RESEARCH WORKING PAPER SERIES

CHARACTERISTICS OF THE LARGE EARLY 2020 DECLINE
IN NEW BUSINESSES DURING COVID-19

Travis Howe[I]

May 2020

Keywords: COVID-19, new business applications, planned wages,
entrepreneurship

[I] Ewing Marion Kauffman Foundation

OVERVIEW

The impact of COVID-19 on entrepreneurial activity in the United States has immediate implications for business owners and their employees, as well as consequences for long-term economic recovery. This report analyzes one important indicator of entrepreneurship – new business applications – in the first 16 weeks of 2020 and historically. Week 16 in 2020 ended on April 18.

The data analyzed here come from the new weekly release of the time series Business Formation Statistics (BFS) of the U.S. Census Bureau. *Business applications* are applications for an employer identification number (EIN).[1] Many of these applications will not result in the emergence of an employer business,[2] but some will become employers. *Business applications with planned wages* is a subset of business applications, in which the applicant indicates a date for planned wages. Business applications with planned wages are likely to become employer businesses (Bayard et al., 2018).

---

[1] This excludes some applications, described by the Census (https://www.census.gov/econ/bfs/about_the_data.html) and in Bayard et al. (2018), such as applications for tax liens, estates, trusts, some financial filings, applications missing state-county geocodes, some applications from specific agricultural, public entities, and some industries are excluded.
[2] See https://www.census.gov/data/developers/data-sets/cbp-nonemp-zbp.html for the Census nonemployer data.

The trend in business applications and business applications with planned wages is shown in Figure 1, covering the first week of 2006 through the week ending April 18, 2020. The shaded region corresponds to the Great Recession (December 2007 to June 2009). There is an upward trend in business applications beginning around 2010 whereas the trend line for business applications with planned wages is essentially flat between 2010 and the present.

Figure 1 Overall U.S. Business Applications and Business Applications with Planned Wages – by week beginning January 7, 2006 through April 18, 2020
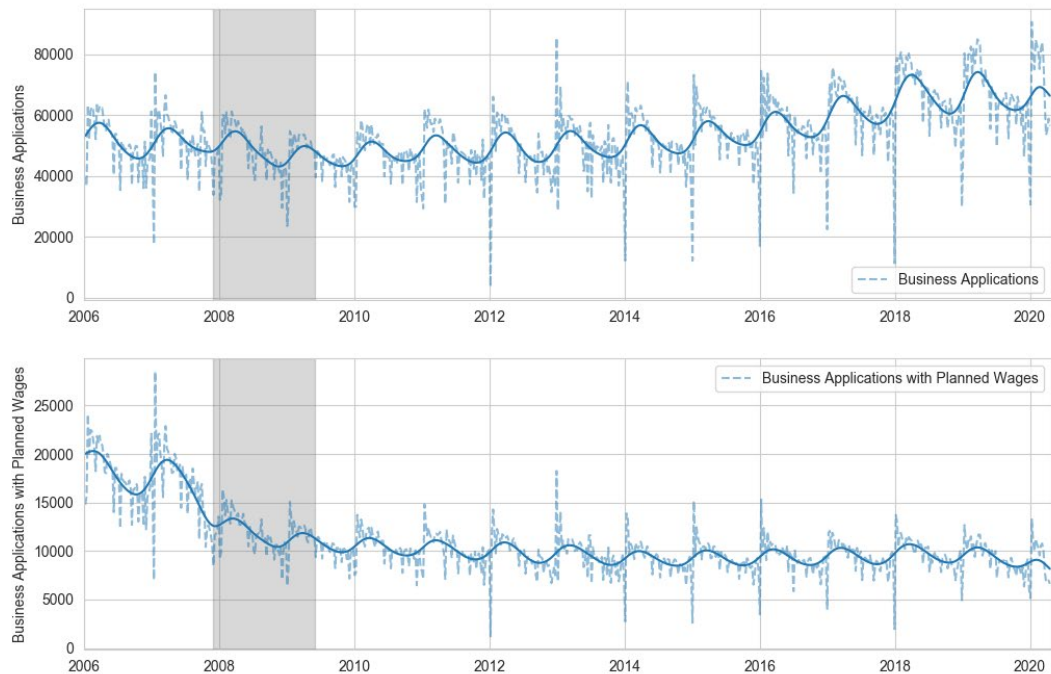
Note: Dotted lines indicate actual values; solid lines are values that have been smoothed with an HP filter.

