Internet Appendix for

Expected Business Conditions and Bond Risk Premia

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IA.A. Predictive ability across forecast horizons

To better understand the predictive ability of survey forecasts for different forecast horizons, we construct horizon specific versions of the first 3 principal components $\left(\mathcal{P}^{\mathbb{E}}_{1,t}, \mathcal{P}^{\mathbb{E}}_{2,t}, \mathcal{P}^{\mathbb{E}}_{3,t}\right)$ and the macroeconomic expectations factor, ME_t, using data from the Survey of Professional Forecasters (SPF). We estimate the horizon specific principal components and ME_t factors analogously to their full horizon counterparts in Section III. The results, which are presented in Table IA.1, show that the predictive ability of survey forecasts is not confined to a particular forecast horizon. In fact, albeit some heterogeneity is present in the loading sizes and significance, we see that the overall results are remarkably similar across forecast horizons. The pattern of loadings being an increasing function of bond maturity in absolute value emerges again and the same functions of horizon specific components forecast bond risk premia for all maturities. As such, we view our use of the full term structure of survey expectations as a way to average, in a sense, over the heterogeneities in the predictive abilities, thereby avoiding having to evaluate all possible combinations of components and forecast horizons in the SPF data.

IA.B. The term structure of survey forecasts

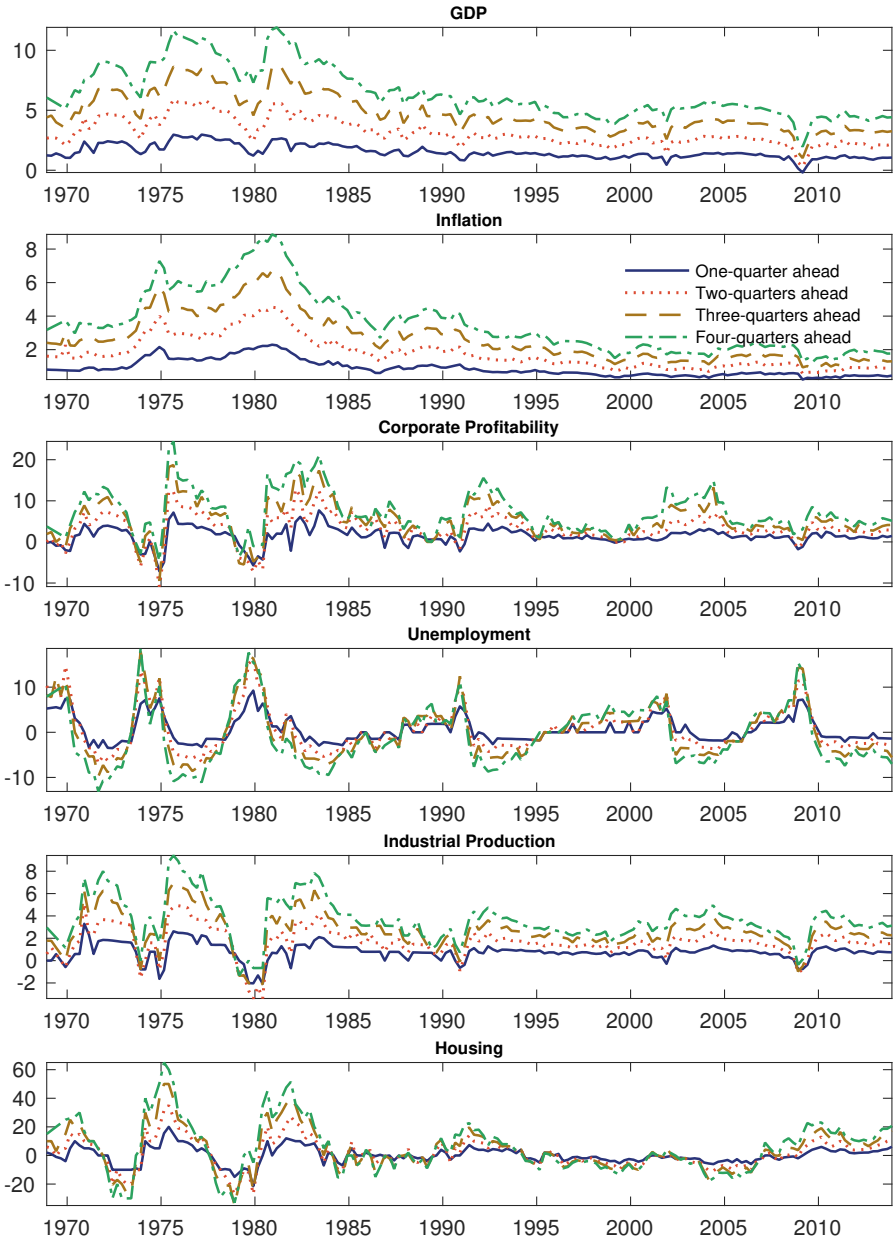
The descriptive statistics in Section III suggested that survey forecasts are extrapolative in the forecast horizon. As a verification, we plot in Figure IA.1 1- through 4-quarter-ahead forecasts from the SPF. As suggested by the descriptive statistics, we see that the majority of the forecasts are indeed displaying extrapolative behavior.

