

## Online Appendix

# Methods for Backcasting, Nowcasting and Forecasting Using Factor-MIDAS: With An Application To Korean GDP\*

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### Abstract

This is the appendix to the above paper. It includes tables and figures that are excluded from the main paper. See the main paper for a description of the tables and figures included herein.

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Table A 1: Relative MSFEs When Backcasting, Nowcasting, and Forecasting Korean GDP\*

Panel (a): First Available

Factors	Recursive	Backcast		Nowcast				Forecast					
		prev. qtr.		current quarter				1 quarter ahead		2 quarter ahead			
		-1	1	2	3	4	5	6	7	8	9		
	RW	1.45	1.35	1.12	<b>0.94</b>	<b>0.94</b>	1.01	1.14	1.13	1.20	1.68		
	CBADL	5.49	4.67	3.28	1.73**	1.63**	1.63**	1.36**	1.32**	1.37**	1.46		
	BEX	3.48*	3.25*	2.16	<b>0.89</b>	<b>0.87</b>	<b>0.85</b>	<b>0.64*</b>	<b>0.62*</b>	<b>0.64*</b>	<b>0.71**</b>		
Mean of Benchmarks		4.38	3.85	2.73	1.55	1.47	1.42	0.92	0.89	0.93	1.10		
	OPCA	3.01	2.46	1.70	<b>0.80*</b>	<b>0.77*</b>	<b>0.84*</b>	<b>0.72*</b>	<b>0.69*</b>	<b>0.73*</b>	<b>0.87</b>		
w/o AR	RPCA	3.01	2.46	1.70	<b>0.80*</b>	<b>0.77*</b>	<b>0.84*</b>	<b>0.72*</b>	<b>0.69*</b>	<b>0.73*</b>	<b>0.87</b>		
	EM	3.25	2.96**	2.00**	1.07	1.08	1.09	<b>0.88</b>	<b>0.82</b>	<b>0.81</b>	<b>0.86*</b>		
	KF	2.72	2.32**	1.73**	<b>0.91</b>	<b>0.90</b>	<b>0.98</b>	<b>0.82</b>	<b>0.77</b>	<b>0.80</b>	<b>0.90</b>		
	OPCA	<b>0.70<sub>GB</sub></b>	<b>0.83<sub>FB</sub></b>	<b>0.70*</b>	<b>0.49**</b>	<b>0.57**</b>	<b>0.66*</b>	<b>0.75*</b>	<b>0.75*</b>	<b>0.80*</b>	<b>0.97</b>		
w/ AR	RPCA	<b>0.70</b>	<b>0.83</b>	<b>0.70*</b>	<b>0.49**</b>	<b>0.57**</b>	<b>0.66*</b>	<b>0.75*</b>	<b>0.75*</b>	<b>0.80*</b>	<b>0.97</b>		
	EM	1.18	1.45*	1.12	1.00	1.09	1.07	1.05	<b>0.95</b>	<b>0.97</b>	1.12		
	KF	<b>0.90</b>	<b>0.99</b>	<b>0.93</b>	<b>0.71</b>	<b>0.78</b>	1.06	1.02	<b>0.98</b>	<b>0.98</b>	1.21		
	OPCA	3.10	2.63	1.82	<b>0.83*</b>	<b>0.75**</b>	<b>0.75*</b>	<b>0.61**</b>	<b>0.58**</b>	<b>0.62*</b>	<b>0.74*</b>		
1	Unrestricted	RPCA	3.10	2.63	1.82	<b>0.83*</b>	<b>0.75**</b>	<b>0.75*</b>	<b>0.61**</b>	<b>0.58**</b>	<b>0.62*</b>	<b>0.74*</b>	
	w/o AR	EM	3.33	3.10**	2.14**	1.13	<b>0.98</b>	1.05	<b>0.78</b>	<b>0.69</b>	<b>0.78</b>	<b>0.80*</b>	
	KF	2.81	2.45**	1.80**	<b>0.90*</b>	<b>0.75**</b>	<b>0.80**</b>	<b>0.72*</b>	<b>0.57*</b>	<b>0.62*</b>	<b>0.79</b>		
	OPCA	<b>0.76</b>	<b>0.88</b>	<b>0.68<sub>FB</sub></b>	<b>0.47<sub>FB</sub></b>	<b>0.49**</b>	<b>0.59<sub>FB</sub></b>	<b>0.49<sub>FB</sub></b>	<b>0.53**</b>	<b>0.70*</b>	<b>0.73<sub>FB</sub></b>		
Unrestricted	RPCA	<b>0.76</b>	<b>0.88</b>	<b>0.68*</b>	<b>0.47**</b>	<b>0.49**</b>	<b>0.59*</b>	<b>0.49**</b>	<b>0.53**</b>	<b>0.70*</b>	<b>0.73<sub>FB</sub></b>		
	w/ AR	EM	1.33	1.39	1.03	<b>0.80</b>	<b>0.75</b>	<b>0.85</b>	<b>0.75</b>	<b>0.82</b>	<b>0.73</b>	1.09	
	KF	<b>0.91</b>	<b>0.99</b>	<b>0.76</b>	<b>0.57**</b>	<b>0.50**</b>	<b>0.66</b>	<b>0.58**</b>	<b>0.48<sub>FB</sub></b>	<b>0.55<sub>FB</sub></b>	1.07		
	OPCA	2.47	2.16	1.51	<b>0.70*</b>	<b>0.71**</b>	<b>0.77**</b>	<b>0.64**</b>	<b>0.65*</b>	<b>0.69*</b>	<b>0.81*</b>		
Smoothed	RPCA	2.47	2.16	1.51	<b>0.70*</b>	<b>0.71**</b>	<b>0.77**</b>	<b>0.64**</b>	<b>0.65*</b>	<b>0.69*</b>	<b>0.81*</b>		
	EM	2.44	2.43**	1.75*	<b>0.84*</b>	0.92	0.95	<b>0.75</b>	<b>0.75</b>	0.74	<b>0.83*</b>		
	KF	2.32	2.11**	1.58*	<b>0.78**</b>	0.81	<b>0.89</b>	<b>0.72*</b>	<b>0.72</b>	<b>0.74</b>	<b>0.84*</b>		
	Mean with 1 factor	1.43	1.42	1.08	<b>0.62**</b>	<b>0.62**</b>	<b>0.72**</b>	<b>0.67**</b>	<b>0.65*</b>	<b>0.70*</b>	<b>0.84</b>		
	OPCA	3.10	2.28	1.53	<b>0.65*</b>	<b>0.52*</b>	<b>0.51**</b>	<b>0.41**</b>	<b>0.40**</b>	<b>0.44**</b>	<b>0.57<sub>GB</sub></b>		
w/o AR	Basic	RPCA	3.10	2.28	1.53	<b>0.65*</b>	<b>0.52*</b>	<b>0.51**</b>	<b>0.41<sub>FB</sub></b>	<b>0.40**</b>	<b>0.44**</b>	<b>0.57*</b>	
	EM	3.34	3.11**	1.74**	<b>0.80</b>	<b>0.79</b>	<b>0.69**</b>	<b>0.56*</b>	<b>0.56*</b>	<b>0.56**</b>	<b>0.71</b>		
	KF	2.61	2.29*	1.59	<b>0.61**</b>	<b>0.54**</b>	<b>0.53**</b>	<b>0.43**</b>	<b>0.44**</b>	<b>0.47**</b>	<b>0.60*</b>		
	OPCA	<b>0.71<sub>FB</sub></b>	<b>0.85</b>	<b>0.69*</b>	<b>0.41<sub>FB</sub></b>	<b>0.38<sub>GB</sub></b>	<b>0.42**</b>	<b>0.48**</b>	<b>0.39<sub>GB</sub></b>	<b>0.44**</b>	<b>0.57*</b>		
2	Basic	RPCA	<b>0.71</b>	<b>0.84<sub>FB</sub></b>	<b>0.67*</b>	<b>0.42**</b>	<b>0.38**</b>	<b>0.42**</b>	<b>0.48**</b>	<b>0.39**</b>	<b>0.44**</b>	<b>0.57*</b>	
	w/ AR	EM	1.18	1.55*	<b>0.88</b>	<b>0.56**</b>	<b>0.63*</b>	<b>0.58**</b>	<b>0.56*</b>	<b>0.55*</b>	<b>0.54**</b>	<b>0.72*</b>	
	KF	<b>0.87</b>	<b>0.94</b>	<b>0.65<sub>FB</sub></b>	<b>0.41**</b>	<b>0.39**</b>	<b>0.40<sub>GB</sub></b>	<b>0.43**</b>	<b>0.41**</b>	<b>0.41<sub>GB</sub></b>	<b>0.66*</b>		
	OPCA	3.08	2.78	1.72	<b>0.66*</b>	<b>0.52**</b>	<b>0.52**</b>	<b>0.48**</b>	<b>0.42**</b>	<b>0.44**</b>	<b>0.62*</b>		
Unrestricted	RPCA	3.08	2.78	1.72	<b>0.66*</b>	<b>0.52**</b>	<b>0.52**</b>	<b>0.48**</b>	<b>0.42**</b>	<b>0.44**</b>	<b>0.62*</b>		
	w/o AR	EM	3.72*	3.20**	1.88**	<b>0.83</b>	0.90	1.02	<b>0.72</b>	<b>0.77</b>	<b>0.83</b>	0.94	
	KF	2.72	2.43**	1.56	<b>0.69*</b>	<b>0.69</b>	<b>0.85</b>	<b>0.57*</b>	<b>0.46**</b>	<b>0.50**</b>	<b>0.65*</b>		
	OPCA	<b>0.73</b>	<b>0.89</b>	<b>0.76</b>	<b>0.49**</b>	<b>0.41**</b>	<b>0.59**</b>	<b>0.43**</b>	<b>0.56*</b>	<b>0.65</b>	<b>0.61*</b>		
Unrestricted	RPCA	<b>0.73</b>	<b>0.89</b>	<b>0.76</b>	<b>0.49**</b>	<b>0.41**</b>	<b>0.59**</b>	<b>0.43**</b>	<b>0.56*</b>	<b>0.65</b>	<b>0.61*</b>		
	w/ AR	EM	1.31	1.29	1.35	<b>0.78</b>	<b>0.82</b>	1.15	<b>0.76</b>	<b>0.97</b>	1.43	1.05	
	KF	1.12	1.16	<b>0.96</b>	<b>0.57*</b>	<b>0.68</b>	<b>0.83</b>	<b>0.65</b>	<b>0.60</b>	<b>0.58*</b>	<b>0.85</b>		
	OPCA	3.41*	2.54**	1.61	<b>0.60**</b>	<b>0.56**</b>	<b>0.53**</b>	<b>0.41**</b>	<b>0.42**</b>	<b>0.45**</b>	<b>0.59*</b>		
Smoothed	RPCA	3.41*	2.54**	1.61	<b>0.60**</b>	<b>0.56**</b>	<b>0.53**</b>	<b>0.41**</b>	<b>0.42**</b>	<b>0.45**</b>	<b>0.59*</b>		
	EM	3.18**	2.76**	1.62	<b>0.69**</b>	<b>0.70*</b>	<b>0.62**</b>	<b>0.50**</b>	<b>0.52*</b>	<b>0.52**</b>	<b>0.65*</b>		
	KF	2.99**	2.31**	1.44	<b>0.58**</b>	<b>0.56**</b>	<b>0.54**</b>	<b>0.42**</b>	<b>0.44**</b>	<b>0.46**</b>	<b>0.60*</b>		
	Mean of 2 factors	1.59	1.49	1.01	<b>0.48**</b>	<b>0.48**</b>	<b>0.52**</b>	<b>0.44**</b>	<b>0.44**</b>	<b>0.48**</b>	<b>0.62*</b>		
	OPCA	2.38	1.95	1.42	<b>0.65*</b>	<b>0.62</b>	<b>0.66</b>	<b>0.57*</b>	<b>0.79</b>	<b>0.92</b>	1.17		
w/o AR	Basic	RPCA	2.41	1.92	1.42	<b>0.66</b>	<b>0.62</b>	<b>0.64</b>	<b>0.57*</b>	<b>0.78</b>	<b>0.95</b>	1.19	
	EM	2.90	2.29**	1.50	<b>0.78</b>	<b>0.73</b>	<b>0.78*</b>	<b>0.73</b>	1.12	1.06	1.49		
	KF	2.14	1.58	1.09	<b>0.53*</b>	<b>0.49*</b>	<b>0.58*</b>	<b>0.58*</b>	<b>0.78</b>	<b>0.98</b>	1.38		
	OPCA	<b>0.72</b>	<b>0.83</b>	<b>0.81</b>	<b>0.40**</b>	<b>0.46*</b>	<b>0.52*</b>	<b>0.60*</b>	<b>0.80</b>	<b>0.96</b>	1.29		
Basic	RPCA	<b>0.72<sub>FB</sub></b>	<b>0.83<sub>GB</sub></b>	<b>0.75*</b>	<b>0.40**</b>	<b>0.46*</b>	<b>0.52*</b>	<b>0.60*</b>	<b>0.80</b>	<b>0.99</b>	1.29		
	w/ AR	EM	1.29	1.42	<b>0.86</b>	<b>0.56*</b>	<b>0.64*</b>	<b>0.69*</b>	<b>0.62*</b>	<b>0.97</b>	<b>0.80</b>	1.62	