BUSINESS APPLICATIONS IN RECENT YEARS

Figure 2 displays weekly totals for the last 28 months for business applications and business applications with planned wages, going back to the first week of 2018. There is considerable variability in the data, as well as a number of interesting trends:

- First, the levels for both business applications and business applications with planned wages tend to fall over the course of the year. This yearly seasonality[3] is

---

[3] Seasonality refers to patterns in the data that recur at regular intervals of time, in this case yearly.

marked by higher application activity in the first and second quarters of the year.[4] New business applications fell from a high of 80,700 to a low of 30,020 during 2018, a decrease of 63%. In 2019, the high and low were 84,940 and 41,950, respectively, which is a 50% decline. Business applications with planned wages saw a similar trend, declining about 64% and 53% respectively, over the course of 2018 and 2019.

- Second, there are especially pronounced downward spikes at the end of a year and upward spikes at the beginning, coinciding with holiday weeks including Christmas, New Year's, and the end of the calendar year. The other large downward spikes occur during the weeks of other federal holidays such as Memorial Day, Labor Day, and Columbus Day.

- Third, the decline in recent weeks – corresponding to the COVID-19 pandemic – appears unusually large: from 84,730 applications during the week ending February 1 to 53,510 applications during the week ending March 28 (a 37% decline).

