from the previous year) expect jobs/orders to increase six percent or more in 2019, while only 2% (also unchanged) expect them to decrease by the same amount. The majority (54%) expects jobs/orders to stay about the same or perhaps increase slightly (21%, down from 29%).

We calculated an average expected change in jobs/orders of +4.3% from 2018 to 2019, down from the expectation of +5.1% job/order growth from 2017 to 2018.

Figure 4. How do you expect your 2019 *jobs/orders* to compare to 2018?
All respondents, Winter 2018–2019
Average Change: +4.3%



Forty-three percent (down a tad from 45%) of 1–9-employee shops expect jobs/orders to increase six percent or more from 2018 to 2019, although virtually no one expects them to decrease six percent or more. Fifty-six percent expect jobs/orders to stay roughly the same, or undergo a minimal increase or decrease. The expected change in jobs/orders for these businesses is +3.9%.

A bit more than one-third (38%, down from 50%) of 10–19-employee shops expect a job/order increase of six percent or more in 2019, while 3% expect a decrease of ten percent or more. Almost two-thirds (63%, up from 57%) expect jobs/orders to stay roughly the same or see a minimal increase or decrease with a heavy skew toward an increase (42% expect jobs/orders to increase between one and five percent). The expected change in jobs/orders for these businesses is +4.5%.

Fifty-nine percent (up from 41%) of 20–49-employee expect jobs/orders to increase six percent or more while 9% (up three points) expect them to decrease six percent or more. Just under one-third (32%, down from 53%) expect jobs/orders to stay roughly the same. The expected change in jobs/orders for these businesses is +5.3%.

For 50+employee shops, 50% (down one percentage point from 51%) expect jobs/orders to increase six percent or more and virtually no one (down from 4%) expects a corresponding decrease. Still, 51% (up from 45%) expect jobs/orders to stay about the same. The expected change in jobs/orders for these businesses is +5.6%.

Table 4. How do you expect your 2019 *jobs/orders* to compare to 2018?
Respondents by establishment size, Winter 2018–2019

	1–9 employees	10–19 employees	20–49 employees	50+ employees	All Respondents
increase more than 10%	11%	13%	23%	22%	13%
increase between 6% and 10%	32%	25%	36%	28%	31%
increase between 1% and 5%	17%	42%	18%	30%	21%
stay about the same	35%	13%	9%	18%	28%
decrease between 1% and 5%	4%	8%	5%	3%	4%
decrease between 6% and 10%	0%	0%	9%	0%	1%
decrease more than 10%	2%	0%	0%	0%	1%
Average change	3.9%	4.5%	5.3%	5.6%	4.3%

Profitability

And then there are profits. We can talk all we want about revenues and jobs, but is anyone making money? And do they expect to make more of it?

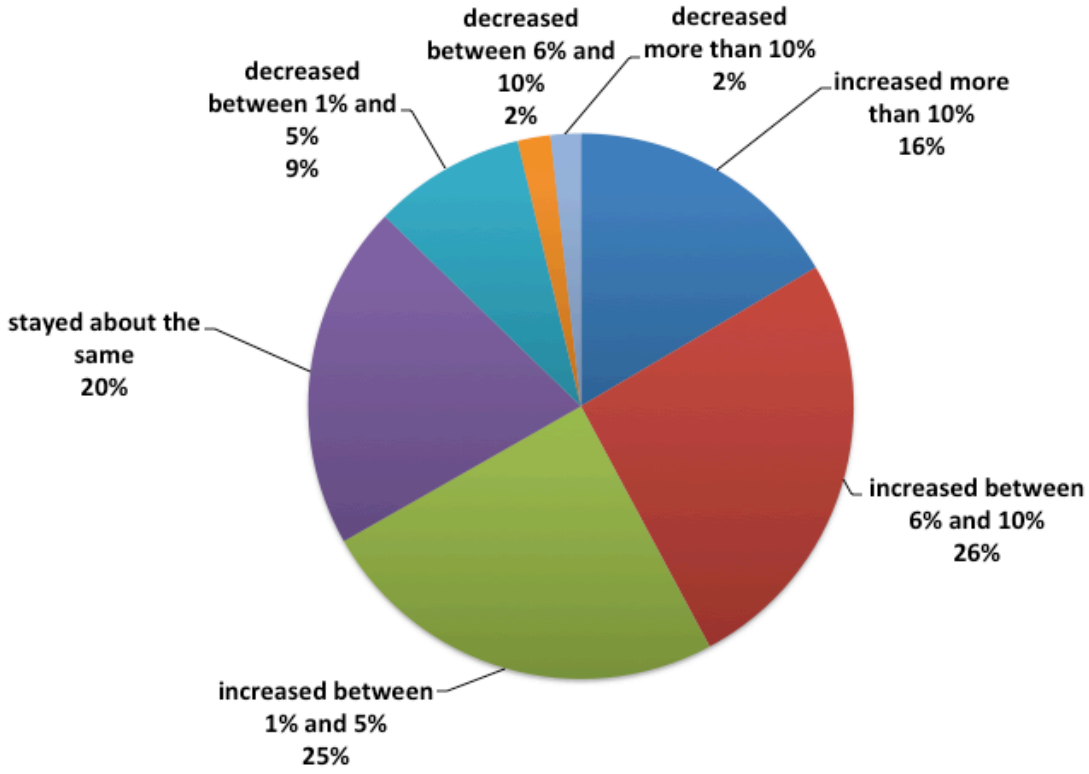
2018 Profits

We can make the same inflation adjustment (back 1.6% out, as we did with revenues) to get a sense of what the real change in profitability has been and is expected to be. (Also note that these data are not the rates of profitability, but are the change in the dollar value of total profits compared to the prior year.)

According to survey respondents, profits in 2018 were up over 2017; 42% (up from 38% the previous year) reported that profits increased six percent or more from 2017. Only four percent (down from 17%) of respondents reported that profits had decreased by six percent or more over 2016.

The average change in profits from 2016 to 2017 was +4.1% or, adjusted for inflation, +2.5%. However, beware of survivor bias.

Figure 5. In terms of your 2018 *profitability*, how did it compare to 2017?
All respondents, Winter 2018–2019
Average Change: +4.1%
Average Change Adjusted for Inflation: +2.5%



For 1–9-employee shops, 43% (up from 41%) said that profits had increased six percent or more from 2017 to 2018 while 2% (way down from 18%) said they had decreased six percent or more. More than one-half (56%, up 41%) reported that profits stayed roughly the same, or saw a minimal increase (26%) or decrease (6%).

The average pre-inflation-adjustment change in profits for these businesses was +4.4%.

For 10–19-employee shops, 51% (up from 37%) said that profits had increased six percent or more while 4% (down from 10%) said they had decreased six percent or more. Just under one-half (46%, down from 52%) reported profits staying roughly the same, or experiencing a minimal increase or decrease (12%). The average pre-inflation-adjustment change in profits for these businesses was +5.1%.

The 20–49-employee shops fared less well than other demographic breakdowns, but are up from last year. One-third (up from 23%) said that profits had increased six percent or more while 15% (down from 21%) said they had decreased six percent or more. Just over one-half (52%, down from 57%) reported that profits stayed roughly the same, or experienced a minimal increase or decrease. The average pre-inflation-adjustment change in profits for these businesses was +1.7%. Adjusted for inflation, it's...not very good.

Things were slightly happier for 50+-employee shops: 35% (down from 39%) said that profits had increased six percent or more, while 5% (down from 10%) said they had decreased six percent or more. Sixty percent (up from 52%) reported that profits stayed roughly the same, or experienced a minimal increase (29%) or decrease (11%). The average pre-inflation-adjustment change in profits for these businesses was +3.6%.

Table 5. In terms of your 2018 *profitability*, how did it compare to 2017? Respondents by establishment size, Winter 2018–2019

	1–9 employees	10–19 employees	20–49 employees	50+ employees	All Respondents
increased more than 10%	13%	38%	14%	21%	17%
increased between 6% and 10%	30%	13%	19%	14%	26%
increased between 1% and 5%	26%	21%	19%	29%	25%
stayed about the same	24%	8%	14%	20%	20%
decreased between 1% and 5%	6%	17%	19%	11%	9%
decreased between 6% and 10%	2%	0%	5%	1%	2%
decreased more than 10%	0%	4%	10%	4%	2%
Average change	4.4%	5.1%	1.7%	3.6%	4.1%
Average change adjusted for inflation	2.8%	3.5%	0.1%	2.0%	2.5%

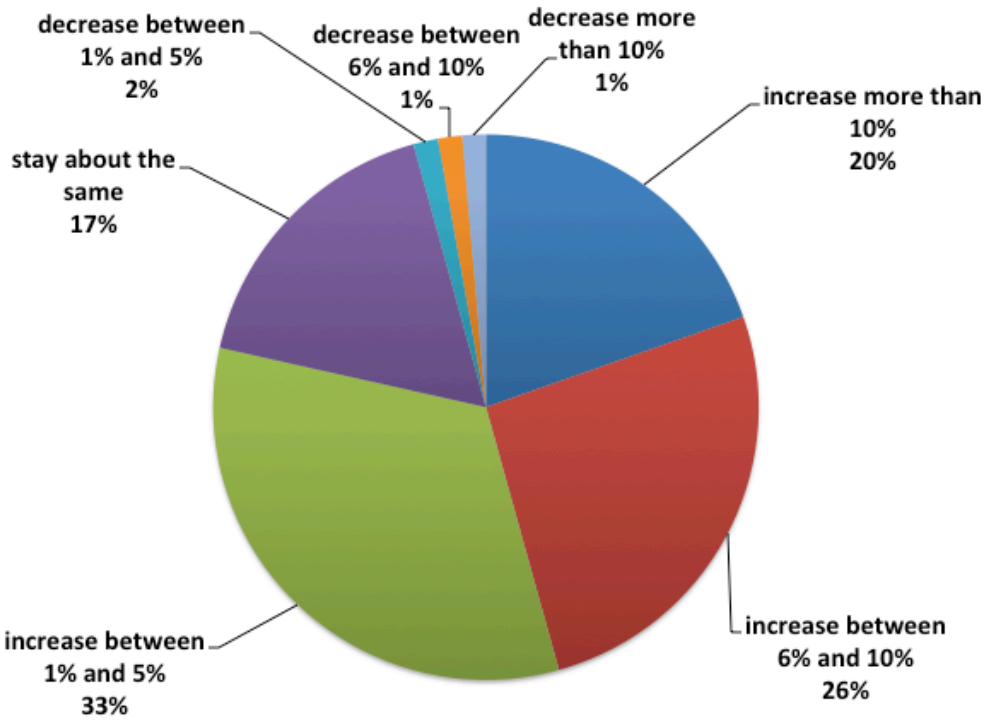
2019 Profitability

Given the foregoing, how sanguine are print businesses about profitability in 2019?

Overall, 46% (up from 38% the previous year) expect profits to increase six percent or more in 2019, while an unchanged 2% expect them to decrease by the same amount. The majority (52%) expects profits to stay about the same (17%) or increase slightly (33%).

We calculated an average expected change in profits of +5.1% from 2018 to 2019, so there is a bit more optimism than there was in our last survey.

Figure 6. How do you expect your 2019 *profitability* to compare to 2018?
All respondents, Winter 2018–2019
Average Change: +5.1%
Average Change Adjusted for Inflation: +3.5%



Forty-five percent (up from 39%) of small (1–9-employee) shops expect profits to increase six percent or more from 2018 to 2019, while 2% (up from none) expect them to decrease six percent or more. More than one-half (53%) expect profits to stay roughly the same, or undergo a minimal increase or decrease. The expected average increase in profits for 2019 is +5.1%, pre-inflation adjustment.

Forty-two percent (up from 38%) of 10–19-employee shops expect profits to increase by six percent or more, while virtually no one (down from 3%) expects them to decrease six percent or more. Nearly six out of 10 (58%, down two points) expect profits to stay roughly the same or see a minimal increase (33%) or decrease. The expected average increase in profits for 2019 is +4.8%, pre-inflation adjustment.

Fifty-seven percent (up from 37%) of 20–49-employee expect profits to increase six percent or more while 14% (up from 7%) expect them to decrease six percent or more. Three out of 10 (29%) expect profits to stay roughly the same or increase or decrease minimally. The expected average increase in profits for 2019 is +5.3%, pre-inflation adjustment.

For 50+-employee shops, 47% (relatively unchanged from 46%) expect profits to increase six percent or more while virtually no one (down from 2%) expects a corresponding decrease. Still, 54% (up two percentage points) expect profits to stay about the same or increase (38%) or decrease minimally. The expected average increase in profits for 2019 is +5.5%, pre-inflation adjustment.

Table 6. How do you expect your 2019 *profitability* to compare to 2018?
Respondents by establishment size, Winter 2018–2019

	1–9 employees	10–19 employees	20–49 employees	50+ employees	All Respondents
increase more than 10%	19%	13%	33%	19%	20%
increase between 6% and 10%	26%	29%	24%	28%	26%
increase between 1% and 5%	34%	33%	19%	38%	33%
stay about the same	17%	25%	10%	15%	17%
decrease between 1% and 5%	2%	0%	0%	1%	1%
decrease between 6% and 10%	0%	0%	14%	0%	1%
decrease more than 10%	2%	0%	0%	0%	1%
Average change	5.1%	4.8%	5.3%	5.5%	5.1%
Average change adjusted for inflation	3.5%	3.2%	3.7%	3.9%	3.5%

Business Conditions Summary

As you saw throughout this section, for each size classification, we took the survey responses and calculated an average change in revenues, jobs/orders, and profits, both for 2018 and 2019. We also adjusted these figures to account for inflation.

So, for Table 7, we calculated[5] a 2.4% industry average increase in revenues, a 2.7% increase in jobs/orders, and a 2.9% increase in profits. We also added our inflation adjustments.

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

Table 7. 2018 vs. 2017 average percentage change in revenues, orders, and profits
Respondents by establishment size, Winter 2018–2019

	1–9 employees	10–19 employees	20–49 employees	50+ employees	All respondents
Revenues	4.0%	2.5%	3.7%	4.6%	3.8%
Revenues adjusted for inflation	2.4%	0.9%	2.1%	3.0%	2.2%
Jobs	2.6%	3.1%	4.7%	4.5%	3.0%
Profits	4.4%	5.1%	1.7%	3.6%	4.1%
Profits adjusted for inflation	2.8%	3.5%	0.1%	2.0%	2.5%

Table 8. 2019 vs. 2018 average percentage change in revenues, orders, and profits
Respondents by establishment size, Winter 2018–2019

	1–9 employees	10–19 employees	20–49 employees	50+ employees	All respondents
Revenues	6.1%	5.0%	4.5%	6.0%	5.8%
Revenues adjusted for inflation	4.5%	3.4%	2.9%	4.4%	4.2%
Jobs	3.9%	4.5%	5.3%	5.6%	4.3%
Profits	5.1%	4.8%	5.3%	5.5%	5.1%
Profits adjusted for inflation	3.5%	3.2%	3.7%	3.9%	3.5%

We know from Census Bureau data that printing shipments did better in 2018 than in 2017, at least after the first quarter (see Section 5), so the generally rosy numbers we have seen in these business conditions data are indicative of this trend. Whether this will hold true for 2019 remains to be seen.

The better-than-last-year-but-still-sluggish profits data generally gibe with government data (see Section 5), with the profit situation better for businesses with less than $25 million in assets (we'll comment on that in the later section).

Looking at the changes in revenues vs. jobs is instructive, especially if we look at the inflation-adjusted revenues (you don't have to adjust jobs for inflation). In most cases, job growth is outpacing revenue growth. As we often comment, this is a short-run-job issue, and while it seems like it should be more of a problem for small establishments than large ones, that's not necessarily the case. Short- or shorter-run

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

can often mean "shorter than a plant is productively used to." Smaller establishments that are predominantly digital or what used to be called "quick" printers figured this out some time ago. But when a larger company's production capabilities and business structure are based on jobs beyond a certain minimum run length, a transition to shorter-run work can cause problems with both productivity and profitability. (And pricing!)

Indeed, as a recent InfoTrends report found, "44% of printers reported that dealing with a high number of small jobs was their biggest workflow bottleneck."[6] It's not just a production headache, but a profitability one, as well.

And as we will see in the next section, despite the improving economic and business environment, it's all about figuring out how to run a shop productively.

Looking Forward

The next section looks at challenges, opportunities, and planned investments.

[6] Keypoint Intelligence – InfoTrends' 2018 *North American Software Investment Outlook*.

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

There have been some interesting developments in the top business challenges reported by print businesses. Once upon a time, "economic conditions" was top of the heap (even when there wasn't a recession), but now that has taken a back seat to more important concerns.

The new number one challenge is "competition from other print providers," selected by 39% of respondents, up from 33% the previous year. Last survey's number one challenge, "pricing," dropped to number two and from 44% to 31%. It's taken a while, but print business owners are finally starting to get a handle on how to price digital and specialty printing, but challenges remain. That this challenge is still at number two more than suggests how difficult that marketplace for these items can be.

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

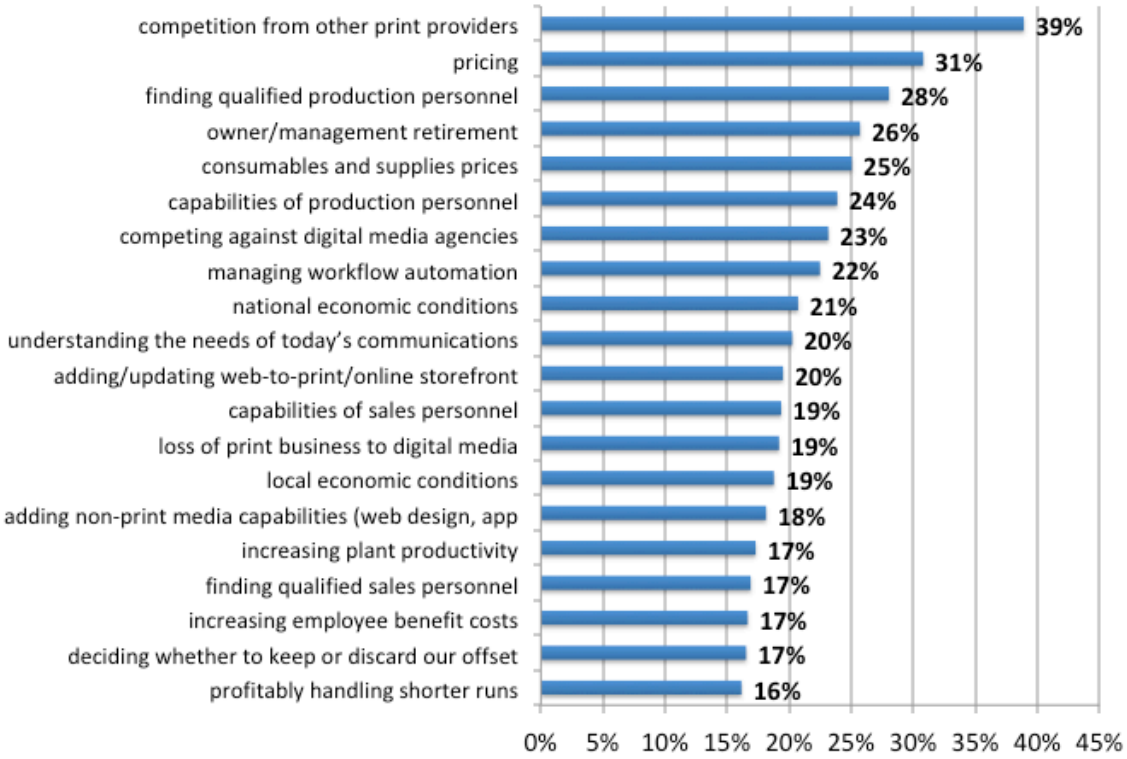
The number three challenge reflects one of the most common conversations the industry has been having: "finding qualified production personnel," up from 25% to 28%. Finding folks who can (and want to) run printing equipment is a big problem for a lot of businesses in this industry.

Number four is also a new entry in the top five challenges: "owner/management retirement," which leapt up from 9% the previous year to 26%. With the industry on a relative upswing, a lot of the older print business owners see this as a good time to get out of the industry while the getting is good.

The number five challenge is also a newbie to the top challenges list: "consumables and supplies prices," up from 9% to 25%. Whether it's paper, ink (certain kinds of inkjet ink saw a spike in raw materials prices recently), plates (the aluminum tariff raised the costs of offset plates), or other items, when printing gets more expensive to produce, that extra cost can't always (or often) (or ever) be passed on to the print buyer, especially in the face of the competition (see Challenge #1).

It's interesting that some of the traditional challenges—especially those involving the search for or the capabilities of sales personnel—have fallen by the wayside. Whether these foci are the beginning of new long-term concerns for the industry or just an anomaly given the specific current environment remains to be seen. It could reflect a "changing of the guard" in print business ownership and management, with new leadership less inclined to focus on the concerns of the previous generation.

Figure 7. In the next 12 months, which of the following will be your biggest *business challenges*?
All respondents, Winter 2018/2019 *(multiple responses permitted)*



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

- 1–9 employees: The top three challenges are "competition from other print providers" (40%), "owner/management retirement" (30%), and "competing against digital media agencies" (30%).
- 10–19 employees: The top three challenges are "capabilities of sales personnel" (50%), "pricing" (42%), and "finding qualified sales personnel" (38%).
- 20–49 employees: " capabilities of sales personnel" (61%), "competition from other print providers" (52%), and "pricing" (43%).
- 50+ employees: "increasing plant productivity" (45%), "managing workflow automation" (42%), and "capabilities of sales personnel" (36%).

Table 9. In the next 12 months, which of the following will be your biggest *business challenges*?
Respondents by establishment size, Winter 2018–2019

	1–9 employees	10–19 employees	20–49 employees	50+ employees	All Responses
competition from other print providers	40%	25%	52%	33%	39%
pricing	27%	42%	43%	30%	31%
finding qualified production personnel	26%	29%	39%	34%	28%
owner/management retirement	30%	21%	13%	9%	26%
consumables and supplies prices	25%	21%	35%	19%	25%
capabilities of production personnel	24%	33%	17%	18%	24%
competing against digital media agencies	30%	4%	13%	3%	23%
managing workflow automation	19%	17%	39%	42%	22%
national economic conditions	19%	25%	26%	21%	21%
understanding the needs of today's communications buyers	21%	25%	9%	20%	20%
adding/updating web-to-print/online storefront	22%	13%	17%	14%	20%
capabilities of sales personnel	6%	50%	61%	36%	19%
loss of print business to digital media	21%	21%	13%	7%	19%
local economic conditions	19%	29%	9%	11%	19%
adding non-print media capabilities (web design, app development, social media management, etc.)	24%	4%	9%	3%	18%
increasing plant productivity	11%	25%	35%	45%	17%
finding qualified sales personnel	8%	38%	43%	29%	17%
increasing employee benefit costs	17%	8%	26%	14%	17%
deciding whether to keep or discard our offset equipment	20%	4%	17%	7%	17%
profitably handling shorter runs	15%	17%	26%	12%	16%
retirement of key production personnel	19%	13%	4%	11%	16%
need for employee training	13%	21%	17%	26%	15%
keeping up with technological changes	13%	17%	13%	20%	14%
selling our business	17%	4%	0%	0%	12%
getting web-to-print to work on smartphones and other mobile devices	15%	0%	4%	4%	11%
finding capital for investments	13%	8%	4%	2%	11%
transitioning jobs from offset to high-speed digital printing equipment	7%	4%	9%	5%	6%
financing costs of our equipment	7%	0%	9%	7%	6%
migrating production to the cloud	7%	0%	0%	3%	5%
migrating business functions to the cloud	4%	4%	0%	6%	4%
training employees to use cloud applications	4%	4%	0%	6%	4%
job tracking	0%	8%	9%	9%	3%

	1–9 employees	10–19 employees	20–49 employees	50+ employees	All Responses
adding packaging printing equipment/services	0%	8%	4%	5%	2%
adding wide-format equipment/services	2%	0%	0%	1%	1%
migrating customer service and sales to the cloud	0%	4%	0%	7%	1%
other	19%	0%	9%	4%	15%

Personnel problems take center stage, whether its finding production staff, the retirement of experienced owners/managers, or the ever-present concern over the skills of salespeople. Among larger establishments, being productive is of increasing concern, and trying to implement some kind of automation both to tackle productivity concerns as well as compensate for the inability to find production staff is of special concern.

"Other" was selected by 15% of respondents. Some top write-in challenges included "lead generation," "regulatory compliance," and "implementing new ERP."

Business Opportunities

Some unusual items have taken precedence in our opportunities list.

One of them is *not* "improving economic conditions," which, at 31%, is down from 41% the previous year and slips to number three.

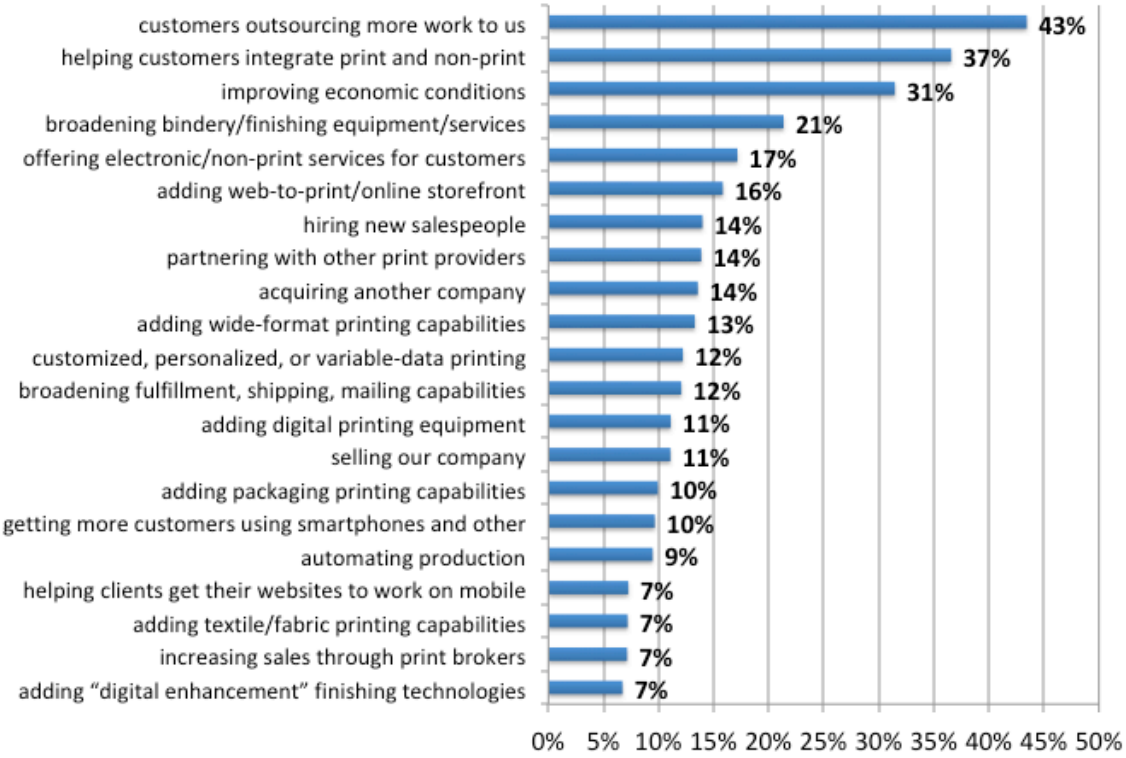
Moving into the number one spot, and up from 27% of respondents last survey to 43%, is "customers outsourcing more work to us." There is always the danger that customers will be able to do a substantial amount of their own printing in-house (back in the 2000s, we saw a big migration of print work—usually of the "quick print" variety—to desktop/network printers). The idea is that customers can save time and expense in the long run by re-outsourcing this work. This is especially the case when it comes to things like wide-format and other kinds of specialty printing.

"Helping customers integrate print and non-print" is up from 28% to 37% but remains at number two. This is a very pro-active opportunity and it is a sign that the industry has at long last realized that print sits side-by-side with other kinds of media. They weren't always cognizant of this fact—or they were in denial. Bolstering this is the opportunity that comes in at number five: "offering electronic, non-print services for customers," holding steady at 17%.

"Broadening bindery/finishing equipment/services," drops two points to 23% but climbs one spot to number four. As has been the case for the past several years, binding/finishing services is one of the bright spots of the industry.

Interestingly, some of the old favorites have dropped out of the top five. "Customized, personalized, or variable-data printing jobs" drops from 27% to 12% and "acquiring another company" drops from 25% to 14%.

Figure 8. In the next 12 months, which of the following represent your best *new business opportunities*?
All respondents, Winter 2018–2019 *(multiple responses permitted)*



The top three opportunities in each size classification are:

- 1–9 employees: The top three opportunities are "customers outsourcing more work to us" (49%—up from 29%), "helping customers integrate print and non-print marketing" (43%—up from 23%), and "improving economic conditions" (34%—up from 31%).
- 10–19 employees: The top three opportunities are "hiring new salespeople" (42%—up from 24%), "improving economic conditions" (38%—up from 36%), and "automating production" (21%—up from 19%).
- 20–49 employees: The top three opportunities are "customers outsourcing more work to us" (48%—up from 29%), "automating production" (39%—up from 22%), and "customized, personalized, or variable-data printing jobs" (39%—up from 28%).
- 50+ employees: The top three opportunities are "helping customers integrate print and non-print marketing" (36%—up from 29%),"customers outsourcing more work to us" (36%—down from 39%), and "hiring new salespeople" (32%—down from 36%).

