

主被动融合：基于 XGBoost 算法的策略型债券指数（附录 1）

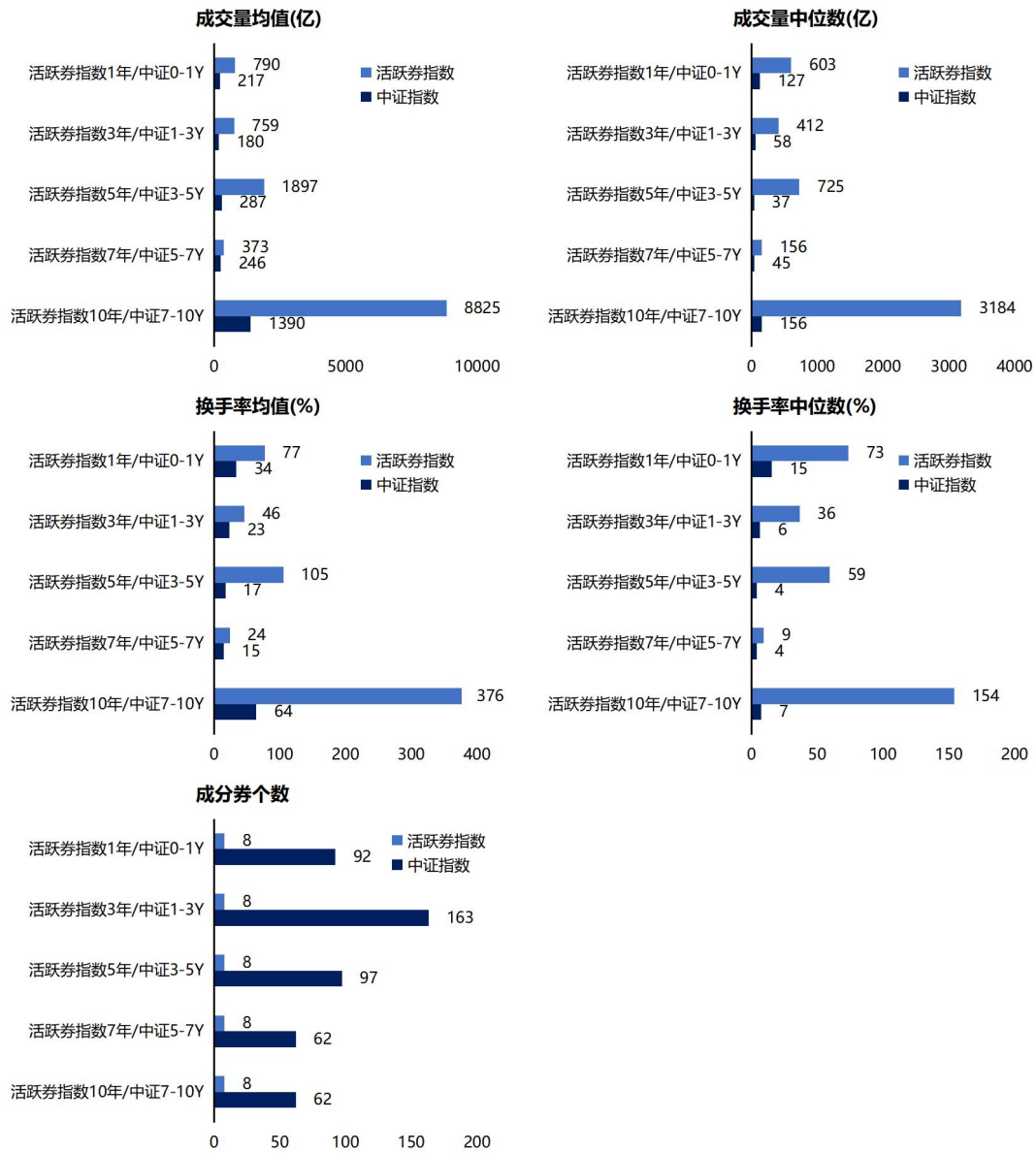
附表 1 国际债券指数主要类型

加权方法	策略	权重确定方式/目标/因子	指数类型	代表性指数
市值加权	/	市值加权	工具指数	J.P. Morgan Global Aggregate Bond Index
	负债匹配	市值加权		Nasdaq BulletShares® USD Corporate Bond Indexes
另类加权	/	等权		Dow Jones Equal Weight U.S. Issued Corporate Bond Index
	基本面加权	GDP	Smart Beta 策略指数	PIMCO Global Advantage Bond Index
		偿债能力		FTSE RAFI Sovereign Developed Markets Bond Index
		公司营业收入、分红、现金流、资产账面价值等		RAFI Bonds US Investment Grade 1-10 Index RAFI Bonds US High Yield 1-10 Index
	风险加权	利差波动率		Bloomberg U.S. Fixed Income Balanced Risk Index
		有效久期		MSCI Fixed Income Low Risk Indexes
		久期倒数		Dow Jones CBOT Treasury Index
	恒定久期	久期盯住		Markit iBoxx 3-Year Target Duration TIPS Index
	阶梯策略	等权		Ryan/NASDAQ U.S. 1-30 Year Treasury Laddered Index
	利率对冲	久期中性		Bloomberg Barclays US Aggregate Zero Duration Index BlackRock Interest Rate Hedged Corporate Bond Index
	基本面策略	Fallen Angel		ICE US Fallen Angel High Yield 10% Constrained Index
		多因子		Northern Trust High Yield Value-Scored US Corporate Bond Index
	ESG 策略	ESG 因子		Bloomberg Barclays MSCI US Aggregate ESG Focus Index (USD)
	动量策略	动量因子		IQ Enhanced Core Plus Bond U.S. Index
	收益增强	最大化持有收益和骑乘收益		FTSE Nomura Carry and Roll Down World Government Bond Index Series
		最大化整体收益率		Bloomberg Barclays U.S. Aggregate Enhance Yield index
	宏观择时	宏观择时、基本面因子、收益增强		BlackRock USD Bond Factor Index