	KF	<b>0.97</b>	<b>0.99</b>	<b>0.60*<sub>GB</sub></b>	<b>0.40**<sub>GB</sub></b>	<b>0.39**<sub>FB</sub></b>	<b>0.43**<sub>FB</sub></b>	<b>0.43**</b>	<b>0.62</b>	<b>0.86</b>	1.21
Unrestricted w/o AR	OPCA	3.03	2.59	1.48	<b>0.59*</b>	<b>0.51*</b>	<b>0.62</b>	<b>0.51*</b>	<b>0.60*</b>	1.16	2.42
	RPCA	3.03	2.59	1.48	<b>0.59*</b>	<b>0.51*</b>	<b>0.62</b>	<b>0.51*</b>	<b>0.60*</b>	1.16	2.42
	EM	3.04	3.04**	1.58	<b>0.88</b>	<b>0.72</b>	1.05	1.09	1.24	1.73	3.08
	KF	2.32	1.96	1.37	<b>0.63*</b>	<b>0.52**</b>	<b>0.51*</b>	<b>0.60*</b>	1.30	1.11	2.13
Unrestricted w/ AR	OPCA	1.11	1.20	<b>0.79</b>	<b>0.53**</b>	<b>0.52*</b>	<b>0.81</b>	<b>0.49**</b>	<b>0.78</b>	1.32	1.11
	RPCA	1.11	1.20	<b>0.79</b>	<b>0.53**</b>	<b>0.52*</b>	<b>0.81</b>	<b>0.49**</b>	<b>0.78</b>	1.32	1.11
	EM	1.23	1.36	1.18	<b>0.77*</b>	<b>0.79</b>	1.16	1.07	1.37	2.06	2.94
	KF	1.17	1.32	1.08	<b>0.53*</b>	<b>0.59**</b>	<b>0.84</b>	<b>0.59*</b>	1.29	1.13	1.66
Smoothed	OPCA	3.00	2.35	1.42	<b>0.55**</b>	<b>0.53**</b>	<b>0.48**</b>	<b>0.41**</b>	<b>0.41**<sub>FB</sub></b>	<b>0.46**</b>	<b>0.62*<sub>FB</sub></b>
	RPCA	3.00	2.35	1.42	<b>0.55**</b>	<b>0.53**</b>	<b>0.48**</b>	<b>0.41**</b>	<b>0.41**<sub>FB</sub></b>	<b>0.46**</b>	<b>0.62*<sub>FB</sub></b>
	EM	2.72**	2.43**	1.31	<b>0.61**</b>	<b>0.64*</b>	<b>0.57**</b>	<b>0.47**</b>	<b>0.53*</b>	<b>0.54**</b>	<b>0.73*</b>
	KF	2.47**	1.99**	1.19	<b>0.51**</b>	<b>0.50**</b>	<b>0.47**</b>	<b>0.39*<sub>GB</sub></b>	<b>0.42**</b>	<b>0.46**<sub>FB</sub></b>	<b>0.63*</b>
<b>-- Mean of 3 factors --</b>		1.39	1.34	<b>0.90</b>	<b>0.45**</b>	<b>0.43**</b>	<b>0.47**</b>	<b>0.42**</b>	<b>0.57*</b>	<b>0.71</b>	1.01
Basic w/o AR	OPCA	1.69	1.98	1.45	<b>0.64*</b>	<b>0.57**</b>	<b>0.61*</b>	<b>0.54*</b>	<b>0.78</b>	1.33	2.85*
	RPCA	1.61	1.98	1.41	<b>0.65*</b>	<b>0.55**</b>	<b>0.63*</b>	<b>0.54*</b>	<b>0.87</b>	1.32	2.87*
	EM	2.66	2.14*	1.31	<b>0.69*</b>	<b>0.74</b>	<b>0.74</b>	<b>0.87</b>	1.68	2.07	3.88**
	KF	1.72	1.53**	<b>0.94</b>	<b>0.45**</b>	<b>0.44**</b>	<b>0.52**</b>	<b>0.56*</b>	1.06	1.73	2.66
Basic w/ AR	OPCA	<b>0.84<sub>FB</sub></b>	1.23	<b>0.99</b>	<b>0.54*</b>	<b>0.43**</b>	<b>0.50**</b>	<b>0.94</b>	1.46	<b>0.72*</b>	3.91*
	RPCA	<b>0.85</b>	1.25	<b>0.93</b>	<b>0.53*</b>	<b>0.43**</b>	<b>0.50**</b>	<b>0.94</b>	1.43	<b>0.82</b>	3.91*
	EM	1.66	1.65	<b>0.97</b>	<b>0.60*</b>	<b>0.65*</b>	<b>0.71</b>	<b>0.98</b>	1.45	2.36	4.05*
	KF	1.11	1.13 <sub>FB</sub>	<b>0.80</b>	<b>0.43**</b>	<b>0.39*<sub>FB</sub></b>	<b>0.44**</b>	<b>0.55</b>	1.31	2.06	2.55
Unrestricted w/o AR	OPCA	1.97	2.18*	1.11	<b>0.45**</b>	<b>0.57*</b>	<b>0.99</b>	1.51	1.61	2.99	6.92
	RPCA	1.97	2.18*	1.11	<b>0.45**</b>	<b>0.57*</b>	<b>0.99</b>	1.51	1.61	2.99	6.92
	EM	2.86	3.05**	1.39	1.08	<b>0.86</b>	1.00	1.55	4.75	2.94**	4.68**
	KF	1.72	1.72**	1.49	<b>0.62**</b>	<b>0.61**</b>	2.77	3.17	1.96	5.64*	8.16**
Unrestricted w/ AR	OPCA	1.72	1.36	<b>0.80</b>	<b>0.42**</b>	1.58	1.17	1.61	1.11	1.70	6.22
	RPCA	1.72	1.36	<b>0.80<sub>FB</sub></b>	<b>0.42**<sub>FB</sub></b>	1.58	1.17	1.61	1.11	1.70	6.22
	EM	1.52	1.89	1.18	1.05	<b>0.88</b>	1.50*	2.02	2.20	2.85	4.63**
	KF	1.17	1.51	1.22	1.51	1.57	1.82	3.97	1.85	5.00*	6.92**
Smoothed	OPCA	2.31	2.02**	1.27	<b>0.53**</b>	<b>0.53**</b>	<b>0.49**</b>	<b>0.43**</b>	<b>0.43**</b>	<b>0.48**</b>	<b>0.64*</b>
	RPCA	2.31	2.02**	1.27	<b>0.53**</b>	<b>0.53**</b>	<b>0.49**</b>	<b>0.43**</b>	<b>0.43**</b>	<b>0.48**</b>	<b>0.64*<sub>FB</sub></b>
	EM	2.51**	2.32*	1.23	<b>0.61**</b>	<b>0.64*</b>	<b>0.58**</b>	<b>0.48**</b>	<b>0.53*</b>	<b>0.53**</b>	<b>0.73*</b>
	KF	2.11**	1.79	1.07	<b>0.50**</b>	<b>0.49**</b>	<b>0.47**</b>	<b>0.40**<sub>FB</sub></b>	<b>0.42**<sub>FB</sub></b>	<b>0.46**<sub>FB</sub></b>	<b>0.64*</b>
<b>-- Mean of 4 factors --</b>		1.25	1.41*	<b>0.85</b>	<b>0.44**</b>	<b>0.45**</b>	<b>0.41**<sub>FB</sub></b>	<b>0.73</b>	<b>0.83</b>	1.05	2.57**
Basic w/o AR	OPCA	1.31	1.27	1.07	<b>0.59*</b>	<b>0.55*</b>	<b>0.62*</b>	<b>0.67</b>	<b>0.92</b>	1.22	2.18
	RPCA	1.37	1.25	1.09	<b>0.59*</b>	<b>0.55*</b>	<b>0.62*</b>	<b>0.66</b>	<b>0.92</b>	1.44	2.18
	EM	2.09	1.80*	1.06	<b>0.67*</b>	1.57	1.08	1.21	2.45*	3.83	4.68*
	KF	1.24	1.28*	<b>0.79</b>	<b>0.43<sub>FB</sub></b>	<b>0.55*</b>	<b>0.59</b>	<b>0.66</b>	1.59	1.45	2.00
Basic w/ AR	OPCA	<b>0.95<sub>FB</sub></b>	1.20	1.00	<b>0.55*</b>	<b>0.55**</b>	<b>0.57*</b>	<b>0.82</b>	1.56	2.14	3.06
	RPCA	1.01	1.21	<b>0.99</b>	<b>0.55*</b>	<b>0.55**</b>	<b>0.57*</b>	<b>0.82</b>	1.53	1.85	3.37*
	EM	1.37	1.66*	<b>0.73<sub>FB</sub></b>	<b>0.61*</b>	1.60	1.24	1.32	4.16	4.07	5.19*
	KF	1.06	1.13 <sub>FB</sub>	<b>0.77</b>	<b>0.46**</b>	<b>0.56</b>	<b>0.57</b>	1.18	1.82	2.60	
Unrestricted w/o AR	OPCA	1.88	1.92	1.20	<b>0.70</b>	2.08	3.72**	1.65	3.66	11.54	13.07
	RPCA	1.88	1.92	1.20	<b>0.70</b>	2.08	3.72**	1.65	3.66	11.54	13.07
	EM	2.67**	3.55**	1.48*	1.53	1.35	3.28	2.18**	3.94*	5.10	10.15*
	KF	1.78	1.58*	1.21	1.08	1.77	<b>0.85</b>	1.25	2.23*	24.51	6.78
Unrestricted w/ AR	OPCA	2.09	1.61	1.09	<b>0.52*</b>	2.09	3.91	2.34*	3.06**	3.90	5.83**
	RPCA	2.09	1.61	1.09	<b>0.52*</b>	2.09	3.91	2.34*	3.06**	3.90	5.83**
	EM	1.82	1.62	1.18	1.18	1.48	2.48	2.03**	4.03**	4.97	11.82**
	KF	1.31	1.42	10.28	<b>0.74*</b>	2.39	<b>0.75</b>	1.24	1.74	4.07	9.36
Smoothed	OPCA	2.25	1.91*	1.13	<b>0.51**</b>	<b>0.51**</b>	<b>0.51**</b>	<b>0.44**</b>	<b>0.49**</b>	<b>0.52**</b>	<b>0.68*<sub>FB</sub></b>
	RPCA	2.25	1.91*	1.13	<b>0.51**</b>	<b>0.51**</b>	<b>0.51**</b>	<b>0.44**</b>	<b>0.49**</b>	<b>0.52**</b>	<b>0.68*<sub>FB</sub></b>
	EM	2.27**	2.10	1.06	<b>0.55**</b>	<b>0.61**</b>	<b>0.60**</b>	<b>0.52**</b>	<b>0.68</b>	<b>0.74</b>	1.05
	KF	1.93**	1.68	<b>0.95</b>	<b>0.47**</b>	<b>0.49*<sub>FB</sub></b>	<b>0.47*<sub>FB</sub></b>	<b>0.42*<sub>FB</sub></b>	<b>0.49*<sub>FB</sub></b>	<b>0.52*<sub>FB</sub></b>	<b>0.71*</b>
<b>-- Mean of 5 factors --</b>		1.09	1.26	<b>0.84</b>	<b>0.45**</b>	<b>0.78</b>	<b>0.72</b>	<b>0.57*</b>	1.09	1.85	2.71*
Basic w/o AR	OPCA	1.15	1.30	<b>0.87</b>	<b>0.57</b>	<b>0.75</b>	1.39	1.08	2.25	3.89	3.18
	RPCA	1.24	1.32	<b>0.94</b>	<b>0.58</b>	<b>0.78</b>	1.38	1.09	2.13	3.80	2.90
	EM	1.91	1.75	1.03	<b>0.89</b>	3.11	1.70	1.70	2.43	3.14	4.53
	KF	1.22	1.15	<b>0.79</b>	<b>0.51**</b>	1.03	<b>0.99</b>	1.22	2.43	4.27	5.91*
Basic w/ AR	OPCA	<b>0.95<sub>FB</sub></b>	1.16	<b>0.90</b>	<b>0.56*</b>	<b>0.70</b>	1.38	<b>0.88</b>	1.61	5.41	4.72

	RPCA	<b>0.98</b>	1.16	<b>0.86</b>	<b>0.56*</b>	<b>0.69</b>	1.37	<b>0.88</b>	1.56	4.95	4.76
	EM	1.49	1.65	<b>0.84</b>	<b>0.76</b>	1.66	1.85	1.53	4.09	4.43	2.46
	KF	1.11	1.06 <sub>FB</sub>	<b>0.72<sub>FB</sub></b>	<b>0.64*</b>	<b>0.86</b>	1.11	<b>0.91</b>	2.06	4.14	7.19*
Unrestricted w/o AR	OPCA	3.17	1.74	1.21	1.96	1.73	3.39**	5.00	2.35*	6.53**	18.97
	RPCA	3.17	1.74	1.21	1.96	1.73	3.39**	5.00	2.35*	6.53**	18.97
	EM	3.13**	2.11*	2.33	<b>0.94</b>	1.42	1.88*	2.36	2.96**	3.33	8.79**
	KF	1.46	1.40	1.71	<b>0.65**</b>	1.32	1.60	2.00	3.84	5.03**	3.84*
Unrestricted w/ AR	OPCA	2.27	1.21	1.16	<b>0.67</b>	1.96	2.63*	2.19	2.30	6.57**	9.20**
	RPCA	2.27	1.21	1.16	<b>0.67</b>	1.96	2.63*	2.19	2.30	6.57**	9.20**
	EM	2.58	1.90**	2.06	<b>0.92</b>	2.11	3.04**	2.57*	6.30	3.79**	7.83**
	KF	1.36	1.66	1.90*	<b>0.63**</b>	2.28	5.44	2.11	6.27**	4.60*	5.70
Smoothed	OPCA	1.47	1.43	<b>0.99</b>	<b>0.48**</b>	<b>0.54<sub>FB</sub></b>	<b>0.57<sub>FB</sub></b>	<b>0.48<sub>FB</sub></b>	<b>0.59<sub>FB</sub></b>	<b>0.59<sub>FB</sub></b>	<b>0.83<sub>FB</sub></b>
	RPCA	1.47	1.43	<b>0.99</b>	<b>0.48**</b>	<b>0.54<sub>FB</sub></b>	<b>0.57<sub>FB</sub></b>	<b>0.48<sub>FB</sub></b>	<b>0.59<sub>FB</sub></b>	<b>0.59<sub>FB</sub></b>	<b>0.83<sub>FB</sub></b>
	EM	1.60	1.87	1.04	<b>0.62**</b>	<b>0.68**</b>	<b>0.71**</b>	<b>0.57*</b>	<b>0.73</b>	<b>0.73*</b>	0.98
	KF	1.45	1.45	<b>0.95</b>	<b>0.52**</b>	<b>0.57**</b>	<b>0.60**</b>	<b>0.51**</b>	<b>0.60*</b>	<b>0.62*</b>	<b>0.85</b>
<b>-- Mean of 6 factors --</b>		1.02	1.16	0.89	0.47 <sub>FB</sub>	0.82	1.03	0.72	1.36	2.29	2.78*
Mean of MIDAS		1.16	1.25	<b>0.86</b>	<b>0.45**</b>	<b>0.50**</b>	<b>0.52**</b>	<b>0.47**</b>	<b>0.61*</b>	<b>0.77</b>	1.12
Mean of All		1.19	1.26	<b>0.93</b>	<b>0.53**</b>	<b>0.58**</b>	<b>0.61**</b>	<b>0.53**</b>	<b>0.60**</b>	<b>0.70*</b>	<b>0.86</b>

Panel (b): Most Recent

Factors	Recursive	Backcast			Nowcast			Forecast					
		prev. qtr.		current quarter	1 quarter ahead			2 quarter ahead					
		-1	1		2	3	4	5	6	7	8	9	
RW		1.07	1.11	1.15	1.25**	1.29**	1.27**	1.41**	1.49**	1.49**	1.60**		
CBADL		4.31*	3.46*	2.53*	1.86**	1.74**	1.71**	1.50**	1.43*	1.50**	1.71		
BEX		2.36*	2.23*	1.49	<b>0.86</b>	<b>0.85</b>	<b>0.81</b>	<b>0.61</b>	<b>0.59*</b>	<b>0.61*</b>	<b>0.67**</b>		
Mean of Benchmarks		3.22*	2.69*	2.01*	1.62	1.54	1.44	0.96	0.89	0.94	1.25		
OPCA		2.26	1.78	1.17	<b>0.76*</b>	<b>0.73*</b>	<b>0.76**</b>	<b>0.67*</b>	<b>0.63*</b>	<b>0.69*</b>	<b>0.83*</b>		
Basic w/o AR	RPCA	2.26	1.78	1.17	<b>0.76*</b>	<b>0.73*</b>	<b>0.76**</b>	<b>0.67*</b>	<b>0.63*</b>	<b>0.69*</b>	<b>0.83*</b>		
EM		2.71**	2.38**	1.40	1.06	1.07	1.00	0.83	0.76	0.77	<b>0.82**</b>		
KF		2.04	1.69	1.16	<b>0.86*</b>	<b>0.85</b>	<b>0.89</b>	<b>0.77</b>	<b>0.71</b>	<b>0.76</b>	<b>0.86*</b>		
OPCA	<b>0.75<sub>FB</sub></b>	<b>0.81<sub>GB</sub></b>	<b>0.61**</b>	0.51**	0.59**	0.67*	0.70*	0.70*	0.76*	0.76*	0.94		
Basic w/ AR	RPCA	<b>0.75</b>	<b>0.86*</b>	<b>0.61**</b>	0.51**	0.59**	0.67*	0.70*	0.70*	0.76*	0.94		
EM		1.17	1.31	<b>0.83</b>	0.99	1.21	1.00	1.01	0.90	0.94	1.11		
KF		<b>0.84</b>	<b>0.84</b>	<b>0.72**</b>	<b>0.71</b>	<b>0.84</b>	1.06	<b>0.99</b>	<b>0.95</b>	<b>0.97</b>	1.22		
OPCA		2.32	1.88	1.25	<b>0.79*</b>	0.70**	<b>0.66**</b>	<b>0.56**</b>	<b>0.51**</b>	<b>0.56*</b>	<b>0.68**</b>		
Unrestricted w/o AR	RPCA	2.32	1.88	1.25	<b>0.79*</b>	<b>0.70**</b>	<b>0.66**</b>	<b>0.56**</b>	<b>0.51**</b>	<b>0.56*</b>	<b>0.68**</b>		
EM		2.74*	2.48**	1.50	1.10	0.94	0.93	0.74	0.60	0.72	<b>0.76**</b>		
KF		2.10	1.79	1.19	<b>0.82**</b>	0.68**	<b>0.67**</b>	<b>0.64*</b>	<b>0.48**</b>	<b>0.54*</b>	<b>0.71**</b>		
OPCA	<b>0.84</b>	<b>0.89*</b>	<b>0.57**</b>	<b>0.46<sub>FB</sub></b>	<b>0.46**</b>	<b>0.54<sub>FB</sub></b>	<b>0.44<sub>FB</sub></b>	<b>0.46**</b>	<b>0.67</b>	<b>0.68</b>	<b>0.68<sub>FB</sub></b>		
Unrestricted w/ AR	RPCA	<b>0.84</b>	<b>0.89*</b>	<b>0.57**</b>	<b>0.46<sub>FB</sub></b>	<b>0.46<sub>FB</sub></b>	<b>0.54<sub>FB</sub></b>	<b>0.44**</b>	<b>0.46**</b>	<b>0.67</b>	<b>0.68<sub>FB</sub></b>		
EM		1.23	1.18	<b>0.76</b>	<b>0.82</b>	0.77	0.85	0.74	0.79	0.69	1.08		
KF		<b>0.85</b>	<b>0.86</b>	<b>0.55**<sub>FB</sub></b>	<b>0.54**</b>	<b>0.46**</b>	<b>0.59*</b>	<b>0.52**</b>	<b>0.40<sub>FB</sub></b>	<b>0.49<sub>FB</sub></b>	1.06		
OPCA		1.65	1.45	<b>0.99</b>	<b>0.63**</b>	0.64**	<b>0.68**</b>	<b>0.58**</b>	<b>0.59**</b>	<b>0.64*</b>	<b>0.76**</b>		
Smoothed	RPCA	1.65	1.45	<b>0.99</b>	<b>0.63**</b>	0.64**	<b>0.68**</b>	<b>0.58**</b>	<b>0.59**</b>	<b>0.64*</b>	<b>0.76**</b>		
EM		1.74	1.78	1.15	<b>0.75**</b>	0.86	0.84	0.69	0.68	0.70	<b>0.79**</b>		
KF		1.53	1.43	1.00	<b>0.69**</b>	<b>0.74</b>	<b>0.78</b>	<b>0.66</b>	<b>0.66</b>	<b>0.70</b>	<b>0.80**</b>		
Mean with 1 factor		1.03	1.02	<b>0.69**</b>	<b>0.54**</b>	0.56**	<b>0.62**</b>	<b>0.61**</b>	<b>0.57**</b>	<b>0.64*</b>	<b>0.78**</b>		
OPCA		2.29	1.63	1.06	<b>0.59**</b>	<b>0.47**</b>	<b>0.43**</b>	<b>0.35**</b>	<b>0.34**</b>	<b>0.39**</b>	<b>0.51**</b>		
Basic w/o AR	RPCA	2.29	1.63	1.06	<b>0.59**</b>	<b>0.47**</b>	<b>0.43**</b>	<b>0.35**</b>	<b>0.34**</b>	<b>0.39**</b>	<b>0.51**</b>		
EM		2.74*	2.50**	1.22	<b>0.78</b>	<b>0.79</b>	<b>0.60**</b>	<b>0.51*</b>	<b>0.50*</b>	<b>0.51**</b>	<b>0.67*</b>		
KF		1.91	1.66	1.04	<b>0.54**</b>	0.49**	<b>0.44**</b>	<b>0.37**</b>	<b>0.37**</b>	<b>0.41**</b>	<b>0.54**</b>		
OPCA	<b>0.78</b>	<b>0.86*</b>	<b>0.61**</b>	0.40**	<b>0.35<sub>GB</sub></b>	<b>0.37**</b>	<b>0.47**</b>	<b>0.33<sub>GB</sub></b>	<b>0.40**</b>	<b>0.50**</b>			
Basic w/ AR	RPCA	<b>0.79</b>	<b>0.86*</b>	<b>0.59**</b>	0.40**	<b>0.35<sub>GB</sub></b>	<b>0.37**</b>	<b>0.47**</b>	<b>0.33<sub>GB</sub></b>	<b>0.40**</b>	<b>0.50<sub>GB</sub></b>		
EM		1.15	1.40	<b>0.69**</b>	<b>0.55**</b>	0.67*	<b>0.53**</b>	<b>0.55*</b>	<b>0.51**</b>	<b>0.50**</b>	<b>0.66**</b>		
KF		<b>0.80</b>	<b>0.81<sub>FB</sub></b>	<b>0.50**<sub>FB</sub></b>	<b>0.36<sub>GB</sub></b>	0.38**	<b>0.36<sub>FB</sub></b>	<b>0.41**</b>	<b>0.37**</b>	<b>0.36<sub>GB</sub></b>	<b>0.60**</b>		
OPCA		2.25	1.97	1.18	<b>0.61**</b>	0.48**	<b>0.44**</b>	<b>0.40**</b>	<b>0.35**</b>	<b>0.39**</b>	<b>0.53**</b>		
Unrestricted w/o AR	RPCA	2.25	1.97	1.18	<b>0.61**</b>	0.48**	<b>0.44**</b>	<b>0.40**</b>	<b>0.35**</b>	<b>0.39**</b>	<b>0.53**</b>		
EM		2.98**	2.55**	1.30	0.81	0.88	0.97	0.68	0.70	0.84	0.94		
KF		1.99	1.77	1.01	<b>0.62**</b>	0.63*	<b>0.77</b>	<b>0.50**</b>	<b>0.37**</b>	<b>0.44**</b>	<b>0.59**</b>		
OPCA	<b>0.62<sub>GB</sub></b>	<b>0.82</b>	<b>0.62*</b>	0.50**	0.38**	<b>0.55**</b>	<b>0.35<sub>FB</sub></b>	<b>0.57</b>	<b>0.72</b>	<b>0.53**</b>			
Unrestricted w/ AR	RPCA	<b>0.62</b>	<b>0.82</b>	<b>0.62*</b>	0.50**	0.38**	<b>0.55**</b>	<b>0.35<sub>FB</sub></b>	<b>0.57</b>	<b>0.72</b>	<b>0.53**</b>		
EM		1.18	1.02	<b>0.95</b>	<b>0.76</b>	<b>0.79</b>	1.17	<b>0.71</b>	1.00	1.63	1.05		
KF		<b>0.89</b>	<b>0.87</b>	<b>0.64*</b>	<b>0.51**</b>	0.59	<b>0.76</b>	<b>0.58</b>	<b>0.54</b>	<b>0.53*</b>	0.80		
OPCA		2.41*	1.73	1.06	<b>0.52**</b>	0.48**	<b>0.43**</b>	<b>0.35**</b>	<b>0.35**</b>	<b>0.39**</b>	<b>0.53**</b>		
Smoothed	RPCA	2.41*	1.73	1.06	<b>0.52**</b>	0.48**	<b>0.43**</b>	<b>0.35**</b>	<b>0.35**</b>	<b>0.39**</b>	<b>0.53**</b>		
EM		2.32*	2.02*	1.04	<b>0.59**</b>	0.64*	<b>0.51**</b>	<b>0.43**</b>	<b>0.44**</b>	<b>0.46**</b>	<b>0.60**</b>		
KF		2.07	1.57	<b>0.89</b>	<b>0.48**</b>	0.48**	<b>0.43**</b>	<b>0.35**</b>	<b>0.36**</b>	<b>0.40**</b>	<b>0.53**</b>		
Mean of 2 factors		1.11	1.05	<b>0.64**</b>	<b>0.41**</b>	0.41**	<b>0.42**</b>	<b>0.37**</b>	<b>0.37**</b>	<b>0.44**</b>	<b>0.55**</b>		
OPCA		1.81	1.47	1.07	<b>0.72</b>	0.71	<b>0.73</b>	0.66	<b>0.92</b>	1.08	1.36		
Basic w/o AR	RPCA	1.83	1.44	1.07	<b>0.73</b>	<b>0.71</b>	<b>0.71</b>	0.66	<b>0.91</b>	1.11	1.37		
EM		2.38*	1.86	1.02	<b>0.85</b>	0.79	0.81	<b>0.80</b>	1.30	1.24	1.69*		
KF		1.49	1.11	<b>0.70</b>	<b>0.53**</b>	0.52	0.61	<b>0.67</b>	<b>0.90</b>	1.16	1.64		
OPCA	<b>0.70</b>	<b>0.84</b>	<b>0.75**</b>	0.42**	0.49	0.58	0.68	<b>0.92</b>	1.12	1.49			
Basic w/ AR	RPCA	<b>0.69<sub>FB</sub></b>	<b>0.84</b>	<b>0.68**</b>	0.42**	0.49	0.58	0.68	<b>0.92</b>	1.15	1.49		
EM		1.16	1.32	<b>0.72*</b>	0.61*	0.74	0.77	0.69	1.12	<b>0.89</b>	1.87*		