Table 10. In the next 12 months, which of the following represent your best *new business opportunities*?
Respondents by establishment size, Winter 2018–2019

	1–9 employees	10–19 employees	20–49 employees	50+ employees	All Responses
customers outsourcing more work to us	49%	13%	48%	36%	43%
helping customers integrate print and non-print marketing campaigns	43%	8%	30%	36%	37%
improving economic conditions	34%	38%	17%	14%	31%
broadening bindery/finishing equipment/services	24%	17%	17%	13%	21%
offering electronic/non-print services for customers (web design, app development, social media management, etc.)	19%	13%	9%	19%	17%
adding web-to-print/online storefront	17%	13%	13%	14%	16%
hiring new salespeople	4%	42%	35%	32%	14%
partnering with other print providers	15%	4%	17%	14%	14%
acquiring another company	13%	8%	26%	16%	14%
adding wide-format printing capabilities	15%	17%	4%	8%	13%
customized, personalized, or variable-data printing jobs	6%	17%	39%	27%	12%
broadening fulfillment, shipping, mailing capabilities	6%	17%	39%	25%	12%
adding digital printing equipment	7%	17%	30%	18%	11%
selling our company	15%	4%	0%	0%	11%
adding packaging printing capabilities	9%	17%	9%	13%	10%
getting more customers using smartphones and other mobile devices	13%	0%	4%	1%	10%
automating production	2%	21%	39%	20%	9%
helping clients get their websites to work on mobile devices	9%	8%	0%	3%	7%
adding textile/fabric printing capabilities	9%	4%	4%	4%	7%
increasing sales through print brokers	7%	4%	13%	10%	7%
adding “digital enhancement” finishing technologies (like Scodix, Highcon, MGI)	9%	0%	4%	5%	7%
migrating customer service and sales to the cloud	7%	4%	4%	3%	6%
adding digital label/wrapper printing capabilities	6%	8%	4%	1%	6%
migrating business functions to the cloud	7%	0%	4%	0%	5%
adding specialty or industrial printing capabilities	7%	0%	0%	4%	5%
migrating production to the cloud	7%	0%	0%	2%	5%
video production services	7%	0%	0%	0%	5%
using marketing automation for our business (like HubSpot, Eloqua,	4%	0%	9%	9%	4%

	1–9 employees	10–19 employees	20–49 employees	50+ employees	All Responses
Marketo)					
selling marketing automation services to our customers	0%	4%	17%	15%	3%
disposing of offset equipment to concentrate on digital printing	2%	4%	9%	2%	3%
training employees to use cloud applications	2%	4%	0%	5%	2%
adding additional offset printing equipment	0%	0%	9%	9%	1%
other	17%	21%	0%	3%	15%

It's actually refreshing that "improving economic conditions" is kind of a tepid opportunity this survey since we never really thought of it as an "opportunity" *per se*. It's nice to have a good economy—which we have had for a number of years now—and sales are certainly easier in a growing economy, but print demand hasn't followed economic conditions in a long time. Unfortunately, in today's economy, better conditions mean more investment in digital communications that displace print or reduce the need for it. And just wait until 5G becomes a reality. (See our Forecast section.)

Even the perennial "hiring new salespeople" (happily) got a lukewarm reception this survey. That so many strategic items top the list—especially recognizing the need to help customers integrate print and non-print—is an encouraging sign that we are seeing a new breed of print business leadership that thinks creatively about where print is and where it is going.

"Other" was selected by 15% of respondents. Some write-in opportunities included "absorbing new business from competitor who shut down," "acquiring a business that's good fit; more product; more partnerships," and "providing data analytics."

Planned Investments

What are print businesses planning to buy in 2019? Well, not a great deal.

The number one item is "finishing/bindery equipment for digital production" (25%—down one point from the previous year's survey).

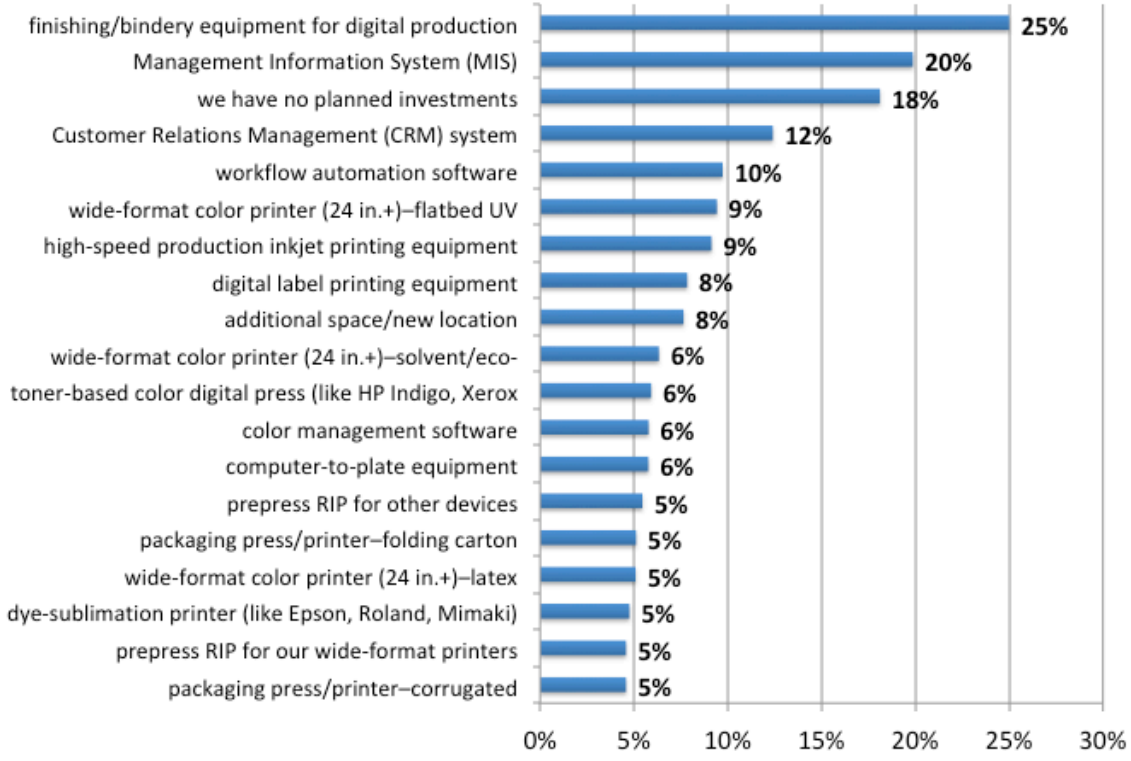
The number two item is "Management Information System (MIS)" (20%—up from 11%).

The number three response was number two a year ago and number one two years ago: "we have no planned investments," selected by 18% down from 21% (and down from 25% two years ago).

Number four is "Customer Relations Management (CRM) system," selected by 12%, up from 5%.

Rounding out the top five is "workflow automation software," selected by 10%, down from 15%.

Figure 9. Which of the following *investment items* have you budgeted for and plan to acquire in the next 12 months?
All respondents, Winter 2018–2019 *(multiple responses permitted)*



The top three investments in each size classification are:

- 1–9 employees: The top three responses are "Management Information System (MIS)," (24%, up from 10%), "finishing/bindery equipment for digital production" (22%, up from 19%), and "we have no planned investments" (19%, down from 27%).

- 10–19 employees: The top three responses are "finishing/bindery equipment for digital production" (33%, up from 31%), "we have no planned investments" (25%, up from 12%), and Customer Relations Management (CRM) system" (8%, up from &%).
- 20–49 employees: The top three planned investments are "finishing/bindery equipment for digital production" (39%, up from 22%), with "workflow automation software," "toner-based color digital press (like HP Indigo, Xerox iGen)" and "Management Information System (MIS)" all at 26%.
- 50+ employees: The top three planned investments are "finishing/bindery equipment for digital production" (23%, up from 18%), "finishing/bindery equipment for offset/analog production" (21%, down from 22%), and "workflow automation software (20%, up from 16%).

Table 11. Which of the following *investment items* have you budgeted for and plan to acquire in the next 12 months?
Respondents by establishment size, Winter 2018–2019

	1–9 employees	10–19 employees	20–49 employees	50+ employees	All Responses
finishing/bindery equipment for digital production	22%	33%	39%	23%	25%
Management Information System (MIS)	24%	0%	26%	10%	20%
we have no planned investments	19%	25%	9%	10%	18%
Customer Relations Management (CRM) system	13%	8%	17%	12%	12%
workflow automation software	7%	8%	26%	20%	10%
wide-format color printer (24 in.+)–flatbed UV (like EFI VUTEk, Canon Océ Arizona, HP Scitex)	11%	4%	9%	9%	9%
high-speed production inkjet printing equipment (like HP PageWide, Canon Océ ColorStream/ImageStream)	9%	0%	22%	14%	9%
digital label printing equipment	9%	8%	4%	5%	8%
additional space/new location	6%	8%	13%	15%	8%
wide-format color printer (24 in.+)–solvent/eco-solvent (like Epson, Roland)	9%	0%	0%	5%	6%
toner-based color digital press (like HP Indigo, Xerox iGen)	2%	8%	26%	12%	6%
color management software	7%	0%	9%	5%	6%
computer-to-plate equipment	7%	4%	0%	9%	6%
prepress RIP for other devices	7%	0%	9%	0%	5%
packaging press/printer–folding carton	7%	4%	0%	0%	5%
wide-format color printer (24 in.+)–latex (like HP Latex)	4%	8%	9%	5%	5%
dye-sublimation printer (like Epson, Roland, Mimaki)	7%	0%	0%	3%	5%
packaging press/printer–corrugated	7%	0%	0%	0%	5%
prepress RIP for our wide-format printers	7%	0%	0%	0%	5%

	1–9 employees	10–19 employees	20–49 employees	50+ employees	All Responses
finishing/bindery equipment for offset/analog production	0%	4%	17%	21%	4%
sheetfed offset press	0%	0%	17%	11%	3%
color measurement equipment (densitometer, spectrophotometer)	0%	0%	4%	6%	1%
rebuilding our web offset press	0%	0%	0%	3%	0%
web offset press—new	0%	0%	0%	2%	0%
packaging press/printer–flexible packaging	0%	0%	0%	1%	0%
other	17%	21%	9%	10%	16%

Once again, finishing/bindery equipment and various kinds of software—MIS, CRM, or workflow automation—top the list of planned investments. There seems to be minimal desire to buy a lot of hardware; even some of wide-format categories that had been relatively high in past recent surveys seem to have cooled. The emphasis now—borne out by the challenges and opportunities responses—is that the time has come to get the most productivity out of the equipment they already have, whether that's finding qualified production people or turning to software.

"Other" was selected by 16% of respondents. Some write-in investments included "inkjet addressing," "inserter," "router and cutter," "cold laminator for wide format."

Looking Forward

The low planned investment figures are not a surprise when we look at the next section: a lot of shop are not interested in adding (or have already added) new types of printing capabilities.

3. New Capabilities

In each survey, we try to gauge the extent that print service providers are branching out into new product and service areas, such as wide-format printing and all the various applications that fall under that increasingly broad category. In this survey, we asked which of the following capabilities they planned to add in the next 12 months:

- 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 or industrial printing (like coffee mugs, golf balls, smartphone cases)
- corrugated packaging printing
- folding carton printing/converting
- flexible packaging printing/converting
- 3D printing
- printed electronics

Interestingly, the top item selected was "specialty or industrial printing," selected by 13% of respondents. The 20–49-employee establishments are the most interested in this item (22%), followed by 1–9-employee establishments (15%).

The number two item is "high-speed production inkjet," selected by 10%. It was the 20–49-employee establishments who were most interested in this (87%).

3D printing, textile/fabric printing for soft signage, and wide-format printing all came in at 7%. The 1–9-employee shops were most interested in 3D printing and soft signage (9% each), while 20–19-employee shops were most interested in wide-format printing.

As we usually find when we ask this question, various kinds of packaging are very far down the list.

"Other" was selected by 11% of respondents; the top write-in response (which we will need to add to our survey) is "none of the above."

Figure 10. Do you plan to add any of the following capabilities in the next 12 months? All respondents, Winter 2018–2019 (*multiple responses permitted*)

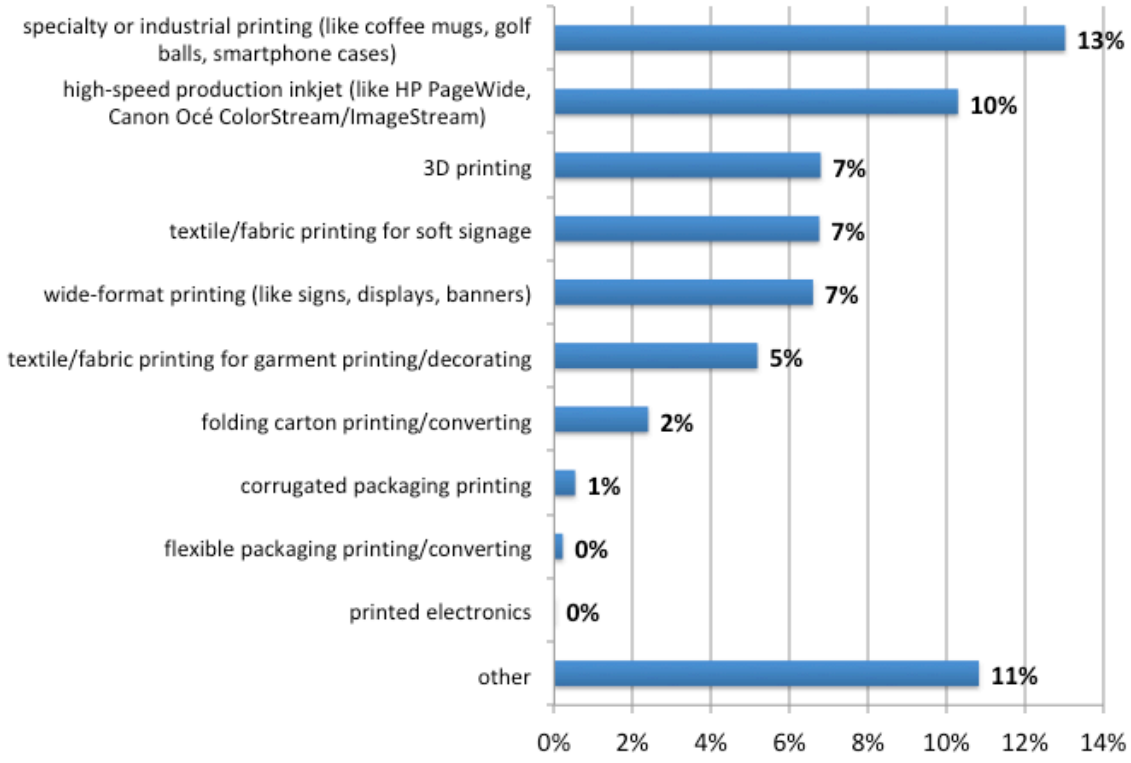


Table 12. Do you plan to add any of the following capabilities in the next 12 months?) Respondents by establishment size, Winter 2018–2019 (*multiple responses permitted*)

	1–9 employees	10–19 employees	20–49 employees	50+ employees	All Responses
specialty or industrial printing (like coffee mugs, golf balls, smartphone cases)	15%	0%	22%	2%	13%
high-speed production inkjet (like HP PageWide, Canon Océ ColorStream/ ImageStream)	0%	4%	87%	14%	10%
3D printing	9%	4%	0%	3%	7%
textile/fabric printing for soft signage	9%	4%	0%	2%	7%
wide-format printing (like signs, displays, banners)	4%	4%	22%	12%	7%
textile/fabric printing for garment printing/decorating	4%	0%	22%	0%	5%
folding carton printing/converting	2%	4%	0%	5%	2%
corrugated packaging printing	0%	4%	0%	0%	1%
flexible packaging printing/converting	0%	0%	0%	3%	0%
printed electronics	0%	0%	0%	0%	0%
other	11%	4%	22%	7%	11%

Going Forward

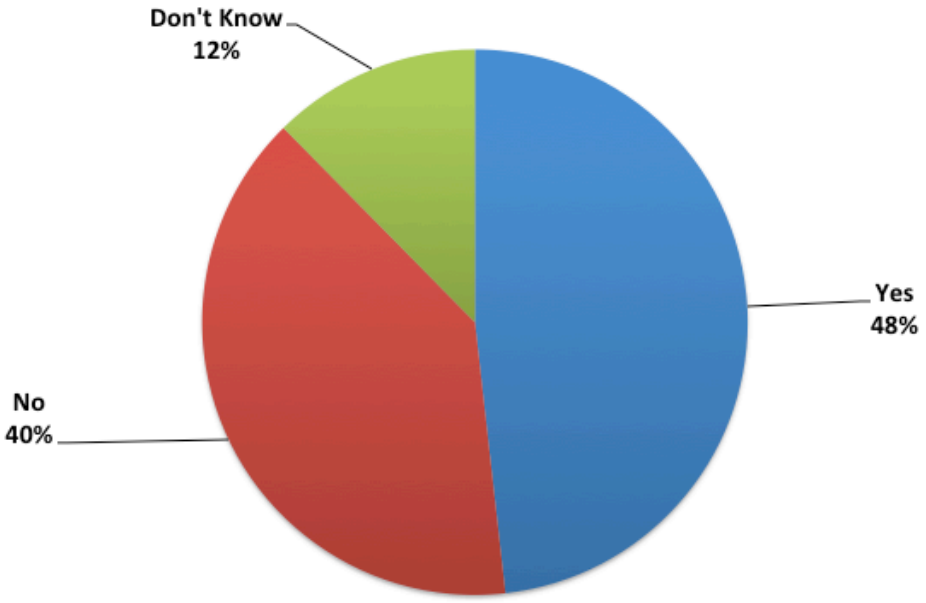
The low numbers in this section reflect the fact that the majority of shops, if they were ever likely to add these items, they have already done so. Some of the investment data show some expansion of capabilities; for a recent WhatTheyThink feature, we broke out planned investment in different classes of wide-format printing equipment and found that planned investment in flatbed UV printers exceeded that in solvent printers, suggesting that shops were interested in adding those specialty or industrial printing applications. We don't know 100% for sure, but we suspect a lot of these shops had previously invested in a solvent or latex printer to get their feet wet in wide format, and now are interested in adding these newer applications.

4. Hiring

Anecdotally, we know that finding qualified employees has been one of the perennial challenges in recent years, and our recent surveys have confirmed this. True, going back to the 1990s, there has been grousing about finding decent salespeople (or at least those with good books of business), but now finding production people has become a major challenge. That said, are print businesses hiring? And, if so, whom?

First of all, are print businesses planning to hire any employees in the next 12 months? As it turns out, yes, but not as many as last year: just under one-half (47%) do plan to hire staff—although this is down from 65% in the previous year's survey. Four out of 10 do not—and 12% don't know, which suggests that they are not lacking in qualified staff but may need to fill whatever vacancies crop up over the course of the year.

Figure 11. Are you considering hiring/adding staff in the next 12 months?
All respondents, Winter 2018–2019



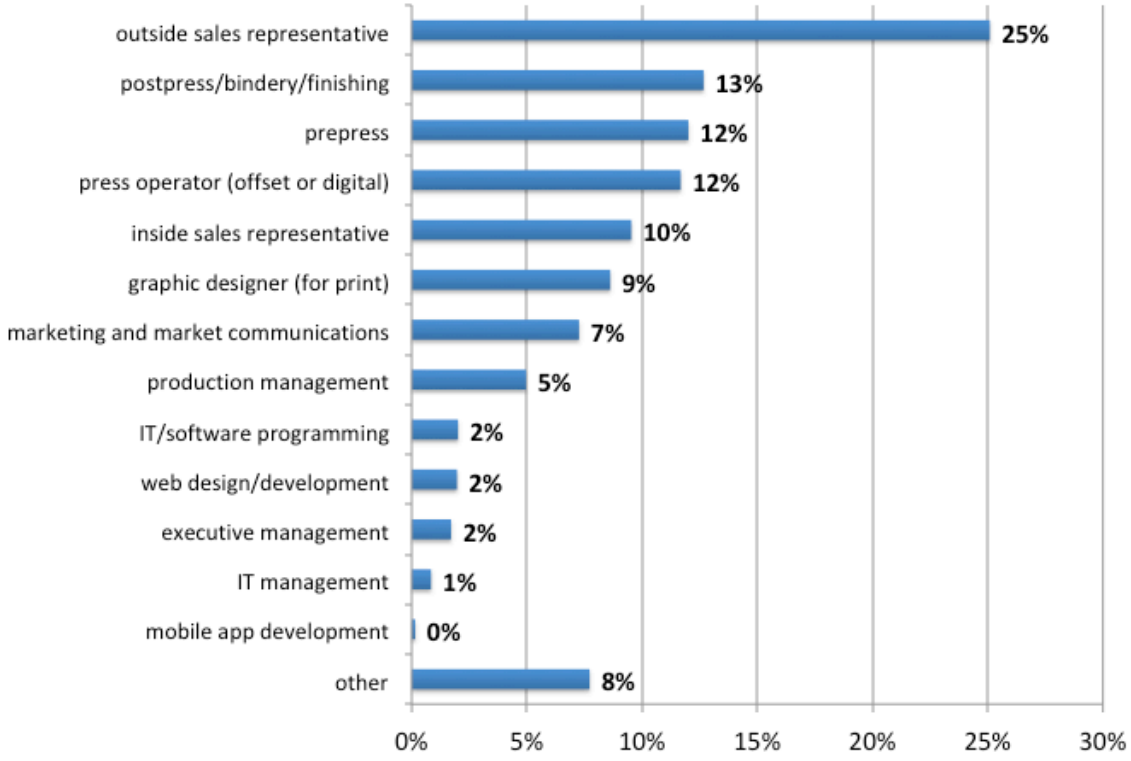
Perhaps not unexpectedly, hiring plans increase with increasing establishment size. More than three-fourths (77%) of 50+-employee establishments plan to hire or add staff in 2019, compared to 40% of 1–9-employee shops.

Table 13. Are you considering hiring/adding staff in the next 12 months?
Respondents by establishment size, Winter 2018–2019

	1–9 employees	10–19 employees	20–49 employees	50+ employees	All Responses
Yes	40%	67%	60%	77%	48%
No	49%	21%	15%	11%	39%
Don't Know	11%	13%	25%	12%	12%

Whom do shops plan to hire? Despite all the talk about production personnel, the top position selected by survey respondents this time around was outside sales representative, selected by 25% of respondents. Postpress/bindery/finishing staff was a somewhat distant number two at 13%. Prepress staff and press operator were each selected by 12%.

Figure 12. If yes, for what positions are you looking to hire? (*multiple responses permitted*)
Respondents considering hiring in 2019, Winter 2018–2019



Different size establishments have different hiring/staff needs. This year, the top two positions shops are looking to hire, broken down by size classification, are:

- 1–9 employees: outside sales representative (18%) and prepress (15%).
- 10–19 employees: The top positions open are outside sales reps (38%) and inside sales representative (17%), and marketing or market communications (17%).
- 20–49 employees: The top positions open are outside sales representative (39%), press operator (30%), and postpress/bindery/finishing (26%).
- 50+ employees: The top positions open are outside sales representative (47%), postpress/bindery/finishing (34%), and press operator (29%).

Table 14. If yes, for what positions are you looking to hire? (*multiple responses permitted*) Respondents considering hiring in 2018by establishment size, Winter 2018–2019

	1–9 employees	10–19 employees	20–49 employees	50+ employees	All Responses
outside sales representative	18%	38%	39%	47%	25%
postpress/bindery/finishing	9%	13%	26%	34%	13%
prepress	15%	0%	9%	8%	12%
press operator (offset or digital)	9%	4%	30%	29%	12%
inside sales representative	6%	17%	17%	20%	10%
graphic designer (for print)	9%	4%	17%	5%	9%
marketing and market communications	4%	17%	17%	8%	7%
production management	2%	8%	13%	16%	5%
IT/software programming	0%	4%	4%	14%	2%
web design/development	0%	0%	13%	9%	2%
executive management	0%	0%	9%	12%	2%
IT management	0%	0%	0%	12%	1%
mobile app development	0%	0%	0%	2%	0%
other	7%	13%	13%	3%	8%

In our previous year's survey, we found a greater desire to hire IT management and IT/software programming, as well as graphic designers and marketing/market communications personnel, especially among the larger establishments. This year, these positions seem to have taken a back seat to some of the more traditional sales and production positions. Perhaps it was easy to find IT and software people and now the challenge is filling the traditional positions. Given what we saw in the challenges section, that seems likely.

"Other" was selected by 8% of respondents. The top write-in response was "customer service."

Looking Forward

Let's now turn from our survey to government data. How many establishments are there? How are shipments and profits doing?

5. Graphic Communications Industry Economic Trends

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

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

Remember, these are aggregate industry data, a combination of industry leaders, laggards, and everyone in between. When you see the trends, it's a baseline or an average. Always keep in mind that there are many profitable, healthy, and growing companies that are performing exceptionally well, and that underperforming businesses tend to drag down the average. Think of it as the opposite of survivor bias.

Printing Establishments

The composition of the printing industry today—NAICS 323[7]—is predominantly small businesses; 70% of the 25,521 establishments counted in 2016 were those that had under 10 employees. About one-fourth (23%) 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.

These two charts have updated last year's data with 2016 *County Business Patterns* as well as estimates from our own forecasts. Figure 14 includes a 2023 forecast. By the way, a complete demographic resource is now available through APTech called PrintStats.[8]

Between 2015 and 2023, we are looking to consolidate the smaller end of the industry by about 2,400 establishments, while at the higher end, we're looking at a decline of another 300 or so establishments.

[7] "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."
[8] Visit https://www.printtechnologies.org/research--market-data/market-data/printstats/. WhatTheyThink also provides summaries of industry data at http://whattheythink.com/industry-data/.

Figure 13. US commercial printing establishments by size, 2016
Total establishments: 25,521

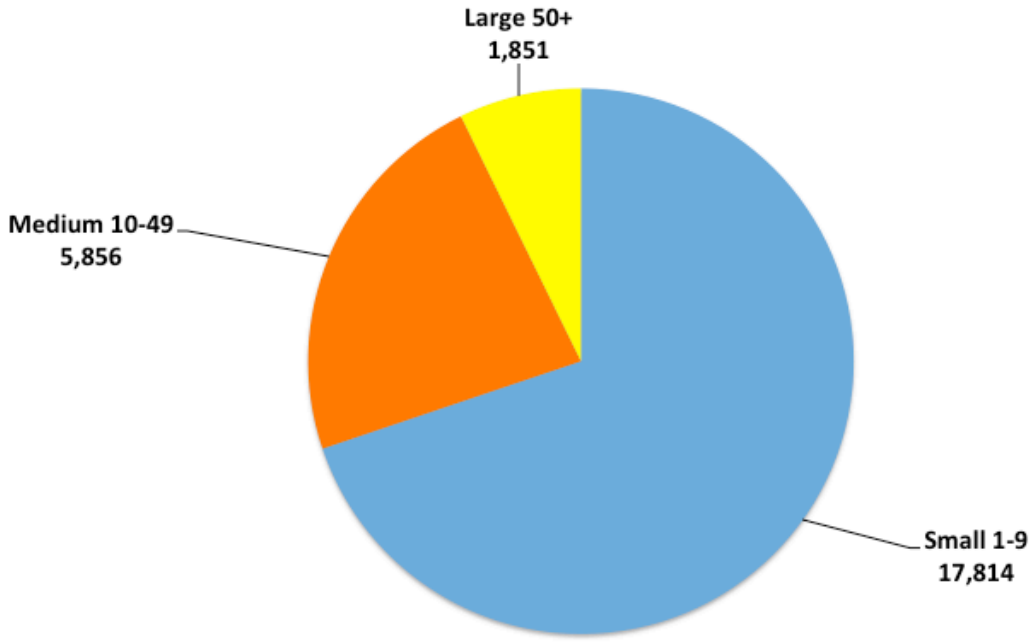
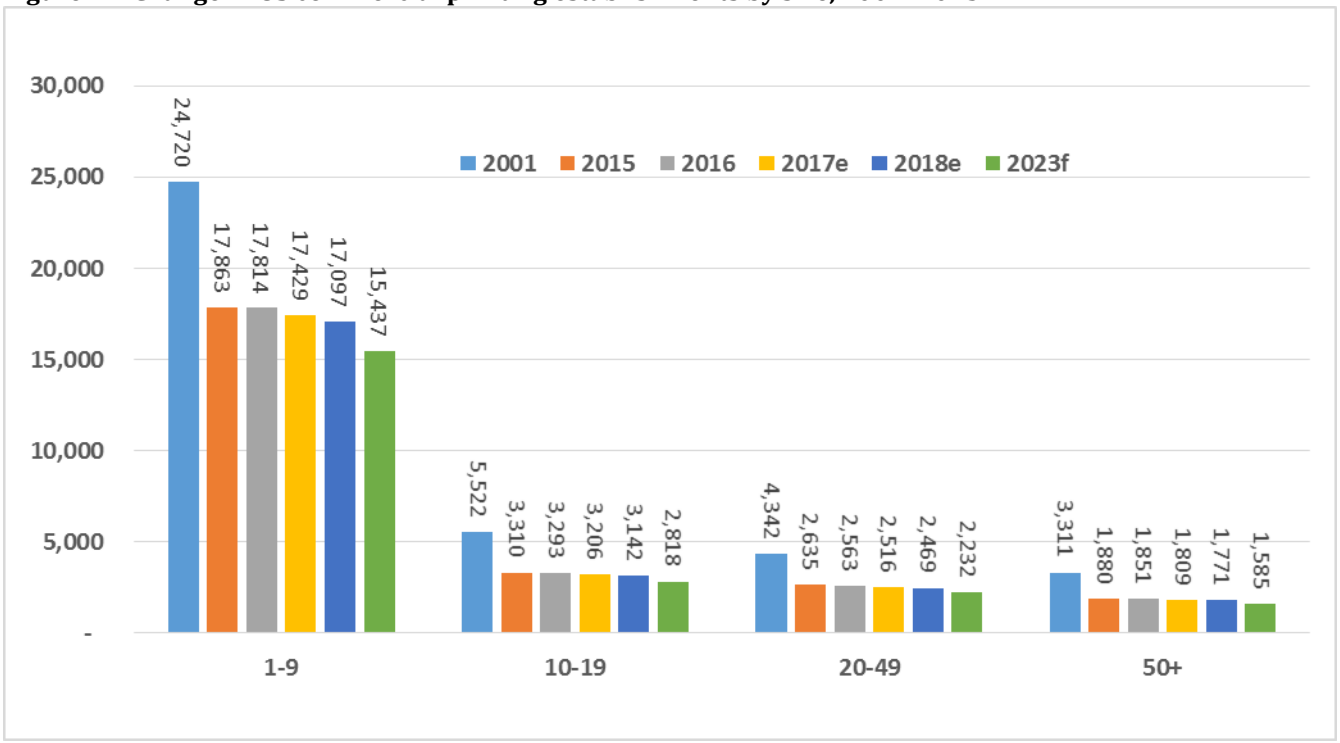


Figure 14. Change in US commercial printing establishments by size, 2001–2023



Births/Deaths

Figure 15 is repeated from the previous year's report; current birth/death data were not available as this report was being finalized, and will be published in March 2019. We will provide updated data on the WhatTheyThink Data Analysis site[9] once it becomes available. So this commentary repeats last year's commentary.