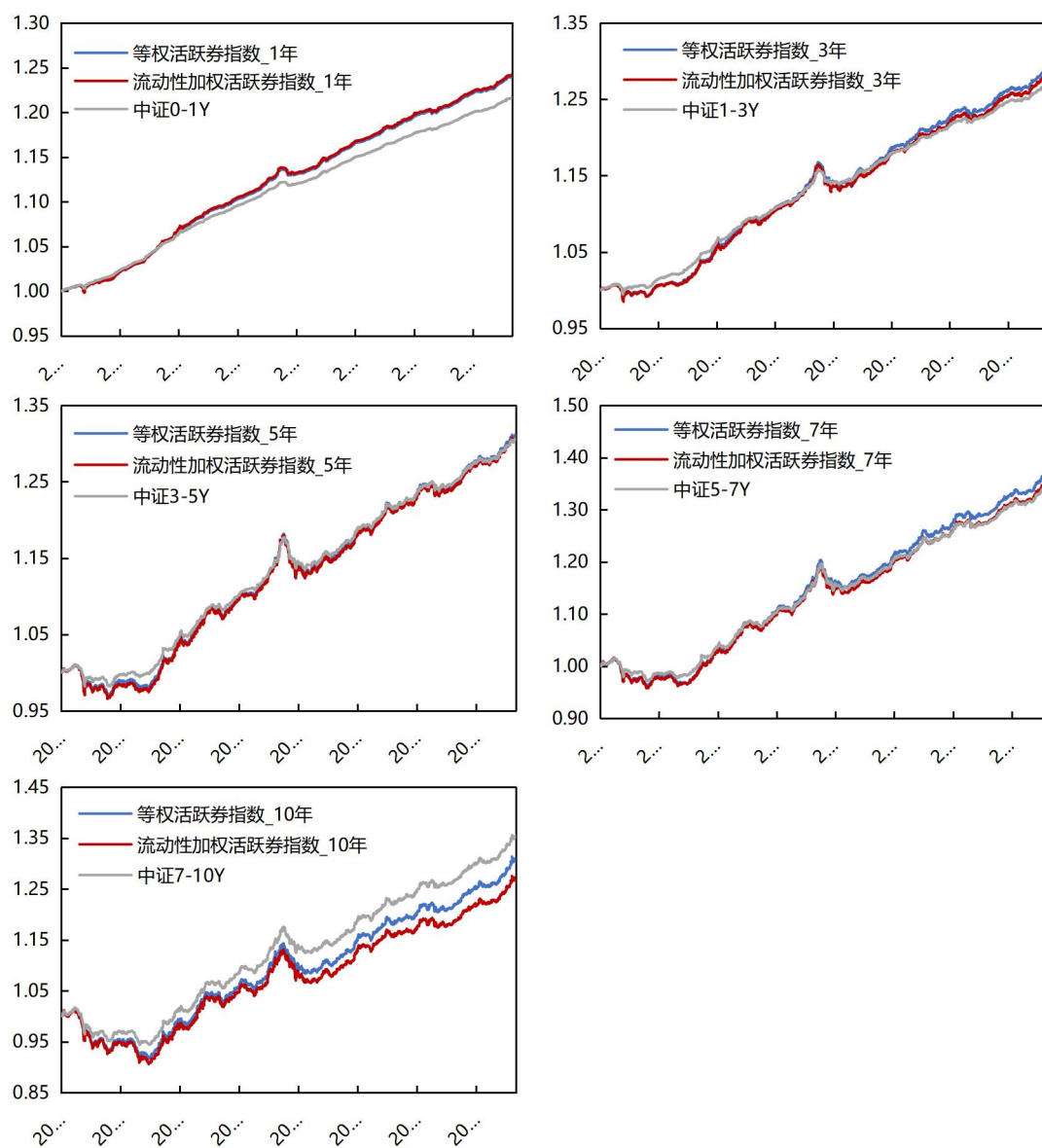
附表 2 多因子久期择时策略各个时期的期限选择

日期	期限选择策略表现（净值）	中证国债及政策性金融债指数（净值）	期限选择	日期	期限选择策略表现（净值）	中证国债及政策性金融债指数（净值）	期限选择
2016/8/31	1.0059952	1.0049644	10	2020/6/30	1.422584888	1.147037	1
2016/9/30	1.010184768	1.0105617	7	2020/7/31	1.424469387	1.1405212	1
2016/10/31	1.010084254	1.0155261	1	2020/8/31	1.427990675	1.1357812	3
2016/11/30	1.009682342	1.0060604	1	2020/9/30	1.436078386	1.135594	5
2016/12/30	1.013701786	0.9909648	1	2020/10/30	1.44233739	1.1385342	7
2017/1/26	1.014907584	0.984637	1	2020/11/30	1.460462234	1.1412871	10
2017/2/28	1.019292797	0.9841477	10	2020/12/31	1.461099434	1.1524718	1
2017/3/31	1.021208966	0.9849827	1	2021/1/29	1.466196625	1.1521815	1
2017/4/28	1.022116616	0.9800705	1	2021/2/26	1.485347499	1.1518175	10
2017/5/31	1.036031201	0.9731228	10	2021/3/31	1.494371134	1.1606047	7
2017/6/30	1.040891845	0.9835019	3	2021/4/30	1.507419982	1.1677161	10
2017/7/31	1.042520945	0.9849631	1	2021/5/31	1.512200162	1.175594	3
2017/8/31	1.050258848	0.982569	10	2021/6/30	1.543939882	1.1765706	10
2017/9/29	1.053326444	0.9864831	1	2021/7/30	1.551977016	1.1950258	10
2017/10/31	1.054860298	0.9801226	1	2021/8/31	1.551023481	1.1983828	10
2017/11/30	1.057737429	0.9759867	10	2021/9/30	1.547179269	1.2005832	7
2017/12/29	1.063819948	0.9779242	3	2021/10/29	1.565503442	1.197904	7
2018/1/31	1.079246082	0.9797117	10	2021/11/30	1.576688494	1.2093718	10
2018/2/28	1.095490247	0.9893209	10	2021/12/31	1.593466194	1.2186	10
2018/3/30	1.11547407	0.9987736	10	2022/1/28	1.58296318	1.2284448	10
2018/4/27	1.121815206	1.0129493	7	2022/2/28	1.584872867	1.2248457	10
2018/5/31	1.141607167	1.0163481	10	2022/3/31	1.586236967	1.2256736	10