Figure 2 Overall U.S. Business Applications and Business Applications with Planned Wages, by week beginning January 4, 2018 through April 18, 2020
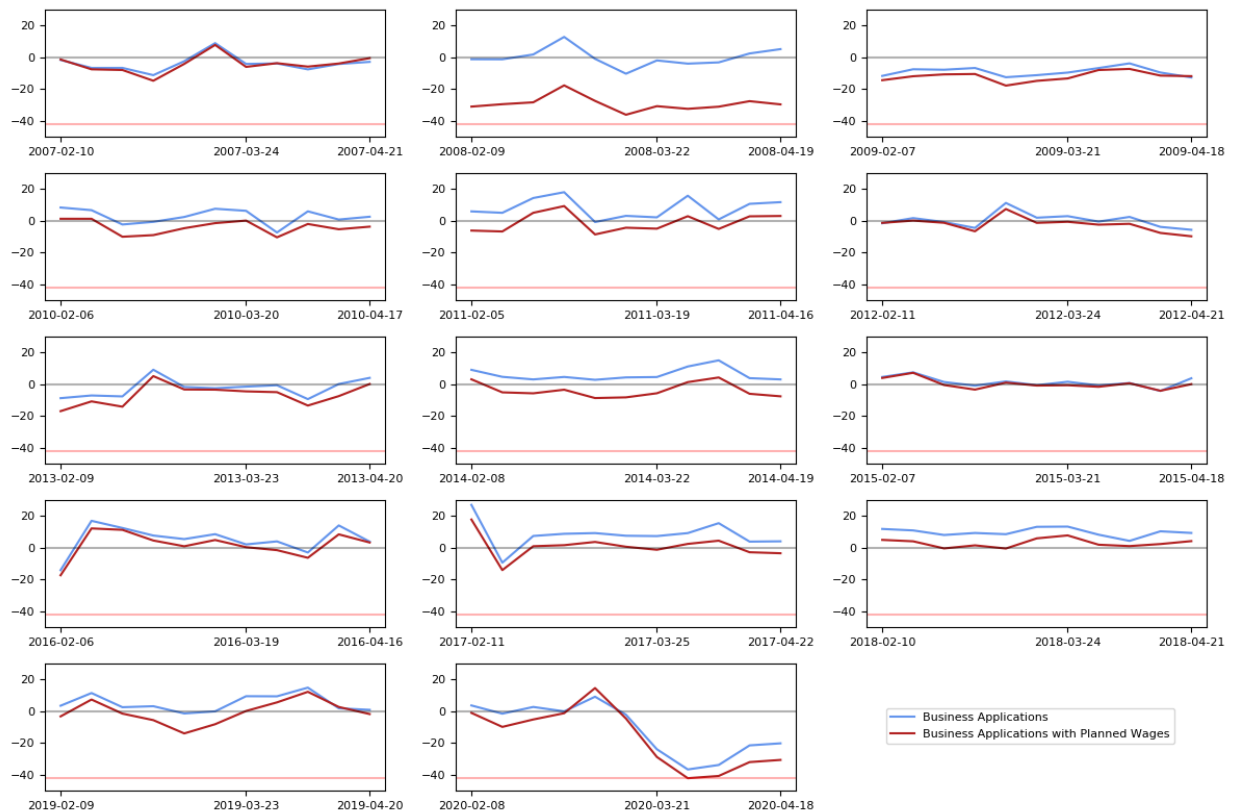
---
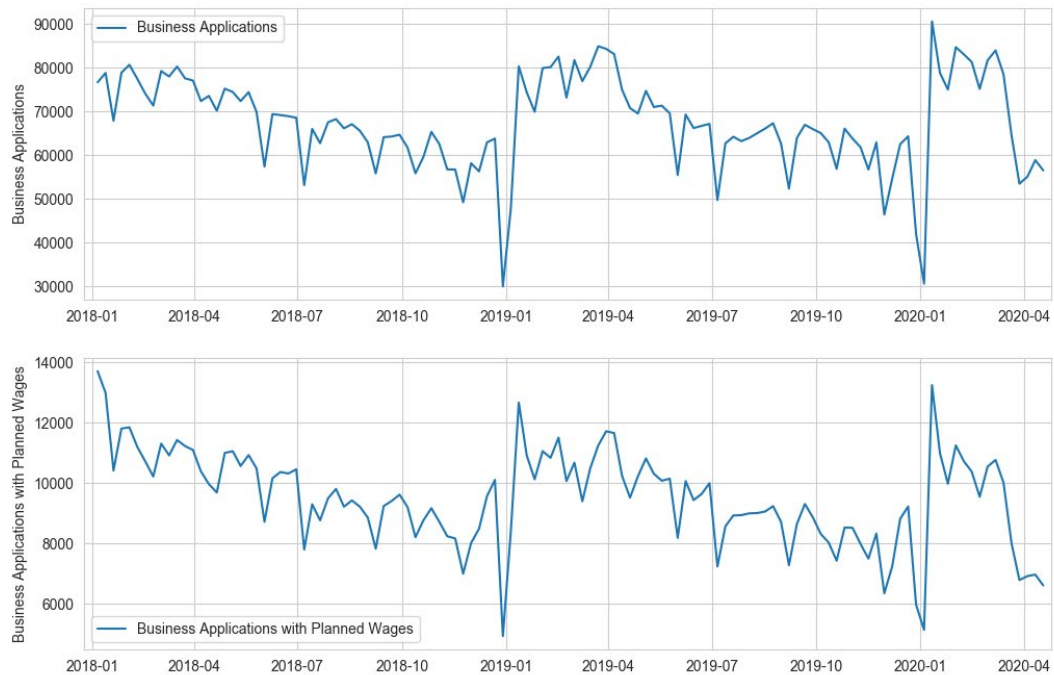
[4] See Bayard et al. (2018).

To frame the recent decline in a historical context, Figure 3 contains the year over year percentage change in both business applications and business applications with planned wages by week of year, for Weeks 6 through 16, modified from Haltiwanger (2020).[5] There was an approximately 40% decrease in both business applications and business applications with planned wages in Week 13 (March 22-28, 2020) relative to Week 13 (March 24-30, 2020). This decline is uncharacteristically large compared to the year over year change in previous years for these same set of weeks.

During the Great Recession (see 2008 and 2009 in Figure 3), business applications declined, but the magnitude of the decline was smaller than what we see in 2020: the decline did not exceed 20% at any time. Notably, in 2008, business applications with planned wages decreased much more than business applications – and fell close to 40% between Weeks 6 and 16 in that year.

Figure 3 Year over Year Percentage Change in Business Applications by week (for Weeks 6 through 16 in each year 2007-2020).

HOW DO BUSINESS APPLICATIONS IN THE FIRST 16 WEEKS OF 2020 COMPARE WITH RECENT "NORMAL" YEARS?

What might we expect based on what has occurred in recent years? Tables 1 and 2 contain actual and predicted[6] values for business applications and business applications with planned wages, respectively, along with the percentage change in the far-right column. A positive value for percentage change reflects higher actual than predicted activity.