We can look at industry birth and death data to get a sense of how the industry is stabilizing to some degree. From 2014 to 2015, there had been an increase of nearly 1,300 establishments, but a decrease of just over 1,900 establishments, for a net loss of about 600 establishments. This represents the same percentage change as previous years, so we haven't been seeing a huge acceleration or deceleration of industry consolidation. However, the initial number of establishments is contracting so every year's percent change represents a smaller number of establishments.

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

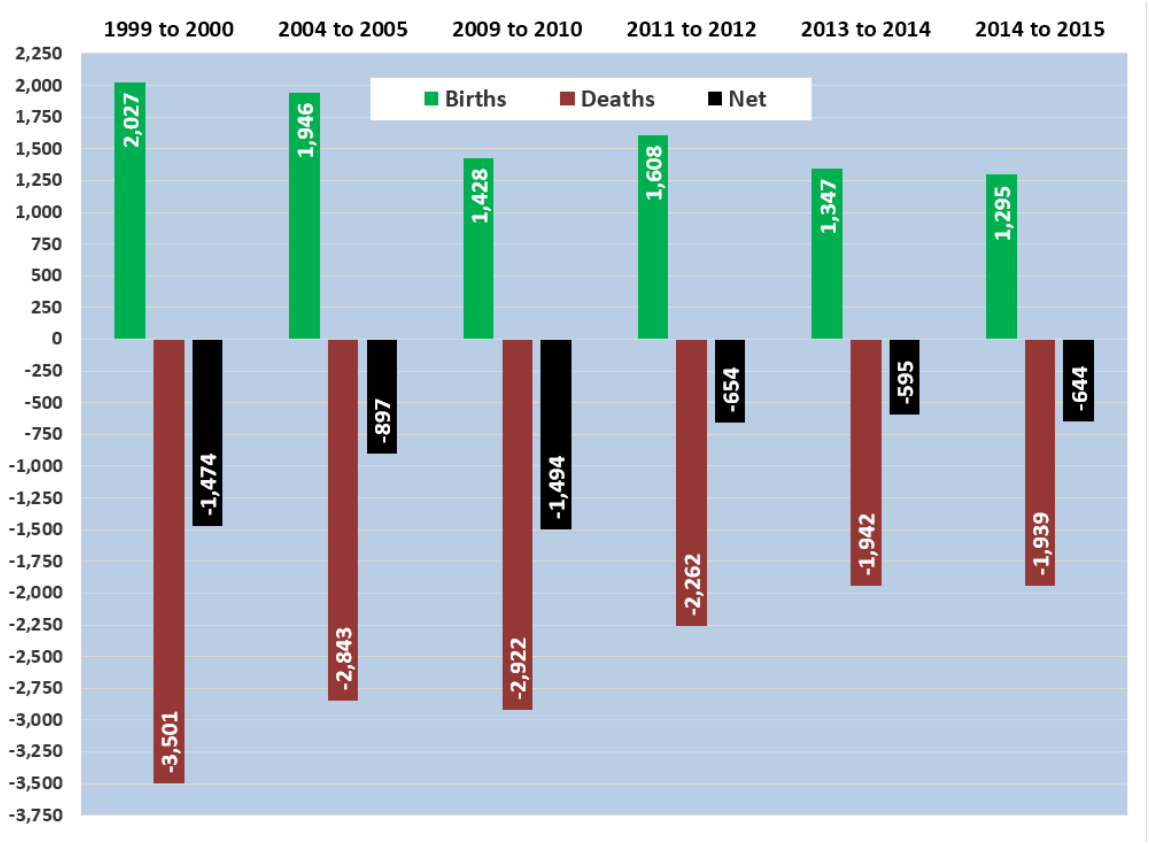
At the same time, births and deaths don't always represent brand-new businesses or pushing-up-the-daisies dead ones. Rather, businesses often change their corporate structure. A corporation closes, a proprietorship opens. So it is often the same people just changing their tax structure. There is also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

Also, we can't discount the fact that some healthy printing businesses may classify themselves as something other than "commercial printing" (that is, NAICS 323). Those that, for example, decided to become "marketing services providers" may have chosen to classify themselves in a services NAICS like 541 rather than a manufacturing NAICS like 323.

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

[9] Lots of good stuff at http://whattheythink.com/industry-data/.

Figure 15. Printing industry establishment births/deaths, 1999–2015



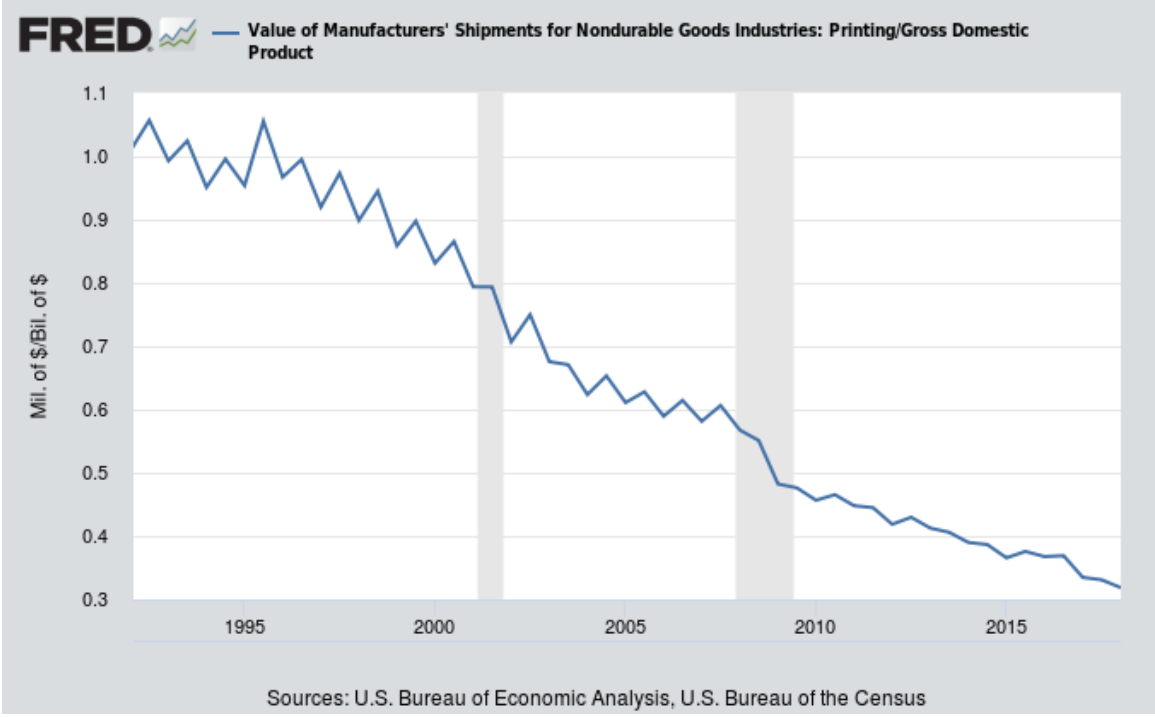
Printing Industry Shipments

Here's where the fun begins, and while this section is usually depressing, we have had relatively good news on the shipments front in 2018. But let's get the bad news out of the way first and start with printing shipments as a percentage of GDP. Since 1997, the value of printing shipments went from around 1% of GDP all the way down to about 0.3%. After the general economic recovery in July 2009, things looked like they were evening out, but they just kept going down. (These figures are not inflation-adjusted so as to avoid disagreements about which inflation adjustment to use, but we're just looking for an overall pattern.)

Essentially, this is the story of technology. Printing shipments as a percentage of GDP started to plummet when the Internet truly "arrived" circa 1996 and while we can blame the recession for some of the drop after 2008, remember also that this was also the period that saw the advent of social media, the smartphone, and mobile media. Every new electronic medium has disrupted print's standing in the overall scheme of media.

We should prepare ourselves for the rollout of 5G, which will happen in earnest in 2019 and 2020. "5G" stands for fifth-generation cellular wireless, and will offer "greater speed (to move more data), lower latency (to be more responsive), and the ability to connect a lot more devices at once (for sensors and smart devices)."[10] We'll have more to say about 5G in our Forecast and Trends section.

Figure 16. Printing shipments as a percentage of current-dollar GDP, 1992–2018



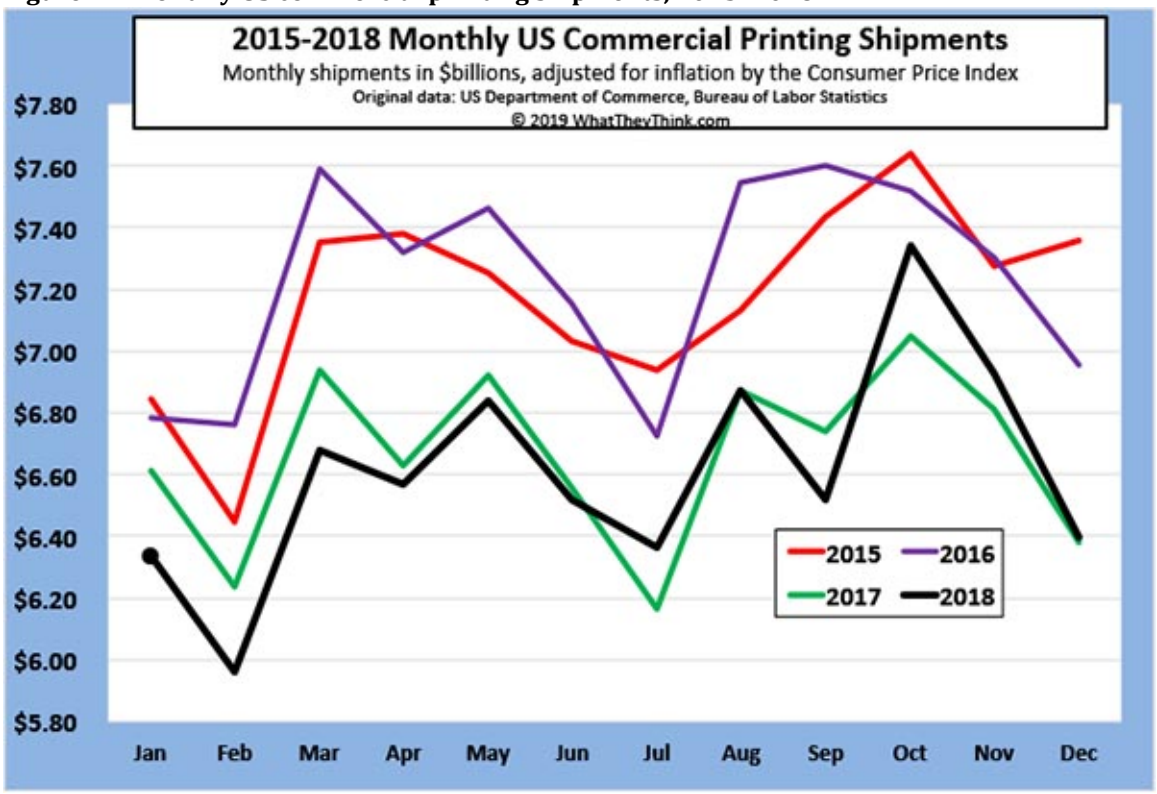
[10] Sascha Segan, "What Is 5G?" *PC Magazine*, January 28, 2019, https://www.pcmag.com/article/345387/what-is-5g.

The monthly shipments data in Figure 17 below are up through December 2018, the most recent month for which we have data for this report.

2018 has been an interesting, perhaps transitional year for printing shipments. As you can see, it was the first year in a long time in which shipments equaled—or, in some months, exceeded—the previous year. (And, heck, this is even after adjusting for inflation!) It also has come to reflect what could very well be the new industry seasonality: October now seems to be the peak month of the year for industry shipments.

We expected December 2018 shipments to come in lower than November—and they did—but we had hoped that they would be above December 2017 shipments—and they are. But, just barely: $6.40 billion in December 2018 vs. $6.38 billion in December 2017 (all adjusted for inflation).

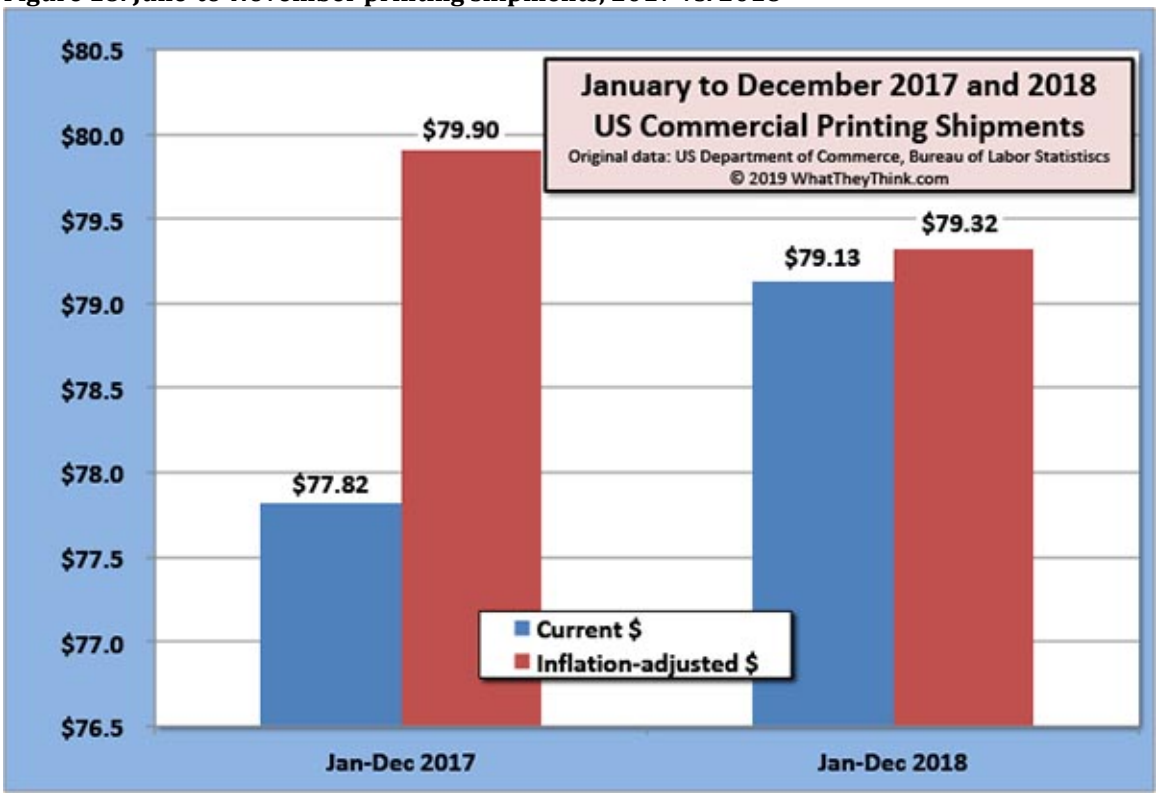
Figure 17. Monthly US commercial printing shipments, 2015–2018



A bit disappointingly, though, as a whole, final shipments for 2018 came in at $79.3 billion, not *quite* surpassing 2017's $79.9 billion, but we did come pretty darn close. We got off to a slow start last year, and it wasn't until mid-year that shipments really began to perk up. And couldn't quite make up that lost ground.

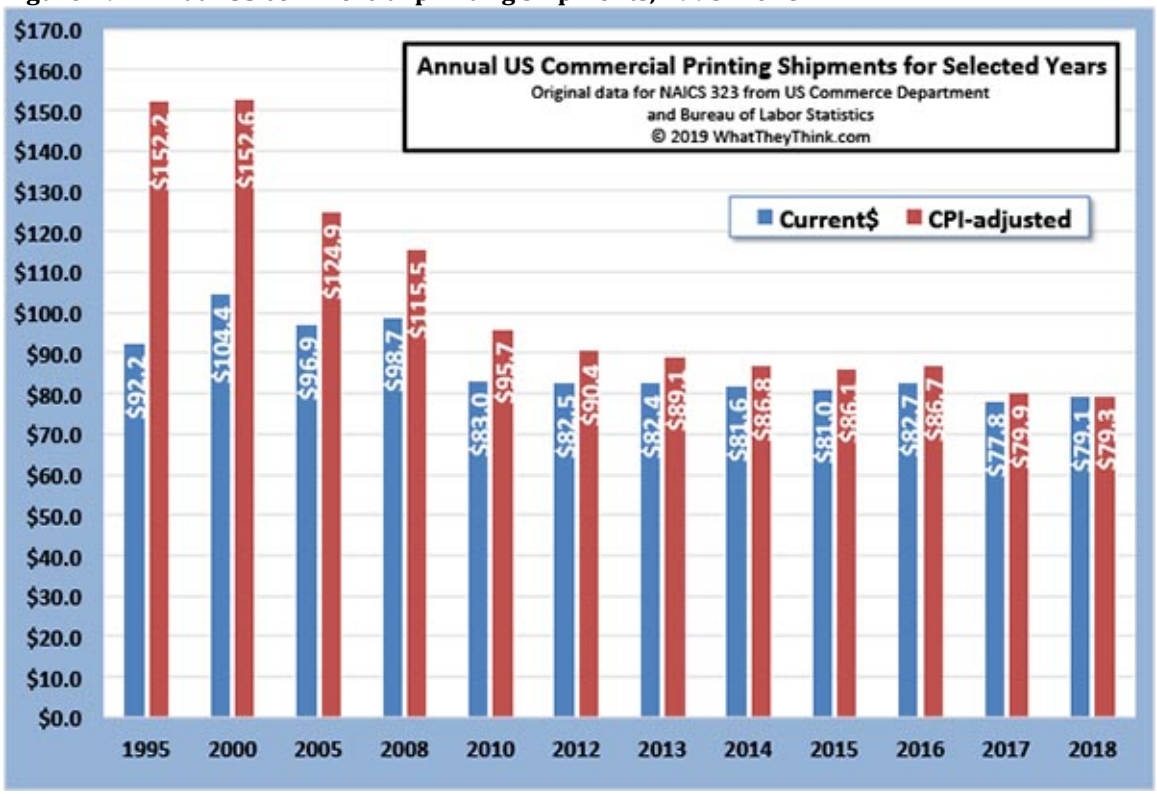
Still, all things considered, 2018 wasn't a horrible year for the industry. Also remember that these figures—like any aggregate industry data—are averages, and that there are some extremely successful businesses in tis industry. We also can't discount the fact that some successful "print" businesses may not classify themselves in NAICS 323 any longer.

Figure 18. June-to-November printing shipments, 2017 vs. 2018



Looking at annualized shipments for selected years since 1995, we can see how things have changed since the advent of the Internet. We've leveled off a bit this decade, but 2017 shipments were more of a comedown than previous years. As for 2018, we stayed just about even...which is good news and bad news.

Figure 19. Annual US commercial printing shipments, 1995–2018



Shipments Per Employee

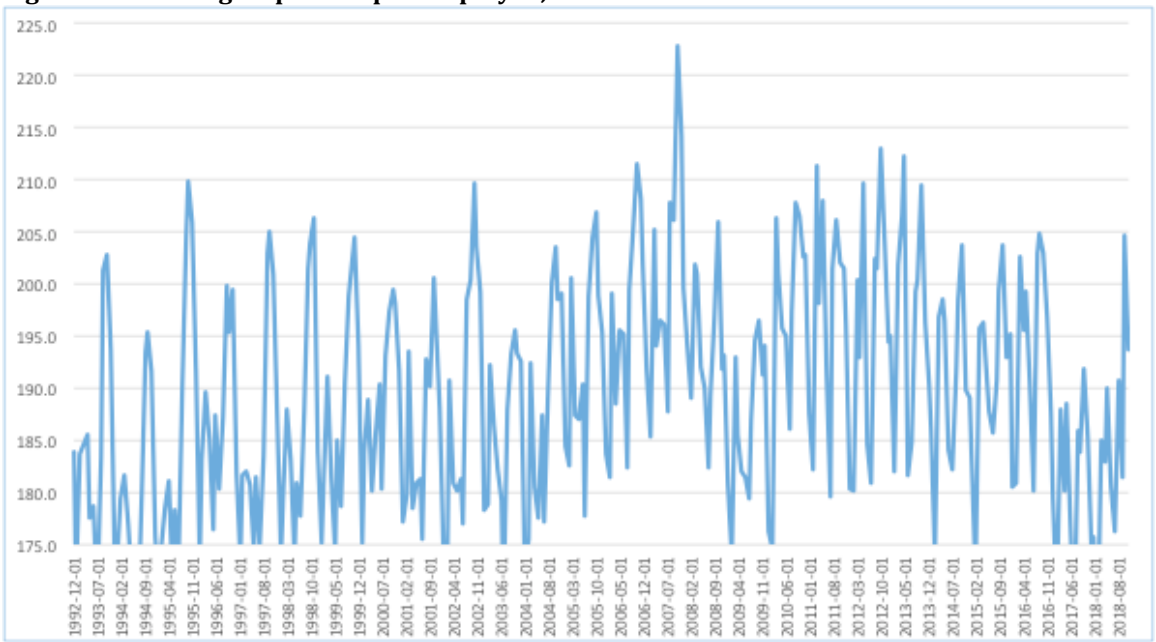
When we look at printing shipments per employee, we have to take into account two things: shipments have been declining (at least until 2018) and employment has been going down (this has not changed). When shipments per employee go down, it probably means lot of employees will be losing jobs or businesses will be closing. When it goes up, it could mean the opposite.

If we look at shipments per employee on a monthly basis (Figure 20), the data tend to be very noisy, as months jump up and down. Some months have big jumps, small have small jumps, but if there is any kind of discernible trend, it's that they have been on an upswing over the past year, with a bit of a drop toward the end of the year.

The industry—like all industries—has regular seasonal up and downs (even if that seasonality has been shifting over the past decade, as we have been seeing in our shipments data) and slack time can be used for training, acquiring new equipment or capabilities, etc. Also note that some shipments may not get billed immediately. (A shipment doesn't count until it's billed—or payment received.) So unless business owners see some big change on the horizon, shipments will vary but employment won't.

With the combination of consolidation and a push for increased automation, there is the pressure to be more productive and get more done with fewer people, which looks like is starting to happen.

Figure 20. Printing shipments per employee, 1992–2018



Graphic Arts Employment

For the year, printing employment is down -0.02%, and the all the declines have been on the production side. If we had to make a guess about what's going to happen this year, we will probably see non-production, administrative staff take a big hit as consolidation and automation continue.

Note that the content creation side of things is a bit more positive. PR tends to be the bright spot (three guesses who often handles a company's social media) and if we back PR out of ad agencies, we can see the PR effect quite dramatically.

Pity about direct mail—employment is down -10.7% from December 2017 to December 2018. This doesn't necessarily foretell the death of direct mail, just that it is migrating to businesses that do other things as well, so they tend not to be broken out separately. As we see elsewhere in industry data, individuals and employees move from business category to business category—and our challenge is to find out where they've got to.

Table 15. Graphic arts employment, 2017 vs. 2018

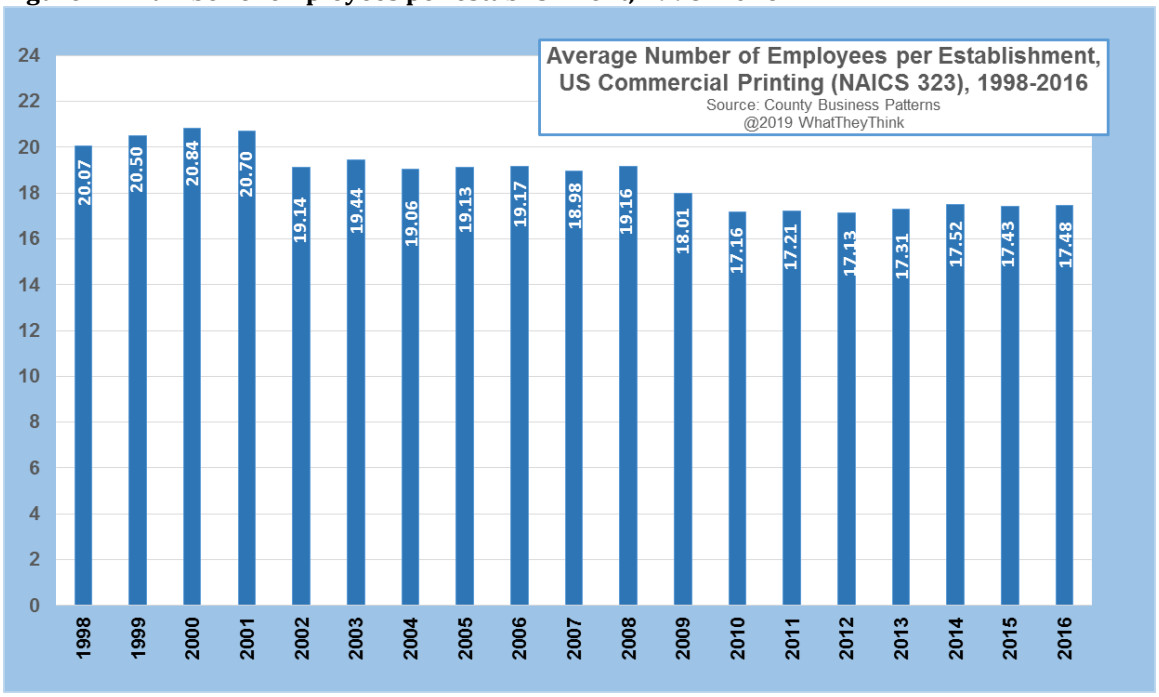
Employment in thousands of workers	December 2017	December 2018	Y/Y Change	January 2017	January 2018	Y/Y Change
Printing, all	439.3	427.5	-2.7%	431.5	421.0	-0.02
Printing, production	304.9	290.0	-4.9%	298.5	238.5	-0.20
Printing, less production	134.4	137.5	2.3%	133.0	182.5	0.37
Publishing	720.3	735.7	2.1%	727.8	729.2	0.00
Periodicals	92.7	86.4	-6.8%	88.9		
Newspapers	155.5	141.8	-8.8%	153.8		
Publishing, ex-newspaper	564.8	593.9	5.2%	574.0		
Graphic design	63.5	65.2	2.7%	61.1		
Public relations	59.3	62.6	5.6%	57.0		
Ad agencies, includes PR	493.0	493.8	0.2%	479.1	486.8	0.0
Ad agencies, less PR	433.7	431.2	-0.6%	422.1		
Agency (incl PR) + design	556.5	559.0	0.4%	540.2		
Direct Mail Advertising	45.0	40.2	-10.7%	42.6		

Employees Per Establishment

For most of the 2000s, the average number of employees per establishment was on the decline, although not by an awful lot. After 2008, the average number of employees dropped, but has remained somewhat stable over the course of the 2010s. The story of the 21st century has been the gradual elimination of prepress as discrete stages of production—yes, shops still have one or two prepress experts, but they don't need strippers, separators, and platemakers the way they used to. Computer-to-plate helped reduce the staff, and then digital printing continued that trend. We have also started to see the same kind of thing happening in postpress; not that it is being absorbed into the printing process (although for inline finishing, that can be the case) but rather it is increasingly being done in-house instead of outsourced to a specialty finishing house. This is a reflection of the fast-turn nature of today's jobs; who has time to send out finishing work any anymore? So as we have seen in the investments and opportunities data, shops have been adding binding and finishing and, as a result, need people to run this equipment.

The past six to eight years has been largely a consolidation and digital printing story. There has also been a shift in the kinds of employees print businesses are looking for; as we saw in our previous year's survey data, IT and programming employees were highly sought-after. That has shifted this year to salespeople and some production staff. As automation continues—and as production staff become harder to find—we may not find average number of employees per establishment go down, but the composition of those staffs will likely change from being production-centric to sales/marketing/business development- and IT-centric.

Figure 21. Number of employees per establishment, 1998–2016



Printing Industry Capacity Utilization

We always include capacity utilization in these reports more out of tradition or than any practical reason as it has become an increasingly anachronistic economic indicator for the industry. Although it can be important for individual companies, even then it's a flawed metric. We include it because people still like to refer to it, and it's not *completely* unimportant, although people can attach too much significance to capacity utilization.

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

The problem with this metric, at least for the printing industry, is that it assumes that prices and profits are solely dependent on production capability. However, there are other inputs involved beyond sheer production capacity. The capacity utilization calculation doesn't 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. In particular, skilled employees can reduce unproductive utilization and increase profits—and now automation can increasingly serve that function. This becomes even thornier when talking about new kinds of wide-format and specialty printing, where costs can be all over the place, depending on equipment, substrates, even inks and other consumables.

So looking at Figure 22, capacity utilization started to drop in the 1980s, when the value of printed goods rose thanks to cost reductions from digital prepress and the growth of process color printing, which had greater ROI than black and white. As a result, profits were good even though utilization was going down.