2018/6/29	1.15772061	1.0248418	5	2022/4/29	1.593739234	1.2300385	10
2018/7/31	1.160207972	1.0352273	1	2022/5/31	1.589374301	1.2374617	10
2018/8/31	1.162801269	1.0334007	7	2022/6/30	1.600968627	1.2372399	10
2018/9/28	1.177850243	1.0352534	10	2022/7/29	1.621156361	1.2465053	10
2018/10/31	1.201667906	1.046598	10	2022/8/31	1.608470813	1.2591147	10
2018/11/30	1.221812187	1.0591102	10	2022/9/30	1.627430984	1.2568087	10
2018/12/28	1.234364718	1.0690586	5	2022/10/31	1.6030148	1.2665621	10
2019/1/31	1.237194746	1.0788897	1	2022/11/30	1.611744658	1.2530843	10
2019/2/28	1.246436467	1.0785178	10	2022/12/30	1.609835063	1.2589119	10
2019/3/29	1.247119515	1.0833062	1	2023/1/31	1.611224673	1.2585942	7
2019/4/30	1.259809579	1.0723661	7	2023/2/28	1.616294391	1.2598754	1
2019/5/31	1.269705509	1.0810555	7	2023/3/31	1.61949627	1.2680142	1
2019/6/28	1.281806057	1.0873769	10	2023/4/28	1.633013396	1.2755007	10
2019/7/31	1.29243992	1.0949116	10	2023/5/31	1.642205138	1.2847935	10
2019/8/30	1.296524418	1.1036728	3	2023/6/30	1.645178844	1.2919108	10
2019/9/30	1.298861922	1.1031313	1	2023/7/31	1.660318108	1.2963859	10
2019/10/31	1.318702687	1.0986757	7	2023/8/31	1.651531871	1.3060617	10
2019/11/29	1.330512724	1.109985	7	2023/9/28	1.656262849	1.3003203	10
2019/12/31	1.34908615	1.1185746	10	2023/10/31	1.657479374	1.3021293	10
2020/1/23	1.378577848	1.1268706	10	2023/11/30	1.67532214	1.3050558	10
2020/2/28	1.397151289	1.1436682	10	2023/12/29	1.693570418	1.3184859	10
2020/3/31	1.429871734	1.1566319	7	2024/1/31	1.711953787	1.3323133	10
2020/4/30	1.426605192	1.1755144	1	2024/2/29	1.718171774	1.3434856	10
2020/5/29	1.423715603	1.1577259	1				