Table 1 Business Applications: Actual versus Predicted

Week End	Business Applications, Actual	Business Applications, Predicted	Change between Predicted and Actual
2020-02-08	83,100	81,898.32	+ .5%
2020-02-15	81,340	80,479.77	+ 1.1%
2020-02-22	75,180	80,137.15	- 6.2%
2020-02-29	81,740	80,892.15	+ 1.0%
2020-03-07	83,990	82,130.46	+ 2.3%
2020-03-14	78,530	83,397.02	- 5.8%
2020-03-21	64,680	84,343.15	- 23.3%
2020-03-28	53,510	84,321.42	- 36.5%
2020-04-04	55,090	82,729.13	- 33.4%
2020-04-11	58,900	79,959.87	- 26.3%
2020-04-18	56,550	77,558.49	- 27.1%

---

[6] We use two predictive models (one for each of the two variables, trained on data spanning Week 1, 2006 and Week 5, 2020) to estimate the values for Weeks 6 through 16 that we would have observed *had the pandemic not occurred*. In contrast to baselining the decline in applications by 2019 or pre-pandemic 2020 levels, the model takes into account more aspects of the variables' histories including trends, yearly seasonality, holidays, and recent past values. See Varian (2014) for a discussion of the use of predictive models to estimate counterfactual values used in the calculation of these types of effects. We use the Python library *fbprophet* (see https://facebook.github.io/prophet/docs/quick_start.html) to model each process. Model parameters include holiday effects and multiplicative seasonality. Code available upon request.

Table 2 Business Applications with Planned Wages: Actual versus Predicted

Week End	Business Applications with Planned Wages, Actual	Business Applications with Planned Wages, Predicted	Change between Predicted and Actual
2020-02-08	10,730	10,807.80	- 0.7%
2020-02-15	10,380	10,601.52	- 2.1%
2020-02-22	9,550	10,434.82	- 8.5%
2020-02-29	10,550	10,353.37	+ 1.9%
2020-03-07	10,770	10,446.07	+ 3.1%
2020-03-14	10,020	10,735.17	- 6.7%
2020-03-21	8,020	11,067.27	- 27.5%
2020-03-28	6,790	11,155.71	- 39.1%
2020-04-04	6,920	10,818.35	- 36.0%
2020-04-11	6,970	10,210.76	- 31.7%
2020-04-18	6,610	9,767.29	- 32.3%

In Figure 4, the 2020 business applications data thus far is compared to predicted business applications had the pandemic not occurred, based on historical data through February 1, 2020. The same comparison is made for business applications with planned wages in Figure 5.

Two points are noteworthy based on Tables 1 and 2 and Figures 4 and 5. First, the first major decline occurred the week ending March 21 followed by another large fall the following week (ending March 28).[7] After this, actual applications have risen slightly and predicted values have fallen.

Second, although a decline occurring over the course of the year would normally be expected based on previous years, the decline seen in the actual numbers is dramatically larger than would be expected if 2020 had been a "normal" year. It is not clear if and how the rest of the year will look due to the shocks of COVID-19 and economic recovery strategies.

---

[7] The CARES Act was signed into law on March 27, the Friday of this week.

