Supplementary Materials:

Credit Spreads, Business Conditions, and Expected Corporate Bond Returns

Hai Lin [1], Xinyuan Tao [2], Junbo Wang [3] and Chunchi Wu [4],*

[1] School of Economics and Finance, Victoria University of Wellington, Wellington 6140, New Zealand

[2] Martin Tuchman School of Management, New Jersey Institute of Technology, Newark, NJ 07102, USA

[3] Department of Economics and Finance, City University of Hong Kong, 220, Hong Kong, China

[4] School of Management, State University of New York at Buffalo, Buffalo, NY 14260, USA

* Correspondence: chunchiw@buffalo.edu; Tel.: +01-716-645-0448

In the Supplementary Materials, we report additional results and provide links to our data and program codes. Due to the space constraint, we have not reported all results for the predictive regressions (in-sample) using macroeconomic and policy uncertainty data in the main text. Table S1 shows these results. In addition, in the text, we report the results that combine AAA/AA bonds together to increase the number of observations and efficiency of empirical estimation. In this appendix, we report the results of AAA bond to show robustness of our results to separation of AAA and AA bonds. The results of AAA bonds are reported in Table S2. These results show a similar predictability pattern to AA bonds.

Our data and program codes can be accessed from the following URL:

https://www.dropbox.com/sh/gusr0yjjswhd9my/AABIHLhTDvKrQmhU8-qF_wW8a?dl=0

Table S1. Policy uncertainty, macroeconomic condition and bond return predictability. This table reports the coefficients of predictive regressions using policy uncertainty and macroeconomic variables. The economic uncertainty index (EPU) is from Baker, Bloom and Davis (2016) and macroeconomic variables include industrial production growth (IPG), non-farm payroll (PAY), inflation (CPI) and unemployment rate (UNEM) from the Federal Reserve Board.

	Predictors	Monthly Horizon					Quarterly Horizon					Yearly Horizon				
		AAA/AA	A	BBB	Junk	All	AAA/AA	A	BBB	Junk	All	AAA/AA	A	BBB	Junk	All
	EPU	0.41	0.73	0.83	1.28	0.80	0.27	0.72	0.91	1.40	0.86	0.18	0.54	0.76	1.11	0.65
	IPG	−0.01	−0.05	−0.05	−0.08	−0.04	−0.01	−0.04	−0.05	−0.07	−0.04	−0.02	−0.04	−0.05	−0.07	−0.05
Coefficients	PAY	−0.09	−0.16	−0.18	−0.24	−0.17	−0.08	−0.15	−0.18	−0.21	−0.16	−0.08	−0.13	−0.18	−0.20	−0.15
	CPI	−0.06	−0.07	−0.10	−0.11	−0.09	−0.05	−0.07	−0.09	−0.10	−0.08	−0.03	−0.04	−0.05	−0.06	−0.05
	UNEM	0.07	0.16	0.20	0.26	0.18	0.07	0.16	0.20	0.24	0.17	0.06	0.12	0.16	0.19	0.14
	EPU	2.39	3.57	3.54	4.53	4.01	2.50	5.14	6.08	7.55	6.42	3.17	7.25	9.07	9.65	8.59
	IPG	−1.10	−3.30	−2.97	−4.41	−3.29	−1.23	−4.42	−4.35	−5.49	−4.62	−3.92	−8.24	−9.55	−9.32	−8.63
t-values	PAY	−2.92	−4.72	−5.09	−5.93	−5.21	−4.05	−6.45	−7.37	−7.77	−7.24	−7.83	−10.89	−13.73	−12.62	−12.36
	CPI	−2.98	−3.09	−3.96	−3.91	−4.03	−4.15	−4.20	−5.27	−5.21	−5.12	−4.78	−4.10	−5.55	−5.19	−5.22
	UNEM	1.98	3.90	4.52	5.01	4.41	2.71	5.55	6.56	6.96	6.17	4.36	8.02	9.67	8.91	8.60

Table S2. Predictability for AAA bonds. This table reports the results of return predictability for corporate AAA bonds. The excess return is used as the dependent variable. The predictors include three sets of variables: the conventional credit spread variables, the GZ-family credit spread variables and term structure variables. The conventional credit spread variables include the default spread (DFS), the issuer quality index (IQ), and the commercial paper spread (CPS). The GZ credit spread variables include the actual GZ spread (AGZ), the predicted GZ spread without an option adjustment (PGZ1), the predicted GZ spread with an option adjustment (PGZ2), and the excess bond premium without an option adjustment on callable bonds (EBP). Term structure variables include the three-month Treasury bill rate (TBL) and the term spread (TMS). We report in- and out-of-sample R^2 values and utility gains for monthly, quarterly and yearly horizons. The signs [a], [b], and [c] denote the significance at 1%, 5%, and 10% levels, respectively.