	KF	<b>0.81</b>	<b>0.81<sub>FB</sub></b>	<b>0.47**<sub>FB</sub></b>	<b>0.40**<sub>FB</sub></b>	<b>0.40**</b>	<b>0.46**</b>	<b>0.47**</b>	<b>0.69</b>	1.00	1.38
Unrestricted w/o AR	OPCA	2.37	1.97	1.03	<b>0.60**</b>	<b>0.54**</b>	<b>0.67</b>	<b>0.55</b>	<b>0.63</b>	1.40	2.97
	RPCA	2.37	1.97	1.03	<b>0.60**</b>	<b>0.54**</b>	<b>0.67</b>	<b>0.55</b>	<b>0.63</b>	1.40	2.97
	EM	2.43	2.46**	1.08	<b>0.90</b>	<b>0.75</b>	1.07	1.16	1.34	2.14	3.77
	KF	1.60	1.36	<b>0.89</b>	<b>0.63**</b>	<b>0.47**</b>	<b>0.45**</b>	<b>0.60*</b>	1.55	1.28	2.59*
Unrestricted w/ AR	OPCA	1.00	1.05	<b>0.61</b>	<b>0.56**</b>	0.49	<b>0.89</b>	<b>0.46**</b>	<b>0.81</b>	1.59	1.21
	RPCA	1.00	1.05	<b>0.61</b>	<b>0.56**</b>	0.49	<b>0.89</b>	<b>0.46**</b>	<b>0.81</b>	1.59	1.21
	EM	1.22	1.06	<b>0.88</b>	<b>0.75</b>	0.82	1.19	1.15	1.51	2.54	3.57
	KF	1.02	<b>0.97</b>	<b>0.71</b>	<b>0.55**</b>	<b>0.55**</b>	<b>0.80</b>	<b>0.55*</b>	1.53	1.26	1.94
Smoothed	OPCA	2.16	1.67	<b>0.96</b>	<b>0.51**</b>	<b>0.49**</b>	<b>0.41**</b>	<b>0.38**</b>	<b>0.36**</b>	<b>0.43**</b>	<b>0.57**<sub>FB</sub></b>
	RPCA	2.16	1.67	<b>0.96</b>	<b>0.51**</b>	<b>0.49**</b>	<b>0.41**</b>	<b>0.38**</b>	<b>0.36**</b>	<b>0.43**</b>	<b>0.57**<sub>FB</sub></b>
	EM	1.96	1.77*	<b>0.82</b>	<b>0.51**</b>	<b>0.60*</b>	<b>0.46**</b>	<b>0.42**</b>	<b>0.48**</b>	<b>0.50**</b>	<b>0.71**</b>
	KF	1.62	1.32	<b>0.69**</b>	<b>0.41**</b>	<b>0.42**</b>	<b>0.37<sub>FB</sub></b>	<b>0.34<sub>FB</sub></b>	<b>0.36<sub>FB</sub></b>	<b>0.41<sub>FB</sub></b>	<b>0.58**</b>
<b>-- Mean of 3 factors --</b>		<b>0.98</b>	<b>0.97</b>	<b>0.58**</b>	<b>0.42**</b>	<b>0.40<sub>FB</sub></b>	<b>0.43**</b>	<b>0.40**</b>	<b>0.58</b>	<b>0.77</b>	<b>1.10</b>
Basic w/o AR	OPCA	1.42	1.59	1.05	<b>0.67*</b>	<b>0.57**</b>	<b>0.59**</b>	<b>0.59*</b>	<b>0.92</b>	1.69	3.71*
	RPCA	1.32	1.59	1.03	<b>0.67*</b>	<b>0.54**</b>	<b>0.61**</b>	<b>0.59*</b>	1.04	1.69	3.73*
	EM	2.29*	1.80*	<b>0.84</b>	<b>0.73</b>	0.80	<b>0.77</b>	1.02	2.07	2.64*	5.01*
	KF	1.28	1.14	<b>0.53**</b>	<b>0.43**</b>	<b>0.44**</b>	<b>0.54*</b>	<b>0.65</b>	1.29	2.23	3.43*
Basic w/ AR	OPCA	<b>0.71<sub>FB</sub></b>	<b>0.97</b>	<b>0.75</b>	<b>0.55**</b>	<b>0.42**</b>	<b>0.45**</b>	1.14	1.83	<b>0.77</b>	5.09*
	RPCA	<b>0.75</b>	1.00	<b>0.70</b>	<b>0.54**</b>	<b>0.42**</b>	<b>0.44**</b>	1.14	1.79	<b>0.89</b>	5.10*
	EM	1.44	1.51*	<b>0.70*</b>	<b>0.64*</b>	<b>0.70</b>	<b>0.72</b>	1.21	1.77	3.05*	5.14**
	KF	<b>0.81</b>	<b>0.86<sub>FB</sub></b>	<b>0.49**</b>	<b>0.38**</b>	<b>0.39<sub>FB</sub></b>	<b>0.46*</b>	<b>0.62</b>	1.63	2.73	3.17
Unrestricted w/o AR	OPCA	1.60	1.57	<b>0.71**</b>	<b>0.48**</b>	0.64	1.11	1.88	2.00	3.71	8.90
	RPCA	1.60	1.57	<b>0.71**</b>	<b>0.48**</b>	0.64	1.11	1.88	2.00	3.71	8.90
	EM	2.63**	2.51**	<b>0.94</b>	1.17	<b>0.95</b>	1.10	1.80	5.92	3.73**	6.06**
	KF	1.37	1.27	<b>0.92</b>	<b>0.60**</b>	<b>0.55**</b>	3.56	4.11	2.33	7.36*	10.58**
Unrestricted w/ AR	OPCA	1.50	<b>0.99</b>	<b>0.49**</b>	<b>0.46**</b>	1.84	1.20	1.97	1.34	1.98	7.96
	RPCA	1.50	<b>0.99</b>	<b>0.49<sub>FB</sub></b>	<b>0.46**</b>	1.84	1.20	1.97	1.34	1.98	7.96
	EM	1.62	1.78	<b>0.92</b>	1.14	<b>0.92</b>	1.64*	2.40	2.57	3.65	5.92*
	KF	<b>0.80</b>	1.07	<b>0.81</b>	1.49	1.64	2.17	5.01	2.09	6.40*	8.85**
Smoothed	OPCA	1.82	1.51	<b>0.87</b>	<b>0.47**</b>	<b>0.48**</b>	<b>0.41**</b>	<b>0.39**</b>	<b>0.37**</b>	<b>0.44**</b>	<b>0.57**</b>
	RPCA	1.82	1.51	<b>0.87</b>	<b>0.47**</b>	<b>0.48**</b>	<b>0.41**</b>	<b>0.39**</b>	<b>0.37**</b>	<b>0.44**</b>	<b>0.57**</b>
	EM	1.93*	1.70*	<b>0.73</b>	<b>0.49**</b>	0.56	<b>0.44**</b>	<b>0.40**</b>	<b>0.46**</b>	<b>0.48**</b>	<b>0.69**</b>
	KF	1.51	1.24	<b>0.60**</b>	<b>0.38<sub>FB</sub></b>	<b>0.39**</b>	<b>0.35**</b>	<b>0.33<sub>GB</sub></b>	<b>0.35<sub>FB</sub></b>	<b>0.40<sub>FB</sub></b>	<b>0.57<sub>FB</sub></b>
<b>-- Mean of 4 factors --</b>		<b>0.97</b>	1.04	<b>0.49**</b>	<b>0.39**</b>	<b>0.40**</b>	<b>0.33<sub>GB</sub></b>	<b>0.83</b>	<b>0.94</b>	1.24	3.23**
Basic w/o AR	OPCA	1.03	<b>1.00</b>	<b>0.76</b>	<b>0.58**</b>	0.61	<b>0.69</b>	<b>0.79</b>	1.06	1.49	2.78*
	RPCA	1.06	<b>0.98</b>	<b>0.77</b>	<b>0.58**</b>	0.62	<b>0.69</b>	<b>0.79</b>	1.07	1.80	2.77*
	EM	2.08	1.64*	<b>0.75</b>	<b>0.76</b>	2.03	1.26	1.50	3.10*	5.00	6.03*
	KF	1.02	1.00	<b>0.44<sub>GB</sub></b>	<b>0.41**</b>	0.60	<b>0.64</b>	<b>0.80</b>	1.98	1.81	2.56
Basic w/ AR	OPCA	<b>0.78<sub>FB</sub></b>	<b>0.97</b>	<b>0.69</b>	<b>0.57*</b>	0.62	<b>0.65</b>	1.00	1.98	2.79*	3.98
	RPCA	<b>0.86</b>	<b>0.97</b>	<b>0.70</b>	<b>0.57*</b>	0.62	<b>0.65</b>	1.00	1.94	2.34	4.40*
	EM	1.47	1.59**	<b>0.57**</b>	<b>0.71</b>	2.11	1.57	1.71	5.31	5.38	6.67**
	KF	<b>0.96</b>	<b>0.92<sub>FB</sub></b>	<b>0.47**</b>	<b>0.45**</b>	0.65	<b>0.66</b>	<b>0.82</b>	1.41	2.31	3.33
Unrestricted w/o AR	OPCA	1.57	1.35	<b>0.79</b>	<b>0.87</b>	2.71	4.79**	1.97	4.65*	15.11	16.96
	RPCA	1.57	1.35	<b>0.79</b>	<b>0.87</b>	2.71	4.79**	1.97	4.65*	15.11	16.96
	EM	2.81**	3.33*	1.17	1.87*	1.74	3.80	2.61**	4.95**	6.61	13.37*
	KF	1.37	1.19	<b>0.75</b>	1.28	2.10	<b>0.92</b>	1.47	2.62*	32.57	8.94
Unrestricted w/ AR	OPCA	1.55	1.12	<b>0.70</b>	<b>0.56</b>	2.73	4.99*	2.82*	3.88**	5.08	7.56**
	RPCA	1.55	1.12	<b>0.70</b>	<b>0.56</b>	2.73	4.99*	2.82*	3.88**	5.08	7.56**
	EM	1.93	1.45	1.08	1.30	1.85	2.71	2.45**	5.18**	6.44	15.53**
	KF	1.02	1.01	9.28	<b>0.70</b>	2.92	<b>0.75</b>	1.40	1.99	5.26	12.29
Smoothed	OPCA	1.64	1.36	<b>0.79</b>	<b>0.46**</b>	<b>0.49**</b>	<b>0.47**</b>	<b>0.43**</b>	<b>0.48**</b>	<b>0.52**</b>	<b>0.66<sub>FB</sub></b>
	RPCA	1.64	1.36	<b>0.79</b>	<b>0.46**</b>	<b>0.49**</b>	<b>0.47**</b>	<b>0.43**</b>	<b>0.48**</b>	<b>0.52**</b>	<b>0.66<sub>FB</sub></b>
	EM	1.75	1.59	<b>0.68*</b>	<b>0.50**</b>	<b>0.59**</b>	<b>0.56**</b>	<b>0.52*</b>	<b>0.70</b>	<b>0.82</b>	1.17
	KF	1.38	1.19	<b>0.57*</b>	<b>0.40<sub>FB</sub></b>	<b>0.45<sub>FB</sub></b>	<b>0.41<sub>FB</sub></b>	<b>0.39<sub>FB</sub></b>	<b>0.48<sub>FB</sub></b>	<b>0.51<sub>FB</sub></b>	<b>0.70*</b>
<b>-- Mean of 5 factors --</b>		<b>0.85</b>	<b>0.94</b>	<b>0.53**</b>	<b>0.44**</b>	<b>0.93</b>	<b>0.81</b>	<b>0.62</b>	1.29	2.36	3.46*
Basic w/o AR	OPCA	1.00	1.08	<b>0.66**</b>	<b>0.63</b>	0.91	1.75	1.37	2.91	5.17*	4.18
	RPCA	1.12	1.09	<b>0.70**</b>	<b>0.64</b>	0.94	1.75	1.38	2.75	5.04*	3.79
	EM	2.02	1.55	<b>0.72*</b>	<b>0.90</b>	4.04	2.04	2.11	2.97	4.07	5.83
	KF	<b>0.97</b>	<b>0.94</b>	<b>0.50<sub>FB</sub></b>	<b>0.53**</b>	1.25	1.16	1.54	3.14	5.61	7.75*
Basic w/ AR	OPCA	<b>0.83<sub>FB</sub></b>	<b>0.94</b>	<b>0.68*</b>	<b>0.62</b>	<b>0.87</b>	1.76	1.07	2.00	7.21	6.29
	w/ AR										