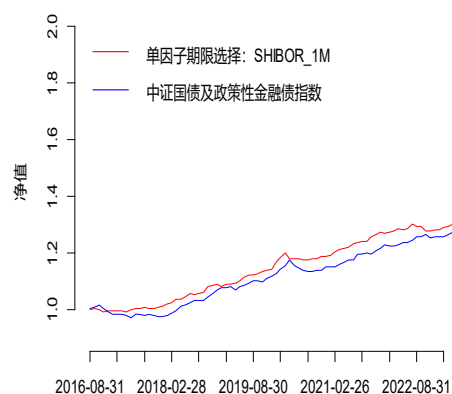
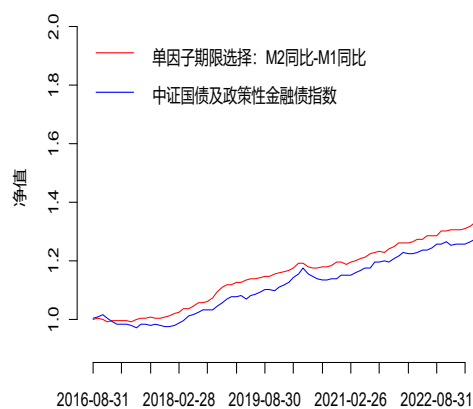
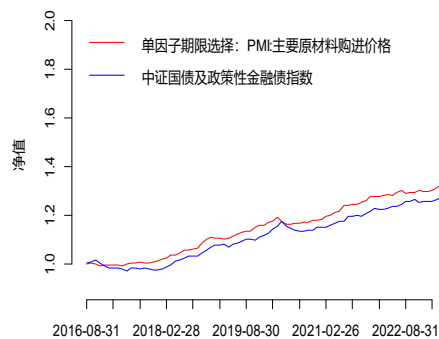
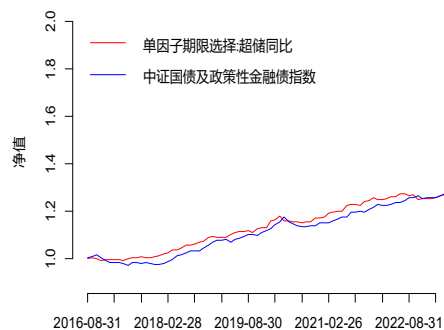
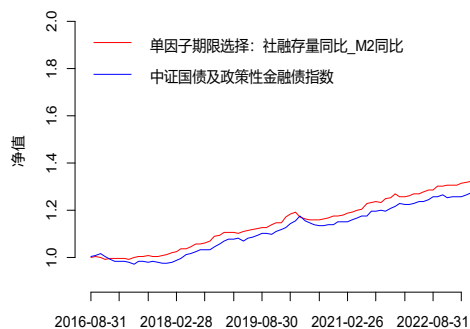
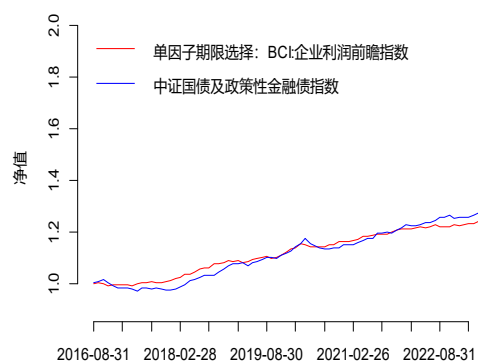
主被动融合：基于 XGBoost 算法的策略型债券指数（附录 2）



