Are Business Applications Early Economic Indicators?

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Are changes in early-stage business activity informative about the direction of the economy? Existing research indicates that startup activity and economic conditions are intricately tied. Employer business startups are critical for job creation and productivity growth in the U.S. economy.[1] Furthermore, early characteristics of startups are persistent, and they matter for post-entry business growth and dynamics that feed into aggregate outcomes.[2] As a result, the changes in the volume and types of early-stage businesses can affect future employment and economic activity. Conversely, startups and young firms tend to be particularly sensitive to economic conditions.[3]

Early-stage entrepreneurs may react to early signs of changing economic environment, and reassess their business plans, leading to shifts in business initiation. The number and characteristics of businesses in their initial stages can therefore signal changes in the aggregate economy. But to what extent, and how early?

Until recently, it was difficult to answer this question, because comprehensive, timely, and high-frequency data on business initiations has not been available. The Census Bureau's Business Formation Statistics (BFS), initially released in 2018 as a quarterly data product, fills this gap by providing weekly and monthly data on new business applications, and actual and projected employer business formations originating from these applications.[4] The BFS has been particularly useful in tracking the surge of new business activity during the COVID-19 recession at weekly frequency, and at sectoral and state-level detail.

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[1] See, e.g., Haltiwanger, Jarmin, and Miranda (2013).

[2] See, e.g., Bayard et al. (2018), Brown et al. (2019), Guzman and Stern (2020), and Sterk, Sedlacek, and Pugsley (2021).

[3] For example, there was a major drop in the number of business startups in the early phases of the Great Recession (see Figure 1). However, this drop was only visible in hindsight due to a lack of high-frequency, timely, and up-to-date data on business formation based on data available at that time.

[4] The source for the BFS is administrative data on applications for Employer Identification Numbers (EINs) filed with the IRS on Form SS-4. See Bayard et al. (2018) for details on the development of the BFS and the definitions of various BFS series released at Business Formation Statistics. The monthly BFS is released within ten days of the end of the reference month. A core set of business application series are also released weekly on the Thursday following the end of the reference week. The BFS series start in July 2004.

[Insert Figure 1 Here]

Earlier work on the BFS series indicates that the dynamics of business applications is closely related to changes in economic activity. Dinlersoz at al. (2021) show that business application activity fell at the start of both the Great Recession and the COVID-19 recession, but the time-path of applications has been quite different for the two recessions. Business applications and projected formations fell sharply in the first quarter of 2020, but then they recovered quickly before reaching all-time highs by mid-2020. In contrast, during the Great Recession applications and actual formations declined gradually and did not recover to their pre-recession levels for an extended period. At a local level, Bayard et al. (2018) find that business applications have been lower in metro areas that experienced higher house price declines during the Great Recession, and higher in counties that experienced higher employment growth since the end of the Great Recession.[5]

Despite this prior work, an open question is whether the BFS series contain systematic early information on changing economic conditions and how strong this information is compared to that provided by various Principal Federal Economic Indicators (PFEIs). The PFEIs include many widely watched economic series that describe the current condition of the economy (e.g., nonfarm employment). In this note, we examine the behavior of the growth rate in key monthly business applications series from the BFS in relation to the growth rates of various monthly PFEIs and assess their correlation.[6] We consider the set of all "Business Applications (BA)", and the business applications that have a relatively high likelihood of turning into employer businesses in the future – "High-Propensity Business Applications (HBA)". HBA is an important subset of BA that consists of business applications that are "likely employers". We also consider the complement of HBA – business applications that do not tend to generate employer businesses, i.e., "likely nonemployers" or "Non-High Propensity Business Applications (NHBA)". [7]

The behavior of the key monthly BFS series is shown in Figure 1. HBA begins to decline

[5] For further analysis of the difference in business formation in the pandemic see Newman and Fikri (2022).

[6] This note draws upon and extends some of the material in Asturias et al. (2021), which contains a more detailed analysis of the properties of the BFS series as early economic indicators.

[7] See Bayard et al. (2018) on the details of how BA and HBA series are constructed. To obtain the BA series, applications for EINs are filtered to exclude applications that are for non-business purposes.