	RPCA	<b>0.85</b>	<b>0.94</b>	<b>0.65**</b>	<b>0.62</b>	<b>0.86</b>	1.77	1.08	1.93	6.61	6.33
	EM	1.64	1.61*	<b>0.60**</b>	<b>0.81</b>	2.21	2.30	1.94	5.11	5.87	3.01
	KF	1.07	<b>0.91</b>	<b>0.51**</b>	<b>0.69</b>	1.07	1.37	1.13	2.60	5.52	9.40*
Unrestricted w/o AR	OPCA	2.85	1.39	<b>0.77</b>	2.57	2.27	4.31**	6.38	2.85**	8.56**	24.56
	RPCA	2.85	1.39	<b>0.77</b>	2.57	2.27	4.31**	6.38	2.85**	8.56**	24.56
	EM	3.11**	1.70*	1.77*	1.18	1.76**	2.01**	2.79	3.70**	4.14	11.50**
	KF	1.15	1.01	1.27	<b>0.54**</b>	1.62**	1.93*	2.49**	4.87	6.49**	4.73**
Unrestricted w/ AR	OPCA	1.91	<b>0.92</b>	<b>0.78</b>	<b>0.71</b>	2.51	3.20*	2.56	2.83	8.56**	11.75**
	RPCA	1.91	<b>0.92</b>	<b>0.78</b>	<b>0.71</b>	2.51	3.20*	2.56	2.83	8.56**	11.75**
	EM	2.69**	1.77*	1.59	1.10	2.69	3.30**	3.02*	8.41	4.57**	10.15**
	KF	<b>0.94</b>	1.15	1.44	<b>0.58**</b>	2.79*	6.71	2.58*	7.95**	5.86*	7.00
Smoothed	OPCA	1.05	1.02	<b>0.67**</b>	<b>0.41<sub>FB</sub></b>	<b>0.51**</b>	<b>0.52**</b>	<b>0.45<sub>FB</sub></b>	<b>0.59*</b>	<b>0.57<sub>FB</sub></b>	<b>0.85</b>
	RPCA	1.05	1.02	<b>0.67**</b>	<b>0.41<sub>FB</sub></b>	<b>0.51**</b>	<b>0.52**</b>	<b>0.45<sub>FB</sub></b>	<b>0.59*</b>	<b>0.57<sub>FB</sub></b>	<b>0.85<sub>FB</sub></b>
	EM	1.21	1.40	<b>0.66*</b>	<b>0.56**</b>	<b>0.66**</b>	<b>0.67**</b>	<b>0.54*</b>	<b>0.73</b>	<b>0.77</b>	1.03
	KF	1.01	1.02	<b>0.57</b>	<b>0.44**</b>	<b>0.52**</b>	<b>0.54**</b>	<b>0.48**</b>	<b>0.59<sub>FB</sub></b>	<b>0.61*</b>	<b>0.86</b>
<hr/>											
Mean of 6 factors											
	Mean of MIDAS	<b>0.84</b>	<b>0.89</b>	<b>0.52**</b>	<b>0.40**</b>	<b>0.49**</b>	<b>0.47**</b>	<b>0.45**</b>	<b>0.63</b>	<b>0.86</b>	1.27
	Mean of All	<b>0.76</b>	<b>0.82</b>	<b>0.58**</b>	<b>0.46**</b>	<b>0.54**</b>	<b>0.56**</b>	<b>0.50**</b>	<b>0.58*</b>	<b>0.72</b>	<b>0.91</b>

\* Notes: See notes to Tables 1-4. Entries in this table are ratios of point MSFEs of our benchmark or ‘strawman’ AR(SIC) model to each other model, for various estimation methods and horizons. Panel (a) reports MSFEs based on experiments using ‘first available’ real-time quarterly historical data, and Panel (b) reports results based on the use of ‘most recent’ real-time quarterly historical data. All results are based on recursively estimated models. The column denoted by ‘Backcast’ contains MSFEs for quarterly forecasts of GDP made 1-month prior to the calendar date of the quarterly GDP datum being predicted, and the columns denoted by ‘Nowcast’ contain MSFEs for forecasts of the first, second and third months of each quarterly calendar dated GDP observation. Finally, the columns denoted by ‘Forecast’ contain MSFEs based on 1-quarter ahead predictions made from 1 month after the end of the quarter (called month 4) to 3 month ahead (called month 6). Months 7-9 correspondingly refer to 2-quarter ahead predictions. Bold entries denote cases for which the point MSFE of a given model is lower than the point MSFE of the AR(SIC) model. Entries superscripted by a \*\* (5% level) and a \* (10% level) are significantly better than the AR(SIC) model, based on application of the DM predictive accuracy test. Finally, entries subscripted with ‘FB’ denote the MSFE-best models for a given number of estimated factors and for each horizon, while entries subscripted with ‘GB’ denote MSFE-best models across all specification permutations, for a given horizon. See Section 5 for complete details.

Table A 2: Relative MSFEs When Backcasting, Nowcasting, and Forecasting Korean GDP\*

Panel (a): First Available

Factors	Recursive	Backcast		Nowcast				Forecast					
		prev. qtr.		current quarter				1 quarter ahead		2 quarter ahead			
		-1	1	2	3	4	5	6	7	8	9		
	RW	1.45	1.35	1.12	<b>0.94</b>	<b>0.94</b>	1.01	1.14	1.13	1.20	1.68		
	CBADL	5.16	4.84	3.42	2.02**	1.91**	1.97**	1.75**	1.73**	1.84**	1.54		
	BEX	2.63	2.56	1.76	<b>0.94</b>	<b>0.93</b>	<b>0.97</b>	<b>0.85</b>	<b>0.85</b>	<b>0.91</b>	<b>0.82</b>		
	Mean of Benchmarks	4.24	3.94	2.83	1.81	1.73*	1.73	1.24**	1.22**	1.31**	1.14		
	OPCA	1.22	1.42	1.12	<b>0.71</b>	<b>0.81</b>	<b>0.95</b>	<b>0.98</b>	1.08*	1.09	<b>0.94</b>		
w/o AR	RPCA	1.22	1.42	1.12	<b>0.71</b>	<b>0.81</b>	<b>0.95</b>	<b>0.98</b>	1.08*	1.09	<b>0.94</b>		
	EM	1.26	1.59	1.23	<b>0.82</b>	<b>0.95</b>	1.12	1.06	1.05	1.09	<b>0.86</b>		
	KF	1.16	1.35	1.14	<b>0.76</b>	<b>0.89</b>	1.05	1.02	1.04	1.07	<b>0.87</b>		
	OPCA	<b>0.70</b>	<b>0.86</b>	<b>0.81</b>	<b>0.71</b>	0.86	1.05	<b>0.96</b>	1.16	1.21	<b>0.97</b>		
w/ AR	RPCA	<b>0.70</b>	<b>0.80</b>	<b>0.81</b>	<b>0.71</b>	0.86	1.05	<b>0.96</b>	1.16	1.21	<b>0.97</b>		
	EM	<b>0.73</b>	<b>0.90</b>	<b>1.00</b>	<b>0.95</b>	0.98	1.34	1.14	1.28	1.39	1.03		
	KF	<b>0.65<sub>FB</sub></b>	<b>0.78<sub>GB</sub></b>	<b>0.92</b>	<b>0.84</b>	0.92	1.31*	1.07	1.20	1.34	1.04		
	OPCA	1.52	1.58**	1.08	<b>0.70</b>	<b>0.72</b>	<b>0.76</b>	<b>0.97</b>	<b>0.73<sub>GB</sub></b>	<b>0.84</b>	<b>0.89</b>		
1	Unrestricted	RPCA	1.52	1.58**	1.08	<b>0.70</b>	<b>0.72</b>	<b>0.76</b>	<b>0.97</b>	<b>0.73</b>	<b>0.84</b>	<b>0.89</b>	
	w/o AR	EM	1.56	1.58	1.08	<b>0.69</b>	<b>0.68</b>	<b>0.97</b>	1.08	<b>0.96</b>	1.15	1.41	
	KF	1.28	1.45	<b>1.00</b>	<b>0.68</b>	<b>0.65<sub>FB</sub></b>	<b>0.73<sub>FB</sub></b>	<b>0.85</b>	<b>0.81</b>	<b>0.73<sub>GB</sub></b>	<b>0.80<sub>GB</sub></b>		
	OPCA	<b>0.92</b>	1.14	<b>0.78**</b>	<b>0.65<sub>FB</sub></b>	<b>0.73</b>	0.94	<b>0.88</b>	1.03	1.30	1.22		
Unrestricted	RPCA	<b>0.92</b>	1.14	<b>0.78**</b>	<b>0.65*</b>	<b>0.73</b>	0.94	<b>0.88</b>	1.03	1.30	1.22		
	w/ AR	EM	1.03	1.11	<b>0.87</b>	<b>0.71</b>	0.96	1.42	1.04	1.16	1.31	1.14	
	KF	<b>0.80</b>	1.02	<b>0.88</b>	<b>0.69</b>	<b>0.74*</b>	<b>0.91</b>	<b>0.84<sub>FB</sub></b>	1.08	1.18	1.07		
	OPCA	1.71	1.58	1.18	<b>0.74</b>	0.80	0.95	<b>0.88</b>	<b>0.95</b>	1.04	<b>0.94</b>		
Smoothed	RPCA	1.71	1.58	1.18	<b>0.74</b>	0.80	0.95	<b>0.88</b>	<b>0.95</b>	1.04	<b>0.94</b>		
	EM	1.50	1.61	1.27	<b>0.74</b>	0.86	1.03	0.90	<b>0.96</b>	1.05	<b>0.90</b>		
	KF	1.46	1.48	1.20	<b>0.73</b>	0.83	0.98	<b>0.88</b>	<b>0.94</b>	1.03	<b>0.90</b>		
	Mean with 1 factor	<b>0.93</b>	1.11	<b>0.91</b>	<b>0.66</b>	0.75	0.89	<b>0.86</b>	<b>0.91</b>	<b>0.94</b>	<b>0.83</b>		
	OPCA	1.35	1.29	<b>0.93</b>	<b>0.59</b>	<b>0.59</b>	<b>0.76</b>	<b>0.88</b>	1.00	1.13	1.03		
w/o AR	RPCA	1.35	1.29	<b>0.93</b>	<b>0.59</b>	<b>0.59</b>	<b>0.76</b>	<b>0.89</b>	1.01	1.13	1.03		
	EM	1.31	1.32	<b>0.89</b>	<b>0.61</b>	<b>0.65</b>	<b>0.90</b>	1.09	1.01	1.17	1.11		
	KF	1.21	1.23	<b>0.95</b>	<b>0.57</b>	<b>0.63</b>	<b>0.82</b>	<b>0.95</b>	<b>0.98</b>	1.07	1.08		
	OPCA	<b>0.89</b>	<b>0.82</b>	<b>0.77</b>	<b>0.52*</b>	0.59	0.88	<b>0.79</b>	<b>0.87</b>	1.03	1.12		
Basic	RPCA	<b>0.89</b>	<b>0.82<sub>FB</sub></b>	<b>0.77</b>	<b>0.51<sub>FB</sub></b>	0.59	<b>0.87</b>	<b>0.79</b>	<b>0.87</b>	1.03	1.12		
	w/ AR	<b>0.77</b>	<b>0.86</b>	<b>0.81</b>	<b>0.68</b>	<b>0.56*</b>	1.10	1.04	<b>0.98</b>	1.20	1.30		
	EM	<b>0.73<sub>FB</sub></b>	<b>0.82</b>	<b>0.67<sub>FB</sub></b>	<b>0.51*</b>	0.59	<b>0.97</b>	<b>0.81</b>	<b>0.85</b>	1.06	1.52		
	KF	1.54	1.61	<b>0.94</b>	<b>0.66*</b>	<b>0.57**</b>	<b>0.75<sub>FB</sub></b>	<b>0.99</b>	<b>0.86</b>	1.80	1.27		
2	Unrestricted	RPCA	1.54	1.61	<b>0.94</b>	<b>0.66*</b>	<b>0.57**</b>	<b>0.75<sub>FB</sub></b>	<b>0.99</b>	<b>0.86</b>	1.80	1.27	
	w/o AR	EM	1.38	1.51	1.06	<b>0.59*</b>	<b>0.78</b>	1.30	1.38	1.43	1.80	1.87	
	KF	1.48	1.38	<b>0.99</b>	<b>0.72</b>	0.65	1.05	1.02	<b>0.95</b>	1.74	1.53		
	OPCA	<b>0.96</b>	<b>0.90</b>	<b>0.86</b>	<b>0.61*</b>	0.84	1.28	1.12	1.34	3.26	1.59		
Unrestricted	RPCA	<b>0.96</b>	<b>0.90</b>	<b>0.86</b>	<b>0.61*</b>	<b>0.84</b>	1.28	1.12	1.34	3.26	1.59		
	w/ AR	<b>0.94</b>	1.21	1.01	<b>0.76</b>	<b>0.92</b>	1.48	1.53	1.50	2.32*	2.00*		
	EM	1.01	1.24	<b>0.86</b>	<b>0.77</b>	1.13	1.44	1.57**	1.33	2.91*	3.08		
	KF	2.46*	1.82	1.17	<b>0.70*</b>	<b>0.67**</b>	<b>0.75**</b>	<b>0.73<sub>GB</sub></b>	<b>0.78</b>	<b>0.93<sub>FB</sub></b>	<b>0.94<sub>FB</sub></b>		
Smoothed	RPCA	2.46*	1.82	1.17	<b>0.70*</b>	<b>0.67**</b>	<b>0.75**</b>	<b>0.73<sub>GB</sub></b>	<b>0.78</b>	<b>0.93<sub>FB</sub></b>	<b>0.94<sub>FB</sub></b>		
	EM	2.16*	1.77	1.19	<b>0.67*</b>	<b>0.71*</b>	<b>0.81*</b>	<b>0.80</b>	<b>0.80</b>	<b>0.99</b>	1.02		
	KF	2.05	1.61	1.08	<b>0.65*</b>	<b>0.67**</b>	<b>0.76**</b>	<b>0.74</b>	<b>0.79</b>	<b>0.94</b>	<b>0.95</b>		
	Mean of 2 factors	1.05	1.07	<b>0.80</b>	<b>0.54*</b>	<b>0.55<sub>FB</sub></b>	<b>0.77*</b>	<b>0.78*</b>	<b>0.77<sub>FB</sub></b>	1.03	<b>0.96</b>		
	OPCA	1.18	1.20	<b>0.80</b>	<b>0.45*</b>	<b>0.49*</b>	<b>0.66</b>	1.13	1.07	2.19	3.17*		
w/o AR	RPCA	1.16	1.19	<b>0.80</b>	<b>0.44*</b>	<b>0.49*</b>	<b>0.67</b>	1.14	1.08	2.19	3.18*		
	EM	1.23	1.32	<b>0.85</b>	<b>0.46*</b>	<b>0.70</b>	<b>0.86</b>	1.14	2.74*	2.64**	4.43**		
	KF	<b>0.98</b>	1.00	<b>0.74</b>	<b>0.40*</b>	<b>0.65</b>	<b>0.65</b>	<b>0.99</b>	1.90	2.21	3.78**		
	OPCA	<b>0.79</b>	<b>0.81</b>	<b>0.71</b>	<b>0.36*</b>	<b>0.39**</b>	<b>0.68</b>	1.05	<b>0.75</b>	1.67	2.32*		
Basic	RPCA	<b>0.79</b>	<b>0.81<sub>FB</sub></b>	<b>0.72</b>	<b>0.39*</b>	<b>0.38**</b>	<b>0.68</b>	1.04	<b>0.76</b>	1.69	2.39**		
	w/ AR	<b>0.70</b>	<b>0.91</b>	1.12	<b>0.46*</b>	<b>0.43*</b>	<b>0.92</b>	1.39	2.82**	1.79	3.76**		

