Business Applications as Economic Indicators

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Motivation

- Business Formation Statistics (BFS) provide high frequency, timely data on early-stage new business activity in the U.S.
  - All applications for an EIN via IRS form SS-4 (starting in 2004q3) delivered weekly to Census Bureau are inputs to the BFS
  - Attractive features: high (monthly) frequency, timeliness (short production lags), not subject to frequent significant revisions

- Question: Are changes in early-stage business activity informative about the direction of the economy?
  - Those who file business applications are forward-looking (i.e., future economic activity affects current business applications)
  - Conversely, future economic activity is related to current business creation (i.e., current business applications affect future economic activity)

- Until recently, it was difficult to answer this question, because comprehensive, timely, and high-frequency data on business initiations has not been available

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BFS series of focus as economic indicators

- **BA** – most comprehensive series, includes applications made by “likely employers” and “likely non-employers”

- **HBA** – particularly informative about “likely employers”, contains the key application characteristics correlated with future employer business formation. Highly correlated with actual and projected employer business formation, and applications with planned wages
  - **NHBA** =(**BA**-**HBA**) set of “likely non-employers”, of particular interest considering the increasing prevalence of self-employment (the gig economy)

- We use seasonally adjusted monthly series

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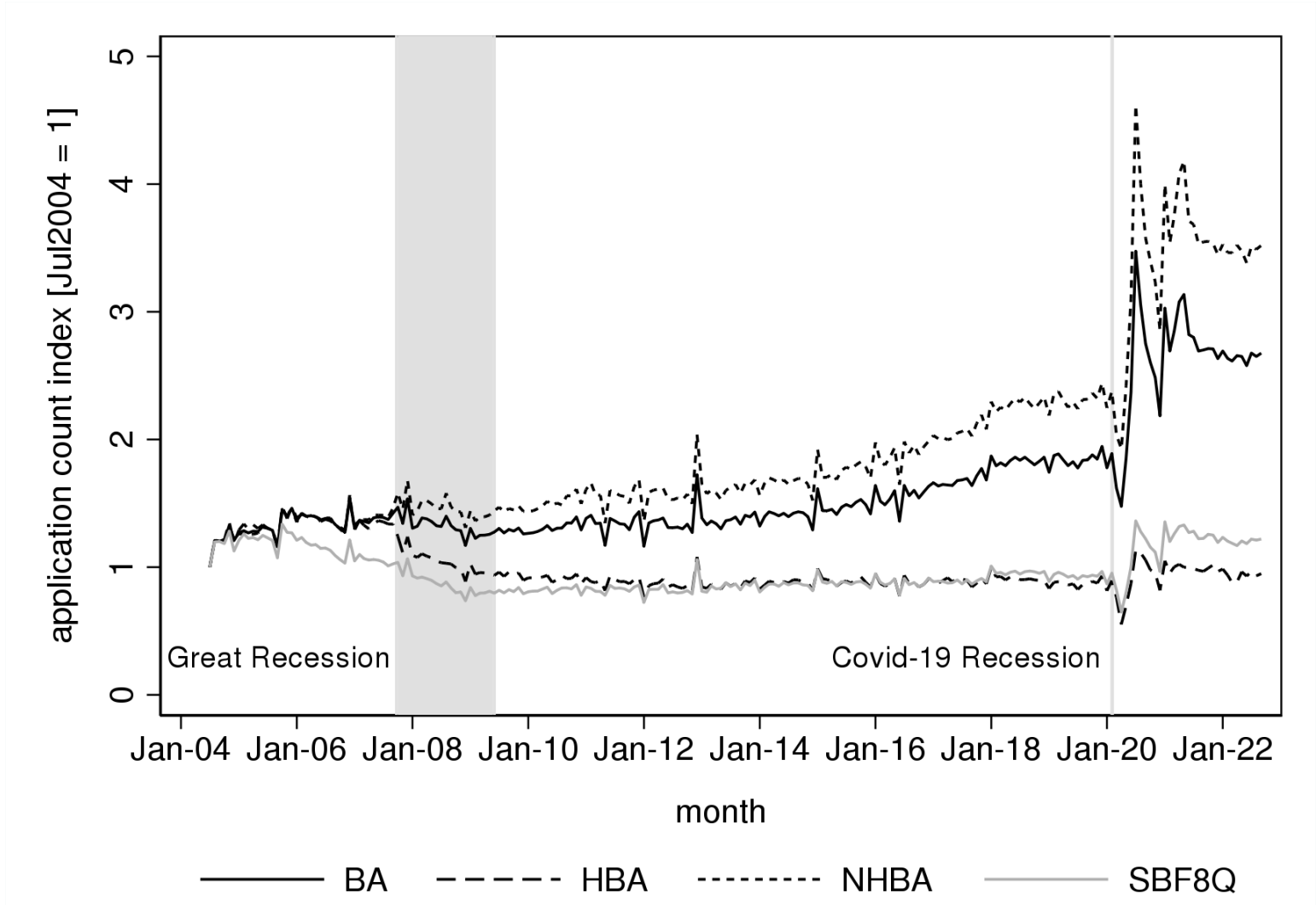