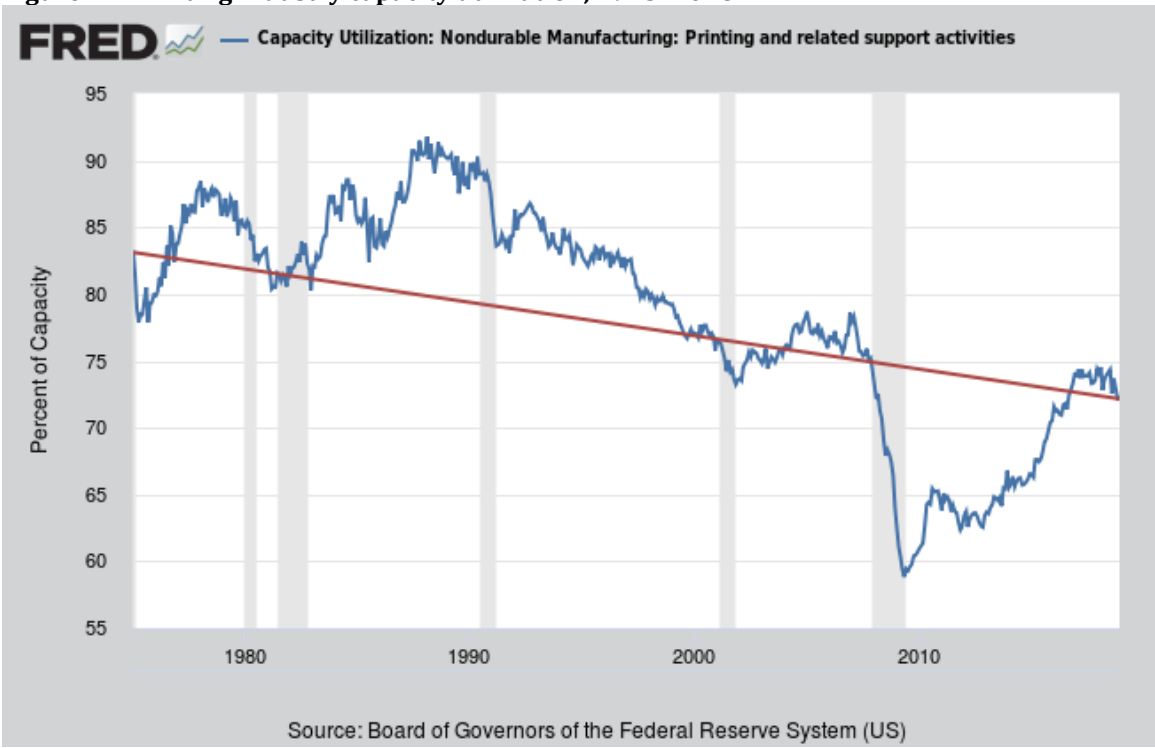
In recent years since the recession, capacity utilization had been rising until the last couple of years—although with all the consolidation we have been experiencing, you'd think it would be stronger. Still, it's nowhere near its pre-recession level, although it had come close.

As we said earlier, we question the use of capacity utilization, and that's because a lower utilization is often blamed for lack of pricing power, which is not likely to be the case. After all, what's one way to increase capacity utilization? Close plants. The thing is, we've *been* closing plants for 20 years now, and the pricing issue is no better, as our own survey data continues to tell us.

Pricing challenges may have 99 causes, but capacity utilization ain't one.[11] This is why we advise caution when using certain kinds of metrics; they can often lead to illogical conclusions.

[11] We're so hip.

Figure 22. Printing industry capacity utilization, 1975–2018



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 does it cost to produce what a given industry or market produces? Different industries that produce different products have different inputs. For printers, it's equipment, paper, ink, and other consumables. For the creative markets (designers, ad agencies, etc.), it's computers, software, and other tools. In some cases, those inputs are getting more expensive (paper, ink, and plates, for example, in the case of printers) and in some cases cheaper (software, in the case of creatives—and, yes, printers, too).

We typically look at the PPI for different aspects of printing, as well as related communications. As you can see from Figure 23, the PPI for offset had been on a downward trend but spiked toward the end of 2018. Any printer can tell you that consumables of all kinds have increased in price as of late, whether it's paper, or ink, or even plates, thanks to the aluminum tariffs.

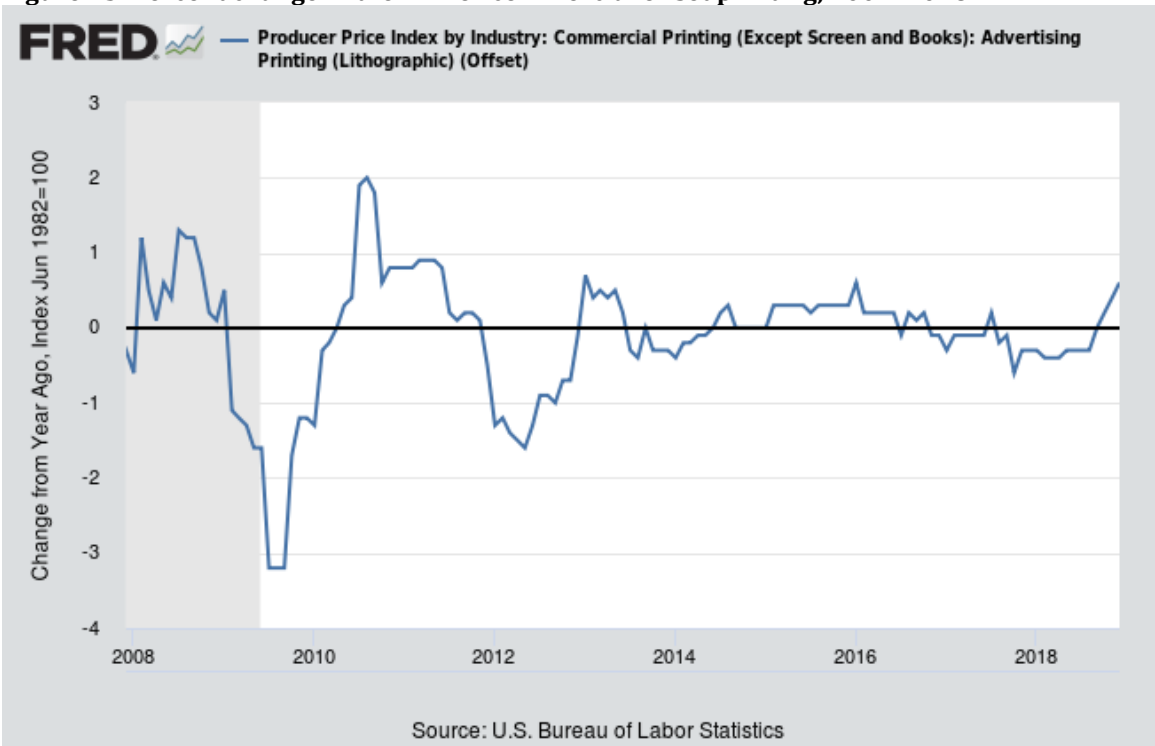
We often use the *Consumer* Price Index (CPI) for cost comparisons because that reflects the prices of most relevance to our own personal wallets, but looking at the PPI helps us understand what's going on with supply and demand.

So the prices of the goods you are selling and the materials, labor, etc., are increasing, while the only things that are declining in terms of costs are certain technologies, such as cellphone costs, and maybe software. Revenue is affected by market prices, and all other costs are following the CPI. So, if costs are going up and you are having trouble getting sufficient demand, *and* if you can't raise prices, you can't cover those costs properly. As a result, the bottom line looks really bad.

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

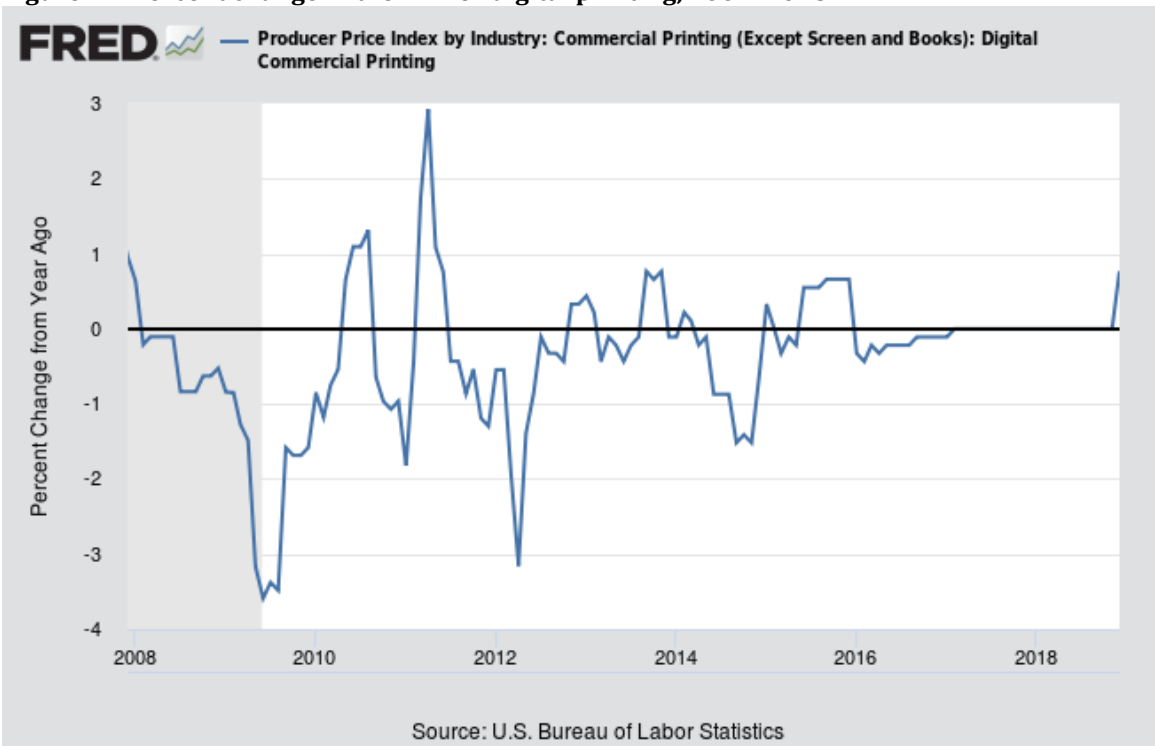
On the other hand, the advent of wide-format, specialty, and newer kinds of printing *are* seeing increased demand, and can command higher prices—we often refer to a lot of these products as "high-value applications" because margins on them are still very good. So even if the cost of, say, UV inkjet ink goes up (which it has, because of an increase in the cost of some of the chemicals used to make it), it is still possible to cover your costs on many of those kinds of jobs.

Figure 23. Percent change in the PPI for commercial offset printing, 2007–2018



The change in PPI for digital printing, on the other hand, has been remarkably steady—until there was a spike in late 2018 thanks to an increase in ink prices.

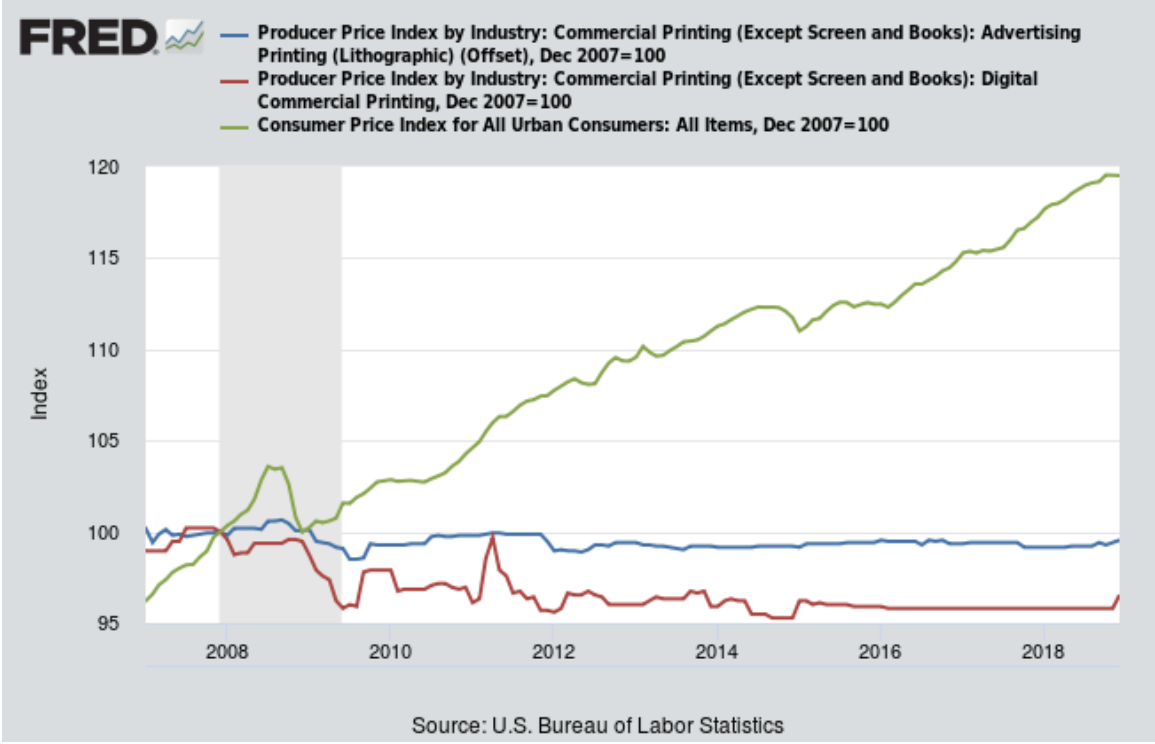
Figure 24. Percent change in the PPI for digital printing, 2007–2018



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

Look at the gap (19 percentage points) between the blue line (commercial printing PPI) and the green line (CPI) in the chart below. (It's even bigger for digital printing, the red line.) On the offset side, you have lower prices than you had seven years ago and on the digital side, you have lower prices than you had five years ago. On the plus side, with digital, you have newer equipment that is more efficient, especially in that digital presses are not long-term investments and can be upgraded or replaced fairly readily.

Figure 25. Percent change in the CPI vs. PPI for commercial offset and digital printing, 2007–2018

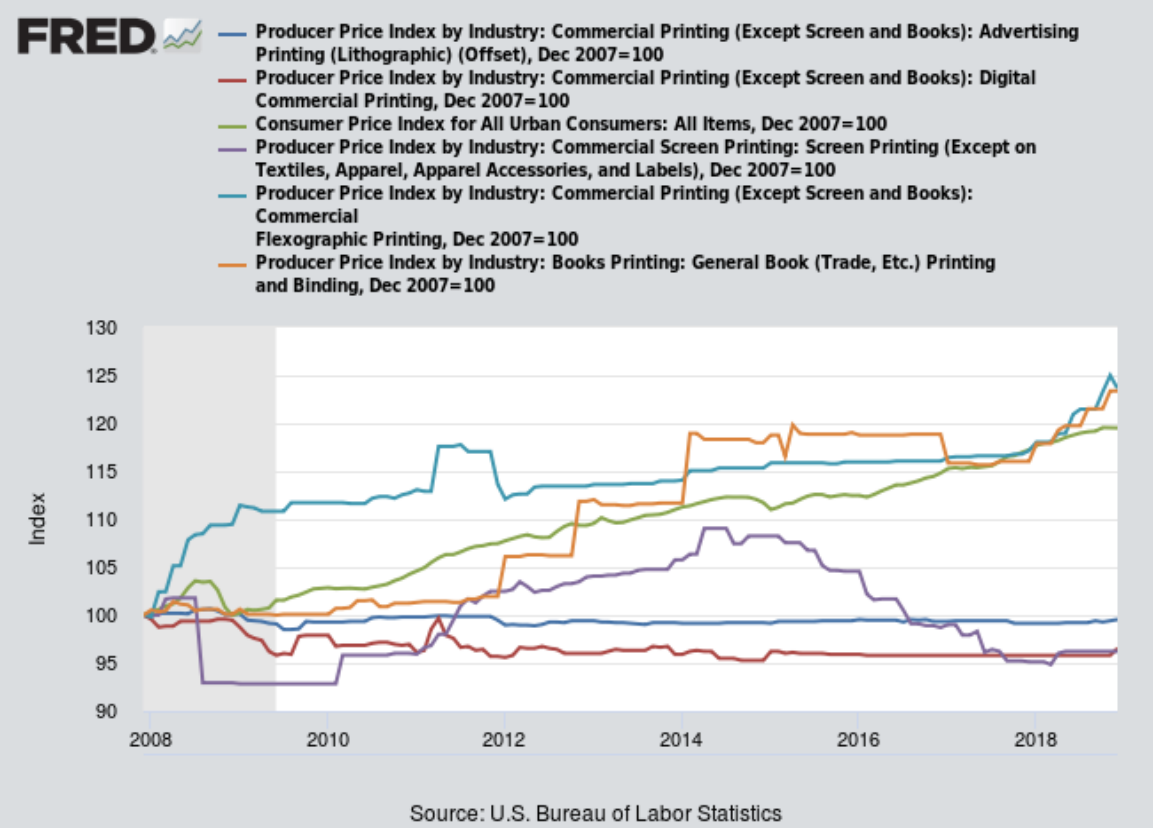


In Figure 26, we look at the PPIs of various kinds of print vs. the CPI. Book printing prices have fallen even as the volume of books printed have fallen. The prices of individual books can go up because the long-run inexpensive books are no longer being sold.

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

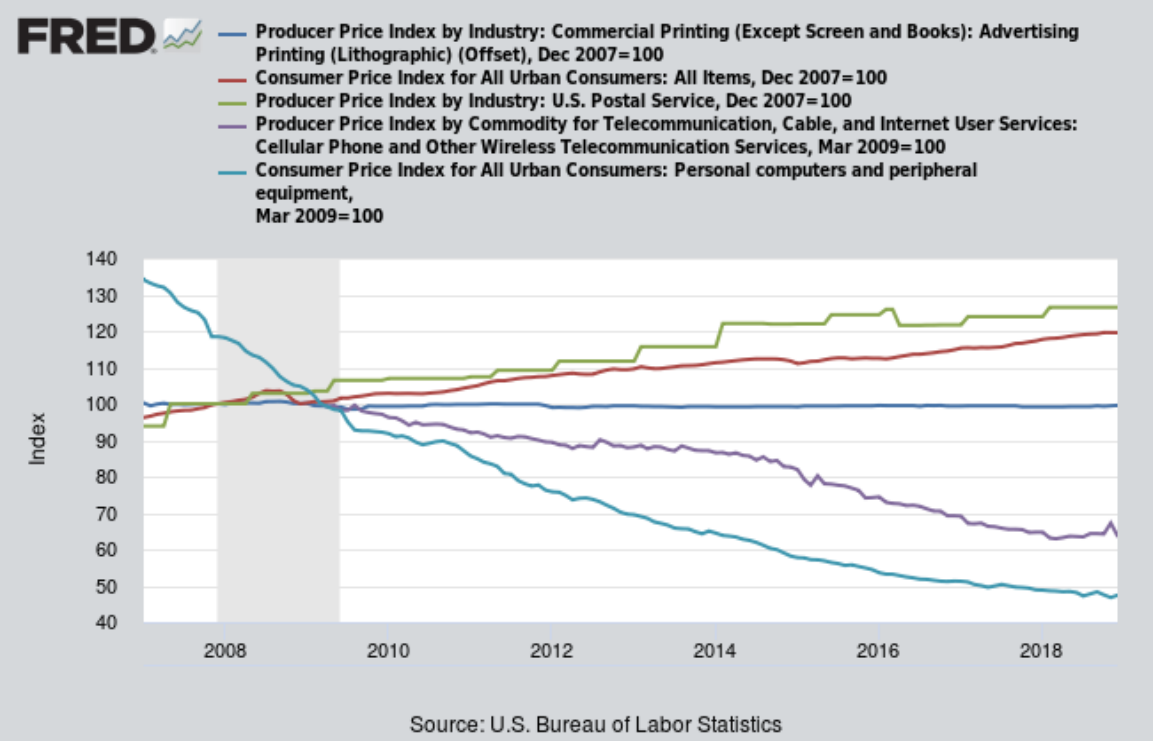
Screen printing has backed off, which we suspect is due to the prevalence of digital inkjet equipment, which can print on the same kinds of materials as screen but in shorter, more customized/personalized runs.

Figure 26. Percent change in the CPI vs. PPI for commercial offset, digital, screen, book, flexo printing, 2007–2018



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

Figure 27. Percent change in the CPI vs. PPI for printing prices, postal costs, wireless communications, and computers, 2007–2018



Industry Profits

Commercial printing profits have been rather stable, albeit in a not-great kind of way, over the past several years, peaking at $4 billion in early 2016 and troughing at just above $1 billion a year later. Generally, though, profits have been more stable than shipments. Annualized, profits from Q4 2017 to Q3 2018 were $3.07 billion.

It has been interesting to look at the profitability of large print businesses and compare it to that of smaller businesses (Table 16). For large printers ($25+million in assets), profits before taxes were 0.37% of revenues, and for the last six quarters they've averaged 1.04% of revenues. But look at the "non-large" printers (<$25 million in assets): their Q3 profits before taxes were 7.71% of revenues, and for the last six quarters averaged 7.41% of revenues. This disparity between these "two cities" is not a new story; it's something we have been seeing for the past couple of years: low profitability of the large printers is dragging down average industry profitability. For the industry as a whole, cracking $4 billion in profits is a rare event.

Figure 28. Printing industry shipments vs. profits, Q4 1995–Q3 2018

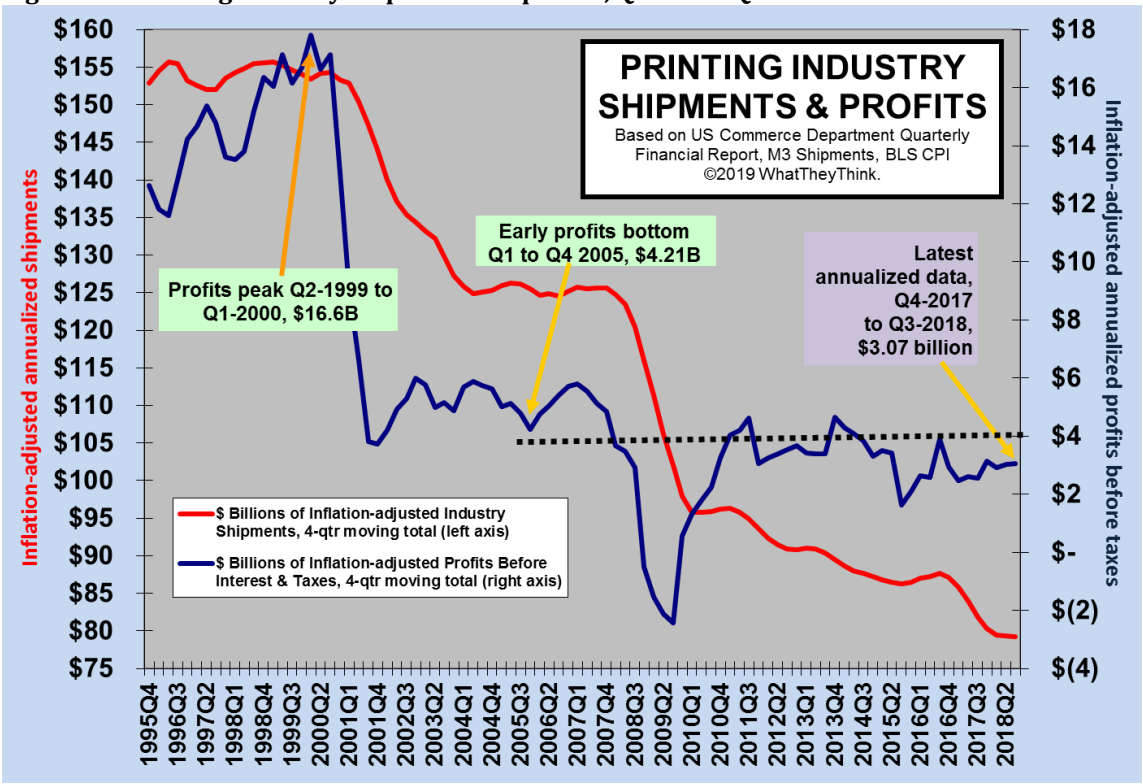


Table 16. Printing profits by assets, Q2 2016–Q3 2018

Net Income Before Taxes	2Q 2017	3Q 2017	4Q 2017	1Q 2018	2Q 2018	3Q 2018	Simple average, last six quarters
All commercial printers	**5.55%**	**3.73%**	**1.85%**	**3.52%**	**6.15%**	**3.94%**	**4.12%**
<$25 million in assets	7.01%	6.56%	5.98%	8.35%	8.84%	7.71%	7.41%
>$25 million in assets	4.11%	1.12%	-1.87%	-1.06%	3.55%	0.37%	1.04%

NOTES: Approximate breakpoint for $25 million is 100 employees; Q1-2018 had $1.8 billion of "writedowns," defined as "nonrecurring items, including gain (loss) on sale of assets, restructuring costs, asset writedowns, etc." and Q3-2018 had $1.34 billion; Data are from the Department of Commerce *Quarterly Financial Report* released December, 2018.

Data analysis ©2019, WhatTheyThink

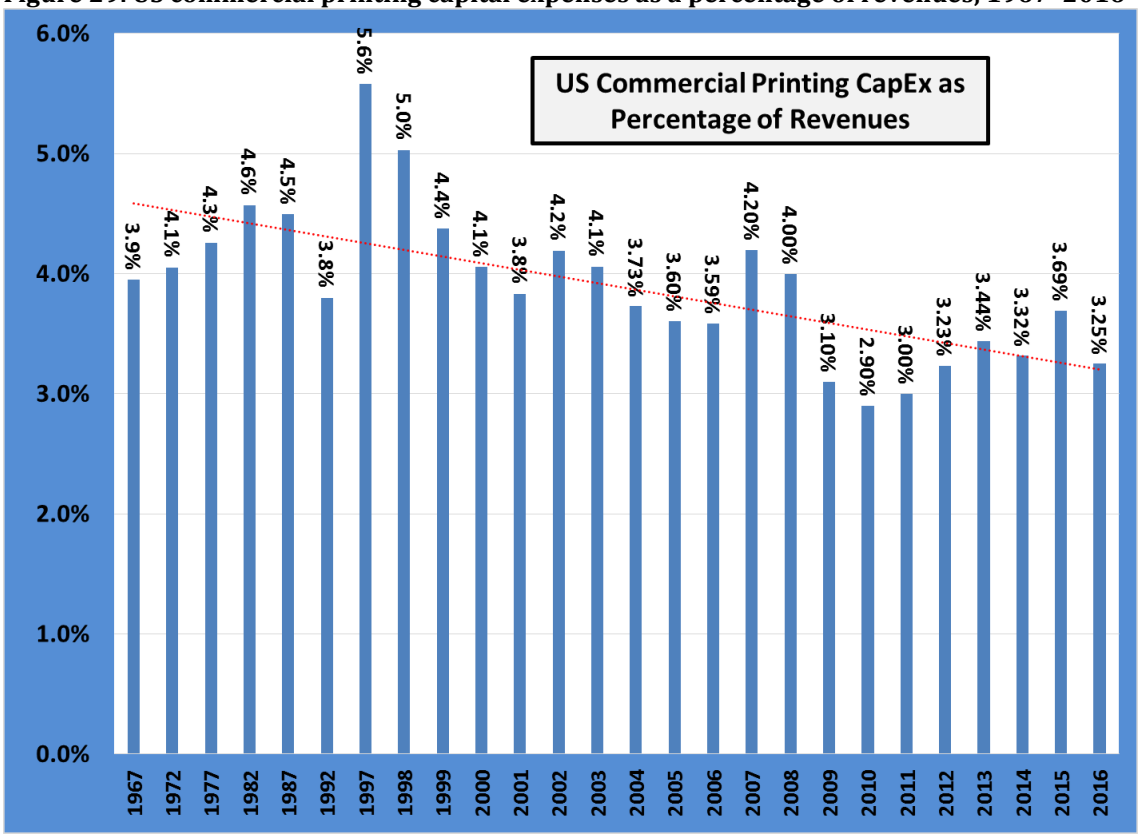
The cost of investment (for large printers, interest expense was 4.8% of sales, compared to 0.8% for the non-large printers) remains a burden on businesses whose capital investments and acquisitions have not matched the demands of the market. Smaller shops have generally invested more prudently, and quickly adopted digital technologies, putting them in a position to more nimbly adapt to changes in the marketplace.

Industry Capital Expenditures

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

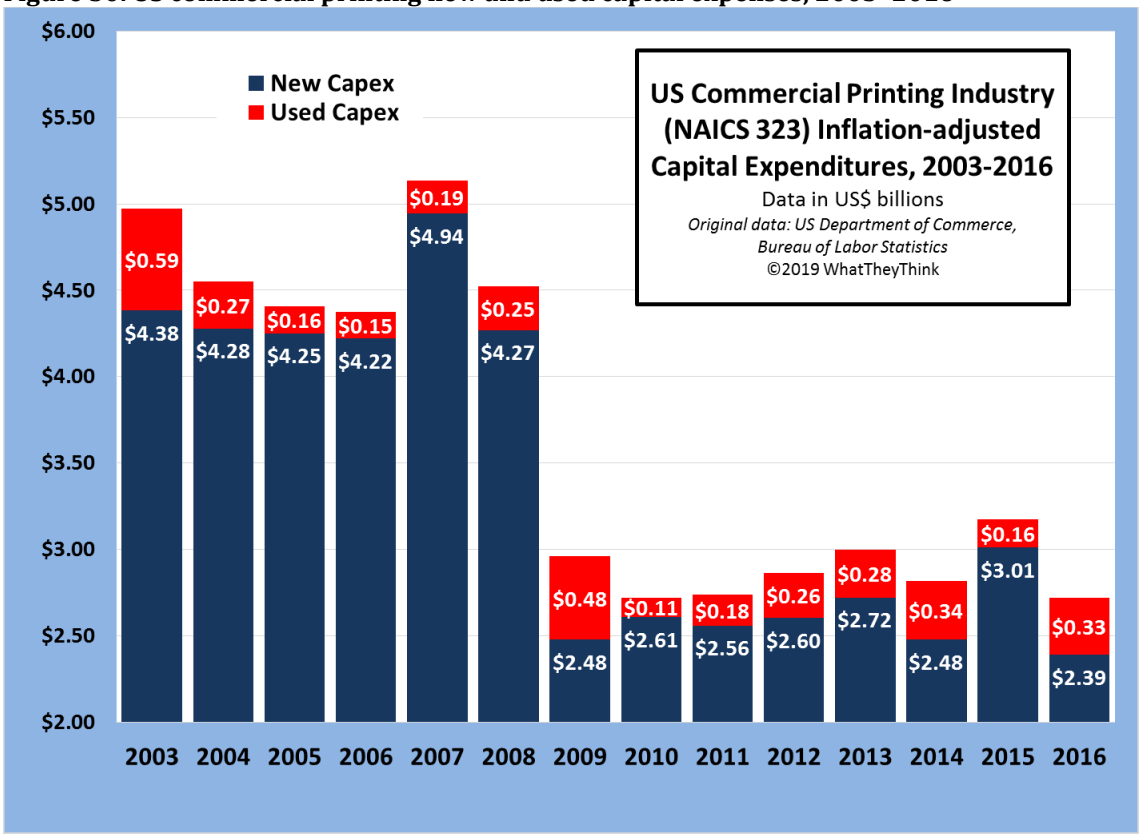
The latest data tell us that about 3.25% of revenues are being spent on capital investments, and remember that "capital expenditures" can also include things like moving or expanding their location. One concern is the fact that consolidation spending is, in some accounting systems, considered a capital expense (though not in the reports whose findings we cite). From a print business's accounting perspective, it counts toward capital spending. More importantly, though, it takes money away from reinvestment in the productive base of the company. There's only so much money hanging around.