	KF	<b>0.63<sub>GB</sub></b>	<b>0.96</b>	<b>0.71<sub>FB</sub></b>	<b>0.36*<sub>GB</sub></b>	<b>0.38**<sub>GB</sub></b>	<b>0.57*<sub>FB</sub></b>	1.23	1.71	1.39	3.51*
Unrestricted w/o AR	OPCA	2.18	2.05	1.50	<b>0.99</b>	<b>0.73</b>	2.87	3.72**	6.12**	15.43*	22.62*
	RPCA	2.18	2.05	1.50	<b>0.99</b>	<b>0.73</b>	2.87	3.72**	6.12**	15.43*	22.62*
	EM	1.26	2.42	1.65	1.32	<b>0.75</b>	2.44*	4.45**	3.84	9.43**	7.64*
	KF	1.57	1.35	<b>0.93</b>	<b>0.49*</b>	<b>0.88</b>	1.79	2.93*	2.77*	6.11**	18.92
Unrestricted w/ AR	OPCA	1.89	2.68	2.02*	1.66	1.39	3.12	4.99	5.71*	29.49	30.06**
	RPCA	1.89	2.68	2.02*	1.66	1.39	3.12	4.99	5.71*	29.49	30.06**
	EM	1.28	2.25	1.93	1.67	1.12	2.91**	4.48**	4.54**	10.23**	8.62**
	KF	1.97	1.54	1.69	<b>0.82</b>	1.10	1.44	2.56	3.24	8.48*	16.87*
Smoothed	OPCA	2.12*	1.66	1.18	<b>0.78</b>	<b>0.75</b>	<b>0.77</b>	<b>0.78</b>	<b>0.75<sub>FB</sub></b>	<b>0.88</b>	<b>0.90</b>
	RPCA	2.12*	1.66	1.18	<b>0.78</b>	<b>0.75</b>	<b>0.77</b>	<b>0.78</b>	<b>0.75<sub>FB</sub></b>	<b>0.88</b>	<b>0.90</b>
	EM	1.85	1.83	1.22	<b>0.80</b>	<b>0.83</b>	<b>0.92</b>	<b>0.84</b>	<b>0.86</b>	1.02	1.00
	KF	1.80	1.62	1.13	<b>0.75</b>	<b>0.75</b>	<b>0.77</b>	<b>0.76<sub>FB</sub></b>	<b>0.76</b>	<b>0.87<sub>FB</sub></b>	<b>0.89<sub>FB</sub></b>
- - Mean of 3 factors - -		-1.00	-1.08	-0.75	-0.45*	-0.50*	-0.80	-1.05	-1.23	-2.31*	-4.01**
Basic w/o AR	OPCA	1.10	1.04	<b>0.77</b>	<b>0.58</b>	<b>0.47*</b>	<b>0.63*</b>	1.44	2.61**	2.94*	4.66**
	RPCA	1.03	1.08	<b>0.82</b>	<b>0.59</b>	<b>0.47*</b>	<b>0.54<sub>GB</sub></b>	1.43	2.55**	2.94*	5.30**
	EM	1.10	1.21	<b>0.92</b>	<b>0.48*</b>	<b>0.43<sub>FB</sub></b>	<b>0.87</b>	1.60	2.07	3.48**	4.93**
	KF	1.01	1.02	<b>0.73</b>	<b>0.46*</b>	<b>0.47*</b>	<b>0.73</b>	1.26	1.95	3.48*	5.29**
Basic w/ AR	OPCA	<b>0.76<sub>FB</sub></b>	<b>0.87<sub>FB</sub></b>	<b>0.78</b>	<b>0.44*</b>	<b>0.53*</b>	<b>0.83</b>	1.25	2.02*	3.86*	4.35*
	RPCA	<b>0.79</b>	<b>0.90</b>	<b>0.74</b>	<b>0.48*</b>	<b>0.46*</b>	<b>0.73</b>	1.29	1.96*	3.74*	4.41*
	EM	<b>0.83</b>	1.15	1.06	<b>0.43*</b>	<b>0.51*</b>	<b>0.83</b>	1.31	2.58	1.97	4.68*
	KF	<b>0.99</b>	<b>0.90</b>	<b>0.66<sub>FB</sub></b>	<b>0.43<sub>FB</sub></b>	<b>0.47*</b>	<b>0.74</b>	1.43	1.66	1.29	2.79*
Unrestricted w/o AR	OPCA	3.64	2.83	2.30	1.99	9.56	5.94	2.11	4.32*	12.33	11.90**
	RPCA	3.64	2.83	2.30	1.99	9.56	5.94	2.11	4.32*	12.33	11.90**
	EM	3.29**	2.64	2.45	2.57	4.44	2.53	2.84**	3.64	7.00	7.88**
	KF	2.40	1.14	4.59**	1.64	3.11*	3.95**	2.26	2.41	8.49	12.45**
Unrestricted w/ AR	OPCA	5.84	3.55	3.32	1.07	1.89	4.20**	1.57	5.05	19.21	14.52**
	RPCA	5.84	3.55	3.32	1.07	1.89	4.20**	1.57	5.05	19.21	14.52**
	EM	2.27	2.43	1.85	1.36	3.13	1.49	6.39	2.95	5.99*	12.15**
	KF	4.24	2.33	3.67*	<b>0.55*</b>	<b>0.99</b>	3.76	4.46	3.04*	10.51	34.47
Smoothed	OPCA	2.01*	1.60	1.21	<b>0.78</b>	<b>0.85</b>	<b>0.75</b>	<b>0.90</b>	<b>0.85<sub>FB</sub></b>	<b>0.95<sub>FB</sub></b>	1.40
	RPCA	2.01*	1.60	1.21	<b>0.78</b>	<b>0.85</b>	<b>0.75</b>	<b>0.90</b>	<b>0.85<sub>FB</sub></b>	<b>0.95<sub>FB</sub></b>	1.40
	EM	1.84	1.82	1.22	<b>0.81</b>	<b>0.85</b>	<b>0.95</b>	<b>0.83</b>	1.03	1.19	1.39
	KF	1.86	1.64	1.20	<b>0.80</b>	<b>0.82</b>	<b>0.76</b>	<b>0.83<sub>FB</sub></b>	<b>0.87</b>	<b>0.95</b>	<b>1.27<sub>FB</sub></b>
- - Mean of 4 factors - -		-1.16	-1.07	-0.80	-0.46*	-0.80	-0.87	-0.96	-1.38	-2.31	-3.71**
Basic w/o AR	OPCA	1.14	1.18	<b>0.71</b>	<b>0.58</b>	<b>0.85</b>	1.08	2.31**	4.21**	5.25*	5.97*
	RPCA	1.13	1.26	<b>0.75</b>	<b>0.66</b>	<b>0.86</b>	1.12	2.14**	4.09**	4.86*	5.86**
	EM	1.18	1.21	<b>0.82</b>	<b>0.63</b>	<b>0.95</b>	1.30	1.98	4.75*	5.82**	8.54**
	KF	<b>0.87<sub>FB</sub></b>	1.12	<b>0.64<sub>GB</sub></b>	<b>0.48<sub>FB</sub></b>	<b>0.82</b>	1.29	2.41	3.15*	5.21**	5.76**
Basic w/ AR	OPCA	1.30	1.12 <sub>FB</sub>	1.01	<b>0.59*</b>	<b>0.80</b>	1.47	2.29**	3.40*	5.89**	3.89**
	RPCA	1.20	1.16	<b>0.89</b>	<b>0.71</b>	<b>0.79</b>	1.36	2.20*	4.74*	6.22*	4.13**
	EM	1.05	1.20	<b>0.90</b>	<b>0.67</b>	<b>0.57<sub>FB</sub></b>	2.00	2.94	4.42*	7.65	8.65**
	KF	<b>0.89</b>	1.14	<b>0.69</b>	<b>0.50*</b>	<b>0.76</b>	1.51	2.04	4.72**	6.02*	6.39**
Unrestricted w/o AR	OPCA	2.55**	3.89*	9.23	1.23	1.60	1.91	2.21	3.77	6.50	5.20**
	RPCA	2.55**	3.89*	9.23	1.23	1.60	1.91	2.21	3.77	6.50	5.20**
	EM	2.75	7.84	2.98	1.30	1.25	2.24*	3.38**	9.52**	12.61	24.89
	KF	7.28	2.11	1.96	<b>0.50*</b>	<b>0.77</b>	2.44	2.82	6.20	7.77**	5.90*
Unrestricted w/ AR	OPCA	1.91	1.71	1.74	1.40	2.64	1.48	2.70	10.46	36.48	6.55*
	RPCA	1.91	1.71	1.74	1.40	2.64	1.48	2.70	10.46	36.48	6.55*
	EM	1.20	1.42	1.33	1.16	3.68	3.84**	5.07**	13.46**	14.87	21.59
	KF	1.26	1.39	1.17	<b>0.59*</b>	1.93	3.25	1.72	9.63*	9.51	4.99
Smoothed	OPCA	2.25*	1.80*	1.36	<b>0.84</b>	<b>1.00</b>	<b>0.80</b>	1.06	1.02	1.16 <sub>FB</sub>	2.10 <sub>FB</sub>
	RPCA	2.25*	1.80*	1.36	<b>0.84</b>	<b>1.00</b>	<b>0.80<sub>FB</sub></b>	1.06	1.02 <sub>FB</sub>	1.16 <sub>FB</sub>	2.10 <sub>FB</sub>
	EM	1.99*	2.02	1.40	<b>0.83</b>	<b>0.93</b>	1.11	1.02	1.38	1.72	2.32*
	KF	1.94*	1.84*	1.29	<b>0.83</b>	<b>0.92</b>	<b>0.84</b>	<b>0.95<sub>FB</sub></b>	1.18	1.25	2.53
- - Mean of 5 factors - -		-1.07	-1.14	-0.89	-0.53*	-0.68	-0.85	-1.21	-2.25	-3.99	-4.13*
Basic w/o AR	OPCA	1.12	1.03	<b>0.77</b>	<b>0.82</b>	1.36	2.30	3.59**	5.58	7.34*	6.66
	RPCA	1.17	1.04	<b>0.76</b>	<b>0.70</b>	1.37	2.30	3.13**	8.36	7.37	11.54
	EM	<b>0.88</b>	1.05	<b>0.94</b>	<b>0.75</b>	<b>0.92</b>	2.25	4.16*	8.54	14.89**	14.67**
	KF	<b>0.78<sub>FB</sub></b>	<b>0.95<sub>FB</sub></b>	<b>0.67<sub>FB</sub></b>	<b>0.58</b>	2.30	2.08	3.35*	8.92*	11.05	13.63
Basic w/ AR	OPCA	1.06	1.21	<b>0.89</b>	<b>0.77</b>	1.19	2.13	3.37*	12.20	8.06*	6.90

	RPCA	1.23	1.09	<b>0.79</b>	<b>0.72</b>	1.21	2.03	3.07*	7.42	8.33*	11.92	
	EM	<b>0.92</b>	1.10	<b>0.88</b>	<b>0.78</b>	1.40	2.67*	4.23*	9.32*	9.30**	16.23	
	KF	<b>0.78</b>	<b>0.95</b>	<b>0.78</b>	<b>0.60*</b>	2.31	2.53**	2.72*	7.40	16.85**	18.13**	
Unrestricted w/o AR	OPCA	2.28**	2.44	2.61	2.99*	1.60	5.83**	2.48	7.88	12.69	9.07	
	RPCA	2.28**	2.44	2.61	2.99*	1.60	5.83**	2.48	7.88	12.69	9.07	
	EM	2.10	1.61	1.83	1.86	8.44	5.74*	2.38	6.50*	12.49	7.49*	
	KF	1.89	1.45	3.07	2.92	2.78**	3.51*	2.95*	5.65	9.31	11.61*	
Unrestricted w/ AR	OPCA	3.87	5.31	2.82	<b>0.74*</b>	<b>0.85</b>	2.19	2.82	14.04	17.96	10.39	
	RPCA	3.87	5.31	2.82	<b>0.74*</b>	<b>0.85<sub>FB</sub></b>	2.19	2.82	14.04	17.96	10.39	
	EM	2.17	1.71	1.70	1.15	2.79	4.86	3.53**	13.40*	15.19*	10.39*	
	KF	1.53	1.70**	2.54	<b>0.75</b>	2.45	1.74	2.40*	12.01	20.57	11.68	
Smoothed	OPCA	2.10	1.68*	1.45	1.07	1.35*	<b>0.92<sub>FB</sub></b>	1.69	1.29 <sub>FB</sub> *	1.26 <sub>FB</sub>	2.92 <sub>FB</sub>	
	RPCA	2.10	1.68*	1.45	1.07	1.35*	<b>0.92<sub>FB</sub></b>	1.69	1.29 <sub>FB</sub> *	1.26 <sub>FB</sub>	2.92 <sub>FB</sub>	
	EM	1.93	1.80	1.36	1.18	1.15	1.17	2.11	2.04*	1.76	4.12	
	KF	2.01	1.78	1.33	1.21	1.26	<b>0.96</b>	2.25	1.82*	1.39	5.14*	
<hr style="border-top: 1px dashed black;"/>		Mean of 6 factors	1.05	1.04	<b>0.95</b>	<b>0.54<sub>FB</sub>*</b>	1.10	1.55	1.59 <sub>FB</sub>	5.09	6.46	6.11
Mean of MIDAS			<b>0.94</b>	<b>0.99</b>	<b>0.74</b>	<b>0.45*</b>	<b>0.56*</b>	<b>0.71*</b>	<b>0.80</b>	1.12	1.64	2.00
Mean of All			1.15	1.19	<b>0.89</b>	<b>0.61**</b>	<b>0.68*</b>	<b>0.80*</b>	<b>0.82</b>	<b>0.94</b>	1.23	1.32