Then, using application characteristics and information on which applications turn into employer businesses, a set of key application characteristics highly correlated with employer business formation are identified to define HBA. HBA have about 30% likelihood of turning into employer businesses. In contrast, NHBA have only about 4% likelihood.

prior to the Great Recession, declines sharply during that recession, and essentially does not recover through 2019. BA has a modest initial decline in the Great Recession but then has been rising thereafter reflecting an offsetting increase in NHBA. The sharp drop in BA, HBA, and NHBA during the early part of the pandemic is followed by an unprecedented rise in all three. Business applications remain at a substantially higher level through September 2022.

The figure also plots the business formation series (SBF8Q), which indicates the number of actual (2004–2018) and the predicted (2019–2022) business formations originating from BA within 8 quarters of the month of application. The predictions provide model-based estimates for business formations for the periods for which actuals are not yet available – actual business formation data obtained from the Longitudinal Business Database is behind by about 2 years.[8] Observe that HBA tracks SBF8Q closely over time, indicating that HBA is a good proxy for business formations.[9]

I. An Illustrative Cross-Correlogram Analysis

Analysis of leading, coincident and lagging indicators often focuses on the pattern of cross-correlations over different horizons (see, e.g., Stock and Watson (1998) and Backus, Routledge, and Zin (2010). We start by highlighting the relationship between HBA and nonfarm employment, which is an important PFEI. We calculate the cross-correlations

$$(1) \quad \rho_{xy}(k) = corr(x_t, y_{t+k}),$$

between the monthly year-over-year growth rate of nonfarm employment at time t (x_t) and the monthly year-over-year growth rate of HBA at time $t + k$ (y_{t+k}), for lags that range from $k = -12$ to 12. For example, if $k = -12$ then $\rho_{xy}(k)$ calculates the correlation between the growth rate of x at time t and the growth rate of y from 12 months before or time $t - 12$.

[Insert Figure 2 Here]

The result of this exercise is summarized in the cross-correlogram in Figure 2. We conduct our initial analysis of these patterns using data prior to the pandemic (July 2005–December 2019). Panel A of Figure 2 shows that the growth rates of the two series are positively

[8] See Bayard et al. (2018) on the details of discrete dependent variable models that use detailed application characteristics to predict employer business formation from applications.

[9] Decker and Haltiwanger (2022) provide evidence of a surge in establishment births in 2021 and 2022 consistent with the surge in HBA during the pandemic.

correlated for all values of k. Furthermore, the highest correlation occurs at $k = -11$. Thus, HBA leads nonfarm employment growth by 11 months and the correlation at that lead is 0.64. The interpretation is that the HBA growth rate from 11 months prior is the best predictor of the current growth rate in nonfarm employment among all other leads and lags considered.

For comparison, panel B of Figure 2 repeats the analysis with Retail Sales instead of HBA. Retail Sales is a key PFEI; standard macroeconomic models would imply an early consumption response to changing economic outlook, since consumption generally reflects consumers' expectations about employment outlook and real wage growth.[10] Retail Sales indeed leads Nonfarm Employment by 4 months, and the correlation at that lead is 0.85. While HBA has a lower correlation with Nonfarm Employment compared to Retail Sales, it has a substantially larger lead.

II. The Correlation between Business Applications and Principal Federal Economic Indicators

Table 1 contains the results of the cross-correlation analysis between Nonfarm Employment on the one hand, and the key BFS series and PFEIs, on the other. The specific PFEIs included in Table 1 are highly-sensitive Census series that are widely followed and released early (8:30 am EST) on their scheduled day every month.[11] Excluding the pandemic years, Retail Sales has the highest correlation (0.845) with Nonfarm Employment at a lead of 4 months, followed by New Residential Construction Permits and Industrial Production. HBA comes next and has the highest correlation of 0.643 at a lead of 11 months. BA and NHBA have lower correlations and smaller leads. Overall, HBA has the highest lead among the highly-sensitive indicators, and while BA has a lower correlation, it still leads by 5 months – a lead larger than all the PFEIs in Table 1 except for New Residential Construction Permits. Table A1 in the Online Appendix repeats the analysis with all 16 PFEIs considered along with the BFS series. When we focus on the period before the COVID recession, HBA ranks 12th among the PFEIs in terms of correlation, while BA and NHBA are at the bottom. The only PFEI that has a larger lead than HBA, however, is New Single-Family Homes Sold (12 months).

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[10] See, e.g., Breeden (2012).