Figure 29. US commercial printing capital expenses as a percentage of revenues, 1967–2016



It's interesting to look at cap ex data from a trade show perspective. Look at look at 1997 (in Figure 29 above). That was the year of the famous PRINT 97 where a plethora of digital, Direct Imaging, and computer-to-plate systems was introduced. CapEx fever was also fueled by the euphoria of the dot-com bubble. What happened, though, was that all the presses bought in 1997 were sold off in 2003 (look at the spike in used equipment bought in 2003 in Figure 30). GraphExpo 2007 and 2008 also look like they were decent shows, although the spike in used equipment in 2009 suggests the recession forced a lot of companies to ditch their gear.

Figure 30. US commercial printing new and used capital expenses, 2003–2016



Publishing and Advertising

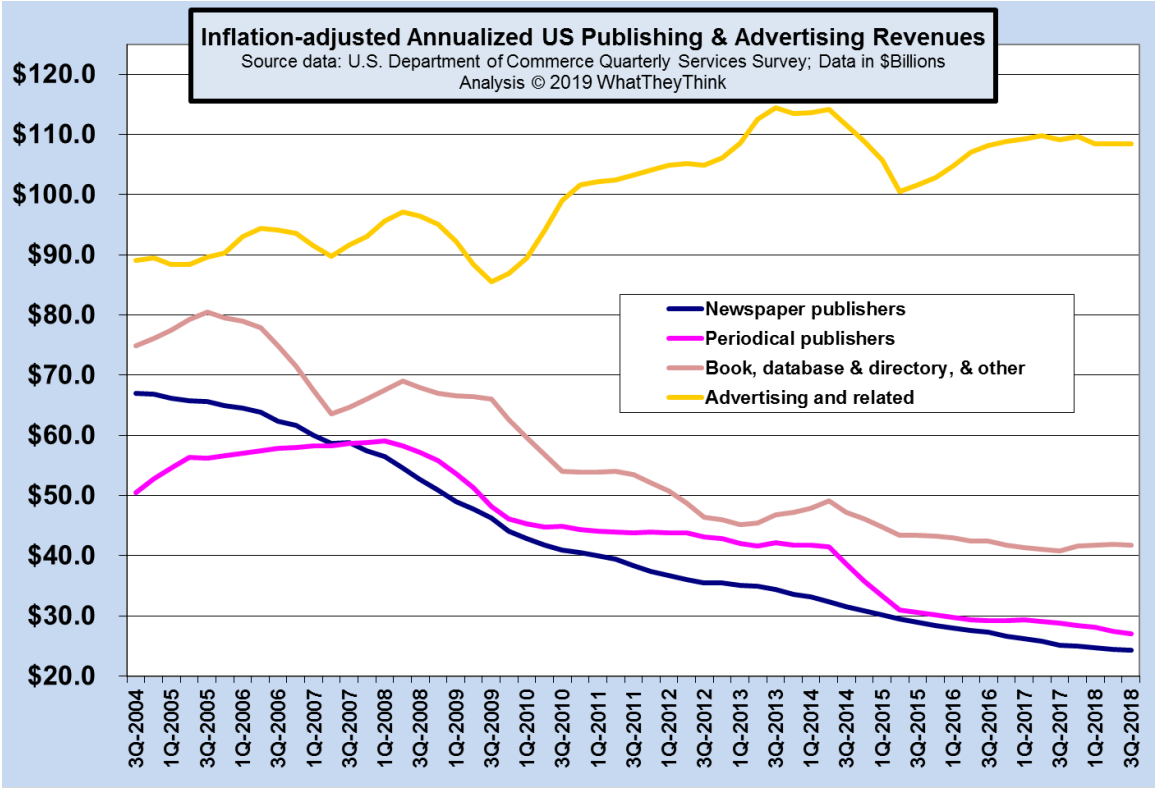
The figure below rounds up the latest revenue data for the various publishing segments as well as ad agencies.

On an annualized basis, since 2004, newspaper publishing revenues have plummeted by about $45 billion. Periodical and book publishers aren't in much better shape.

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

The nature of advertising is changing because things like content marketing, e-newsletters, mobile apps, and things like that can be done internally or with freelancers, and offer much more bang for much less buck. Also, as you may recall from the employment discussion earlier, PR firms/reps are handling a lot of these initiatives, especially social media.

Figure 31. Inflation-adjusted annualized US publishing and advertising revenues, 3Q 2004–3Q 2018



Looking Forward

Compared to recent years, 2018 was a pretty good one for the industry. The industry data we have reflect an industry in transition. Some of the data paint a bleaker picture, but that is due to the fact that some of the data series we use that are based on 2016—that's just the nature of the *County Business Patterns* beast, and hasn't caught up to the current industry...yet. When things change rather abruptly, as they seem to have for the printing industry, not all data sources can keep up. We like to think that this is a good problem to have.

6. Prevailing Macroeconomic Conditions

In this section, we zoom out to get a larger sense of the general economy. In all, the economy has been doing well. GDP growth has been steady, if not stellar, and the employment situation has been improving, not just in terms of the headline unemployment number but also in labor force participation. Other macroeconomic indicators are also positive.

GDP

From the Bureau of Economic Analysis:[12]

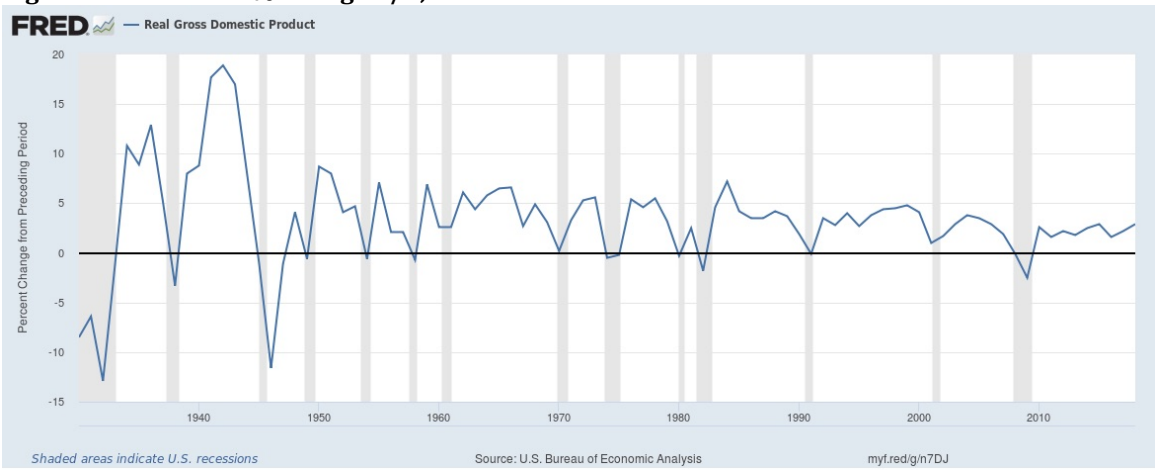
> Real gross domestic product (GDP) increased at an annual rate of 2.6 percent in the fourth quarter of 2018, according to the "initial" estimate released by the Bureau of Economic Analysis. In the third quarter, real GDP increased 3.4 percent.

For the year as a whole:

> Real GDP increased 2.9 percent in 2018 (from the 2017 annual level to the 2018 annual level), compared with an increase of 2.2 percent in 2017 (table 1).

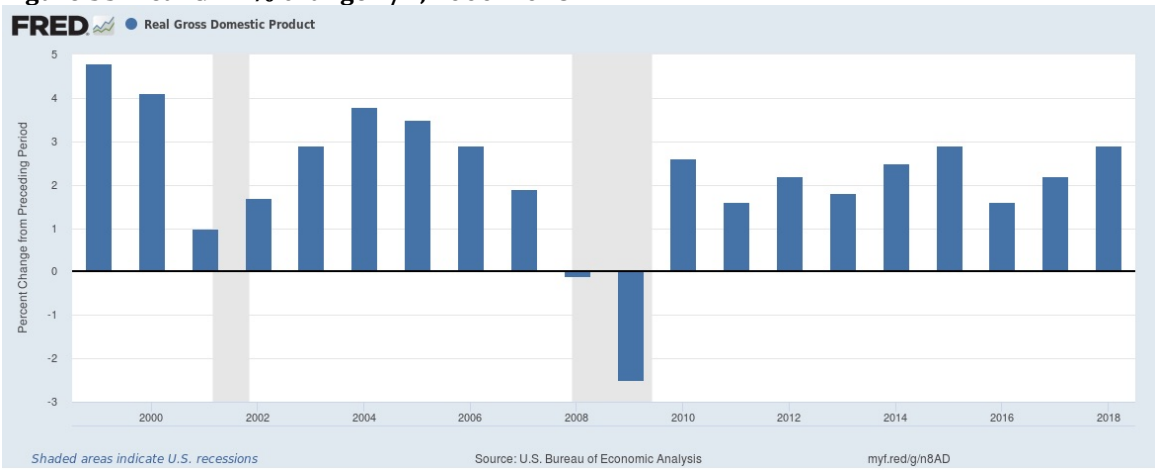
GDP has been getting better, certainly since the depth of the recession, but is still nowhere near the 3.3% post-World-War II average. All the talk recently of massive GDP growth never really panned out. And in many circles, economists are predicting a downturn in the not-too-distant future. (See the NFIB data later in this section; their economists and experts have been foretelling economic doom on the horizon.) (There is an old saying that goes something like, "If you laid 100 economists end to end...it would be a good thing.")

Figure 32. Real GDP % change Y/Y, 1940–2018



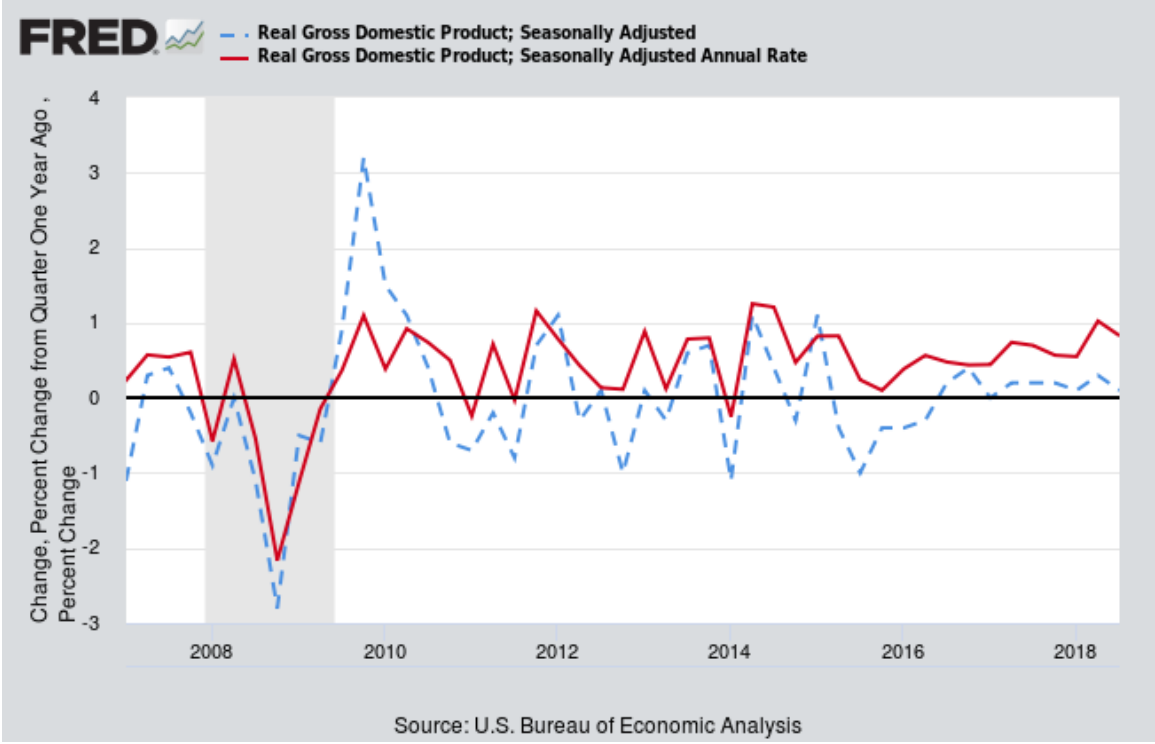
[12] The latest release is at https://www.bea.gov/news/2019/initial-gross-domestic-product-4th-quarter-and-annual-2018.

Figure 33. Real GDP % change Y/Y, 2000–2018



In Figure 34 below, the blue line is the year-to-year GDP, while the red line is quarter-to-quarter; the former removes some of the data noise endemic to the latter.

Figure 34. Percent year-over-year (blue line) change in real GDP vs. quarter-to-quarter (red line), 2008–2018



Proprietors' Income

Figure 35 below shows the percentage change in proprietors' income for the past 10 years compared to current dollar GDP (Figure 36 zooms in to look at the past six years.) Proprietors' income is often seen as a surrogate for small business, and it tends to be out of phase with GDP as large businesses outsource work to small businesses at the beginning of recoveries and then make those services the first to be cut in expectations of a downturn.

Proprietors came out of the recession pretty strong compared to GDP—that's a lot of freelancers, particularly those working in construction and related services, who took a beating after the housing crash that prefaced the recession. They seem to have eased back in line with the economy in general and then some. If we look at the more detailed six-year chart, we see more clearly that proprietors' income had been lagging GDP since 2014, but in the past year took a decided upward turn.

Figure 35. Percent change in proprietors' income vs. GDP (10 years), 2007–2018

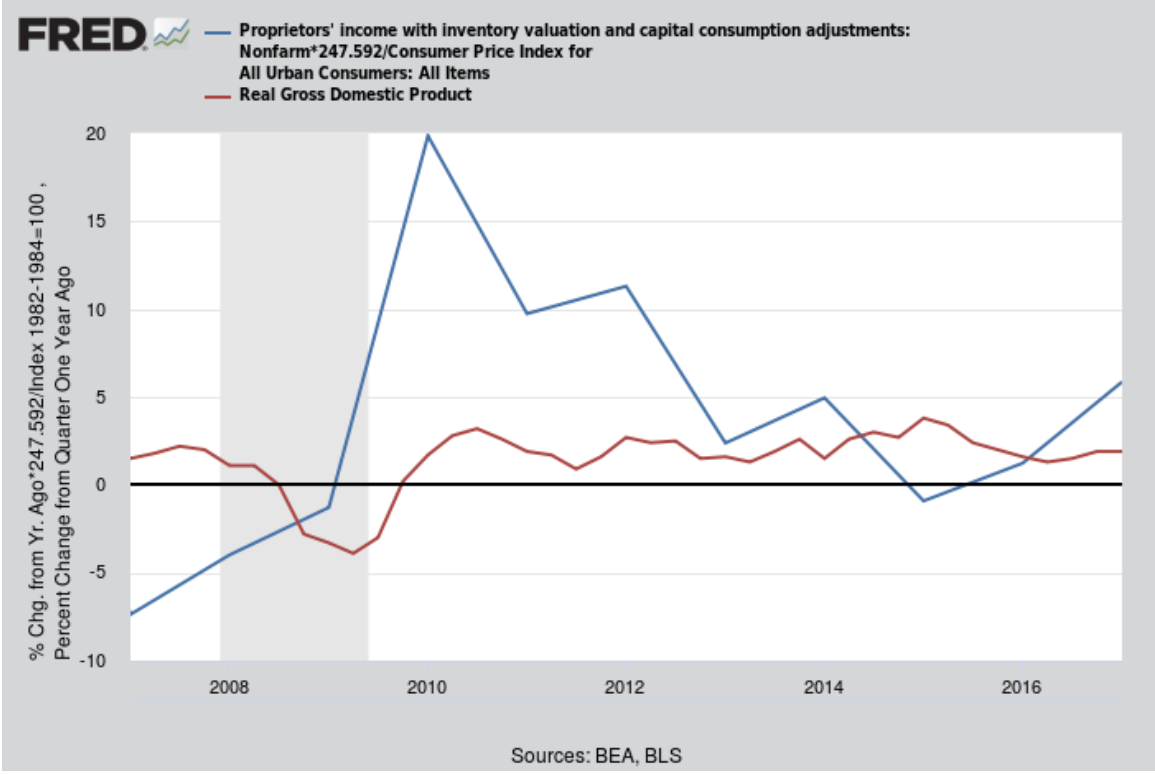
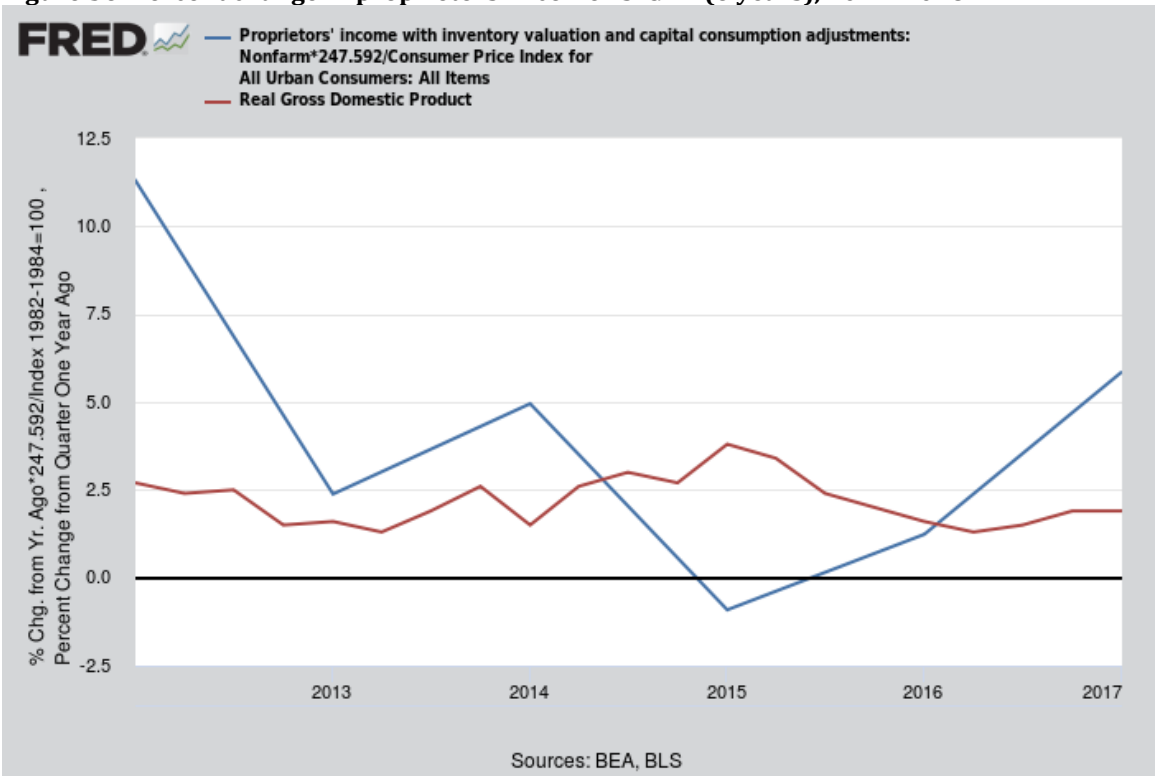


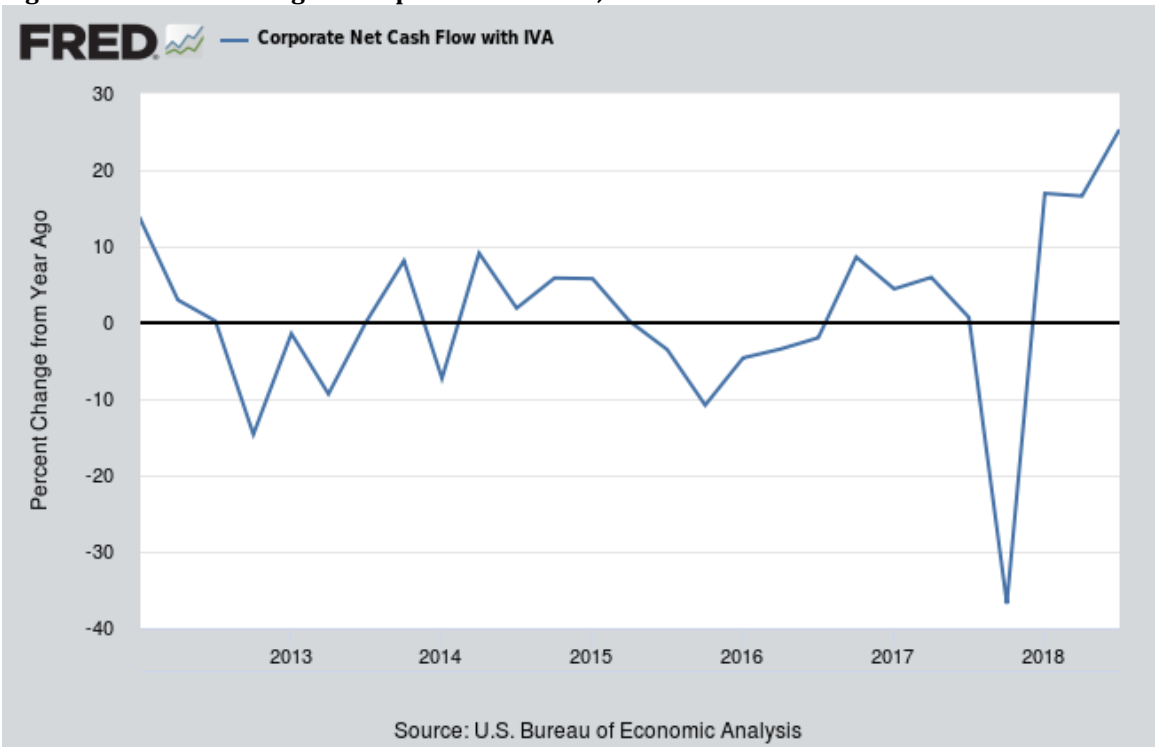
Figure 36. Percent change in proprietors' income vs. GDP (6 years), 2012–2018



Corporate Cash Flow

Likewise, corporate cash flow growth has been inconsistent for the majority of the 2010s. It was down in 2017, but ticked up substantially thanks to tax repatriation and the cut in the corporate tax rate.

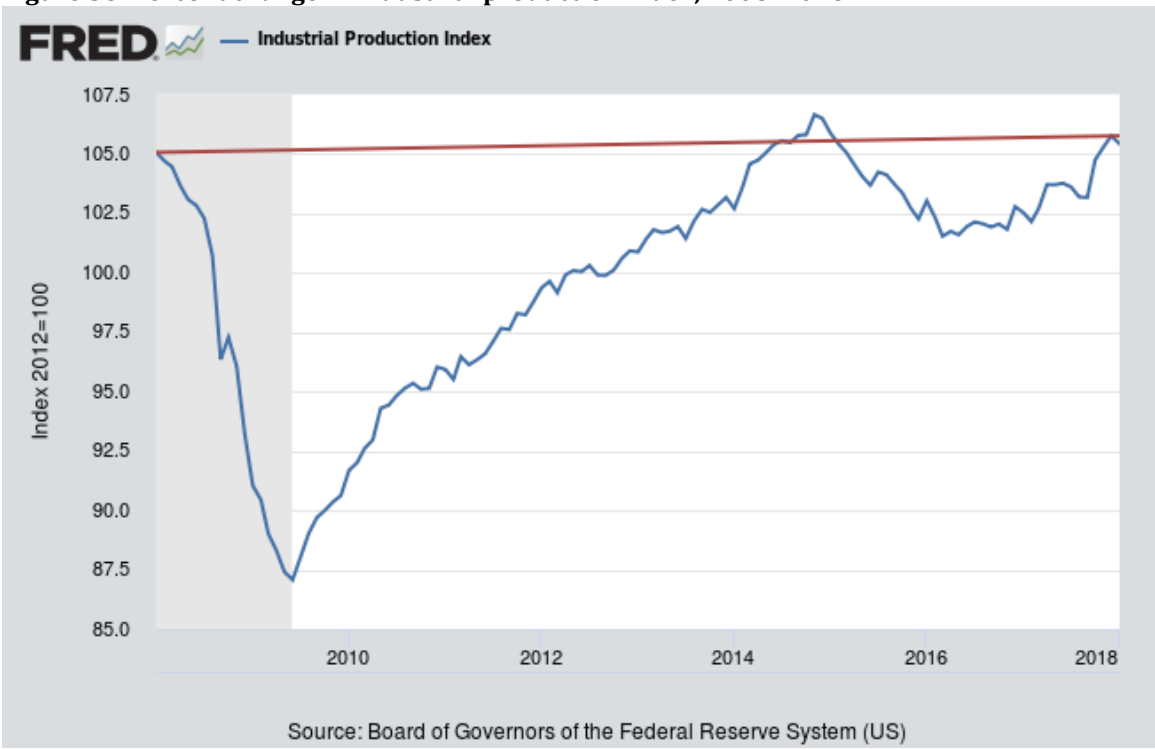
Figure 37. Percent change in corporate cash flow, 2012–2018



Industrial Production Index

If we look at the industrial production index, 2016 had been pretty terrible, and even though it was up in 2017 and 2018, it is still below where it should be. In 2018, it hit the recession line again, although it looks like it simply bounced off that line in the most recently reported quarter. We don't expect that it will get worse, but this still needs to be higher.

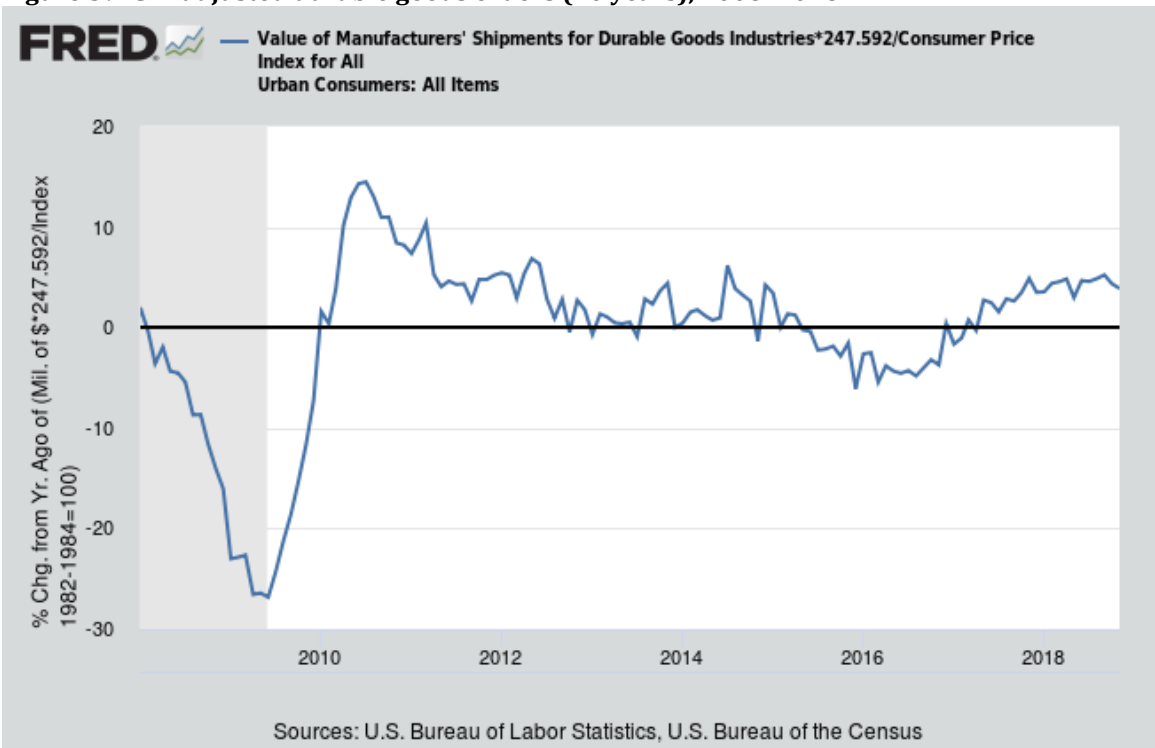
Figure 38. Percent change in industrial production index, 2008–2018



Durable Goods

Durable goods—items like appliances, home and office furnishings, lawn and garden equipment, consumer electronics, toys, small tools, sporting goods, and other goods that last for at least three years (per the official definition)—have been getting better. They retreated a bit in 2016, which could have been an election effect in terms of manufacturing. Durable goods started to perk up again in 2017, but 2018 has been a bit of a mixed bag, with a tick down in the last quarter.