Panel (b): Most Recent

Factors	Recursive	Backcast			Nowcast			Forecast					
		prev. qtr.		current quarter	1 quarter ahead			2 quarter ahead					
		-1	1		2	3	4	5	6	7	8	9	
	RW	1.07	1.11	1.15	1.25**	1.29**	1.27**	1.41**	1.49**	1.49**	1.60**		
	CBADL	4.40*	3.83*	2.74*	2.18**	2.04**	2.07**	2.04**	1.98**	2.17**	1.97*		
	BEX	1.88	1.81*	1.21	0.90	0.91	0.91	0.86	0.84	0.93	0.83		
	Mean of Benchmarks	3.42*	2.95*	2.17*	1.91*	1.84*	1.78	1.35**	1.27	1.40*	1.41		
	OPCA	<b>0.92</b>	1.01	<b>0.73</b>	<b>0.63</b>	<b>0.75</b>	<b>0.86</b>	<b>0.94</b>	1.06	1.13	1.02		
w/o AR	Basic RPCA	<b>0.92</b>	1.01	<b>0.73</b>	<b>0.63</b>	<b>0.75</b>	<b>0.86</b>	<b>0.94</b>	1.06	1.13	1.02		
	EM	1.00	1.26	<b>0.83</b>	<b>0.79</b>	<b>0.94</b>	1.05	1.05	1.04	1.14	<b>0.97</b>		
	KF	<b>0.88</b>	1.01	<b>0.76</b>	<b>0.71</b>	<b>0.87</b>	<b>0.98</b>	<b>1.00</b>	1.03	1.12	<b>0.97</b>		
	OPCA	<b>0.71</b>	<b>0.78</b>	<b>0.56**</b>	<b>0.73</b>	<b>0.82</b>	<b>0.92</b>	<b>0.94</b>	1.21	1.34	1.08		
w/ AR	Basic RPCA	<b>0.71</b>	<b>0.73</b>	<b>0.56<sub>FB</sub></b>	<b>0.73</b>	<b>0.82</b>	<b>0.92</b>	<b>0.94</b>	1.21	1.34	1.08		
	EM	<b>0.71</b>	<b>0.80</b>	<b>0.67*</b>	<b>0.99</b>	1.05	1.25	1.15	1.37	1.60	1.20		
	KF	<b>0.61<sub>FB</sub></b>	<b>0.63<sub>GB</sub></b>	<b>0.61**</b>	<b>0.82</b>	<b>0.90</b>	1.19	1.07	1.28	1.53	1.20		
	OPCA	1.04	1.04	<b>0.70*</b>	<b>0.61**</b>	0.65	<b>0.61*</b>	<b>0.92</b>	<b>0.67</b>	<b>0.77</b>	<b>0.93</b>		
1	Unrestricted RPCA	1.04	1.04	<b>0.70*</b>	<b>0.61**</b>	0.65	<b>0.61*</b>	<b>0.92</b>	<b>0.67<sub>GB</sub></b>	<b>0.77</b>	<b>0.93</b>		
	w/o AR	1.13	1.18	<b>0.73*</b>	<b>0.65*</b>	<b>0.60*</b>	<b>0.84</b>	1.03	<b>0.88</b>	1.24	1.66		
	KF	<b>0.89</b>	1.02	<b>0.64**</b>	<b>0.58**</b>	<b>0.56<sub>FB</sub></b>	<b>0.58<sub>FB</sub></b>	<b>0.74<sub>FB</sub></b>	<b>0.71**</b>	<b>0.69<sub>GB</sub></b>	<b>0.80<sub>GB</sub></b>		
	OPCA	<b>0.90</b>	1.04	<b>0.65**</b>	<b>0.62**</b>	0.66	<b>0.82</b>	<b>0.85</b>	1.01	1.38	1.40		
Unrestricted w/ AR	RPCA	<b>0.90</b>	1.04	<b>0.65**</b>	<b>0.62**</b>	0.66	<b>0.82</b>	<b>0.85</b>	1.01	1.38	1.40		
	EM	<b>0.94</b>	1.07	<b>0.68**</b>	<b>0.69*</b>	1.02	1.48	1.02	1.21	1.47	1.29		
	KF	<b>0.70</b>	<b>0.95</b>	<b>0.63**</b>	<b>0.61**</b>	0.69*	<b>0.81</b>	<b>0.78*</b>	1.13	1.32	1.19		
	OPCA	1.08	1.00	<b>0.74</b>	<b>0.62*</b>	<b>0.70</b>	<b>0.82</b>	<b>0.82</b>	<b>0.90</b>	1.04	<b>0.96</b>		
Smoothed	RPCA	1.08	1.00	<b>0.74</b>	<b>0.62*</b>	<b>0.70</b>	<b>0.82</b>	<b>0.82</b>	<b>0.90</b>	1.04	<b>0.96</b>		
	EM	<b>0.83</b>	1.05	<b>0.79</b>	<b>0.61*</b>	<b>0.76</b>	<b>0.91</b>	<b>0.84</b>	<b>0.91</b>	1.06	<b>0.92</b>		
	KF	<b>0.79</b>	<b>0.92</b>	<b>0.75</b>	<b>0.59*</b>	<b>0.73</b>	<b>0.85</b>	<b>0.82</b>	<b>0.90</b>	1.04	<b>0.92</b>		
	Mean with 1 factor	<b>0.63</b>	<b>0.80</b>	<b>0.58**</b>	<b>0.58**</b>	<b>0.67*</b>	<b>0.75</b>	<b>0.78*</b>	<b>0.86</b>	<b>0.93</b>	<b>0.86</b>		
2	OPCA	<b>0.95</b>	<b>0.93</b>	<b>0.57**</b>	<b>0.47**</b>	<b>0.52**</b>	0.66	<b>0.80</b>	<b>0.96</b>	1.16	1.09		
	Basic RPCA	<b>0.95</b>	<b>0.94</b>	<b>0.57**</b>	<b>0.47**</b>	<b>0.52**</b>	0.66	<b>0.81</b>	<b>0.96</b>	1.16	1.09		
	w/o AR	<b>0.99</b>	<b>0.98</b>	<b>0.57**</b>	<b>0.53*</b>	<b>0.59</b>	0.80	1.04	<b>0.98</b>	1.22	1.32		
	KF	<b>0.87</b>	<b>0.88</b>	<b>0.57**</b>	<b>0.50**</b>	<b>0.56*</b>	<b>0.72</b>	<b>0.89</b>	<b>0.94</b>	1.10	1.26		
Unrestricted w/ AR	OPCA	<b>0.78</b>	<b>0.71</b>	<b>0.59**</b>	<b>0.45**</b>	<b>0.53**</b>	<b>0.79</b>	<b>0.77</b>	<b>0.87</b>	1.06	1.25		
	RPCA	<b>0.79</b>	<b>0.70</b>	<b>0.58**</b>	<b>0.44**</b>	<b>0.53**</b>	<b>0.78</b>	<b>0.77</b>	<b>0.87</b>	1.06	1.25		
	EM	<b>0.75</b>	<b>0.71</b>	<b>0.57**</b>	<b>0.66</b>	<b>0.60</b>	1.01	1.06	<b>0.97</b>	1.35	1.55		
	KF	<b>0.66<sub>FB</sub></b>	<b>0.66<sub>FB</sub></b>	<b>0.47**</b>	<b>0.43**</b>	<b>0.55**</b>	<b>0.89</b>	<b>0.79</b>	<b>0.88</b>	1.17	1.85		
Unrestricted w/ AR	OPCA	1.04	1.08	<b>0.59**</b>	<b>0.53**</b>	<b>0.48**</b>	<b>0.56<sub>FB</sub></b>	<b>0.89</b>	<b>0.79</b>	2.35	1.36		
	RPCA	1.04	1.08	<b>0.59**</b>	<b>0.53**</b>	<b>0.48**</b>	<b>0.56<sub>FB</sub></b>	<b>0.89</b>	<b>0.79</b>	2.35	1.36		
	w/o AR	<b>0.94</b>	1.14	<b>0.63**</b>	<b>0.48**</b>	0.69	1.20	1.36	1.46	2.14	2.37*		
	KF	<b>0.94</b>	<b>0.94</b>	<b>0.57**</b>	<b>0.58**</b>	<b>0.51**</b>	<b>0.88</b>	<b>0.92</b>	<b>0.85</b>	1.98	1.78		
Unrestricted w/ AR	OPCA	<b>0.91</b>	<b>0.75*</b>	<b>0.64*</b>	<b>0.53**</b>	<b>0.85</b>	1.26	1.19	1.66	4.50	1.95		
	RPCA	<b>0.91</b>	<b>0.75*</b>	<b>0.64*</b>	<b>0.53**</b>	<b>0.85</b>	1.26	1.19	1.66	4.50	1.95		
	EM	<b>0.91</b>	<b>0.93</b>	<b>0.71</b>	<b>0.58**</b>	<b>0.84</b>	1.43	1.65*	1.68	2.93*	2.58**		
	KF	<b>0.77</b>	<b>0.94</b>	<b>0.52**</b>	<b>0.59</b>	1.04	1.36	1.67*	1.43	3.68*	3.88		
Smoothed	OPCA	1.62	1.12	<b>0.70**</b>	<b>0.55**</b>	<b>0.55**</b>	<b>0.61**</b>	<b>0.66<sub>GB</sub></b>	<b>0.71</b>	<b>0.91<sub>FB</sub></b>	<b>0.99<sub>FB</sub></b>		
	RPCA	1.62	1.12	<b>0.70**</b>	<b>0.55**</b>	<b>0.55**</b>	<b>0.61**</b>	<b>0.66<sub>GB</sub></b>	<b>0.71</b>	<b>0.91<sub>FB</sub></b>	<b>0.99<sub>FB</sub></b>		
	EM	1.31	1.10	<b>0.68*</b>	<b>0.50**</b>	<b>0.60**</b>	<b>0.67**</b>	<b>0.75*</b>	<b>0.76*</b>	1.00	1.11		
	KF	1.21	<b>0.96</b>	<b>0.62**</b>	<b>0.48**</b>	<b>0.55**</b>	<b>0.62**</b>	<b>0.68**</b>	<b>0.73</b>	<b>0.93</b>	1.01		
Mean of 2 factors	OPCA	<b>0.67</b>	<b>0.71</b>	<b>0.47<sub>FB</sub></b>	<b>0.40<sub>FB</sub></b>	<b>0.43<sub>FB</sub></b>	<b>0.61**</b>	<b>0.68**</b>	<b>0.70<sub>FB</sub></b>	1.11	<b>1.02</b>		
	RPCA	<b>0.93</b>	<b>0.90</b>	<b>0.52**</b>	<b>0.43**</b>	0.44	<b>0.62</b>	1.41	1.22	3.02	4.40*		
	w/o AR	<b>0.91</b>	<b>0.89</b>	<b>0.52**</b>	<b>0.43**</b>	0.45	<b>0.62</b>	1.41	1.30	3.02	4.41*		
	KF	<b>0.71</b>	<b>0.77</b>	<b>0.45<sub>GB</sub></b>	<b>0.34**</b>	0.70	<b>0.59</b>	1.11	2.50*	3.03*	5.22**		
Basic w/ AR	OPCA	<b>0.66</b>	<b>0.77*</b>	<b>0.67</b>	<b>0.31**</b>	<b>0.32**</b>	<b>0.58</b>	1.25	<b>0.78</b>	2.24	3.11**		
	RPCA	<b>0.67</b>	<b>0.75*</b>	<b>0.68</b>	<b>0.33**</b>	<b>0.32**</b>	<b>0.58</b>	1.23	<b>0.79</b>	2.28	3.22**		
	EM	<b>0.69</b>	<b>0.95</b>	<b>0.77*</b>	<b>0.41**</b>	<b>0.35**</b>	<b>0.81</b>	1.69	3.84**	2.35	5.28**		

	KF	<b>0.58<sub>GB</sub></b>	<b>0.84</b>	<b>0.46**</b>	<b>0.29**<sub>GB</sub></b>	<b>0.31**<sub>GB</sub></b>	<b>0.45**<sub>FB</sub></b>	1.46	2.23*	1.84	4.90**
Unrestricted w/o AR	OPCA	1.67	1.60	1.28	1.12	<b>0.72</b>	3.33	4.75**	8.25**	21.83*	32.30*
	RPCA	1.67	1.60	1.28	1.12	<b>0.72</b>	3.33	4.75**	8.25**	21.83*	32.30*
	EM	1.08	2.11	1.32	1.56	<b>0.72</b>	2.92**	5.42**	5.07	13.39**	10.58*
	KF	1.06	1.04	<b>0.54**</b>	<b>0.41**</b>	<b>0.97</b>	2.12**	3.80*	3.51*	8.65**	26.71
Unrestricted w/ AR	OPCA	1.57	2.05	1.79	1.88*	1.49	3.53	6.43	7.77*	41.79*	42.56**
	RPCA	1.57	2.05	1.79	1.88*	1.49	3.53	6.43	7.77*	41.79*	42.56**
	EM	1.08	2.06	1.73	2.08*	1.25	3.43**	5.52**	6.10**	14.45**	12.01**
	KF	1.58	1.32	1.34	<b>0.91</b>	1.20	1.71	3.25	4.10	11.66*	23.72*
Smoothed	OPCA	1.55	1.10	<b>0.78</b>	<b>0.66</b>	<b>0.66</b>	<b>0.66</b>	<b>0.79</b>	<b>0.74<sub>FB</sub></b>	<b>0.97<sub>FB</sub></b>	1.01 <sub>FB</sub>
	RPCA	1.55	1.10	<b>0.78</b>	<b>0.66</b>	<b>0.66</b>	<b>0.66</b>	<b>0.79</b>	<b>0.74<sub>FB</sub></b>	<b>0.97<sub>FB</sub></b>	1.01 <sub>FB</sub>
	EM	1.22	1.20	<b>0.75</b>	<b>0.66</b>	<b>0.75</b>	<b>0.81</b>	<b>0.86</b>	<b>0.95</b>	1.18	1.21
	KF	1.14	1.03	<b>0.67</b>	<b>0.61</b>	<b>0.65</b>	<b>0.65</b>	<b>0.78<sub>FB</sub></b>	<b>0.80</b>	<b>0.97</b>	1.04
<b>-- Mean of 3 factors --</b>		<b>0.65</b>	<b>0.74<sub>FB</sub></b>	<b>0.48**</b>	<b>0.38**</b>	<b>0.40**</b>	<b>0.74</b>	<b>1.17</b>	<b>1.53</b>	<b>3.22**</b>	<b>5.60**</b>
Basic w/o AR	OPCA	<b>0.80</b>	<b>0.82</b>	<b>0.49**</b>	<b>0.57</b>	<b>0.45**</b>	<b>0.56**</b>	<b>1.67*</b>	<b>3.26**</b>	<b>4.06*</b>	<b>6.54**</b>
	RPCA	<b>0.75</b>	<b>0.86</b>	<b>0.53*</b>	<b>0.59</b>	<b>0.45**</b>	<b>0.44<sub>GB</sub></b>	<b>1.66*</b>	<b>3.21**</b>	<b>4.06*</b>	<b>7.49**</b>
	EM	<b>0.87</b>	1.09	<b>0.61**</b>	<b>0.49**</b>	<b>0.34<sub>FB</sub></b>	<b>0.72</b>	<b>2.08**</b>	2.61	<b>4.87*</b>	<b>7.03**</b>
	KF	<b>0.71</b>	<b>0.87</b>	<b>0.52**</b>	<b>0.41**</b>	<b>0.44*</b>	<b>0.71</b>	1.39	2.51	<b>4.83*</b>	<b>7.46**</b>
Basic w/ AR	OPCA	<b>0.63<sub>FB</sub></b>	<b>0.83</b>	<b>0.47**</b>	<b>0.39**</b>	<b>0.54*</b>	<b>0.89</b>	1.53	<b>2.63*</b>	<b>5.59*</b>	<b>6.17*</b>
	RPCA	<b>0.69</b>	<b>0.85</b>	<b>0.46<sub>FB</sub></b>	<b>0.45**</b>	<b>0.43**</b>	<b>0.72</b>	1.59	<b>2.60*</b>	<b>5.41*</b>	<b>6.22*</b>
	EM	<b>0.79</b>	<b>0.93</b>	<b>0.66**</b>	<b>0.39**</b>	<b>0.47**</b>	<b>0.73</b>	1.59	<b>3.44*</b>	2.61	6.77
	KF	<b>0.91</b>	<b>0.74<sub>FB</sub></b>	<b>0.47**</b>	<b>0.37<sub>FB</sub></b>	<b>0.45**</b>	0.64	1.64	2.13	1.49	3.87**
Unrestricted w/o AR	OPCA	3.09*	2.89*	2.03	2.40**	11.77	7.15	2.73	5.71**	16.77	16.91**
	RPCA	3.09*	2.89*	2.03	2.40**	11.77	7.15	2.73	5.71**	16.77	16.91**
	EM	3.01**	2.75*	2.39	3.09	5.23*	2.72	3.57**	4.61	9.44	11.05**
	KF	2.06	1.03	3.95**	1.91	3.87*	4.79**	2.91	3.03*	11.82	17.63**
Unrestricted w/ AR	OPCA	5.61	3.34*	2.99	1.16	<b>2.31*</b>	<b>4.86**</b>	1.83	6.80	26.54	20.78**
	RPCA	5.61	3.34*	2.99	1.16	<b>2.31*</b>	<b>4.86**</b>	1.83	6.80	26.54	20.78**
	EM	2.21	2.25	1.81	1.51	3.93	1.49	8.08	3.63	7.96**	17.35**
	KF	3.90	2.25	3.07**	<b>0.49**</b>	1.14	4.35	5.89	3.85*	14.53	48.74*
Smoothed	OPCA	1.49	1.12	<b>0.81</b>	<b>0.70</b>	<b>0.82</b>	<b>0.65</b>	<b>0.97</b>	<b>0.90</b>	1.07 <sub>FB</sub>	1.72
	RPCA	1.49	1.12	<b>0.81</b>	<b>0.70</b>	<b>0.82</b>	<b>0.65</b>	<b>0.97</b>	<b>0.90<sub>FB</sub></b>	1.07 <sub>FB</sub>	1.72
	EM	1.29	1.28	<b>0.76</b>	<b>0.67</b>	<b>0.80</b>	<b>0.85</b>	<b>0.85<sub>FB</sub></b>	1.17	1.39	1.77
	KF	1.25	1.11	<b>0.75</b>	<b>0.69</b>	<b>0.77</b>	<b>0.65</b>	<b>0.87</b>	<b>0.96</b>	1.08	1.56 <sub>FB</sub>
<b>-- Mean of 4 factors --</b>		<b>0.80</b>	<b>0.89</b>	<b>0.51**</b>	<b>0.38**</b>	<b>0.77</b>	<b>0.78*</b>	1.08	1.69	3.02*	<b>5.25*</b>
Basic w/o AR	OPCA	<b>0.96</b>	<b>0.98</b>	<b>0.53<sub>FB</sub></b>	<b>0.63</b>	1.00	1.32	<b>2.90**</b>	<b>5.39**</b>	<b>7.16*</b>	<b>8.22*</b>
	RPCA	<b>0.96</b>	1.04	<b>0.58**</b>	<b>0.74</b>	1.06	1.41	<b>2.68**</b>	<b>5.22**</b>	<b>6.60*</b>	<b>8.21**</b>
	EM	1.26	1.16	<b>0.71**</b>	<b>0.74</b>	1.32	1.54	<b>2.60*</b>	6.40*	<b>8.08**</b>	<b>12.13**</b>
	KF	<b>0.96</b>	1.09	<b>0.54**</b>	<b>0.52</b>	1.00	1.58	<b>3.15**</b>	4.23*	<b>7.21**</b>	<b>8.22**</b>
Basic w/ AR	OPCA	1.09	<b>0.92</b>	<b>0.71</b>	<b>0.60</b>	<b>0.97</b>	<b>1.78*</b>	<b>2.98**</b>	<b>4.53**</b>	<b>8.32**</b>	<b>5.25**</b>
	RPCA	<b>0.99</b>	<b>0.95</b>	<b>0.59**</b>	<b>0.80</b>	<b>0.92</b>	<b>1.64*</b>	<b>2.87**</b>	<b>6.15**</b>	<b>8.83*</b>	<b>5.59**</b>
	EM	1.25	1.26	<b>0.75*</b>	<b>0.70</b>	<b>0.73<sub>FB</sub></b>	<b>2.42*</b>	3.90	<b>6.00**</b>	10.68	<b>12.29**</b>
	KF	1.05	1.14	<b>0.54**</b>	<b>0.51</b>	<b>0.94</b>	1.81	<b>2.69**</b>	6.41**	<b>8.38*</b>	9.16*
Unrestricted w/o AR	OPCA	2.22**	3.59*	8.08	1.37	1.96	2.40	2.76	4.94	8.79	7.04**
	RPCA	2.22**	3.59*	8.08	1.37	1.96	2.40	2.76	4.94	8.79	7.04**
	EM	2.68	7.01	2.74	1.45	1.52	2.56**	4.33**	12.69**	17.92	35.37
	KF	7.10	1.70	1.66	<b>0.45<sub>FB</sub></b>	<b>0.89</b>	3.04	3.61	7.99*	10.73**	8.36*
Unrestricted w/ AR	OPCA	1.45	1.17	1.34	1.58	3.19	1.72	3.41	14.01	51.21	8.91*
	RPCA	1.45	1.17	1.34	1.58	3.19	1.72	3.41	14.01	51.21	8.91*
	EM	1.31	1.51	1.27	1.29	4.55	4.62**	6.63**	18.09**	20.95	30.76
	KF	<b>0.81</b>	1.19	<b>0.87</b>	<b>0.49**</b>	2.44	3.84	2.05	<b>12.68*</b>	12.98	7.01
Smoothed	OPCA	1.58	1.17	<b>0.96</b>	<b>0.77</b>	1.04	<b>0.75<sub>FB</sub></b>	1.21	<b>1.18<sub>FB</sub></b>	<b>1.38<sub>FB</sub></b>	<b>2.78<sub>FB</sub></b>
	RPCA	1.58	1.17	<b>0.96</b>	<b>0.77</b>	1.04	<b>0.75<sub>FB</sub></b>	1.21	<b>1.18<sub>FB</sub></b>	<b>1.38<sub>FB</sub></b>	<b>2.78<sub>FB</sub></b>
	EM	1.46	1.51	1.01	<b>0.79</b>	<b>0.98</b>	1.16	1.22	1.74	2.21	3.18**
	KF	1.35	1.32	<b>0.92</b>	<b>0.78</b>	<b>0.95</b>	<b>0.84</b>	<b>1.11<sub>FB</sub></b>	1.44	1.55	3.49
<b>-- Mean of 5 factors --</b>		<b>0.80<sub>FB</sub></b>	<b>0.85<sub>FB</sub></b>	<b>0.58**</b>	<b>0.49**</b>	<b>0.76</b>	<b>0.94</b>	1.47	2.87	5.49	<b>5.75**</b>
Basic w/o AR	OPCA	<b>0.89</b>	<b>0.97</b>	<b>0.71</b>	1.06	1.77	3.05	<b>4.85**</b>	7.67	10.30*	9.27
	RPCA	<b>0.98</b>	<b>0.91</b>	<b>0.67</b>	<b>0.86</b>	1.80	3.00	<b>4.20**</b>	11.54	10.31	16.40
	EM	1.02	1.07	<b>0.87*</b>	<b>0.93</b>	1.19	<b>2.86*</b>	5.82*	11.75	21.13**	20.92**
	KF	<b>0.83<sub>FB</sub></b>	<b>0.96</b>	<b>0.61**</b>	<b>0.66</b>	3.17	2.67	<b>4.63*</b>	<b>12.18*</b>	15.73	19.44
Basic w/ AR	OPCA	<b>0.87</b>	<b>0.97</b>	<b>0.68*</b>	<b>0.86</b>	1.58	2.79	<b>4.57**</b>	16.88	<b>11.43*</b>	9.58
	w/ AR										