[11] The only highly-sensitive PFEI not included is U.S. International Trade in Goods and Services. In general, the PFEIs focused on international trade, agriculture, prices, and natural resources have less of a relevance to the BFS series. In particular, international trade is dominated by large, established firms, and only a tiny fraction of new employer businesses is engaged in international trade.

[Insert Table 1 Here]

Table 1 also includes cross-correlations when we use the growth rates for all years (including the pandemic years). The patterns change to some extent given the very sharp contraction in economic activity in March-June 2020. HBA has a lower correlation, but still a substantial lead at 9 months. In contrast, Retail Sales only leads by 1 month. BA and HBA now have negative correlations with, and lag Nonfarm Employment. We find, however, that if all years are included (see Online Appendix Table A1) but the growth rates for the months of March–June 2020 and March–June of 2021 are excluded, then the patterns are closer to those pre-pandemic. Note that we eliminate the growth rates for March–June 2021 because, as the growth rates are calculated on a year-over-year basis, they use data from 2020 in their computation. We discuss the issues of how to consider the sharp contraction in March-June 2020 in more detail in the online appendix.

[Insert Table 2 Here]

Table 2 explores the cross-correlations of HBA with the highly-sensitive PFEIs (i.e., whether HBA leads other PFEIs). Excluding the pandemic years, HBA is leading indicator of Retail Sales and Manufacturing New Orders but is a lagging indicator of New Residential

Permits. Once again, including the pandemic years changes the correlations to some extent. It also increases the lead of HBA over Retail Sales and Manufacturing New Orders, and HBA no longer lags New Residential Permits. However, using all years but excluding March–June 2020 yields patterns more similar to those pre-pandemic.

Table A2 in Online Appendix repeats the analysis with all 16 PFEIs considered. Excluding the pandemic years, HBA leads all PFEIs except for three that are related to construction and housing (New Residential Construction Permits, New Single-family Homes Sold, and New Residential Construction Units Started). When the pandemic years are included, HBA still leads most PFEIs except for the three mentioned before, and Real Hourly Earnings Production and Nonsupervisory Employees, and New Residential Construction Units Completed. Excluding March–June 2020 yields patterns more consistent with those pre-pandemic.

III. Conclusion

Business applications from the BFS provide timely and high frequency information on early-stage business formation – a precursor of both employer and non-employer business formations in the future. This note has examined the properties of three business

application series from the BFS in relation to existing monthly PFEIs. The analysis indicates that applications for likely employers (HBA) are particularly useful as early indicators of aggregate economic activity. HBA leads most PFEIs and appears to be an especially strong early indicator of Nonfarm Employment.

REFERENCES

Asturias, Jose, Emin Dinlersoz, John Haltiwanger, and Rebecca Hutchinson. 2021. "Business Applications as Economic Indicators." Center for Economic Studies Working Paper 21-09.

Backus, David K., Bryan R. Routledge, and Stanley E. Zin. 2010. "The Cyclical Component of US Asset Returns." NYU Working Paper.

Bayard, Kimberly, Emin Dinlersoz, Timothy Dunne, John Haltiwanger, Javier Miranda, and John Stevens. 2018. "Early-Stage Business Formation: An Analysis of Applications for Employer Identification Numbers." NBER Working Paper 24364.

Breeden, Douglas T. 2012. "Consumption as a Leading Indicator." Working Paper, Fuqua School of Business, Duke University.

Brown, David, Earle, John, Kim, Meejung, and Lee, Kyungmin. 2017. "High-Growth Entrepreneurship." CES Working Paper, 17-53.

Decker, Ryan and John Haltiwanger. 2022. "Surging Business formation in the Pandemic: Causes and Consequences," Paper presented at Annual Boston Federal Reserve Conference, November.

Dinlersoz, Emin, Timothy Dunne, John Haltiwanger, and Veronika Penciakova. 2022. "Business Formation: A Tale of Two Recessions," *AEA Papers and Proceedings*.

Haltiwanger, John, Ron Jarmin and Javier Miranda. 2013. "Who Creates Jobs? Small versus Large versus Young." *Review of Economics and Statistics* 95 (2): 347–361.

Guzman, Jorge, and Scott Stern. 2020. "The State of American Entrepreneurship? New Estimates of the Quantity and Quality of Entrepreneurship for 32 US States, 1988-2014." *American Economic Journal: Economic Policy* 12 (4): 212–243.