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Methodology

- Calculate monthly year-over-year growth rates for BFS series and 19 principal federal economic indicators (PFEI's), which are widely watched economic series for the U.S. economy

- Examine the relationship between the growth rates using
  - Cross-correlations
  - Vector autoregression (VAR)

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Cross-correlations

- Define the cross-correlation

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

  - *x* and *y* are *year-over-year growth rates* for any two monthly economic series
  - *k* is the lag in *y* (*k* an integer)
  - *corr* is the correlation between the two variables

- Calculate the correlation between the contemporaneous growth rates of nonfarm employment (*x* above) and the lagged growth rates of HBA, BA, or NHBA (*y* above) for lags that range from -12 to 12 (*k* above)
- Find the correlation with the highest absolute value, ρ^*_{xy} , over the values of lag, *k*, considered and the lag corresponding the highest correlation (*k**)

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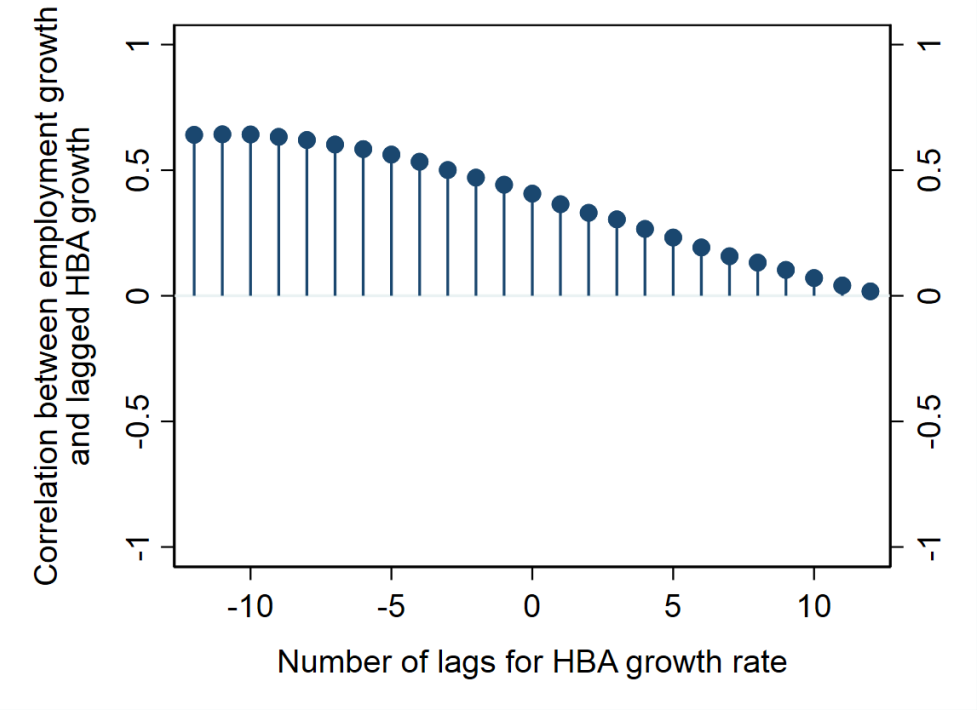
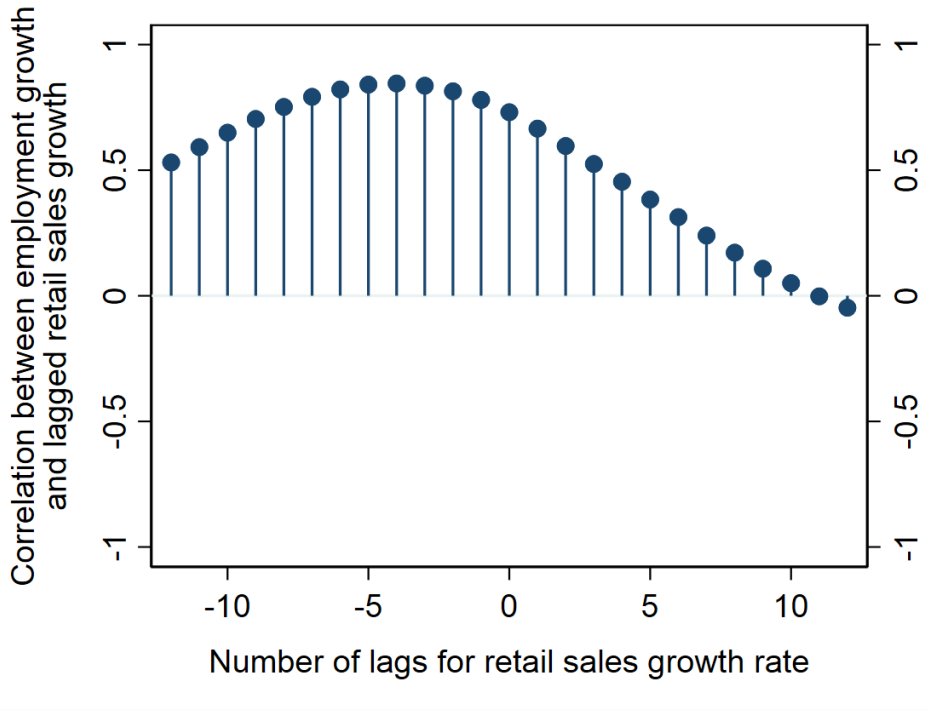
Correlograms

Nonfarm employment and HBA (2005-19)



Nonfarm employment and retail sales (2005-19)



- HBA leads nonfarm employment by 11 months, correlation is 0.64
- Retail sales leads nonfarm employment by 4 months, correlation is 0.85

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

	Excluding 2020-2022		All years (2005-2022)	
Series name	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: * p<0.05, ** p<0.01, *** p<0.001. Table is sorted by the absolute value of the correlation.

- HBA has a longer lead relative to other widely watched PFEIs; HBA has longer lead time than 82-88% of PFEIs considered (depending on time period)
- BA and NHBA
  - Excluding pandemic, they lead and are positively correlated with nonfarm employment
  - Including all years, they lag and are negative correlated with nonfarm employment
- Excluding March-June 2020, patterns are broadly similar to pre-pandemic

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Conclusion and potential future work

- Increased interest in BFS by policymakers, analysts, and the media
- Our work explores the properties of the BFS as a potential leading indicator of economic activity and how it compares to other existing PFEI's
- Potential future work
  - Understanding mechanisms for HBA to be a leading indicator
  - Sectoral BFS series as economic indicators: retail, manufacturing

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