Table IA.1: Predictive ability across forecast horizons.

Table IA.1 reports slope estimates from regressing 1-year-ahead bond risk premia upon horizon specific versions of the first 3 principal components ($\mathcal{P}^{\mathbb{E}}_{1,t}$,$\mathcal{P}^{\mathbb{E}}_{2,t}$,$\mathcal{P}^{\mathbb{E}}_{3,t}$) of the Survey of Professional Forecasters (SPF) forecasts and expected business conditions (ME_t). Although not reported, all regressions contain an intercept. Hansen and Hodrick (1980) t-statistics implemented with 4 lags are presented in parentheses. Adj. R^2 (%) denotes the full sample adjusted coefficient of determination in percentage. The sample period starts in 1968:Q4 and ends in 2014:Q4.

	$\mathcal{P}^{\mathbb{E}}_{1,t}$	$\mathcal{P}^{\mathbb{E}}_{2,t}$	$\mathcal{P}^{\mathbb{E}}_{3,t}$	adj R^2 (%)	ME_t	adj R^2 (%)
			Panel A: Two-year bond			
One-quarter ahead	0.13	0.21	-0.77	20.08	0.47	19.97
	(1.44)	(1.42)	(-3.94)		(5.29)	
Two-quarters ahead	0.19	0.19	-0.77	20.35	0.46	20.39
	(2.36)	(1.22)	(-3.62)		(5.35)	
Three-quarters ahead	0.16	0.22	-0.75	18.58	0.46	18.63
	(2.27)	(1.31)	(-3.12)		(4.37)	
Four-quarters ahead	0.13	0.24	-0.69	15.33	0.45	15.37
	(1.60)	(1.22)	(-2.58)		(3.23)	
			Panel B: Three-year bond			
One-quarter ahead	0.22	0.51	-1.31	19.43	0.86	20.05
	(1.46)	(1.82)	(-3.88)		(5.26)	
Two-quarters ahead	0.32	0.46	-1.37	20.70	0.86	21.32
	(2.23)	(1.66)	(-3.83)		(5.51)	
Three-quarters ahead	0.27	0.51	-1.35	19.31	0.86	19.95
	(1.91)	(1.75)	(-3.35)		(4.60)	
Four-quarters ahead	0.19	0.55	-1.24	16.03	0.86	16.72
	(1.21)	(1.60)	(-2.73)		(3.40)	
			Panel C: Four-year bond			
One-quarter ahead	0.42	0.87	-1.61	19.24	1.20	20.08
	(1.95)	(2.29)	(-3.82)		(5.39)	
Two-quarters ahead	0.51	0.83	-1.69	20.67	1.20	21.50
	(2.58)	(2.18)	(-3.79)		(5.68)	
Three-quarters ahead	0.38	0.91	-1.66	19.03	1.20	19.88
	(2.05)	(2.25)	(-3.23)		(4.70)	
Four-quarters ahead	0.23	0.98	-1.50	15.81	1.20	16.69
	(1.14)	(2.03)	(-2.52)		(3.44)	
			Panel D: Five-year bond			
One-quarter ahead	0.52	1.12	-1.90	19.43	1.46	20.15
	(1.99)	(2.58)	(-4.02)		(5.35)	
Two-quarters ahead	0.63	1.08	-2.02	21.12	1.47	21.84
	(2.57)	(2.52)	(-4.03)		(5.76)	
Three-quarters ahead	0.46	1.19	-1.99	19.72	1.48	20.46
	(2.03)	(2.58)	(-3.42)		(4.84)	
Four-quarters ahead	0.27	1.27	-1.82	16.69	1.49	17.46
	(1.13)	(2.30)	(-2.66)		(3.58)	

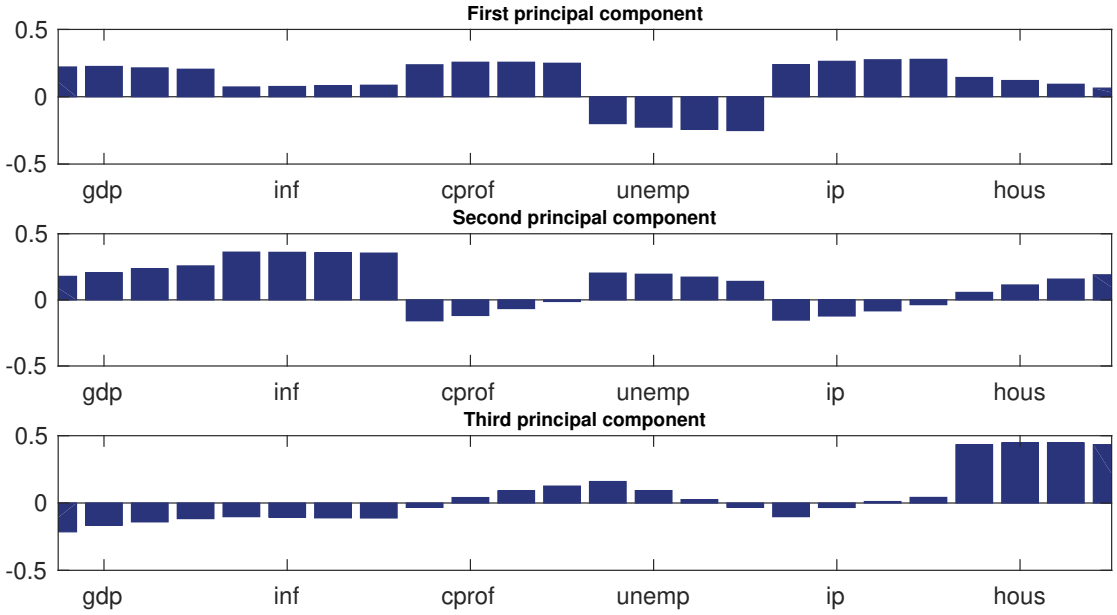
Figure IA.1: Term structure of expected business conditions.
This figure plots 1- through 4-quarter-ahead forecasts from the Survey of Professional Forecasters (SPF). The sample period starts in 1968:Q4 and ends in 2014:Q4.