Newman, Daniel, and Kenan Fikri. 2022. [New Startups Break Record in 2021: Unpacking the Numbers - Economic Innovation Group (eig.org)](eig.org).

Sterk, Vincent, Petr Sedláček, and Benjamin Pugsley. 2021. "The Nature of Firm Growth." *American Economic Review* 111 (2): 547–79.

Stock, James H., and Mark W. Watson. 1998. "Business Cycle Fluctuations in U.S. Macroeconomic Time Series." NBER Working Paper 6528.
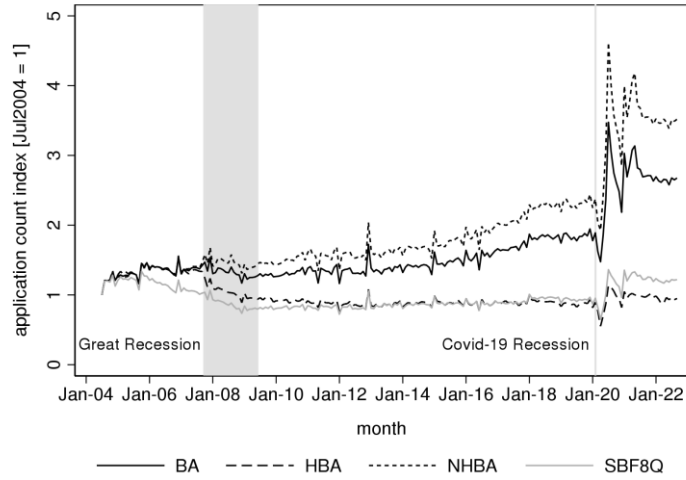
FIGURE 1. KEY BFS MONTHLY SERIES

Note: BA - Business Applications, HBA - High-Propensity Business Applications (likely employers), NHBA – Non-high-propensity Business Applications (likely nonemployers), SBF8Q – Spliced Business Formations within 8 Quarters (actual and predicted business formations). All series are seasonally adjusted.

Panel A. Nonfarm employment and HBA
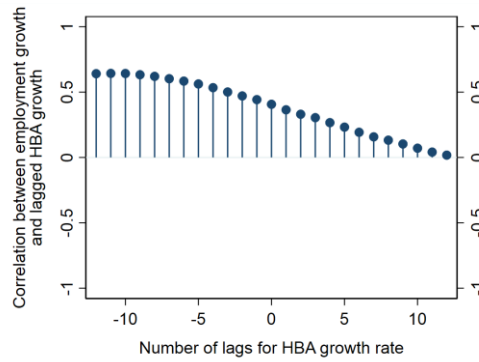
Panel B. Nonfarm employment and retail sales

FIGURE 2. CROSS-CORRELOGRAMS OF MONTHLY YEAR-OVER-YEAR GROWTH RATES FOR 2005–2019

TABLE 1— CROSS-CORRELATIONS FOR THE GROWTH RATES OF HIGHLY-SENSITIVE PFEIS, THE BFS SERIES, AND NONFARM EMPLOYMENT

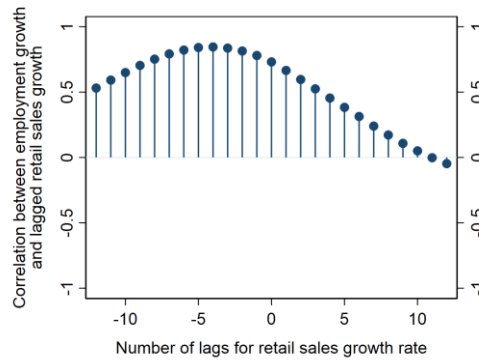| Series name	Excluding 2020-2022		All years (2005-2022)	
	Lead/Lag	Correlation	Lead/Lag	Correlation
Advance Monthly Sales Retail and Food Services	−4	0.845***	−1	0.677***
		(0.041)		(0.052)
New Residential Construction Permits	−8	0.784***	−10	0.416***
		(0.047)		(0.064)
HBA	−11	0.643***	−9	0.496***
		(0.058)		(0.061)
Manufacturing New Orders	−3	0.590***	−1	0.566***
		(0.062)		(0.058)
BA	−5	0.446***	3	-0.538***
		(0.068)		(0.059)
NHBA	−1	0.233**	3	-0.563***
		(0.074)		(0.058)

Notes: Standard errors in parenthesis. Table is sorted by the absolute value of the correlation for the months excluding the pandemic. Note that if the Lead/Lag is negative, then the indicator is leading; if the Lead/Lag is zero then the indicator is coincident; if the Lead/Lag is positive then the indicator is lagging. ***, **, * indicate significance at the 0.1, 1, and 5 percent levels, respectively.