	RPCA	<b>0.97</b>	<b>0.98</b>	<b>0.58**<sub>FB</sub></b>	<b>0.78</b>	1.60	2.66	4.12*	10.12	11.76*	17.07
	EM	1.12	1.21	<b>0.88</b>	<b>1.00</b>	1.97	3.35*	5.76**	12.72*	13.16**	22.86
	KF	<b>0.86</b>	<b>0.94</b>	<b>0.63**</b>	<b>0.67</b>	3.08	3.17*	3.68*	10.09	23.93*	25.87**
	OPCA	2.23*	1.96	2.28	3.99*	2.01*	7.14**	3.36	10.95	18.15	12.90
Unrestricted	RPCA	2.23*	1.96	2.28	3.99*	2.01*	7.14**	3.36	10.95	18.15	12.90
w/o AR	EM	2.39	1.80	1.55	2.51	11.03	7.34*	2.83	8.83*	17.76	10.61*
	KF	1.90	1.42	2.70	3.39	3.75**	4.54**	4.03*	7.75	13.24	16.63*
	OPCA	3.50*	4.03	2.36	<b>0.71*</b>	1.10	2.66	3.75	19.39	25.66	14.75
Unrestricted	RPCA	3.50*	4.03	2.36	<b>0.71*</b>	1.10 <sub>FB</sub>	2.66	3.75	19.39	25.66	14.75
w/ AR	EM	2.45	1.63	1.48	1.27	3.70	6.44	4.23**	18.23*	21.46*	14.84*
	KF	1.65	1.42	1.99	<b>0.76</b>	3.19	2.14	3.06*	16.51	29.45	16.39
	OPCA	1.38	1.01	1.01	1.02	1.38*	<b>0.85<sub>FB</sub></b>	1.92 <sub>FB</sub>	1.50** <sub>FB</sub>	1.48 <sub>FB</sub>	3.91** <sub>FB</sub>
Smoothed	RPCA	1.38	1.01	1.01	1.02	1.38*	<b>0.85<sub>FB</sub></b>	1.92	1.50** <sub>FB</sub>	1.48 <sub>FB</sub>	3.91** <sub>FB</sub>
	EM	1.29	1.23	<b>0.96</b>	1.18	1.19	1.25	2.53	2.63*	2.30	5.76
	KF	1.33	1.16	<b>0.91</b>	1.20	1.29	<b>0.94</b>	2.73	2.29	1.74*	7.24*
-- Mean of 6 factors --		<b>0.86</b>	<b>0.73**<sub>FB</sub></b>	<b>0.70</b>	<b>0.56**<sub>FB</sub></b>	<b>1.39</b>	<b>1.91</b>	<b>2.06</b>	<b>7.00</b>	<b>9.21</b>	<b>8.67</b>
Mean of MIDAS		<b>0.62</b>	<b>0.69</b>	<b>0.45**</b>	<b>0.36**</b>	<b>0.52**</b>	<b>0.65**</b>	<b>0.84</b>	1.34	2.15	2.71*
Mean of All		<b>0.75*</b>	<b>0.80*</b>	<b>0.57**</b>	<b>0.52**</b>	<b>0.63**</b>	<b>0.74**</b>	<b>0.85</b>	1.04	1.49	1.68

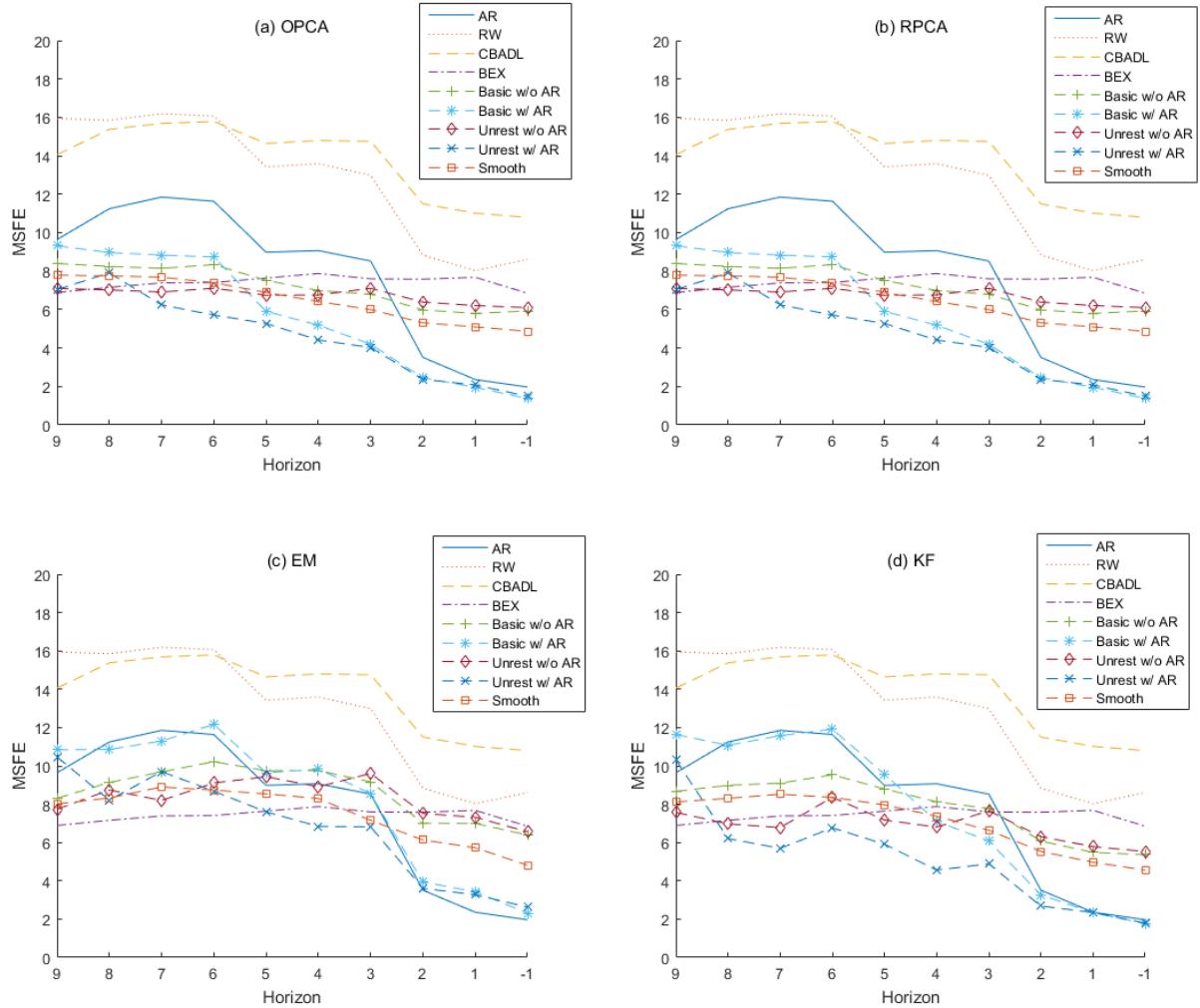
\* Notes: See notes to Tables 1-4.

Table A 3: Summary of MSFE-Best Models Across All Modelling Permutations in Rolling Estimation\*

Fac. No.	Backcast prev. qtr.		Nowcast current quarter			1 quarter ahead			Forecast		
	-1	1	2	3	4	5	6	7	8	9	
First Available	1	Basic w/ AR KF	<b>Basic w/ AR KF</b>	Unrestricted RPCA	Unrestricted OPCA	Unrestricted KF	Unrestricted w/o AR KF	Unrestricted w/o AR KF	Unrestricted w/o AR OPCA	Unrestricted w/o AR KF	Unrestricted w/o AR KF
	2	Basic w/ AR KF	Basic w/ AR RPCA	Basic w/ AR KF	Basic w/ AR RPCA	Mean	Basic w/ AR OPCA	<b>Smoothed</b>	Mean	Smoothed	Smoothed
	3	Basic w/ AR KF	Basic w/ AR RPCA	Basic w/ AR KF	<b>Basic w/ AR KF</b>	Basic w/ AR KF	Basic w/ AR KF	Smoothed	Smoothed	Smoothed	Smoothed
	4	Basic w/ AR OPCA	Basic w/ AR OPCA	Basic w/ AR KF	Basic w/ AR KF	Basic w/ AR EM	Basic w/o AR RPCA	Smoothed	Smoothed	Smoothed	AR
	5	Basic w/o AR KF	AR	<b>Basic w/o AR KF</b>	Basic w/o AR KF	Basic w/ AR EM	Smoothed	Smoothed	AR	AR	AR
	6	Basic w/o AR KF	Basic w/o AR KF	Basic w/o AR KF	Mean	Unrestricted RPCA	Smoothed	AR	AR	AR	AR
Most Recent	1	Basic w/ AR KF	<b>Basic w/ AR KF</b>	Basic w/ AR RPCA	Mean	Unrestricted w/o AR KF	Unrestricted w/o AR KF	Unrestricted w/o AR KF	Unrestricted w/o AR RPCA	Unrestricted w/o AR KF	Unrestricted w/o AR KF
	2	Basic w/ AR KF	Basic w/ AR KF	Mean	Mean	Unrestricted w/o AR	<b>Smoothed</b>	Mean	Smoothed	Smoothed	Smoothed
	3	Basic w/ AR KF	Mean	<b>Basic w/o AR KF</b>	<b>Basic w/ AR KF</b>	<b>Basic w/ AR KF</b>	Basic w/ AR KF	Smoothed	Smoothed	Smoothed	AR
	4	Basic w/ AR OPCA	Basic w/ AR OPCA	Basic w/ AR KF	Basic w/ AR RPCA	Basic w/ AR KF	Basic w/o AR EM	Smoothed	Smoothed	Smoothed	AR
	5	Mean	Mean	OPCA	Unrestricted w/o AR	Basic w/o AR KF	Basic w/ AR EM	Smoothed	AR	AR	AR
	6	Basic w/o AR KF	Mean	Basic w/ AR RPCA	Mean	AR	Both PCAs	Smoothed	AR	AR	AR

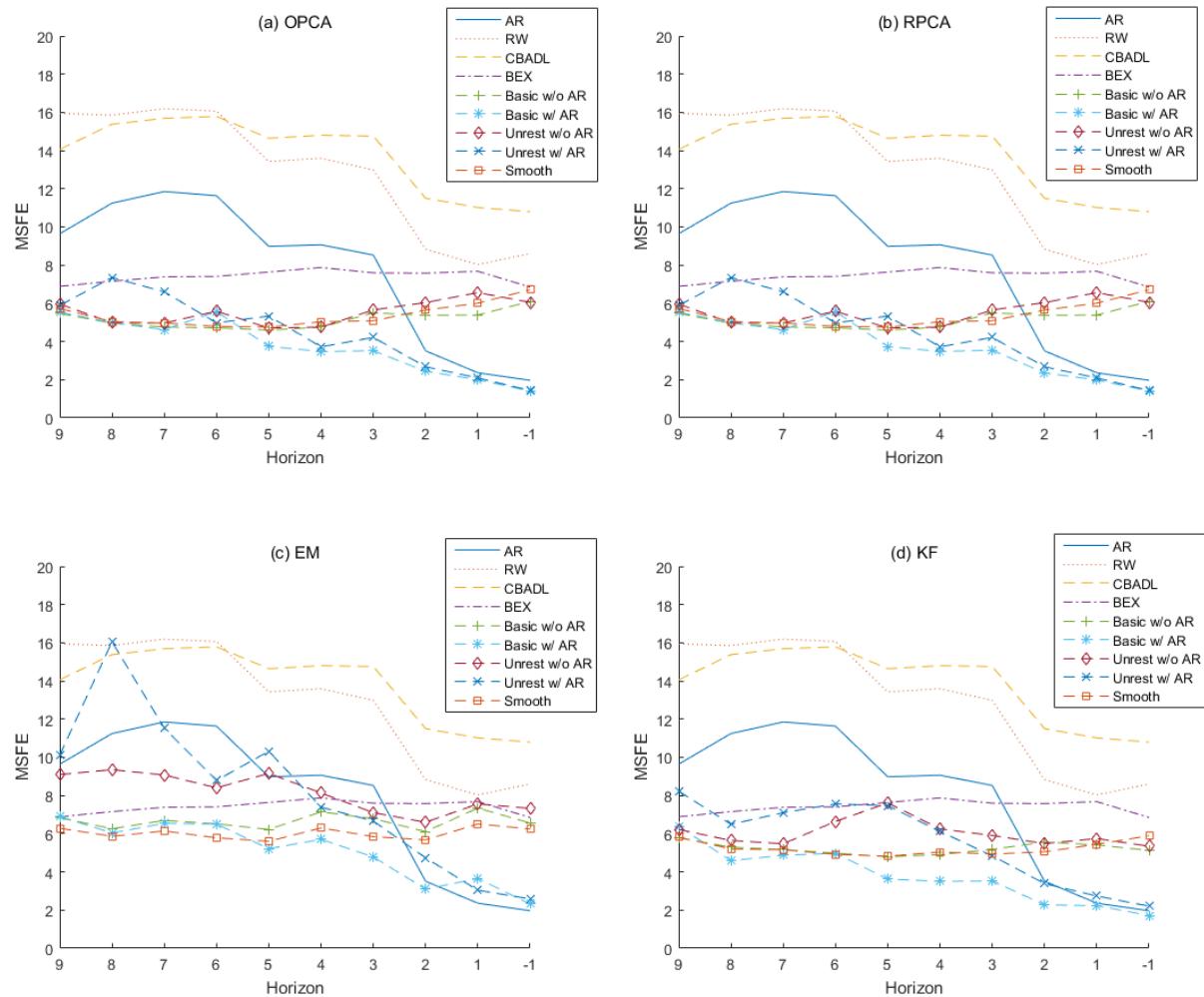
\* Notes: See notes to Table 5. Entries indicate the model and estimation methods for all ‘MSFE-best’ specifications, by historical data type, number of factors used, and horizon. Entries in the row labeled ‘All’ are the ‘MSFE-best’ models across all factor specifications, for a given historical data type. All model estimation is done recursively and AR interpolation is used for missing value construction. For example, for the ‘Backcast’ horizon, the ‘Basic factor-MIDAS’ model with AR terms and with factors estimated using OPCA is the ‘globally best’ performer when experiments are conducted using ‘first available’ real-time historical data. When MSFEs based on the use of OPCA and RPCA are the same up to three decimal places, the PCA method is denoted by ‘both PCA’. Bold entries are the best performer among models with different number of factors in each vintage.

Figure A 1: MSFEs of Forecasting Models Constructed Using One Factor ( $r = 1$ )<sup>\*</sup>



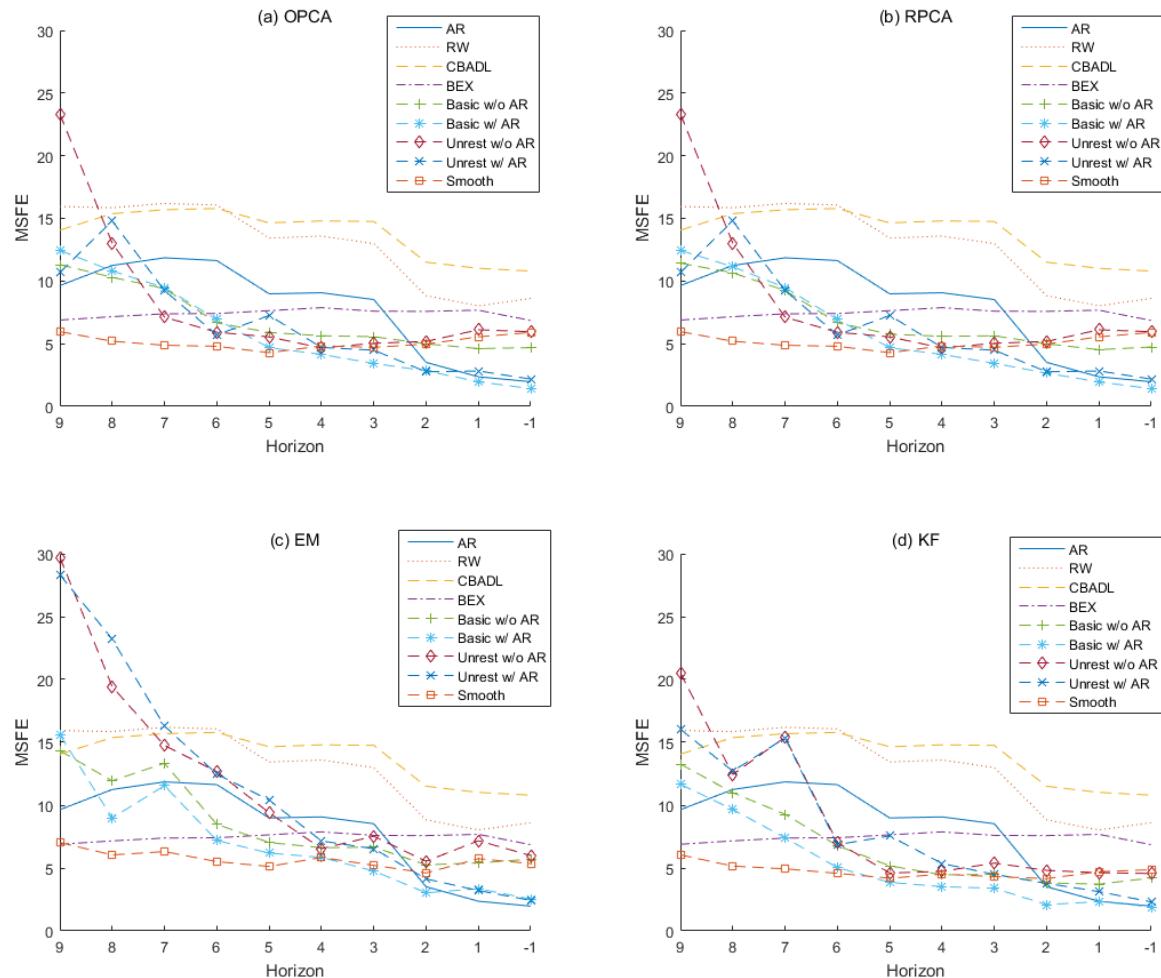
\* Notes: See notes to Figure 5 in main paper. Each panel plots the MSFEs of various models for a different estimation method. Benchmark models, including AR, CBADL and BEX, are redundantly included in all panels of this figure, for comparability. ‘Basic w/o AR’ and ‘Basic w/ AR’ are the basic factor-MIDAS models with and without AR terms. ‘Unrest’ and ‘Smooth’ denote alternative factor-MIDAS specifications (see Section 4). OPCA and RPCA are implemented with AR interpolation, and all forecasts are based on recursively estimated models. See Section 5 for complete details.