IA.C. Visualizing Principal Component Loadings

While the loadings from the principal component analysis are tabulated in Table 1, this section provides a visual interpretation by plotting the loadings in bar form in Figure IA.2. The interpretation is naturally identical to the one obtained from the tabulated

Figure IA.2: Principal Component Loadings.
This figure illustrates the loadings from the principal component analysis in Section III. Loadings are grouped by macroeconomic fundamentals and ordered from shortest to longest forecast horizon.

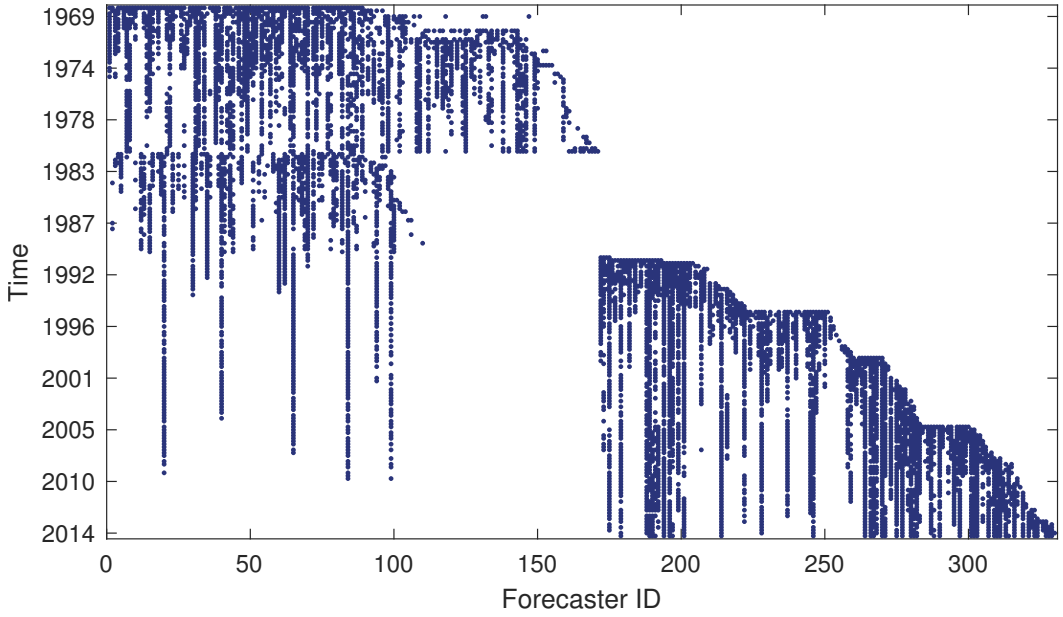


loadings, but the visualization may be more informative in some aspects. In particular, the graphical illustration naturally revels that loadings are similar in size for a particular fundamental across forecast horizons, albeit some heterogeneity in loading sizes are present. However, no loading is placed entirely on a particular forecast horizon for any of the macroeconomic fundamentals.

IA.D. Participation of individual forecasters

As mentioned in Section III, the average number of participating forecasters in our sample is about 36 per quarter. However, this number fluctuates over time as individual forecasters exit and enter the sample at various points in time.[1] To illustrate the participation, we consider in Figure IA.3 the 1-quarter-ahead forecasts provided for the GDP variable over our sample period. Each dot represents a response by forecaster i, who are

Figure IA.3: Participation of individual forecasters.
This figure illustrates the participation of individual forecasters over our sample period. The blue dots represents a submitted forecasts from forecaster i at time t. Forecaster IDs with no forecast submissions have been removed for easier readability of the figure. As a result, our notation of Forecaster ID need not correspond to the ID from the Survey of Professional Forecasters (SPF). The sample period starts in 1968:Q4 and ends in 2014:Q4.



represented by a unique, but anonymous, forecaster ID, at time t. We see that the composition of the panel of professional forecasters vary over time and that individual forecasters frequently enter, exit, and re-enter the sample at various points in time.

[1] See Capistrán and Timmermann (2009) for a discussion on how best to deal with these exits and entries from a forecasting perspective.