TABLE 2— CROSS-CORRELATIONS FOR THE GROWTH RATES OF HBA AND HIGHLY-SENSITIVE PFEIS

Series name	Excluding 2020-2022		All years (2005-2022)	
	Lead/Lag	Correlation	Lead/Lag	Correlation
Advance Monthly Sales Retail and Food Services	−6	0.552***	−8	0.611***
		(0.064)		(0.055)
New Residential Construction Permits	3	0.459***	0	0.432***
		(0.068)		(0.063)
Manufacturing New Orders	−5	0.391***	−9	0.400***
		(0.07)		(0.064)

Notes: Standard errors in parenthesis. Table is sorted by the absolute value of the correlation for the months excluding the pandemic. Note that if the Lead/Lag is negative, then the indicator is leading; if the Lead/Lag is zero then the indicator is coincident; if the Lead/Lag is positive then the indicator is lagging. ***, **, * indicate significance at the 0.1, 1, and 5 percent levels, respectively.

Online Appendix

In this appendix, we repeat the cross-correlation analysis from the main text, except that we now include the pandemic period. Panels A and B of Figure A1 are similar to those of Figure 2, except that we use growth rates for all years (growth rates for July 2005–September 2022). The inclusion of the pandemic years leads to some non-trivial changes. HBA and Retail Sales now exhibit a negative correlation with nonfarm employment for all $k > 0$. Moreover, for HBA the correlations are no longer monotonic in k. Nevertheless, HBA retains its lead of Nonfarm Employment at $k = -9$ and Retail Sales does the same for $k = -1$.

These changes are driven by the unusually sharp contraction in economic activity in the early stages of the pandemic. Figure A2 is similar to Figure A1, except that we exclude growth rates for March–June 2020 and March–June 2021 in the analysis. We eliminate the growth rates for March–June 2021 because, as the growth rates are calculated on a year-over-year basis, they use data from 2020 in their computation. We find that HBA and Retail Sales lead times are closer to those when we focus on the pre-pandemic period in panels A and B of Figure 2.

Figure A3 takes a closer look at the monthly year-over-year growth rates of HBA, Retail Sales, and Nonfarm Employment during the Great Recession and the COVID-19 recession. Panel A shows clearly how HBA and retail sales lead nonfarm employment during the Great Recession. Panel B shows a sharp decline in all three series in April 2020 followed by a swift recovery in HBA and slower recoveries for Retail Sales and Nonfarm Employment, which alter the correlations among these series.

The growth rates during March–June 2020 are dramatic outliers given the unprecedented sharp contraction of the economy during the lockdown phases of the pandemic. In April 2020, Nonfarm Employment declined by 14.3% (on a year-over-year basis), Retail Sales declined by 22.6%, and HBA by 34.7%. For the analysis in this paper seeking to explore the general relationship between the BFS series and key PFEIs, it is unclear that inferences should be based on data that include those outlier months. Nevertheless, we include the analysis with those months for completeness. The results including all years but excluding March–June 2020 are broadly similar to those pre-pandemic (i.e., a comparison of Figure 2 and Figure A2). In other words, these unusual months provide less guidance about the typical relationship between the BFS series and the key PFEIs.

Table A1 reports the lead/lag of all the PFEI's and nonfarm employment and the correlations. Columns 2–7 reports these results for three cases: 1) excluding growth rates for 2020–2022 (our baseline case in the main text), 2) including all years (2005–2022), and 3) including all years (2005–2022) except for the growth rates for March–June of 2020 and 2021. We find that in all three cases, HBA exhibits similar patterns. For the case of BA, the series has a higher lead with a positive correlation when we exclude the growth rates for March–June of 2020 and 2021. Table A2 reports whether HBA leads/lags the PFEI's listed in Table A1 for the same three cases. We find similar patterns in that across the three cases HBA tends to lead the other PFEI's. While HBA's lead times generally increase when we exclude growth rates for March–June of 2020 and 2021, the correlations get weaker in many cases.