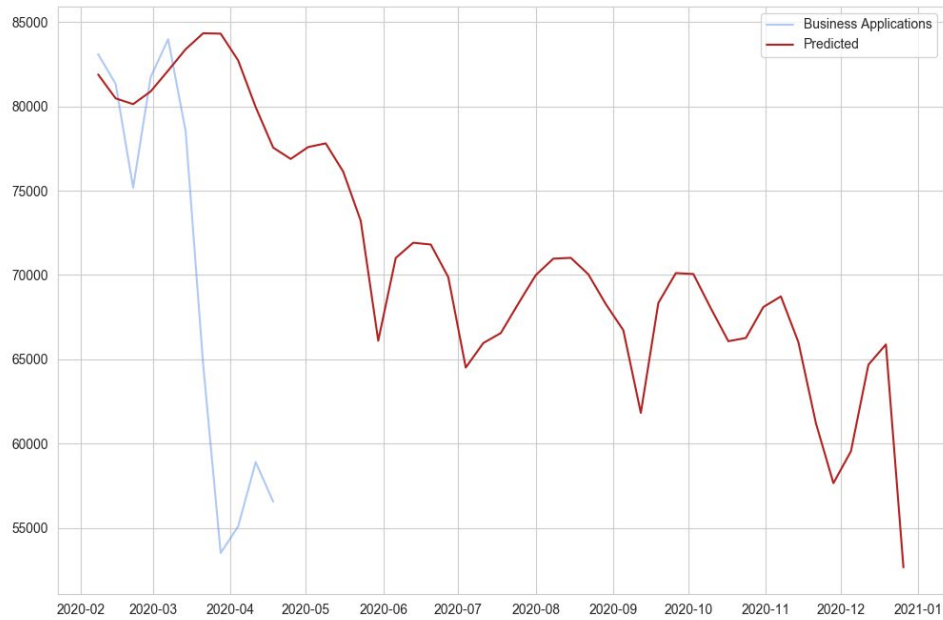**Figure 4** Business Applications versus Predicted Business Applications, Year 2020
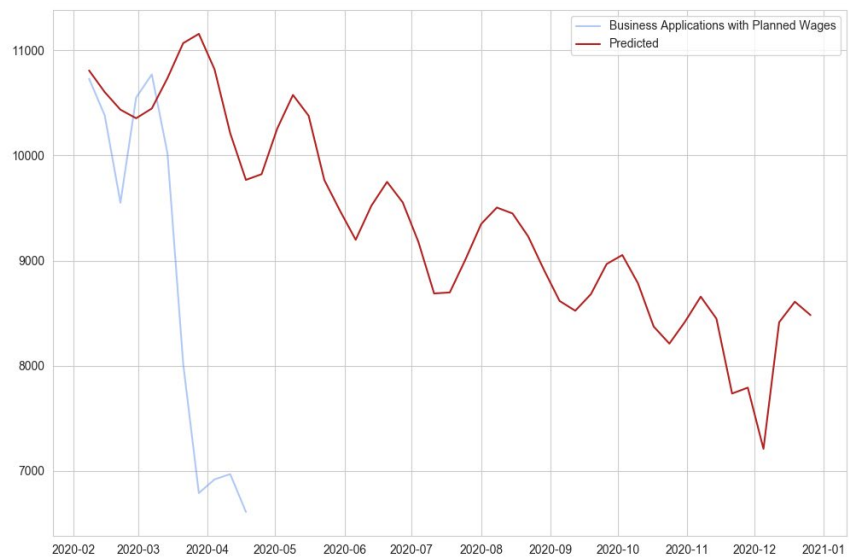

Figure 5 Business Applications with Planned Wages versus Predicted Business Applications with Planned Wages, Year 2020

DISCUSSION

The decline in business applications is an empirical trend. What could this be capturing? At least three scenarios are relevant. This decline could reflect a *delay.* This means that people could been planning to start a new business but are now waiting because of changes in the economy due to COVID-19. If this were the case, we would expect to see total 2020 business applications to pick up, but it would be concentrated toward the end of the year, relative to past years.

This decline could also reflect a *disappearance.* In other words, people may be forgoing business applications altogether. Some may have left the market completely. It is also important to bear in mind that some people might not submit a business application despite engaging in new business activity, and that this type of entrepreneurial activity may have responded in an entirely different manner relative to those businesses that request an EIN number.

There could also be a mix of the above, with some potential entrepreneurs "waiting and watching" and others abandoning the market – and still others engaging in entrepreneurial activity that is not picked up in new business applications.

REFERENCES

Bayard, K., Dinlersoz, E., Dunne, T., Haltiwanger, J., Miranda, J. and Stevens, J. 2018. Early-stage business formation: an analysis of applications for employer identification numbers, Working Papers 18-52 Center for Economic Studies, U.S. Census Bureau.

Haltiwanger, J. 2020. "Applications for New Businesses Contract Sharply in Recent Weeks: A First Look at the Weekly Business Formation Statistics," working paper available online at http://econweb.umd.edu/~haltiwan/first_look.pdf. Last accessed 21 April, 2020.

Varian, Hal R. 2014. "Big Data: New Tricks for Econometrics." *Journal of Economic Perspectives*, 28 (2): 3-28.