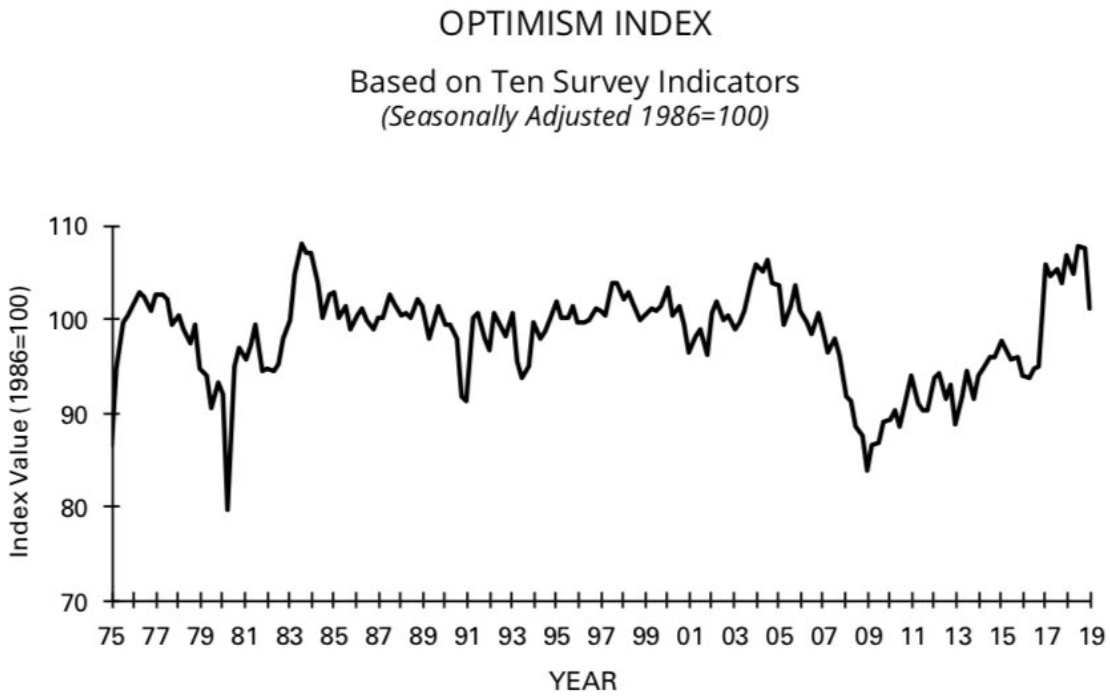
Figure 39. CPI-adjusted durable goods orders (10 years), 2008–2018



NFIB Small Business Index

The NFIB's Small Business Optimism Index is based on the quarterly survey from the National Federation of Independent Businesses (NFIB).[13] It's been pretty low since even before the recession, and there was a slight peak in 2014, although dropped immediately thereafter. It had been climbing throughout 2017 and 2018, likely in anticipation of regulatory rollbacks and tax reform. The recent plunge was from the NFIB's survey in the midst of the government shutdown.

Figure 40. NFIB Small Business Economic Satisfaction Index, 1986–2019



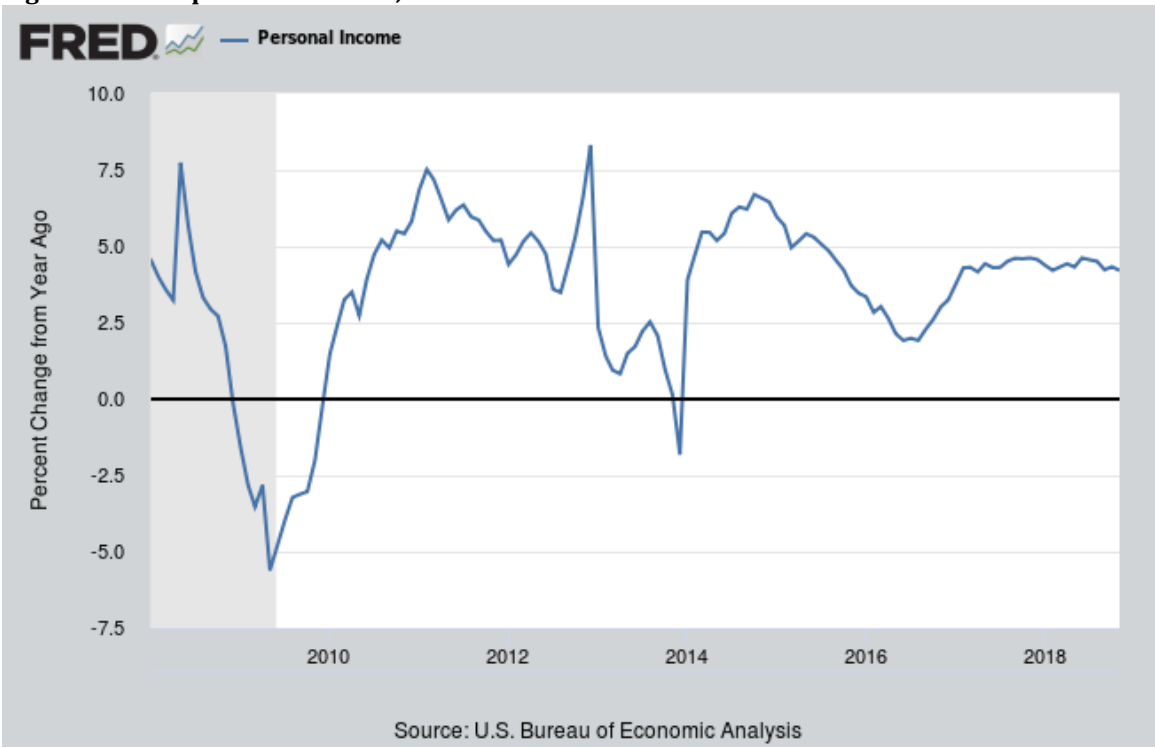
[13] View or download the January 2019 report at https://www.nfib.com/assets/SBET-Jan-2019.pdf.

Personal Income

Real Personal Income

Real personal income took a dive in 2016 and started to climb again, but has been steady throughout 2017 and the first half of 2018, but has started to trend downward.

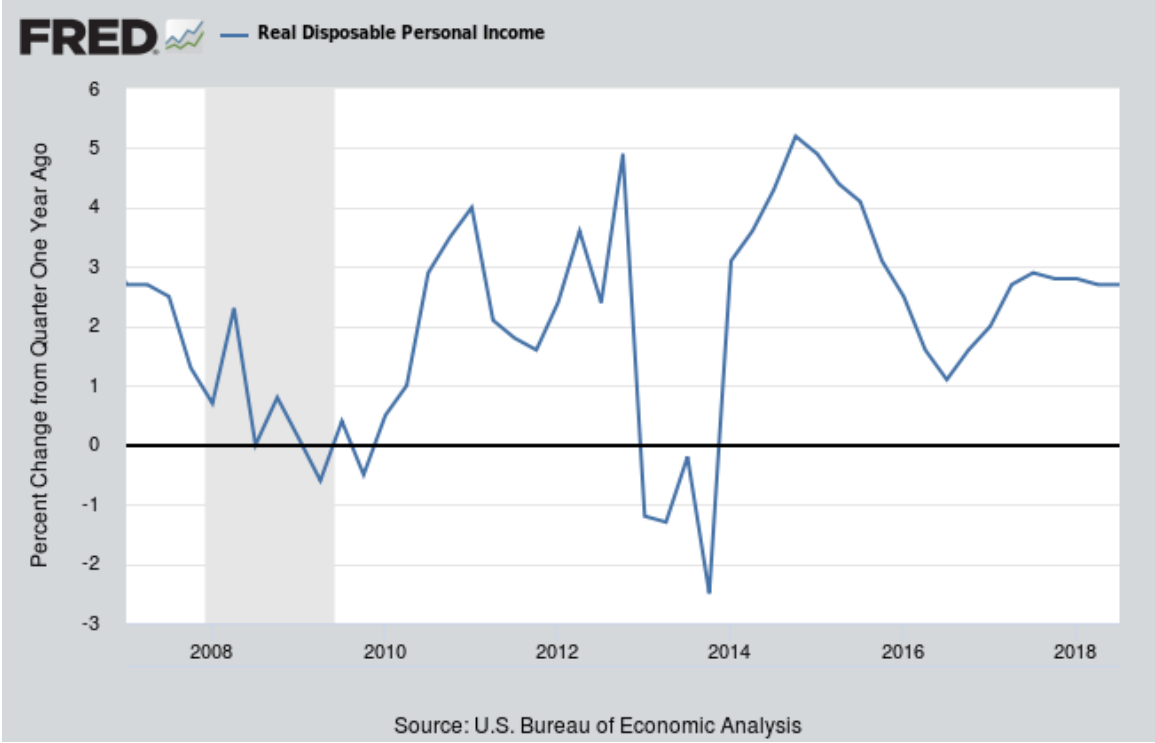
Figure 41. Real personal income, 2008–2018



Real Disposable Personal Income

Disposable income is real personal income after taxes, and it is not up as much as real personal income, for what that's worth.

Figure 42. Real disposable personal income, 2008–2017



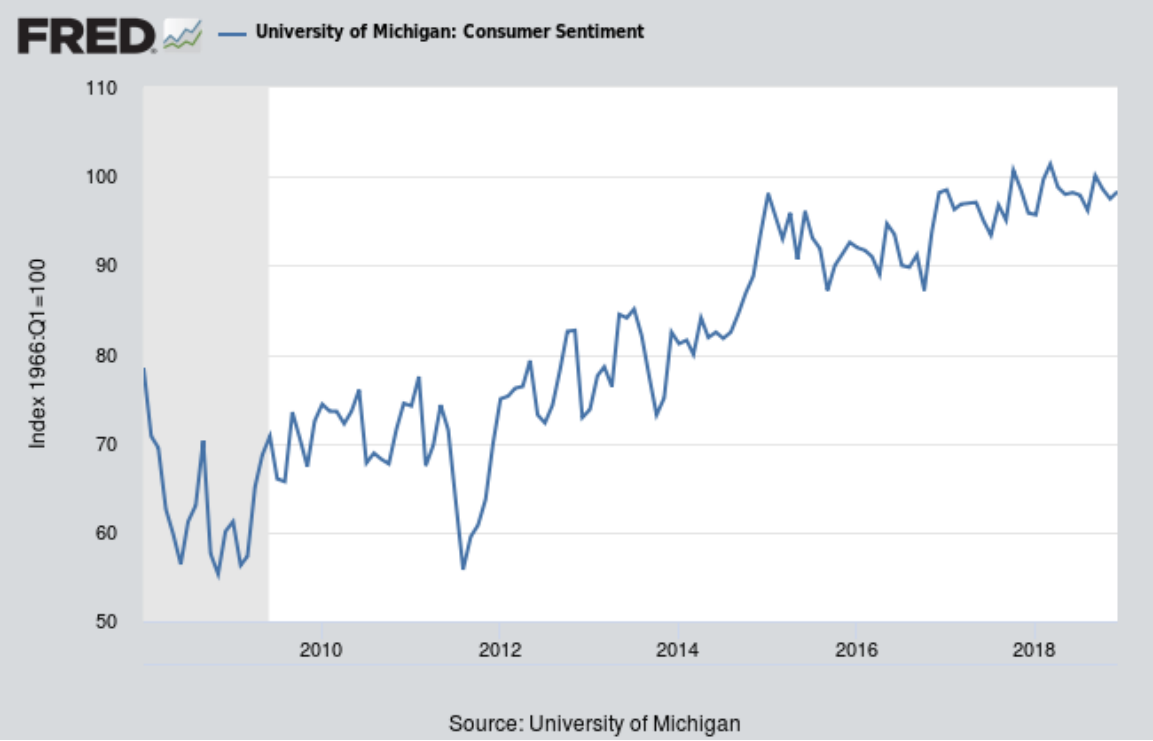
Consumer Confidence

Consumer Sentiment Index

Consumer sentiment is a hard thing to figure, as it seems to ebb and flow independent of what other data points would suggest. (Of course, most consumers don't pore over economic data and pretty much go on "gut" instincts. In other words, people are strange.)

Somewhere around 2015, there was a breakout increase in consumer sentiment seemingly *a propos* of nothing. Perhaps many of the respondents to these surveys are used to the idea that this is normal, so they accept slight improvements. Maybe someone bought them an ice cream. Who knows? They don't have the memory of old-timers who recall the "good old days." Anyway, it's been up and down but generally on an upward trajectory.

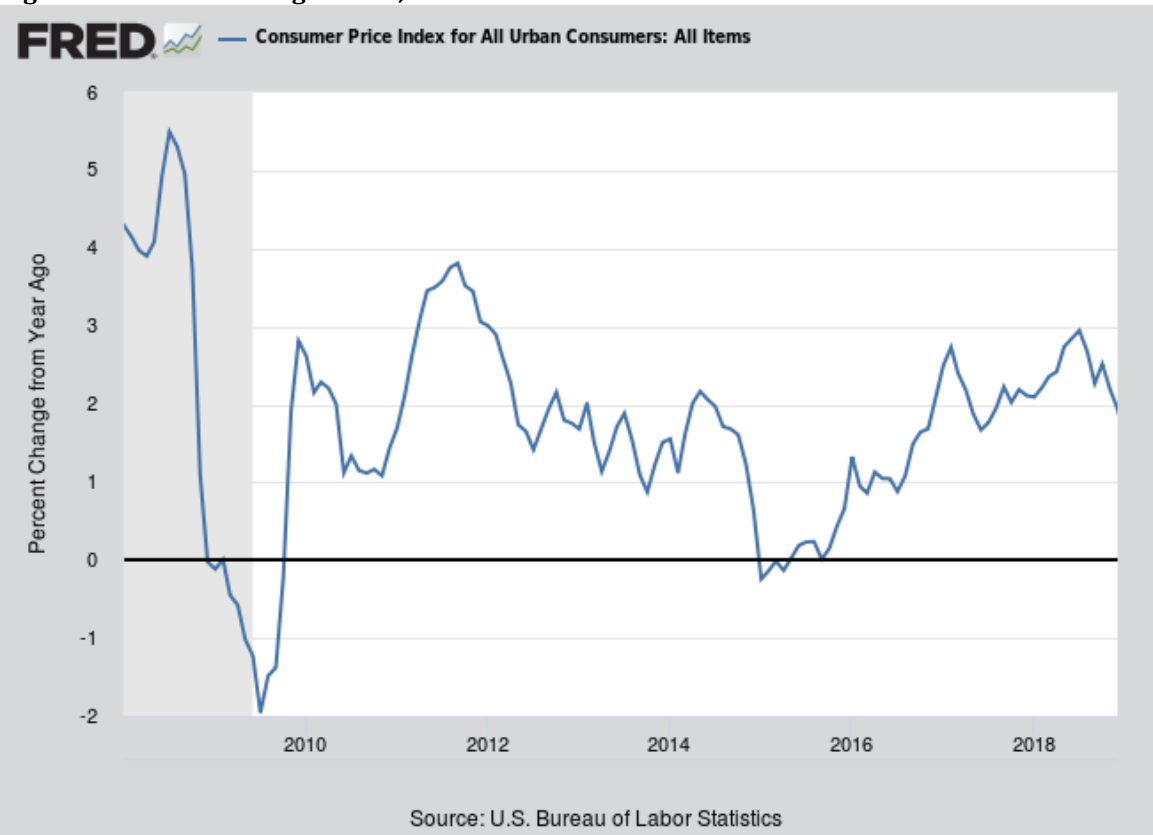
Figure 43. Consumer Sentiment Index, 2008–2018



Consumer Price Index

The figure below shows the percent change in the Consumer Price Index from 2008 to 2018, and it has dropped down to below 2%. This could be a sign that the Fed will stop raising interest rates. Or not. Back in January, the Federal Reserve announced that it was taking a "patient" approach to monetary policy, easing off on rate hikes. But then in mid-February, in the face of disappointing retail sales and the possibility of a slowdown in economic growth, they backtracked their backtracking.[14]

Figure 44. Percent Change In CPI, 2008–2018



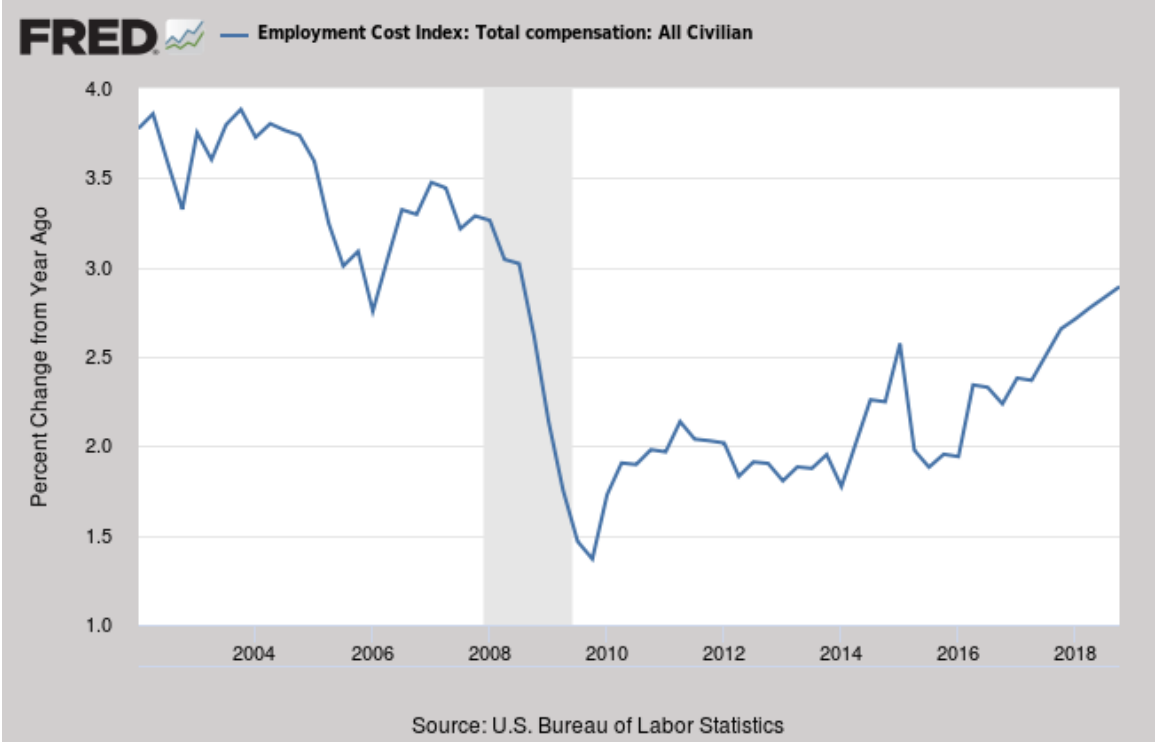
[14] Howard Schneider and Ann Saphir, "Fed policymakers see one U.S. rate hike, or none, as growth slows," Reuters, February 15, 2019, https://www.reuters.com/article/us-usa-fed/fed-policymakers-see-one-u-s-rate-hike-or-none-as-growth-slows-idUSKCN1Q42Q8.

Employment Cost Index

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

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

Figure 45. Employment Cost Index, 2002–2018



Employment and Unemployment

Full-Time Employment

In general, the employment situation is pretty good. It's certainly better than it had been following the recession, even if the headline unemployment rate has tended to understate unemployment because of lower-than-desirable labor force participation, a situation which is starting to correct itself. (For the record, the unemployment rate as of January 2019 is 4.0%.).

So full-time employment is still growing, and has finally exceeded the pre-recession level. Adjusted for the size of labor force (Figure 47), full-time employment has finally surpassed the line indicating the pre-recession level.

Figure 46. Number of employed full-time, 2007–2018

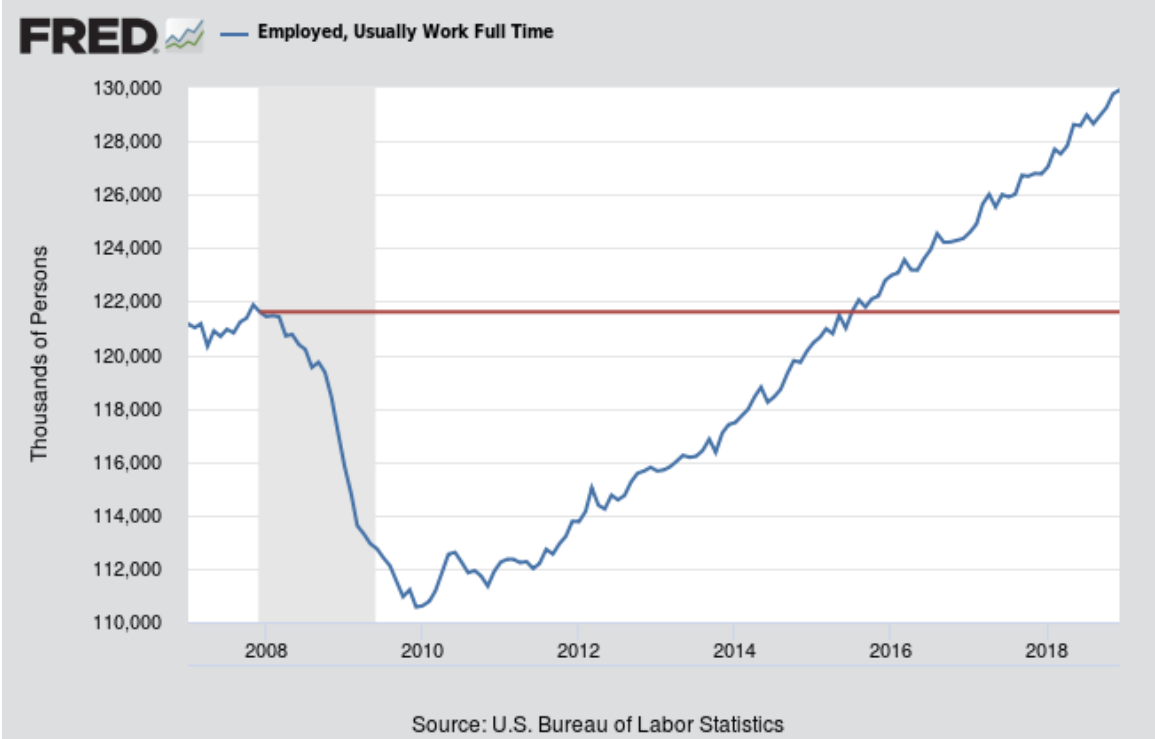
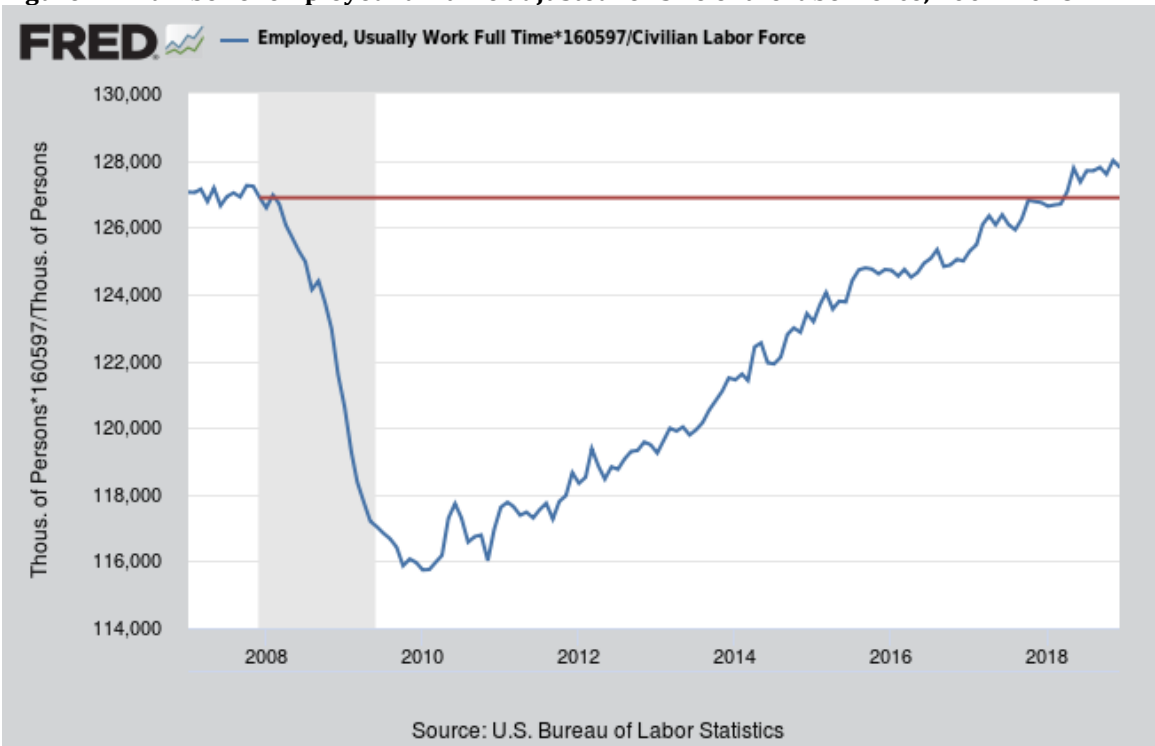


Figure 47. Number of employed full-time adjusted for size of the labor force, 2007–2018

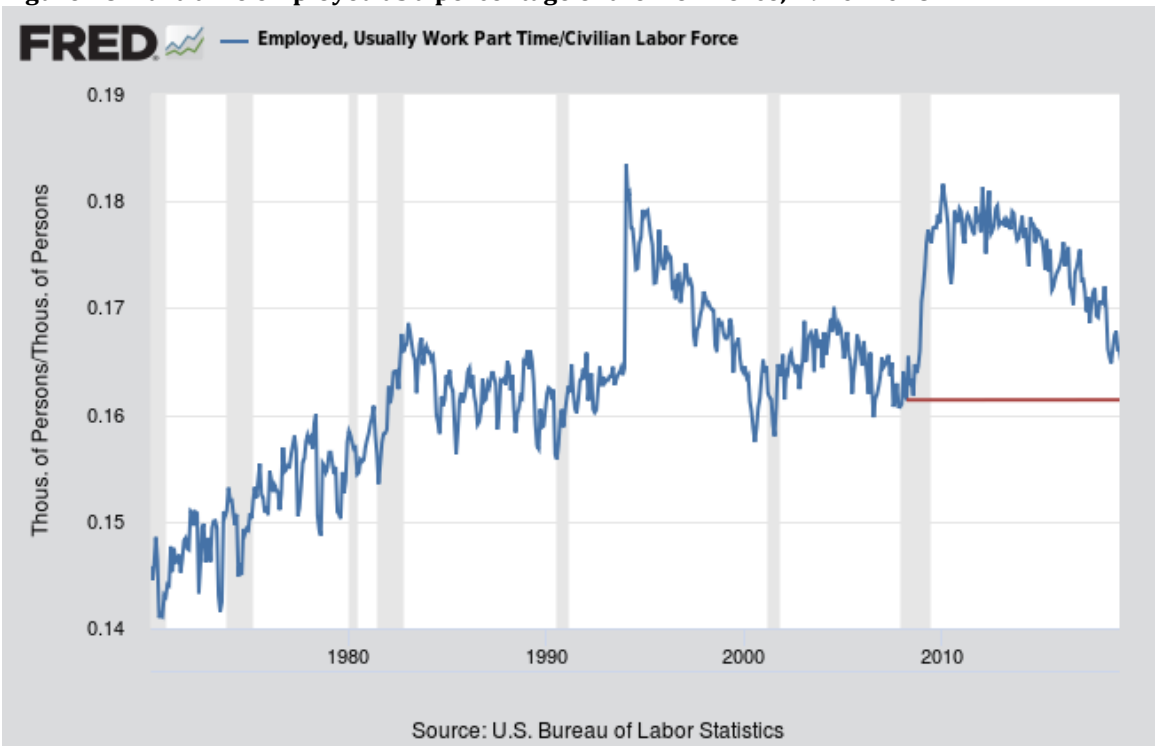


Part-Time Employment

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

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

Figure 48. Part-time employed as a percentage of the workforce, 1970–2018

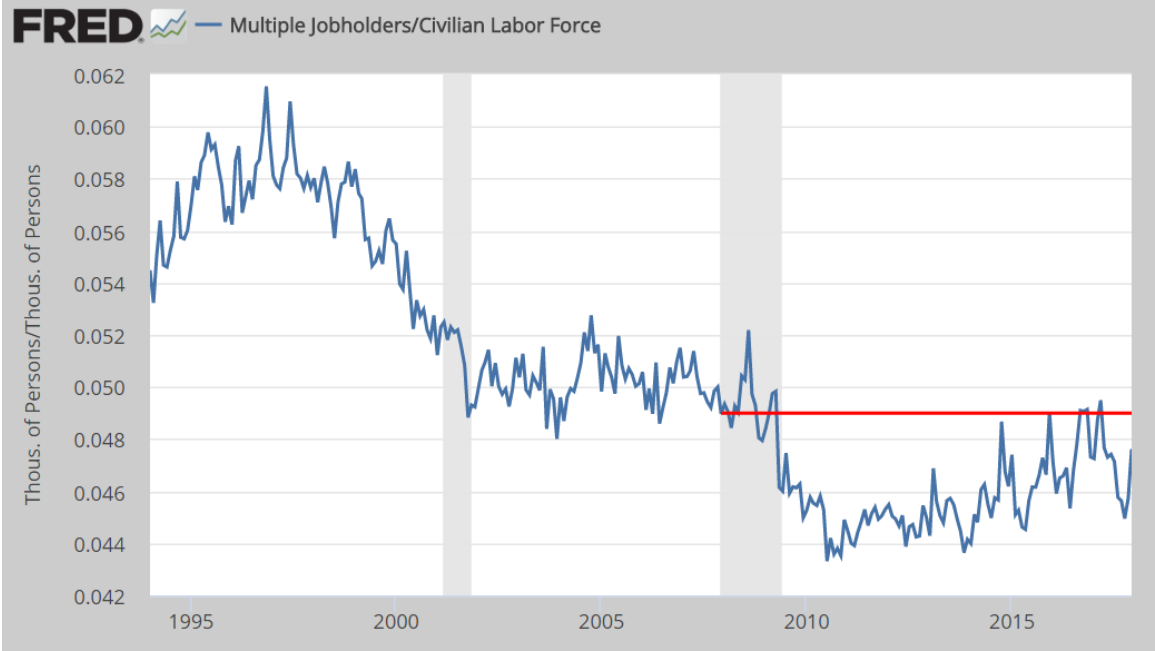


Multiple Jobholders

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

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

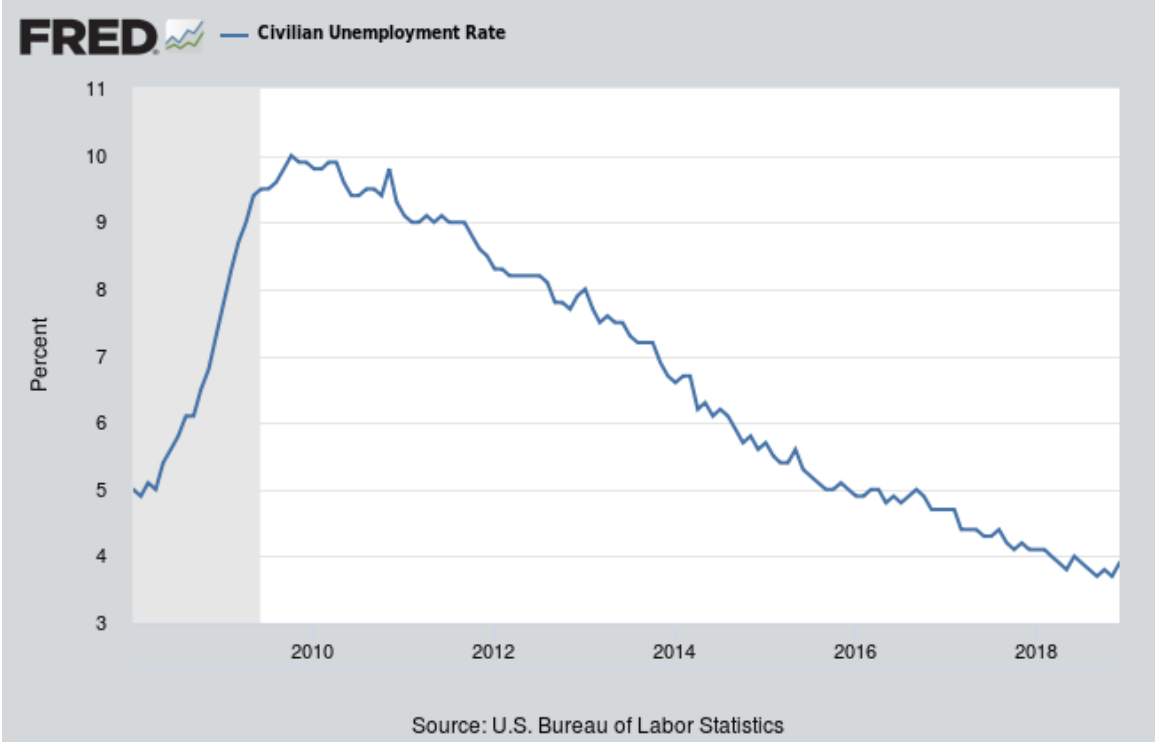
Figure 49. Multiple jobholders as a percentage of the workforce, 1994–2018



Unemployment Rate

In the last employment report at the time of this analysis (January 2019), the headline unemployment rate is 4.0%, up from 3.9% in December 2018.