Figure A1. Cross-correlograms of monthly year-over-year growth rates (all years, 2005–2022)

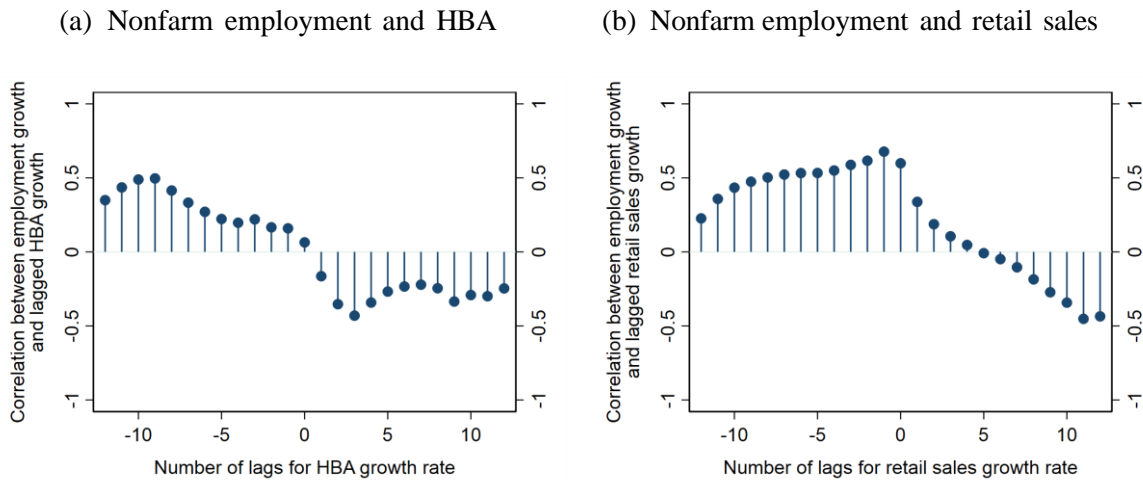(a) Nonfarm employment and HBA   (b) Nonfarm employment and retail sales

Figure A2. Cross-correlograms of monthly year-over-year growth rates

(excluding growth rates for March–June of 2020 and 2021)

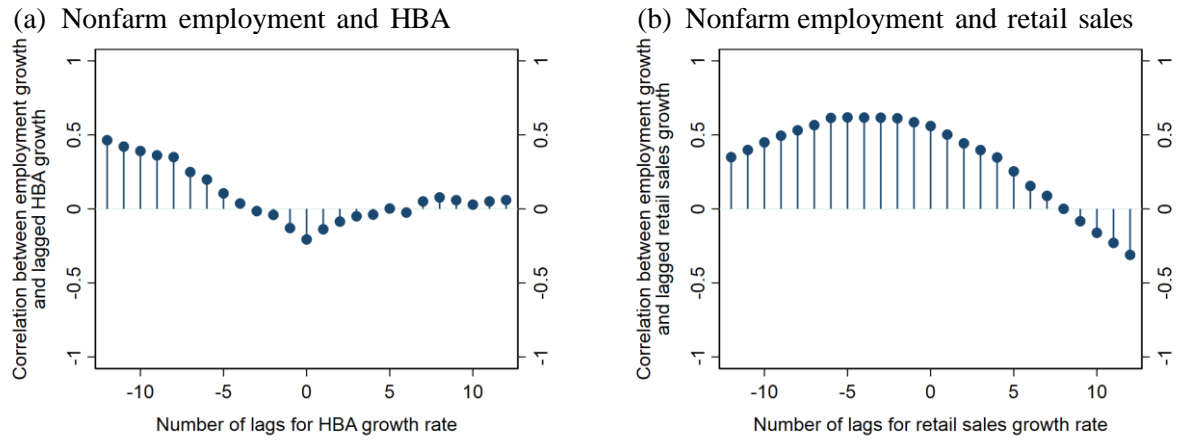(a) Nonfarm employment and HBA

(b) Nonfarm employment and retail sales

Figure A3. Growth rates of HBA, retail sales, and nonfarm employment (year-over-year growth rates)