附图 1 活跃券指数与中证指数底层资产可交易性对比



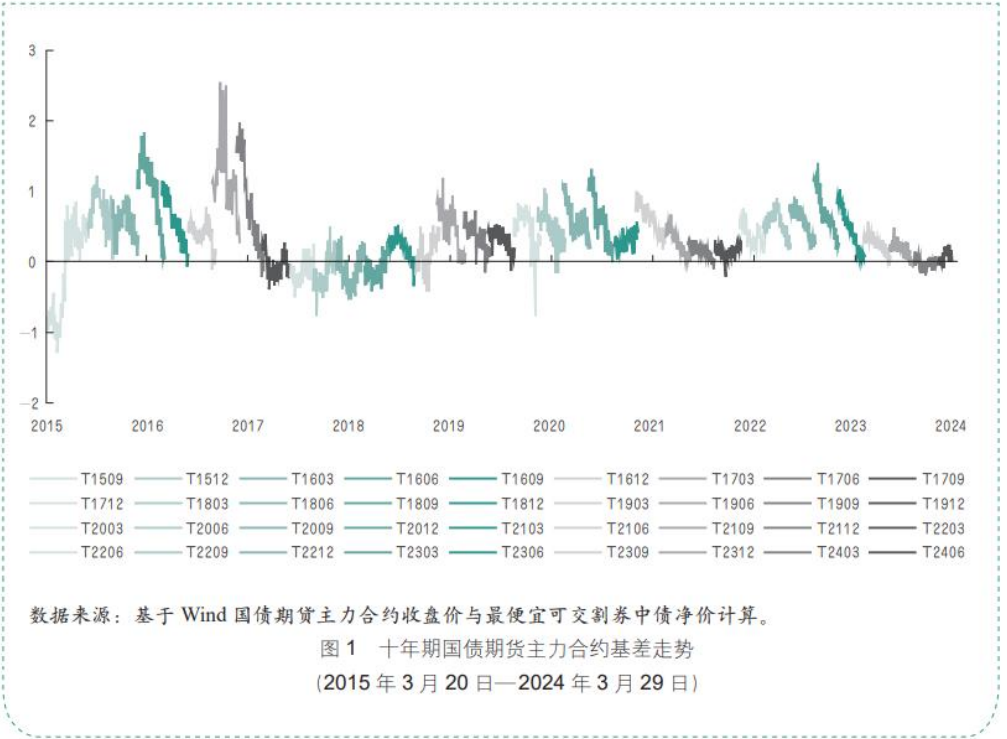
附图 2 活跃券指数走势



注：中证国债及政策性金融债指数通过各个期限利率债全价指数加权计算所得，可理解为不分期限的利率债市场综合表现。

附图3 单因子久期择时指数走势

主被动融合：基于 XGBoost 算法的策略型债券指数（附录 3）