Figure 50. Unemployed as a percentage of the workforce, 2008–2018



Employment-to-Population Ratio

Regardless of how good we think the employment situation is—and make no mistake, it is pretty good—the employment-to-population ratio *suggests* that there is still a large amount of slack, but most of that is Baby Boomers retiring. If we look at the employment-to-population ratio among 25-to-54-year-olds (Figure 52), we've finally rebounded to the pre-recession level.

Figure 51. Employment-to-population ratio, 2007–2018

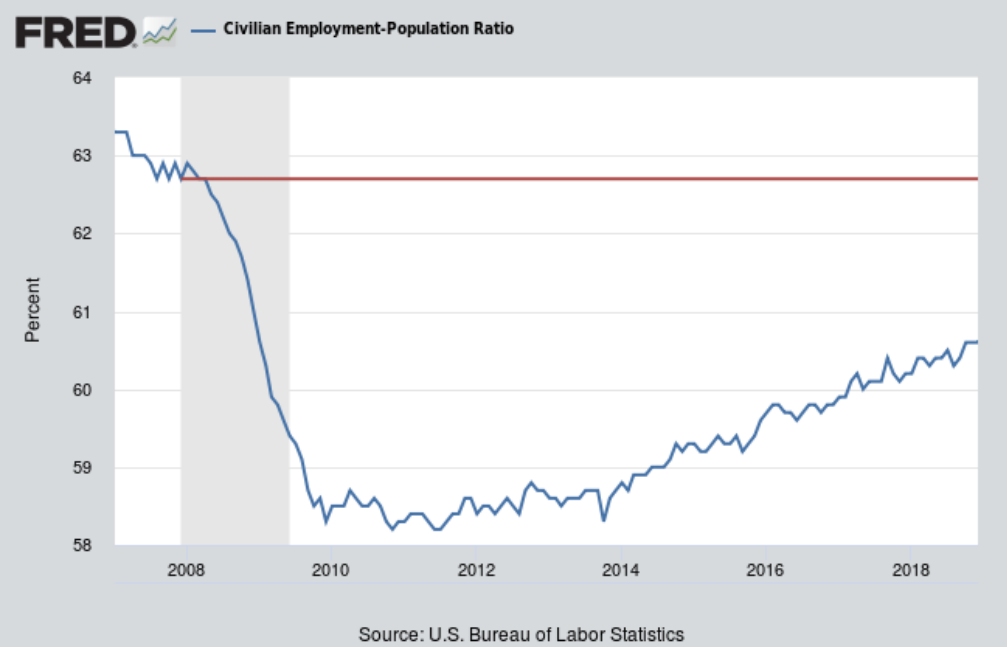
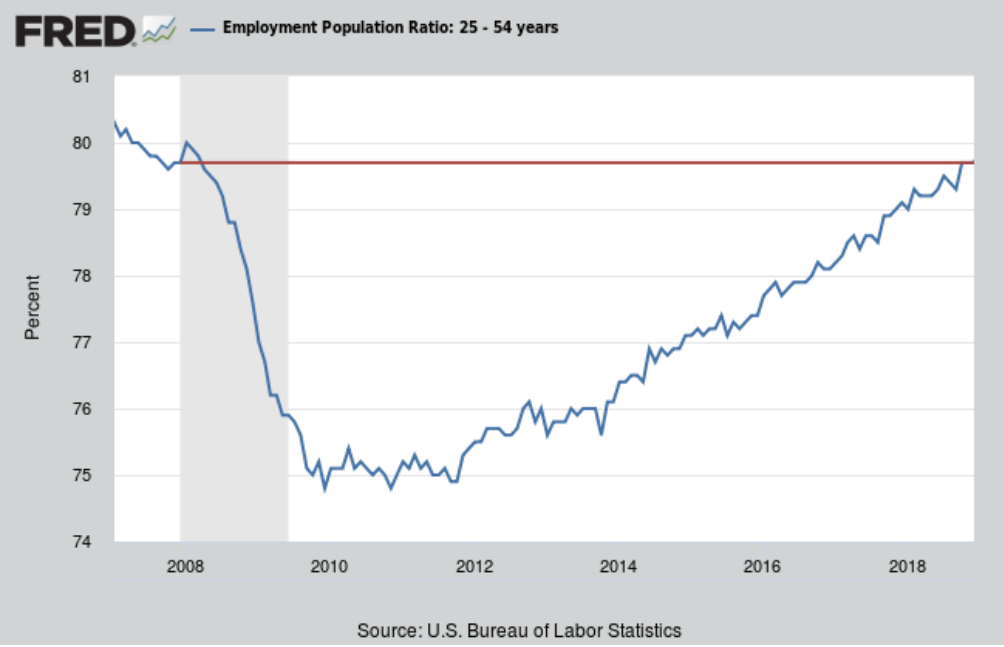


Figure 52. Employment-to-population ratio for 25 to 54-year-old workers, 2007–2016



Labor Force Participation Rate

Another way to look at this is civilian labor force participation rate. It peaked in the late 1990s, started dropping between the two recessions (2001 and 2008), and just kept dropping. But for the prime working age cohort (Figure 54) it's closing in on the pre-recession level and those historical norms.

Figure 53. Labor force participation rate, 1950–2018

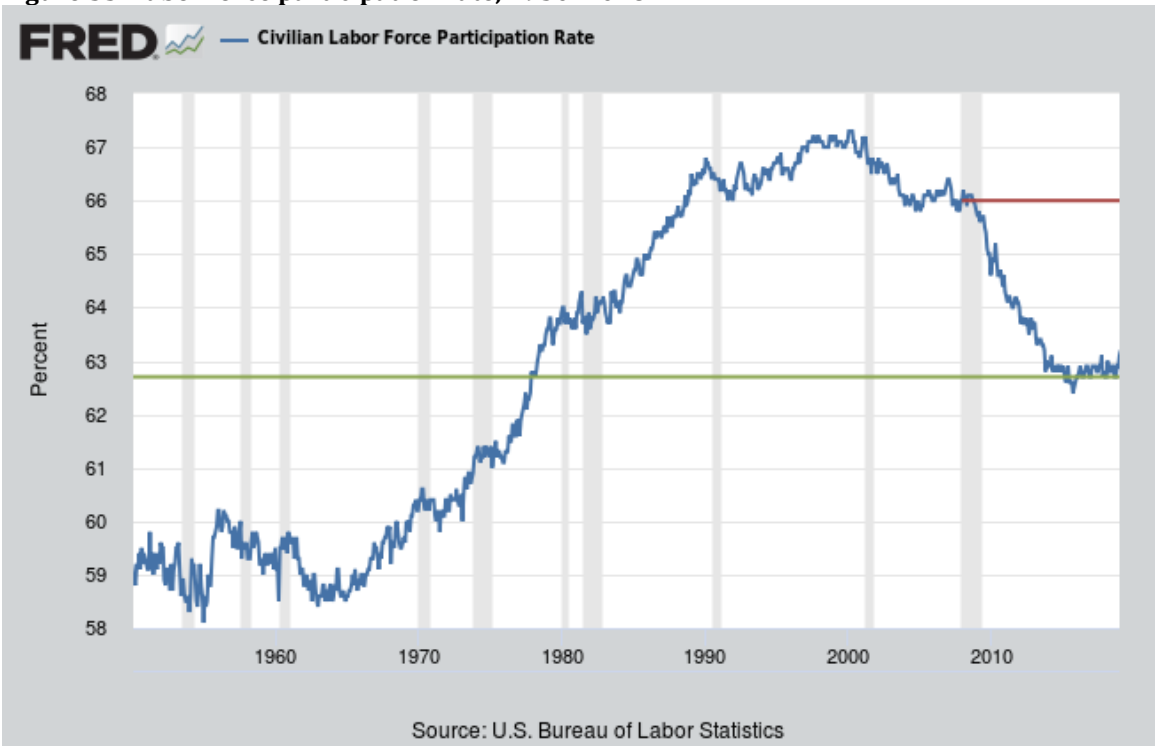
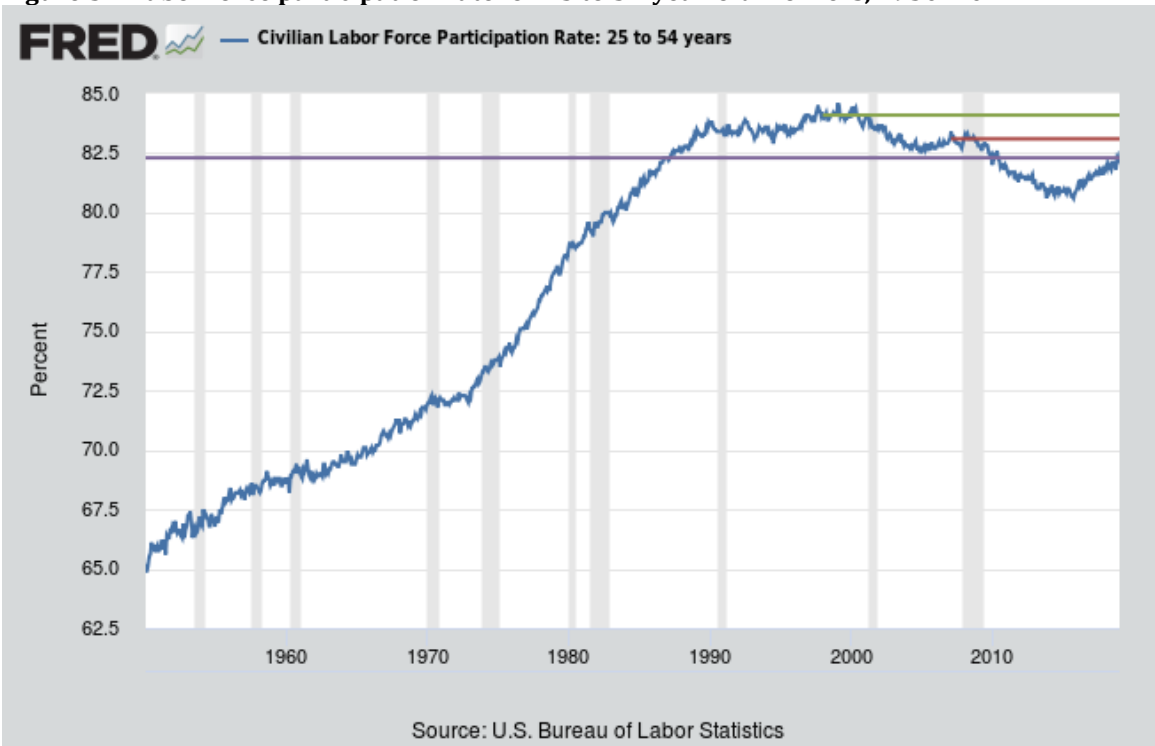


Figure 54. Labor force participation rate for 25 to 54-year-old workers, 1950–2017



Not In Labor Force

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

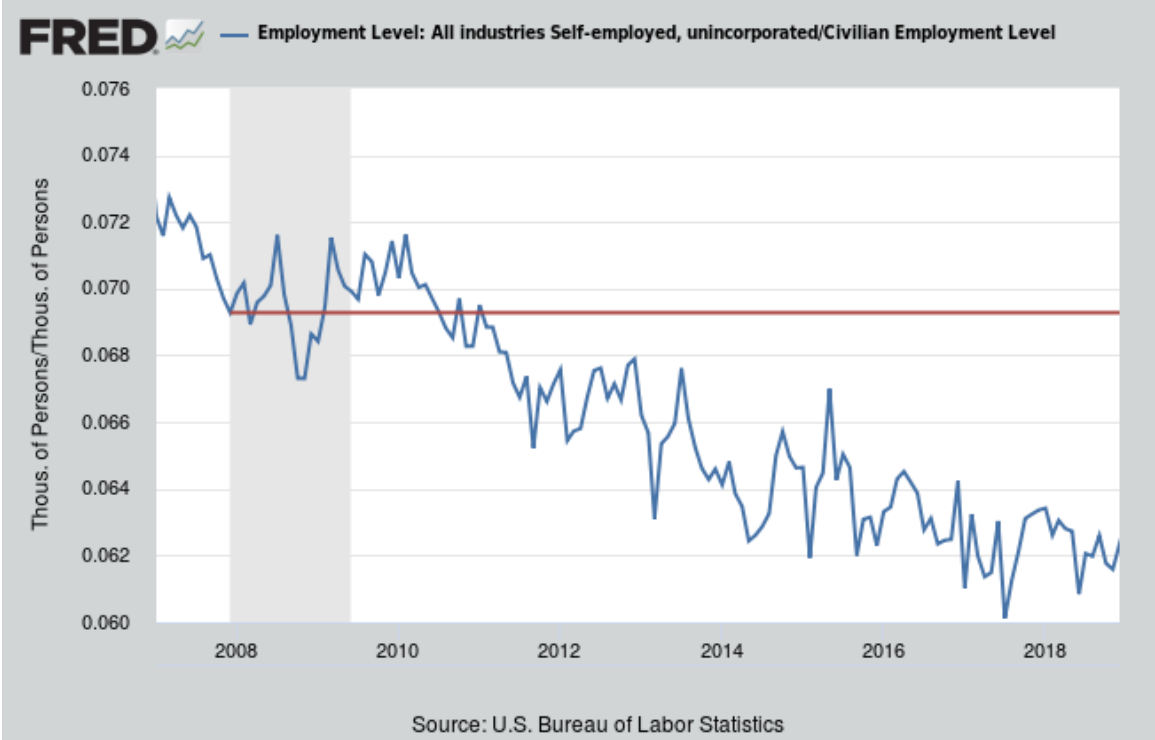
Regardless, this number should never be zero, but neither should it be as high as it has been in recent memory.

Figure 55. Not in labor force, 2007–2018

Self-Employment

Because we're in graphic communications, we automatically think of the self-employed as writers, designers, web developers, and other "information workers," but as it happens, a hefty chunk of the "self-employed" are construction workers, which is why there was such a drop-off after the recession (which was preceded by the housing crash which took a toll the construction industry for a time). Theoretically, you would see many of these workers come to the full-time or part-time workforce or be more entrepreneurial (which, admittedly, is not always possible, and not everyone is adept at being entrepreneurial). Then again, these data reflect self-employed but unincorporated, so it's entirely possible that some of them became S corporations or LLCs. Still, as a percentage of the workforce, the self-employed are down to around 6.2%—which is far below historical norms. So something else is likely going on.

Figure 56. Self-employed as a percentage of the workforce, 2007–2018



Going Forward

For the past several years, the macroeconomic situation has been pretty good, with momentum from the 2010s recovery from the recession carrying us forward. GDP growth has been good, if not great, but employment has been excellent, and inflation tame. Can we keep the good times going? 2019 probably won't be a bad year, but 2020 may show some cracks in the economic armor.

7. Industry Trends and Forecast for 2019

Here's what we see as some of the hot—and not so hot—trends for 2019 and beyond.

Industry Shipments Forecast

As we always caution in these reports, any forecast can only ever predict the past, as they can only extrapolate existing data, albeit doing the extrapolating in different ways. If you are familiar with our past forecast reports, you know we use three basic forecasting models to analyze time series (namely, printing shipments):

- Exponential Smoothing
- Curve
- Box Jenkins

We also average the three models, which gives us a baseline to use when developing our own forecast. An obvious question is, "Well, if you have been doing these forecasts for so long, which of those models has been the most accurate?" Ah, if it were only that simple. If we look at historical shipments data and compare what ultimately came to pass with what the forecasts predicted, none has hit the mark with any consistency. Often, there were major changes in one particular year to which the forecasting model attached too much importance and which we don't believe will be duplicated. Once a forecast model gets hold of an idea, it has a hard time letting go of it, but then a lot of humans are like that, too.

Exponential Smoothing looks to be the most accurate for 2018—but we find it extremely unlikely that the industry shipments will start to *grow* and climb back $92.5 billion by 2026. If wishing made it so... The Curve forecast we find too aggressively negative—even Dr. Joe (Dr. Doom himself) wouldn't expect the industry to shrink to $19.3 billion in 2026. Box Jenkins is a little closer—but still is too positive based on what we know about the industry.

So our own WTT forecasting model is more judgment-based, adding a human[15] perspective based on what we know about the industry, technology, and culture as opposed to what the "robotic" models know just from looking at past data and assuming—depending on the model—that the past will repeat itself more or less aggressively.

We inevitably forecast regular declines in printing shipments through 2026, with some years seeing steeper declines than others. Some qualitative factors—both positive and negative—we have to keep in mind as we look ahead (as we'll expand on some of these in the Trends section):

- A potentially slowing economy (negative)
- Growth of specialty printing (positive)
- Further industry consolidation (negative)
- Election years (positive)

[15] Well, industry analyst, anyway.

- NAICS 323 flight (negative)
- The coming of 5G (negative)

Table 17. NAICS 323 forecast value of shipments, 2017–2026 (2018 $US)

Final 2018=$79.3B	Exponential Smoothing	Curve	Box-Jenkins	Average	WTT
2018	$79.3	$68.0	$79.4	$75.6	$79.3
2019	$81.0	$62.4	$80.0	$74.5	$75.0
2020	$82.6	$56.8	$79.1	$72.8	$73.0
2021	$84.2	$50.9	$77.9	$71.0	$69.0
2022	$85.9	$44.9	$76.8	$69.2	$67.0
2023	$87.5	$38.8	$75.7	$67.3	$64.0
2024	$89.2	$32.5	$74.5	$65.4	$61.0
2025	$90.8	$26.0	$73.4	$63.4	$58.0
2026	$92.5	$19.3	$72.2	$61.4	$56.0

Inflation Multipliers

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

Table 18. CPI multiplier table

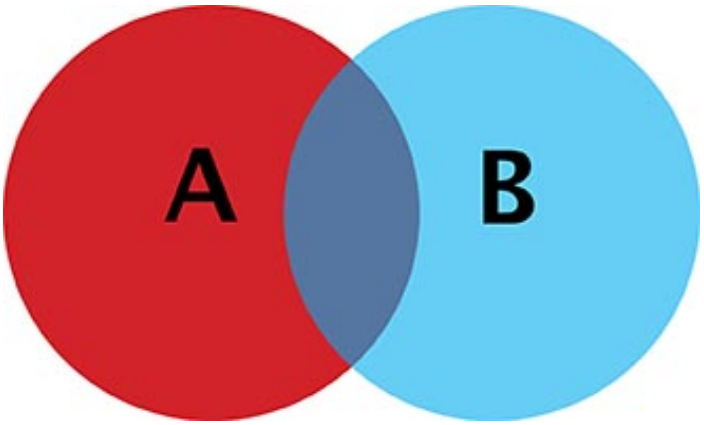
Year	Multiplier
2013	1.078
2014	1.070
2015	1.062
2016	1.041
2017	1.019
2018	1.000

Technology and Other Trends Affecting the Industry

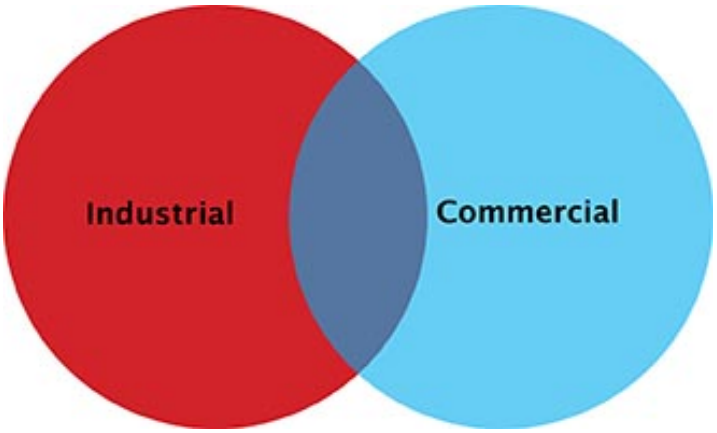
Convergence

"Convergence" is not our favorite buzzword in the world, but it seems to have caught on, so we grudgingly adopt it. Anyway, there is no denying that all the disparate "parts" of the printing industry are in fact converging. What do we mean by "parts"? The term "silos" has also been used (occasionally by us) but we're even less fond of that term. What we are referring to is different kinds of printing, or perhaps "sectors" of the industry. There used to be a fairly clear delineation between what has been called "industrial" printing and what has been called "commercial" printing, but that delineation is getting murkier, as is the distinction between and among other formerly separate print sectors such as packaging and even textiles.

We can illustrate this using Venn diagrams.[16]



The red circle A is a set of one items and the cyan circle B is a set of another items. The region where they overlap contains the items that both sets have in common. So we can use this simple Venn diagram to illustrate where, say, commercial and industrial printing overlap or converge:



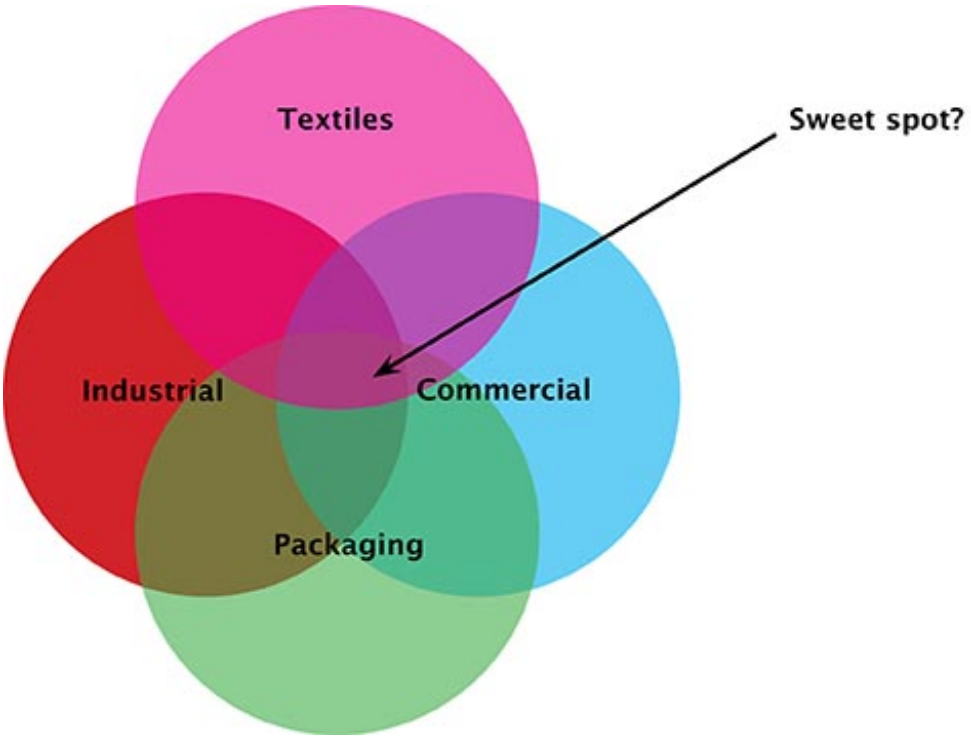
[16] Wikipedia defines a Venn diagram as "a diagram that shows all possible logical relations between a finite collection of different sets."

We can include in the "industrial" circle such items as automotive dashboards, appliance control panels and decoration, measurement units and gradations on pharmaceutical bottles or instruments like hypodermic needles, and a plethora of other print applications that are integrated with larger manufacturing processes. We can include in "commercial" things like brochures, business cards, and photobooks, but also posters, POP and other displays, signage, and so on. In other words, print applications that are sold as printed items *per se*, while industrial printed applications are printed items designed to be sold as something else. It's a fine distinction, but an important one.

You can see that both those circles can contain some dramatically different customers and end users: BMW on the industrial side, and, say, Tom's Diner or a grocery store on the commercial.

Now, where do those two circles overlap? What we often call "specialty printing" can fall in that area of overlap, as can certain kinds of digital décor like wallcoverings, which are not a million miles removed from posters. Basically, any decorated manufactured item that can be sold directly to end users as printed objects.

We can expand the Venn diagram to include other parts of the print industry, which are also starting to converge—like, say, packaging and textiles.



Granted, this analogy is only so useful, but you get the idea. Each of these circles has its own ecosystem, and companies that specialize in, say, packaging have very tight relationships with their customers (brandowners, or consumer product companies) as well as their supply chain. They have specialized processes, skills, or knowledge that outsiders may not possess (such as FDA or EPA regulations pertaining to food

or pharmaceutical packaging, for example, or color management processes that can accurately hit a problematic brand color). Not that these skills or knowledge are completely unfathomable, but longer-term players have a competitive edge, much like commercial print shops that specialize in mailing have an advantage in that they can navigate the US Postal System. So it's these kinds of trade practices more than technology that can erect barriers to entry to these sectors.

Why is this convergence important? For the print service provider, it broadens potential product and service offerings. Knowing what specific applications exist in these different circles gives you an idea of what you could potentially offer customers. It's more about brainstorming potential products, and then whittling down the list of potential applications to those that are immediately actionable.

It's all being driven by inkjet; the same basic technology is evolving to serve all those disparate circles in some fashion. However, print service providers looking to serve all or some of them may have more of a challenge from a business development and marketing standpoint than a technological one.

For industry analysts, the convergence issue raises questions about how to track the industry. Just as the government data-gathering agencies like the BLS are finding it harder to track printers (as we discussed in the Introduction), it could be because printers are increasingly calling themselves something else, and thus classifying themselves in a NAICS category not usually associated with printing.

Consolidation

In addition to converging, the industry has also been consolidating. This is of course no secret to anyone. The industry will continue to shrink, and some of that shrinkage may be due to convergence-based mergers and acquisitions. Very often, the best way for a printing company that specializes in one particular circle (see above) to get involved in a different circle is to go out and buy a company that is already involved in it. We saw this in wide format; a commercial printer that wanted to add signage or display graphics would simply buy a wide-format printing company rather than invest in the equipment and learn how to operate it. The same may very well be true when it comes to these other circles. It also works in the opposite direction; a printing company that wants to expand into something completely different—like printed electronics, for example—may find it better from a business development standpoint to make that initiative a separate company or "greenfield" project. That way it doesn't sap resources from the primary business. On he surface of things, it sounds like that would mean *more* printing establishments, but again it would depend on how that business chose to classify itself, which may not be in NAICS 323.

Another contributor to consolidation may be what we saw in our survey data: "owner/manager retirement" was perceived as a bigger-than-usual challenge this year; that could be a trigger another spate of M&As and closures.

And we can't discount "consolidation" as a purely statistical phenomenon, as "printing companies" that have expanded into other kinds of products and services classify themselves in a NAICS other than 323.