(a) Great Recession
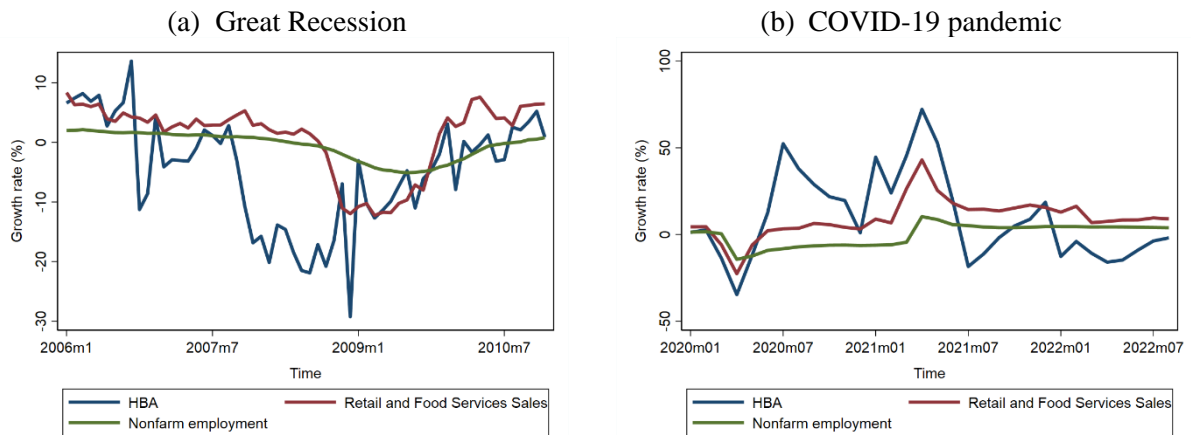
(b) COVID-19 pandemic

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Table A1. Cross-correlations: PFEI growth rate and growth rate in nonfarm employment

Series name	Excluding growth rates for 2020–2022		All years (2005–2022)		Excluding growth rates for March–June of 2020 and 2021	
	Lead/Lag	Correlation	Lead/Lag	Correlation	Lead/Lag	Correlation
Advance Monthly Sales Retail and Food Services	−4	0.845***	−1	0.677***	−5	0.618***
		(0.041)		(0.052)		(0.056)
Construction Spending	1	0.841***	1	0.458***	0	0.589***
		(0.041)		(0.062)		(0.058)
New Single-family Homes for Sale	1	0.798***	2	0.595***	0	0.697***
		(0.046)		(0.056)		(0.051)
Manufacturing and Trade Inventories	1	0.796***	1	0.710***	0	0.778***
		(0.046)		(0.049)		(0.045)
New Residential Construction Permits	−8	0.784***	−10	0.416***	−8	0.517***
		(0.047)		(0.064)		(0.061)
Industrial Production	−4	0.783***	0	0.756***	0	0.678***
		(0.047)		(0.046)		(0.052)
New Residential Construction Units Started	−7	0.774***	−1	0.402***	−4	0.486***
		(0.048)		(0.064)		(0.062)
New Single-family Homes Sold	−12	0.739***	−11	0.348***	−12	0.413***
		(0.051)		(0.066)		(0.065)
Wholesale Inventories	2	0.703***	1	0.652***	0	0.704***
		(0.054)		(0.053)		(0.051)
New Residential Construction Units Completed	−6	0.680***	−2	0.360***	−6	0.451***
		(0.056)		(0.065)		(0.064)
Durable Goods New Orders	−4	0.675***	−1	0.540***	−4	0.502***
		(0.056)		(0.059)		(0.062)
HBA	−11	0.643***	−9	0.496***	−12	0.464***
		(0.058)		(0.061)		(0.063)
Manufacturing and Trade Sales	−3	0.641***	−1	0.638***	−2	0.556***
		(0.059)		(0.054)		(0.059)
Manufacturing Shipments	−3	0.603***	−1	0.624***	−2	0.547***
		(0.061)		(0.055)		(0.06)
Manufacturing New Orders	−3	0.590***	−1	0.566***	−3	0.498***
		(0.062)		(0.058)		(0.062)
Wholesale Sales	−3	0.551***	−1	0.625***	−2	0.533***
		(0.064)		(0.055)		(0.06)
Real Hourly Earnings Production and Nonsupervisory Employees	−2	−0.463***	0	−0.714***	0	−0.619***
		(0.068)		(0.049)		(0.056)
BA	−5	0.446***	3	−0.538***	−12	0.355***
		(0.068)		(0.059)		(0.067)
NHBA	−1	0.233**	3	−0.563***	0	−0.410***
		(0.074)		(0.058)		(0.065)