数据来源：Wind 数据库“债券-专题统计-市场概况-存量统计(按债券类型)”，债券余额数据选取 2015—2023 年末时点值。

图 3 近年来国债及政策性金融债市值相对变化

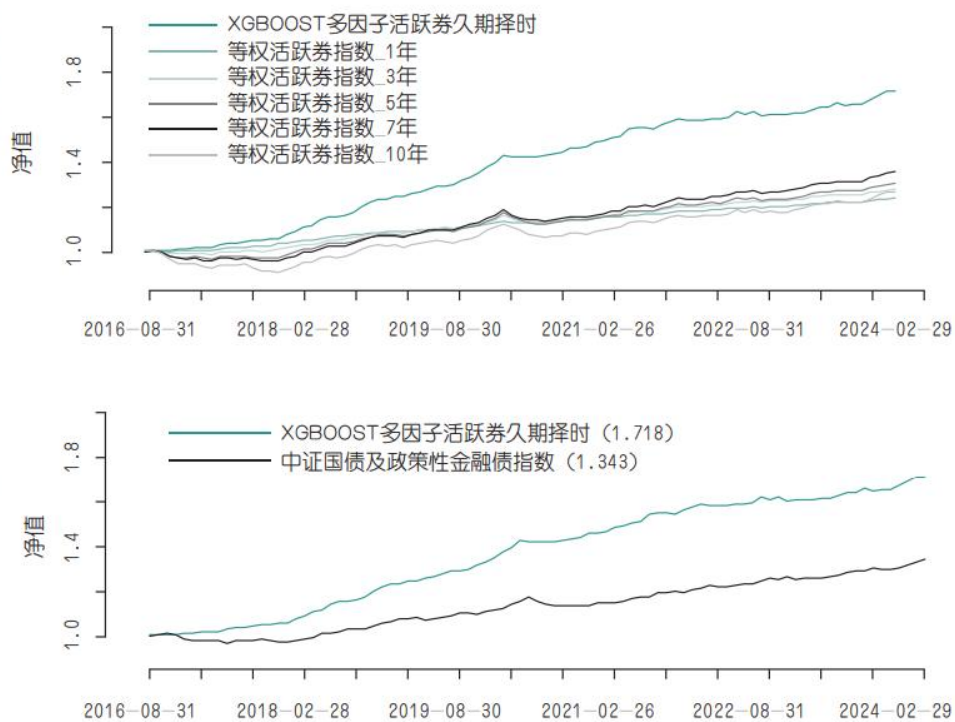


图 4 多因子久期择时指数走势

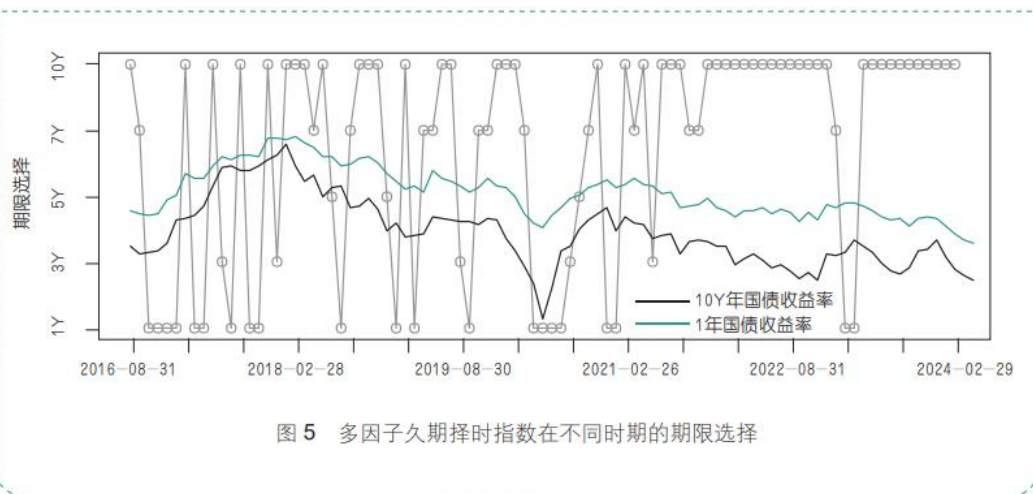


图 5 多因子久期择时指数在不同时期的期限选择