The Coming of 5G

When we looked at printing shipments as a percentage of GDP, we mentioned that the declines the industry has experienced since the late 1990s have been driven by technology—first the Internet in general, then the proliferation of broadband, then the mobile Internet. So we should be wary of the emergence of what is being called "5G." Short for "fifth generation," it is the logical successor to today's 4G cellular networks, but will represent a quantum leap from today's networks:

> 5G networks are the next generation of mobile internet connectivity, offering faster speeds and more reliable connections on smartphones and other devices than ever before.
>
> Combining cutting-edge network technology and the very latest research, 5G should offer connections that are multitudes faster than current connections, with average download speeds of around 1GBps expected to soon be the norm.[17]

It isn't *necessarily* bad news for the printing industry; how many print buyers have had to wait eons for a large production file to upload to a web-to-print site? On a 5G network, those "pipes" are bigger so it will be faster to upload even the biggest files, potentially streamlining file intake and, ultimately, turnaround. That's the good news.

However, faster Internet speeds mean that people can do more things on electronic devices—stream more movies, watch more high-definition video, and basically do a lot more online than they do now. That has been the reason that Internet technology has not always been the printer's friend; it increases the number of things that people can do that are not print-related. And that only gets more acute with the more things people can do on their phones—and if you thought people stared too much at their phones already, just wait!

The Thing II

One of the killer apps of 5G is that it will further enable the so-called Internet of Things (IoT). More and more devices, sensors, and just about anything else will soon be networked. We have been including IoT in these forecasts more because we are bemused by it than truly excited (or frightened) by its potential implications. Some of the anecdotes we come across are fairly amusing (a European colleague of ours moved into a building whose locks used an IoT mobile app—which naturally did not always work reliably, locking him out of his office; cars that only start when they are connected to the Internet suddenly die when they drive into a dead spot; Nike's IoT-enabled self-lacing shoes can't be tied because an upgrade went awry; etc.), but before we all type "epic fail,"[18] it's worth remembering that there was a time in the history of any technology when it didn't work especially well. So perhaps we are being a little unfair to the Internet of Things.

The IoT could potentially disrupt the way everyday products are bought and sold. For example, an IoT-enabled refrigerator that has a display can now become an ad

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[17] Mike Moore, "What is 5G? Everything you need to know," Techradar, https://www.techradar.com/news/what-is-5g-everything-you-need-to-know.

[18] Which no one should ever do.

delivery system, as it pipes ads for Pillsbury or what-have-you directly to your fridge. So where do appliance manufacturers make their money: selling a refrigerator, or selling ads? The result could be cheaper appliances—but no escape from ad content.

The potential for there to be video and audio sensors around us 24/7 is touted by some as a positive good—think of the convenience of voice-activated technology taken to the next level—or a negative bad (privacy issues, hacking, etc.). So while we're not sure what the Age of Alexa is going to truly look (or sound) like, we should prepare ourselves for a world where the expectation is that some kind of content or feedback is a simple voice command away and typing into a search engine is perceived as too slow and laborious. Where does print fit in this kind of world? Making print part of that world is a good start. Technologies like Augmented Reality—adding codes to printed materials that trigger some kind of action when scanned with a smartphone app—make print part of the Internet of Things. Think of printed books that can easily access complementary or supplementary video or other multimedia material right from the page. It's about making print a launchpad for rich media experiences. This is not science-fiction; there are real-world examples happening now. WhatTheyThink's Richard Romano recently wrote a printed book that used HP's Link technology to embed Internet links in the printed page, so that when readers scanned indicated text or images, they could launch a video or web page further explaining what was being discussed in the book.[19] Likewise, CalPoly's Harvey Levenson used Ricoh's Clickable Paper in his textbook *An Introduction to Graphic Communication*,[20] which linked the print book to online course materials and other rich media content.

AR can be added to any kind of print—so the possibilities for taking full advantage of this idea are almost literally endless.

Textile Printing

We routinely include digital textile printing in these forecasts, and there is no reason to omit it this year, especially as it has been growing well beyond dye-sublimation, and new equipment and inksets are increasingly compatible with a wider and wider variety of natural and synthetic fabrics. EFI Reggiani, Mimaki, and Epson (via their Robustelli acquisition) have been leading the charge, with advances appearing regularly. Pigment-based inks represent what could potentially be the Holy Grail for textile printing: one ink that can print on any fabric. It's still a bit kludgy and pie-in-the-sky at present, but we'll bet you dollars to doughnuts that ink chemists throughout the industry are beavering away on this very thing as we speak.

Direct-to-garment printing—non-dye-sub-based inkjet printing directly onto items like T shirts and hoodies—has also seen a lot of movement, and in the past year

[19] Go beyond paper at http://whattheythink.com/news/91876-whattheythinks-richard-romano-launches-beyond-paper-print-18/.
[20] Get introduced at http://whattheythink.com/news/90110-intuideas-launches-updated-interactive-edition-introduction-graphic-communication/.

Roland has staked out a niche in this space, joining Ricoh (via Anajet) and Epson who have been stalwart players in DTG printing.

Going back to our Venn diagrams, it's probably reasonably safe to say that most commercial printers are not likely to embrace the "garment printing" circle—except perhaps simple DTG printing. The real action for printers in textile printing is on the soft signage side. This is not a new trend, but one which our survey data (and other anecdotal evidence) suggests is a continuing one.

Décor

Related to signage is décor—wallcoverings, basically—which is another hot and growing subset of textile printing, although it isn't necessarily strictly the purview of textile printing, as other substrates can be used for décor. The most strongly growing market for décor is environmental graphics, whereby a company, usually a sign shop (but it doesn't have to be) produces all the interior graphics for a company or other organization that is building or moving into a new location. This includes will graphics, floor graphics, window graphics, elevator graphics—basically any surface can be covered with some kind of graphics. These print service providers (and perhaps we should call them print *surface* providers...) often use a variety of different technologies and substrates, not just textiles. They also can incorporate more traditional signage materials (wood, metal) and even dynamic digital signage.

If we wanted to come up with another set of Venn diagrams (and we probably don't), we could illustrate where décor and industrial printing overlap. This category can include things like printed vinyl flooring, digitally printed ceramic tiles for floors or kitchen or bathroom walls, printed *faux* wood flooring—you name it. Last January, World of Concrete show was being held in Las Vegas the same week as EFI Connect, and while we did not attend the World of Concrete, a colleague had snuck away to check out the show and reported on an inkjet system that could print directly on vertical concrete walls. We like to think that the usual suspects in our industry have teams of R&D folks working on these kinds of things.[21]

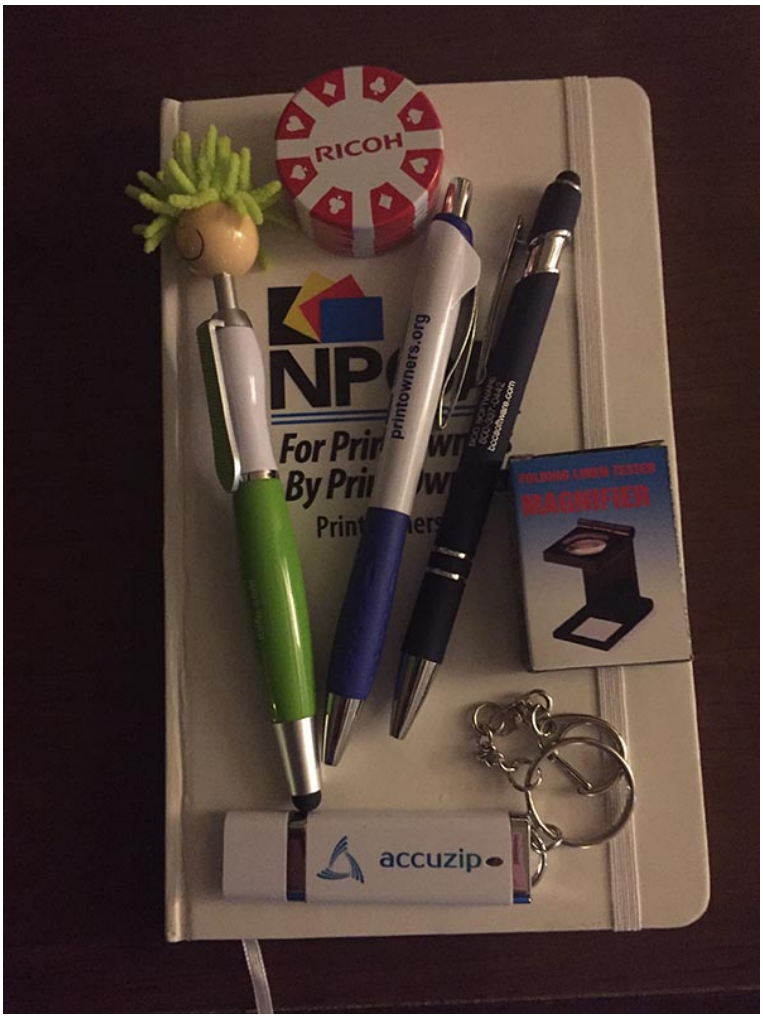
Industrial Printing

So, yeah, industrial printing. This represents another bold new area for print to go, maybe not necessarily "true" industrial printing where printing is part of a larger manufacturing process, but (again, we could use Venn diagrams) where industrial and specialty printing overlap. We often refer to this as "tchotchke" printing—pens, golf balls, smartphone covers, etc., but can include any kind of promotional items. Even T shirts can be included in this category. This kind of printing is often done as part of a larger marketing and promotion campaign—maybe a company is having an event (like a customer or sales conference) and wants to give out printed YETI cups or—at the very least—printed USB drives with promotional materials on them (the irony is not lost on us that these drives contain the materials that at one time commercial printers would print). This can be a great opportunity for a print

[21] Imagine how much shop floor (or trade show booth) space could be saved if someone could invent flatbed printer that could be oriented vertically.

provider that has the capabilities—or knows to whom to outsource—to get extra work from a customer, or perhaps get new customers. And the beauty part is that a lot of these items remain high-value print applications, meaning that they can still be sold for a premium price.

Don't think there is a market for specialty printing? Just one event we recently attended had all of these items in one attendee goody-bag:



Direct-to Shape/Object

A lot of these industrial/specialty printing applications involve printing directly on three-dimensional objects. Many of these specialty items are in fact roughly cylindrical—promotional drinkware, for example, is a hot area. Systems from companies such as Inkcups and Engineered Printing Solutions (EPS) offer digital inkjet printing direct to bottles and glasses, and a couple of years ago, Xerox launched a Direct-to-Object Printer designed produce customized souvenirs in a more or less retail environment (like a gift shop). And certain models in Heidelberg's Primefire series are designed for direct-to-object specialty/industrial printing.

One application that caught our eye, but which has yet to take off, at least in the US, is direct-to-fingernail printing. Fingernails2Go[22] was originally conceived by Butch Baird, Tensator was brought on board to develop the hardware and software, and HP and Triton developed the print engine. It's basically a kiosk. You insert your finger(s) into the machine and it prints—using inks that are FDA- and EU-compliant for cosmetic use—right on your fingernails. (You can also batch-print artificial nails.) Via a touchscreen and complementary smartphone app, you select the design(s) you want to print, even using your own photos. When you're ready to go, the app finds the printer, and *voilà*, decorated fingernails in seconds.

As you would expect, there is a very strong social media component to Fingernails2Go, with users—and it's not just young girls—sharing their nail designs on Instagram. (One top application is bachelor parties or wedding showers; the face of the bride- or groom-to-be is printed on party attendees' fingernails.

Printed fingernails are just scratching the surface of what is possible (as it were). Can direct-to-flesh printing for digital tattooing be far behind?

These and many other applications are hot and growing, representing big opportunities for print service providers who can think beyond paper.

Digital Labels

Or even using paper. Small paper. In a word, labels. Digital label printing is a potentially lucrative opportunity with a lot of as-yet untapped potential. We're not just talking about labels in the traditional sense; yes, strong growth in boutique items like craft beers, wines, sauces, and a zillion other consumer items is creating real demand for short-run digital labels, but labels can also be used in other kinds of industrial and specialty printing applications. For example, Xeikon's industrial printing solutions are largely label-based. Basically, you're using labels to wrap a surface or object instead of printing directly on that surface. (Think about it: what is a vehicle wrap or a window graphic but a label?) We certainly see direct-to-surface/object printing as a major wave of the future, but labels of some kind will continue to be an important component of industrial and specialty printing; it won't be possible to print directly onto *everything*.[23]

Automation

We have been focusing in this report on new print applications, for the simple reason that as the industry changes, the print demand that has been rising has been for new, non-traditional print applications. But we also can't forget that some of the old standby trends are still important, and none of perhaps more important than automation. The pressure to automate as many functions as possible has permeated general commercial printing and has been spreading—slowly—into specialty and wide-format printing. Automation is becoming essential not just to speed turnaround times, minimize waste, and reduce errors—although those are all

[22] Check it out at https://fingernails2go.com.

[23] Although we remain hopeful that someday we will see a drive-through wide-format printer that can print vehicle graphics directly on a car.

vitally important benefits. Automation is also being driven by the difficulty shops are having in finding qualified production staff. Automation is not unique to print production—virtually every manufacturing industry has automated some, most, or all of its factories—but it is becoming an important way to reduce costs and boost profitability.

Binding/Finishing

And we also continue to see the continuing trend of bringing finishing capabilities in-house—be they small- or wide-format-, offset- or digital- compatible. This is growing not just as a value-added service for print clients, but also as a practical reality: who has time to outsource binding and finishing to a third party anymore? Last year, we had expected this to start to play out, and our survey data suggests investment in binding finishing may be slowing down.

We have also spoken often in these reports about digital embellishments. That is, equipment from the likes of Scodix, MGI, and Highcon, to name three. They still haven't shown up substantially in our survey data, but we continue to believe that it is just a matter of time before these finishing applications hit the big time.

Production Inkjet

Production inkjet continues to gain traction, and it's starting to make some conspicuous ripples in our survey data. We do need to be careful in attaching undue importance to low investment figures; these kinds of big-ticket items tend not to score high on planned investment lists (we saw this with offset presses back in the day—they obviously don't sell in the same quantities as software or smaller hardware devices). But that doesn't mean that printers are uninterested in production inkjet. In fact, a recent article by Heidi Tolliver-Walker pointed out that production inkjet has been kind of a stealth technology (which is odd, since we have all been watching it so intently). She writes that, looking at some recent installations, production inkjet has become just another capital investment decision, not one that shops wring their hands over:

> In each case, it was about timing, not technology. Each printer hit a breaking point in which maxing out the capabilities of their existing equipment just wasn't cutting it anymore. Because inkjet's quality, substrates, and color capabilities have become accepted and assumed, their investment decision revolved around cost-justification and timing, just like any other capital investment.[24]

Like digital printing in general, production inkjet just suddenly grew up—and we hardly even noticed it!

Packaging

Finally, we should say a few words about packaging. Our survey data have not shown abundant (or much at all) interest in packaging, despite analysts and

[24] Heidi Tolliver-Walker, "When Did High-Speed Inkjet Become Just Another Capital Investment?" WhatTheyThink, February 26, 2019, http://whattheythink.com/articles/94025-when-did-high-speed-inkjet-become-just-another-capital-investment/.

manufacturers pointing out the opportunities that abound in the packaging (and specifically corrugated) space. As usual our respondents don't see big opportunities in packaging, but then the recent digital equipment introductions have been largely targeted to businesses that already produce analog packaging and need the advantages of digital (short runs, fast turnaround, customization/personalization). As we mentioned earlier, packaging (indeed like industrial printing) is a whole ecosystem and market unto itself, and getting into it requires more than just buying new equipment, but gaining credibility in production environments that are often treated as proprietary manufacturing processes. Idiomatically speaking, it's a tough nut to crack.

Without resorting to more Venn diagrams, we can identify an overlap between corrugated packaging and point of purchase (POP) materials, and the latter is easier to pursue than the former—and in fact POP may be a good entrée into packaging.

The Last Word

We saw encouraging news in 2018, and shipments look like they are on the upswing, certainly compared to past years. Macroeconomic conditions have also been pretty good—but as we go into 2019, there are warning signs on the horizon, although few economists are predicting anything especially dire. So we don't advice print business owners/managers to worry unduly about a looming recession. It's best to think about print, how print us changing, and how the demand for print is changing, which hopefully we have tried to spell out in this report (perhaps *ad nauseam*). We always say in this space that we need a creative and proactive printing industry that focuses and thrives on changes in print demand and technology—and we get the sense that this is happening, which is a good thing. We are encouraged—and have high hopes for 2019 and beyond.

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

Appendix A: Methodology and Questionnaire

The number of respondents in the Winter 2018–2019 survey results is 145 WhatTheyThink printing executives. These were gathered from the total number of respondents, 158. The excluded respondents were from other industries 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 and *Printing News*'s commercial printing subscribers, recruited through social media (Twitter, LinkedIn), and special appeals through the WTT newsletter. The results were weighted to 2016 *County Business Patterns* NAICS 323 (general commercial printers).

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 the option to download the book *Beyond Paper* by Richard Romano.

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

Thank you again for your consideration and your help.

Kindest regards,

Eric Vessels
President, WhatTheyThink

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

☐ Quick printing (mainly b&w digital printing and copying, offset duplicators)
☐ Mainly book printing
☐ Mainly commercial multicolor sheetfed or web offset
☐ Mainly digital color (high-volume, high-production, like iGen or HP Indigo)
☐ Mainly digital black & white (high-volume, like Docutech)
☐ Non-offset commercial (gravure, letterpress, flexo, etc.)
☐ Specialty printing and promotional items (envelopes, business cards, stationery,
☐ greeting cards, novelties, etc.)
☐ Wide-format/signage/display
☐ Prepress services
☐ Binding and finishing services
☐ Inplant printing department, corporate, government, education, or non-profit
☐ Newspaper publisher/printer, daily and non-daily newspapers
☐ Business forms/systems dealer
☐ Business forms printing
☐ Folding carton printing
☐ Other packaging (label & wrapper, flexible packaging, etc.)
☐ Print management company (like InnerWorkings)
☐ Independent print broker
☐ Graphic design, advertising agency, publishing
☐ Paper merchant/dealer, industry manufacturer/vendor/dealer/VAR
☐ Industry journalist, analyst, consultant
☐ Other, please specify _____

2) Where is this business located?

☐ USA
☐ Canada
☐ Mexico or Central or South America
☐ Europe
☐ Asia
☐ Africa
☐ Australia/Oceania

3) How many employees are at this specific location?

☐ 1-4
☐ 5-9
☐ 10-19
☐ 20-49
☐ 50-99
☐ 100-249
☐ 250-499
☐ 500+

4) In terms of your 2018 revenues at this location only, how do they compare to 2017?
☐ 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 2019 revenues at this location to compare to 2018?
☐ 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 2018 jobs/orders at this location only, how do they compare to 2017?
☐ 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 2019 jobs/orders at this location to compare to 2018?
☐ 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 2018 profitability, how did it compare to 2017?
☐ 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 2019 profitability to compare to 2018?
☐ increase more than 10%
☐ increase between 6% and 10%
☐ increase between 1% and 5%
☐ stay about the same
☐ decrease between 1% and 5%
☐ decrease between 6% and 10%
☐ decrease more than 10%

10) In the next 12 months, which of the following will be your biggest business challenges? (click all that apply)
☐ increasing plant productivity
☐ managing workflow automation
☐ competition from other print providers
☐ capabilities of sales personnel
☐ capabilities of production personnel
☐ understanding the needs of today's communications buyers
☐ consumables and supplies prices
☐ economic conditions
☐ financing costs of our equipment
☐ finding capital for investments
☐ need for employee training
☐ finding qualified sales personnel
☐ finding qualified production personnel
☐ increasing employee benefit costs
☐ profitably handling shorter runs
☐ deciding whether to keep or discard our offset equipment
☐ loss of print business to digital media
☐ pricing
☐ job tracking
☐ migrating production to the cloud
☐ migrating business functions to the cloud
☐ migrating customer service and sales to the cloud
☐ training employees to use cloud applications
☐ keeping up with technological changes
☐ owner/management retirement
☐ retirement of key production personnel
☐ selling our business
☐ adding/updating web-to-print/online storefront
☐ getting web-to-print to work on smartphones and other mobile devices
☐ adding wide-format equipment/services
☐ adding packaging printing equipment/services
☐ transitioning jobs from offset to high-speed digital printing equipment

☐ adding non-print media capabilities (web design, app development, social media management, etc.)
☐ competing against digital media agencies
☐ other, please specify _____

11) In the next 12 months, which of the following represent your best new business opportunities? (click all that apply)
☐ improving economic conditions
☐ customers outsourcing more work to us
☐ increasing sales through print brokers
☐ partnering with other print providers
☐ helping clients get their websites to work on mobile devices
☐ offering electronic/non-print services for customers (web design, app development, social media management, etc.)
☐ helping customers integrate print and non-print marketing campaigns
☐ using marketing automation for our business (like HubSpot, Eloqua, Marketo)
☐ selling marketing automation services to our customers
☐ adding additional offset printing equipment
☐ adding digital printing equipment
☐ customized, personalized, or variable-data printing jobs
☐ disposing of offset equipment to concentrate on digital printing
☐ broadening bindery/finishing equipment/services
☐ adding "digital enhancement" finishing technologies (like Scodix, Highcon, MGI)
☐ adding wide-format printing capabilities
☐ adding textile/fabric printing capabilities
☐ adding packaging printing capabilities
☐ adding digital label/wrapper printing capabilities
☐ broadening fulfillment, shipping, mailing capabilities
☐ automating production
☐ adding web-to-print/online storefront
☐ getting more customers using smartphones and other mobile devices
☐ migrating production to the cloud
☐ migrating business functions to the cloud
☐ migrating customer service and sales to the cloud
☐ training employees to use cloud applications
☐ acquiring another company
☐ selling our company
☐ hiring new salespeople
☐ video production services
☐ other, please specify _____

12) Which of the following investment items have you budgeted for and plan to acquire in the next 12 months? (click all that apply)
☐ additional space/new location
☐ color measurement equipment (densitometer, spectrophotometer)
☐ color management software

☐ computer-to-plate equipment
☐ finishing/bindery equipment for offset/analog production
☐ finishing/bindery equipment for digital production
☐ toner-based color digital press (like HP Indigo, Xerox iGen)
☐ high-speed production inkjet printing equipment (like HP PageWide, Canon Océ ColorStream/ImageStream)
☐ sheetfed offset press
☐ web offset press—new
☐ rebuilding our web offset press
☐ wide-format color printer (24 in.+)–solvent/eco-solvent (like Epson, Roland)
☐ wide-format color printer (24 in.+)–latex (like HP Latex)
☐ wide-format color printer (24 in.+)–flatbed UV (like EFI VUTEk, Canon Océ Arizona, HP Scitex)
☐ digital label printing equipment
☐ dye-sublimation printer (like Epson, Roland, Mimaki)
☐ packaging press/printer–corrugated
☐ packaging press/printer–folding carton
☐ packaging press/printer–flexible packaging
☐ prepress RIP for our wide-format printers
☐ prepress RIP for other devices
☐ Management Information System (MIS)
☐ Customer Relations Management (CRM) system
☐ workflow automation software
☐ we have no planned investments
☐ other, please specify

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

15) If yes, for what positions are you looking to hire? (Check all that apply)
☐ executive management
☐ inside sales representative
☐ outside sales representative
☐ marketing and market communications
☐ prepress
☐ production management
☐ press operator (offset or digital)
☐ postpress/bindery/finishing
☐ IT management
☐ IT/software programming
☐ graphic designer (for print)
☐ web design/development
☐ mobile app development
☐ other, please specify _____

17) If you would like a free summary of the report from this survey, and the link to download a free copy of *Beyond Paper* by Richard Romano, please enter your email address below:
_____

Appendix B. Survivor Bias

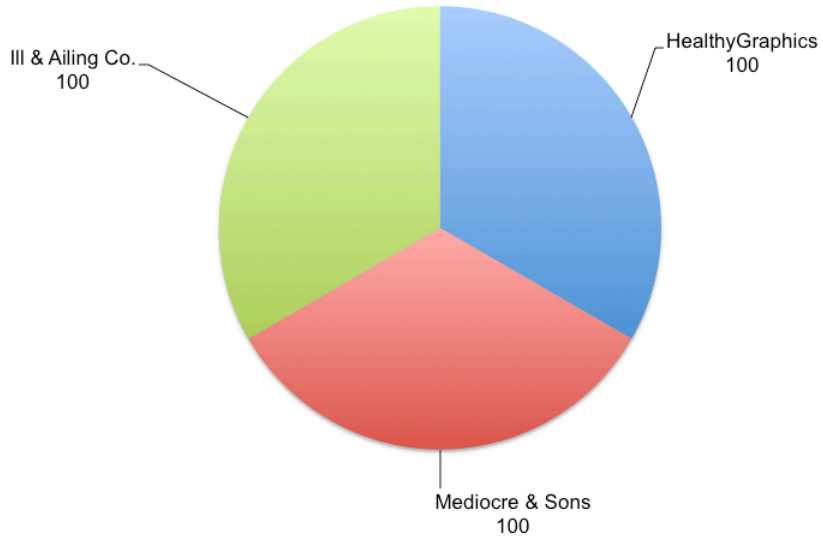
In our survey results, what we refer to as "survivor bias" plays a very important role, as it has in past surveys, and affects the interpretation of survey data. When an industry is growing, this type of bias is not an important statistical issue. But, as you know, the industry has *not* been growing—quite the opposite—so we need to bear survivor bias in mind, because it stems from the fact that really unhealthy print businesses have exited the industry (and thus have not taken our survey), and the ones that survived are naturally healthier than the ones who went—or are going—out of business. After all, businesses that are *really* ailing tend to disregard survey participation requests, since they're too busy trying to stay in business to bother answering a questionnaire.

Survivor bias is nothing unusual, nor is it unique to the printing industry; it's almost always what happens in markets.[25] But how they perceive the remaining print landscape may not be a true reflection of the overall market.

Here's what we mean.

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

Figure 57. The initial market—My Three Printers
Market=300 customers

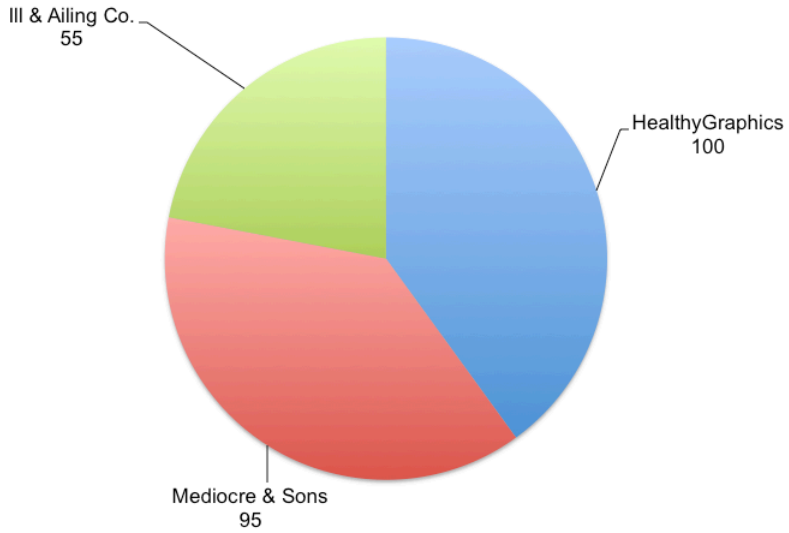


These three printers plug away merrily for a period of time. Now, say there is some sort of upheaval—50 of those customers are gone. Some may have moved away, some may have had their marketing budgets cut and thus stopped printing things, relying instead on digital or social media, and some may have gone out of business

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

or been acquired. In a word, the market for print shrinks. When the smoke clears, there are only 250 customers spread among these three shops. The healthy printer keeps all its original customers, the mediocre printer loses a little bit, and the sick printer loses the most:

Figure 58. Upheaval! The market changes
Market=250 customers

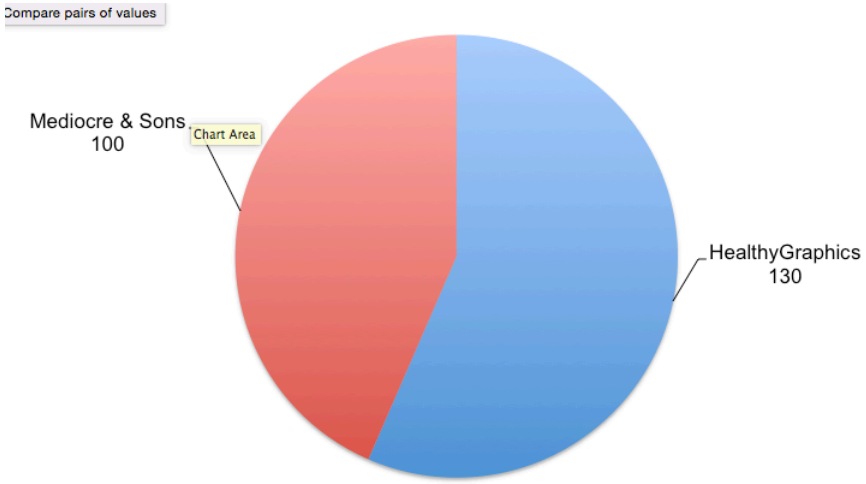


How does each of these printers describe the prevailing economy?

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

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

Figure 59. And then there were two...the printing landscape changes
Market=230 customers



How do the printers now describe the prevailing market?

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

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

Table 19. The effects of survivor bias on market perception

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

Even when aggregate business conditions were up, the print market still declined. So the survivor bias phenomenon leads to a false assessment of aggregate business

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

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

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

Survey data need to be looked at in the context of what we know about the market both in terms of broader statistics like changes in monthly printing shipments and other general economic data, as well as anecdotal evidence gleaned from talking with printers and printers' suppliers and vendors. Other data in the survey also help shed a light on business conditions data.

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

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

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

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