	Predictors	All Bonds			Short-Term Bonds			Long-Term Bonds		
		Month	Quarter	Year	Month	Quarter	Year	Month	Quarter	Year
	DFS	0.09	−0.08	0.92	1.14	0.99	2.87	−0.19	−0.14	−0.20
	IQ	−0.19	−0.12	−0.02	−0.16	−0.15	−0.15	0.15	0.59	0.97
	CPS	0.62	0.01	−0.11	0.12	−0.05	0.58	0.77	0.81	1.63
In-sample adjusted R^2	AGZ	0.19	1.06	1.77	0.20	0.97	1.38	0.33	1.14	2.60
	PGZ1	1.50	4.43	17.69	2.00	4.29	15.45	1.08	3.44	16.73
	PGZ2	0.34	0.92	1.75	0.36	0.58	0.50	0.46	1.07	3.42
	EBP	−0.02	0.35	0.07	−0.07	0.27	−0.02	0.14	0.50	0.48
	PGZ1 + EBP	1.30	4.24	18.33	1.82	4.09	16.09	0.93	3.31	16.85

	TBL	0.08	0.36	−0.05	−0.20	−0.17	0.77	1.02	2.04	4.25
	TBL + TMS	1.14	4.83	11.34	1.22	3.94	9.70	1.88	5.93	16.82
Out-of-sample R^2_{OS}	DFS	−0.54	−1.39	−7.90	−2.30	−4.22	−13.92	0.28	1.10 [b]	0.81 [c]
	IQ	0.36	−0.94	−5.38	−1.94	−4.12	−15.03	2.67	0.94	−1.16
	CPS	1.57 [a]	1.51 [a]	0.10	1.48 [b]	0.30	−2.06	1.92 [a]	3.02 [a]	6.58 [a]
	AGZ	0.38 [a]	−3.53	−20.21	0.08 [b]	2.49 [a]	−29.61	0.99 [c]	−0.93	−8.97
	PGZ1	1.44 [a]	3.20 [a]	3.52 [a]	1.38 [a]	0.46 [a]	−4.36	1.56 [b]	2.84 [a]	10.87 [a]
	PGZ2	−1.11	−2.93	−18.75	−3.46	−9.42	−21.53	0.52 [b]	−0.52	−11.79
	EBP	0.37	−1.20	−1.61	0.90 [c]	−7.34	−12.35	0.67	−0.14	2.40
	PGZ1 + EBP	1.04 [a]	−0.27	−5.23	1.08 [a]	−6.82	−25.32	1.14 [b]	0.85 [a]	6.54 [a]
	TBL	0.30	0.55 [c]	−3.55	−0.22	−1.00	−3.08	1.87 [a]	3.38 [a]	7.04 [a]
	TBL + TMS	0.81 [b]	3.35 [a]	8.45 [a]	1.34 [b]	3.09 [a]	7.48 [a]	2.17 [a]	5.07 [a]	18.12 [a]
	Combination1	1.54 [a]	1.43 [a]	1.08 [a]	2.65 [a]	−1.04	−5.22	1.49 [a]	1.75 [a]	5.87 [a]
	Combination2	1.72 [a]	3.02 [a]	6.59 [a]	3.10 [a]	2.75 [a]	5.86 [a]	1.68 [a]	2.90 [a]	10.23 [a]
	Combination3	1.59 [a]	3.20 [a]	6.77 [a]	2.89 [a]	4.34 [a]	8.83 [a]	1.65 [a]	3.32 [a]	10.20 [a]
Utility gains	DFS	−0.86	−0.80	−0.83	−1.51	−0.95	−0.75	−0.56	−0.15	−0.51
	IQ	−0.91	−0.83	−0.68	−0.72	−0.70	−0.70	−1.41	−1.31	−0.79
	CPS	1.29	0.13	−0.10	0.66	−0.02	−0.11	1.66	0.87	0.41
	AGZ	0.13	0.41	0.46	0.16	0.27	0.20	0.56	0.64	0.06
	PGZ1	0.93	0.97	1.14	0.62	0.68	0.63	0.79	0.94	1.03
	PGZ2	1.30	1.18	1.23	0.77	0.81	0.78	1.23	0.89	0.37
	EBP	0.02	−0.46	−0.26	0.01	−0.27	−0.22	0.07	0.12	−0.16
	PGZ1 + EBP	0.68	1.33	0.72	0.50	0.55	0.20	0.88	1.13	0.83
	TBL	0.19	0.12	−0.57	0.03	−0.11	−0.20	0.72	0.30	0.02
	TBL + TMS	0.03	0.34	0.52	−0.35	−0.38	−0.51	1.60	1.87	2.00
	Combination1	2.02	2.04	2.04	0.92	0.86	0.79	2.13	2.19	1.97
	Combination2	2.02	2.08	2.02	1.02	0.93	0.93	2.47	2.44	2.27
	Combination3	1.60	1.42	1.29	0.78	0.71	0.64	2.06	1.87	1.67