Notes: Standard errors in parenthesis. Table is sorted by the absolute value of the correlations reported in column 3 (correlations calculated excluding growth rates for 2020–2022). Columns 6 and 7 report results when we exclude growth rates for March–June of 2020 and for the same months of 2021. We do so to avoid large outliers that took place during March–June of 2020; we removed the growth rates of March–June of 2021 because, as the growth rates are calculated on a year-over-year basis, they use data from 2020 in their computation. Note that if the Lead/Lag is negative, then the indicator is leading; if the Lead/Lag is zero then the indicator is coincident; if the Lead/Lag is positive then the indicator is lagging. ***, **, * indicate significance at the 0.1, 1, and 5 percent levels, respectively.

Table A2. Cross-correlations: HBA growth rate and growth rate of other PFEI's

Series name	Excluding growth rates for 2020–2022		All years (2005–2022)		Excluding growth rates for March through June of 2020 and 2021	
	Lead/Lag	Correlation	Lead/Lag	Correlation	Lead/Lag	Correlation
Total Nonfarm Employees	−11	0.643***	−9	0.496***	−12	0.464***
		(0.058)		(0.061)		(0.062)
Total Private Sector Employees	−10	0.637***	−9	0.503***	−12	0.473***
		(0.059)		(0.061)		(0.062)
Unemployment Rate	−7	−0.599***	−9	−0.502***	−12	-0.513***
		(0.061)		(0.061)		(0.062)
Manufacturing and Trade Inventories	−12	0.553***	−12	0.499***	−12	0.406***
		(0.064)		(0.061)		(0.062)
Advance Monthly Sales Retail and Food Services	−6	0.552***	−8	0.611***	−12	0.521***
		(0.064)		(0.055)		(0.057)
New Single-family Homes for Sale	−8	0.534***	−12	0.502***	−12	0.481***
		(0.064)		(0.061)		(0.062)
Industrial Production	−8	0.507***	−9	0.451***	−8	0.378***
		(0.066)		(0.062)		(0.064)
New Single-family Homes Sold	5	0.488***	1	0.492***	0	0.502***
		(0.067)		(0.061)		(0.062)
Construction Spending	−12	0.476***	−11	0.381***	−12	0.413***
		(0.067)		(0.065)		(0.066)
New Residential Construction Units Started	0	0.467***	0	0.439***	0	0.377***
		(0.067)		(0.063)		(0.064)
Wholesale Inventories	−12	0.464***	−12	0.492***	−12	0.382***
		(0.068)		(0.061)		(0.062)
New Residential Construction Units Completed	−1	0.459***	1	0.356***	4	0.370***
		(0.068)		(0.065)		(0.067)
New Residential Construction Permits	3	0.459***	0	0.432***	0	0.389***
		(0.068)		(0.063)		(0.064)
Durable Goods New Orders	−5	0.437***	−9	0.407***	−11	0.341***
		(0.069)		(0.064)		(0.065)
Manufacturing and Trade Sales	−10	0.424***	−9	0.497***	−12	0.417***
		(0.069)		(0.061)		(0.062)
Manufacturing Shipments	−10	0.409***	−10	0.402***	−12	0.346***
		(0.07)		(0.064)		(0.065)
Manufacturing New Orders	−5	0.391***	−9	0.400***	−11	0.325***
		(0.07)		(0.064)		(0.065)
Wholesale Sales	−9	0.377***	−9	0.492***	−12	0.417***
		(0.071)		(0.061)		(0.062)
Real Hourly Earnings Production and Nonsupervisory Employees	−12	−0.272***	3	0.374***	0	0.228***
		(0.073)		(0.065)		(0.066)

Notes: Standard errors in parenthesis. Table is sorted by the absolute value of the correlations reported in column 3 (correlations calculated excluding growth rates for 2020–2022). Columns 6 and 7 report results when we exclude growth rates for March–June of 2020 and for the same months of 2021. We do so to avoid large outliers that took place during March–June of 2020; we removed the growth rates of March–June of 2021 because, as the growth rates are calculated on a year-over-year basis, they use data from 2020 in their computation. Note that if the Lead/Lag is negative, then the indicator is leading; if the Lead/Lag is zero then the indicator is coincident; if the Lead/Lag is positive then the indicator is lagging. ***, **, * indicate significance at the 0.1, 1, and 5 percent levels, respectively.