Figure A 2: MSFEs of Forecasting Models Constructed Using Two Factors ( $r = 2$ )\*



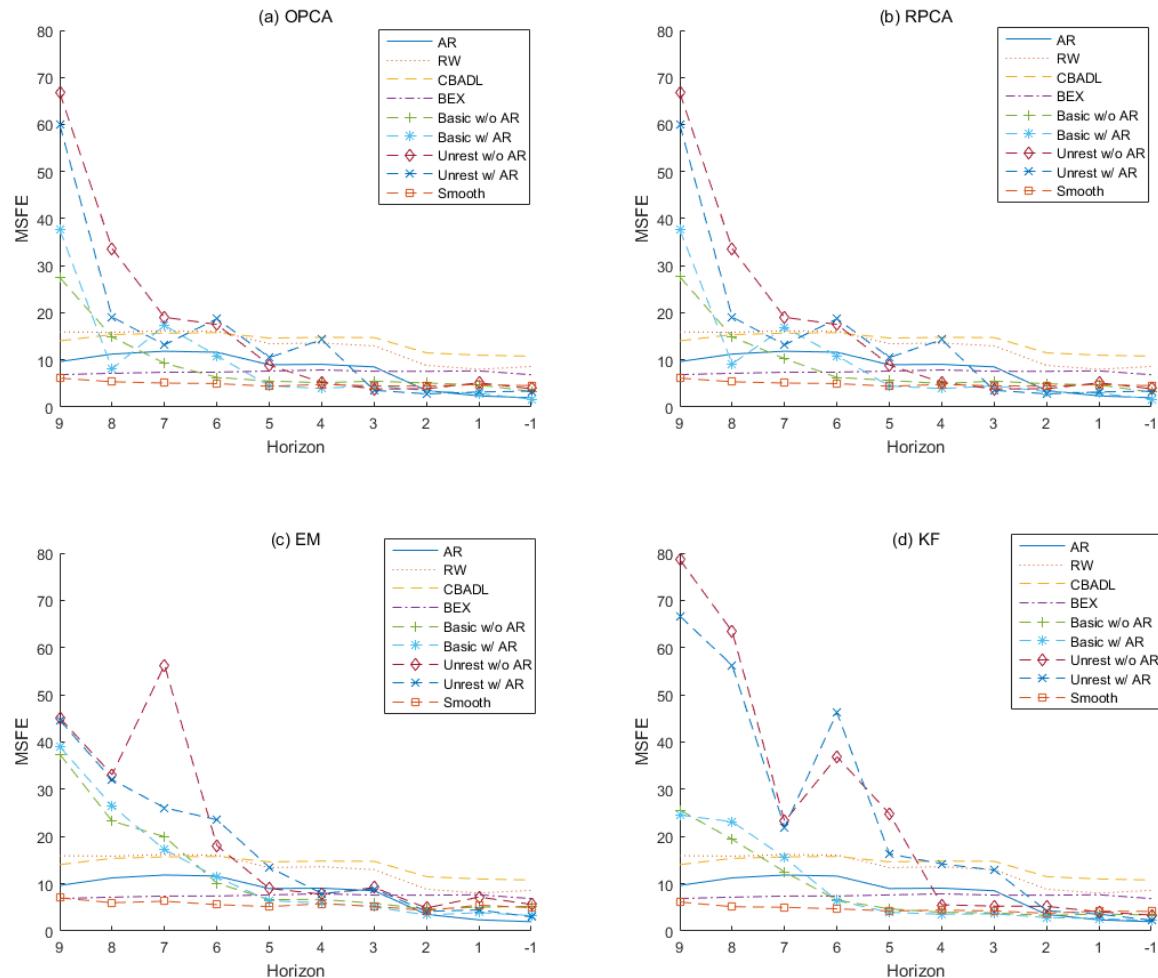
\* Notes: See notes to Figure A1.

Figure A 3: MSFEs of Forecasting Models Constructed Using Three Factors ( $r = 3$ )<sup>\*</sup>



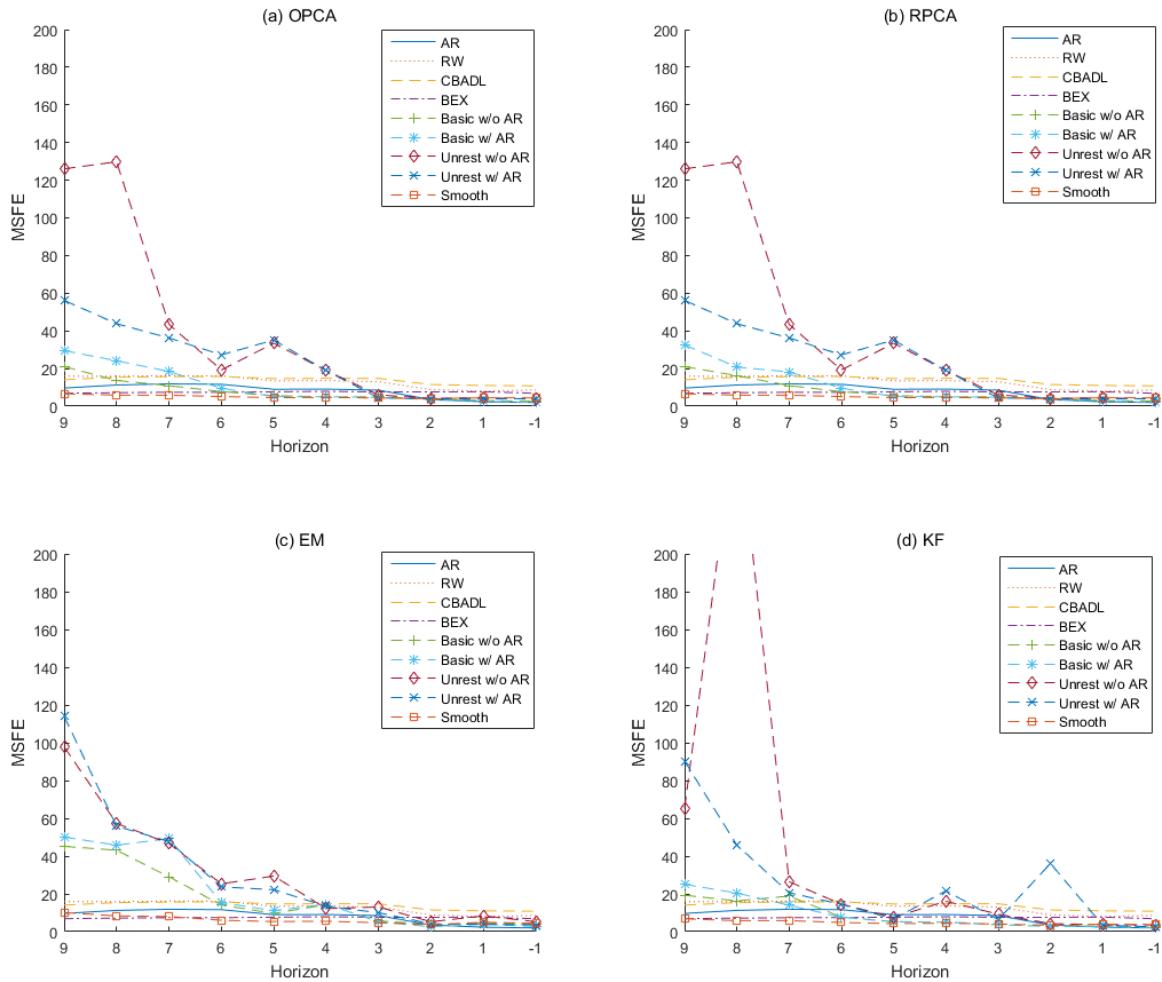
\* Notes: See notes to Figure A1.

Figure A 4: MSFEs of Forecasting Models Constructed Using Four Factors ( $r = 4$ )<sup>\*</sup>



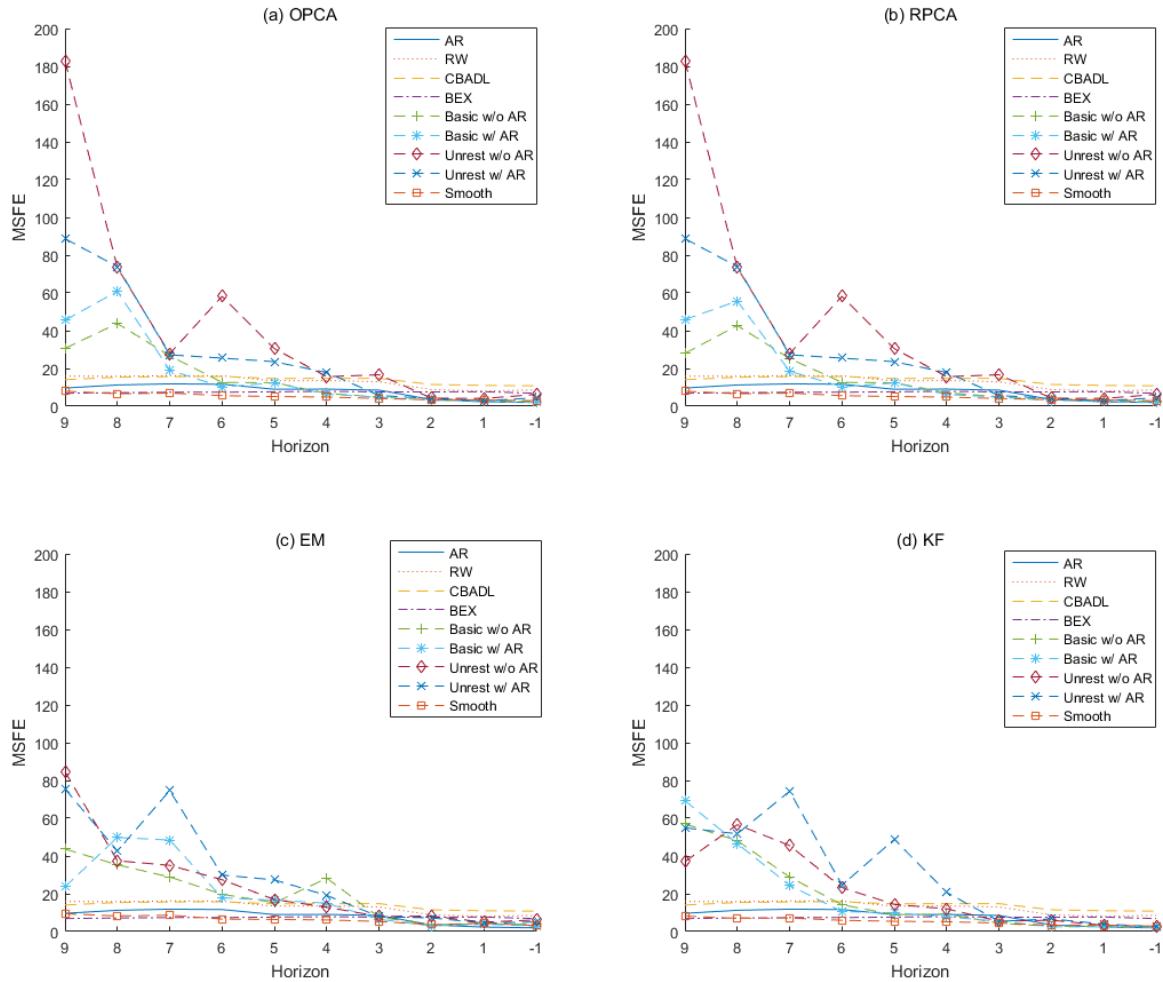
\* Notes: See notes to Figure A1.

Figure A 5: MSFEs of Forecasting Models Constructed Using Five Factors ( $r = 5$ )\*



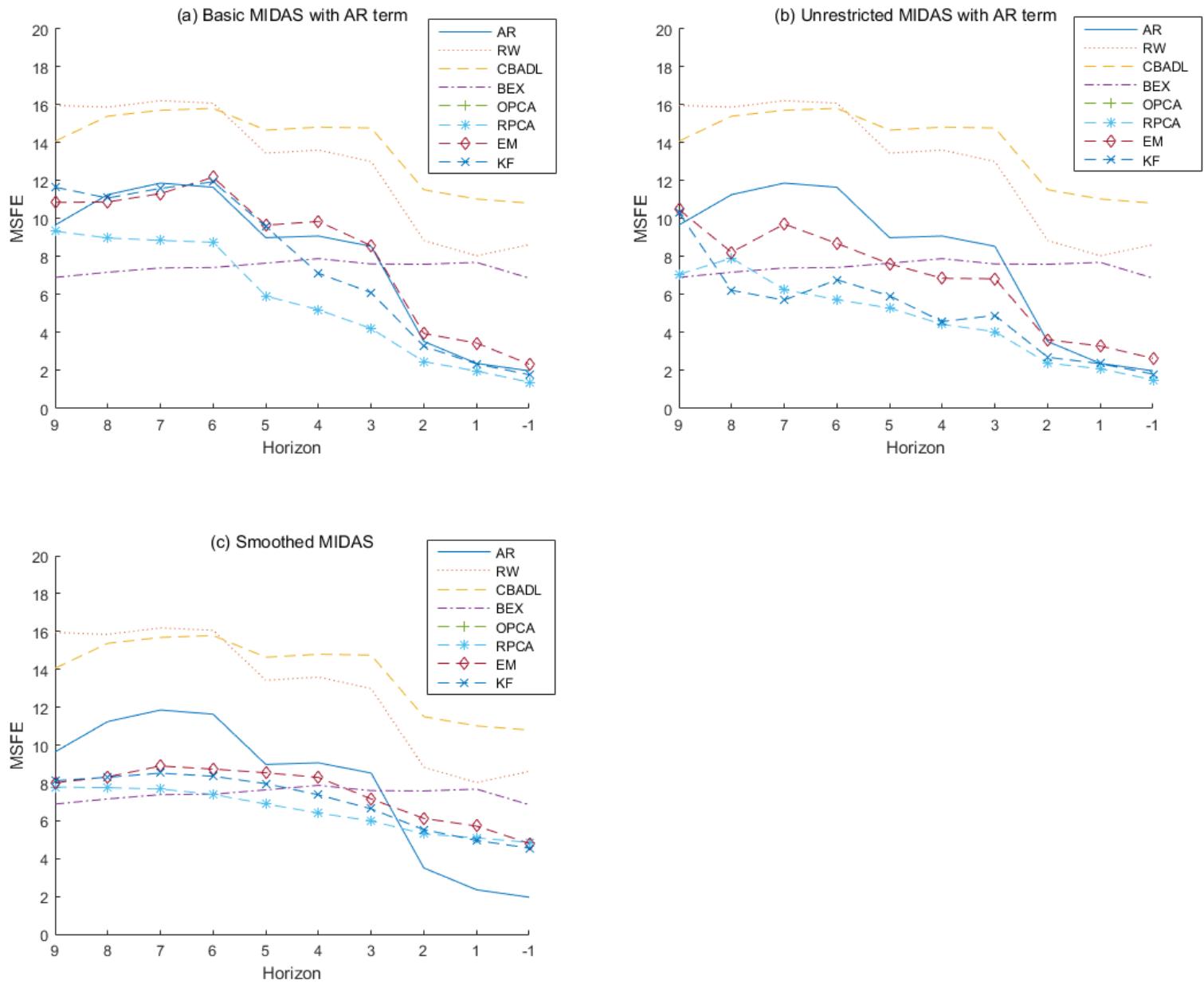
\* Notes: See notes to Figure A1.

Figure A 6: MSFEs of Forecasting Models Constructed Using Six Factors ( $r = 6$ )<sup>\*</sup>



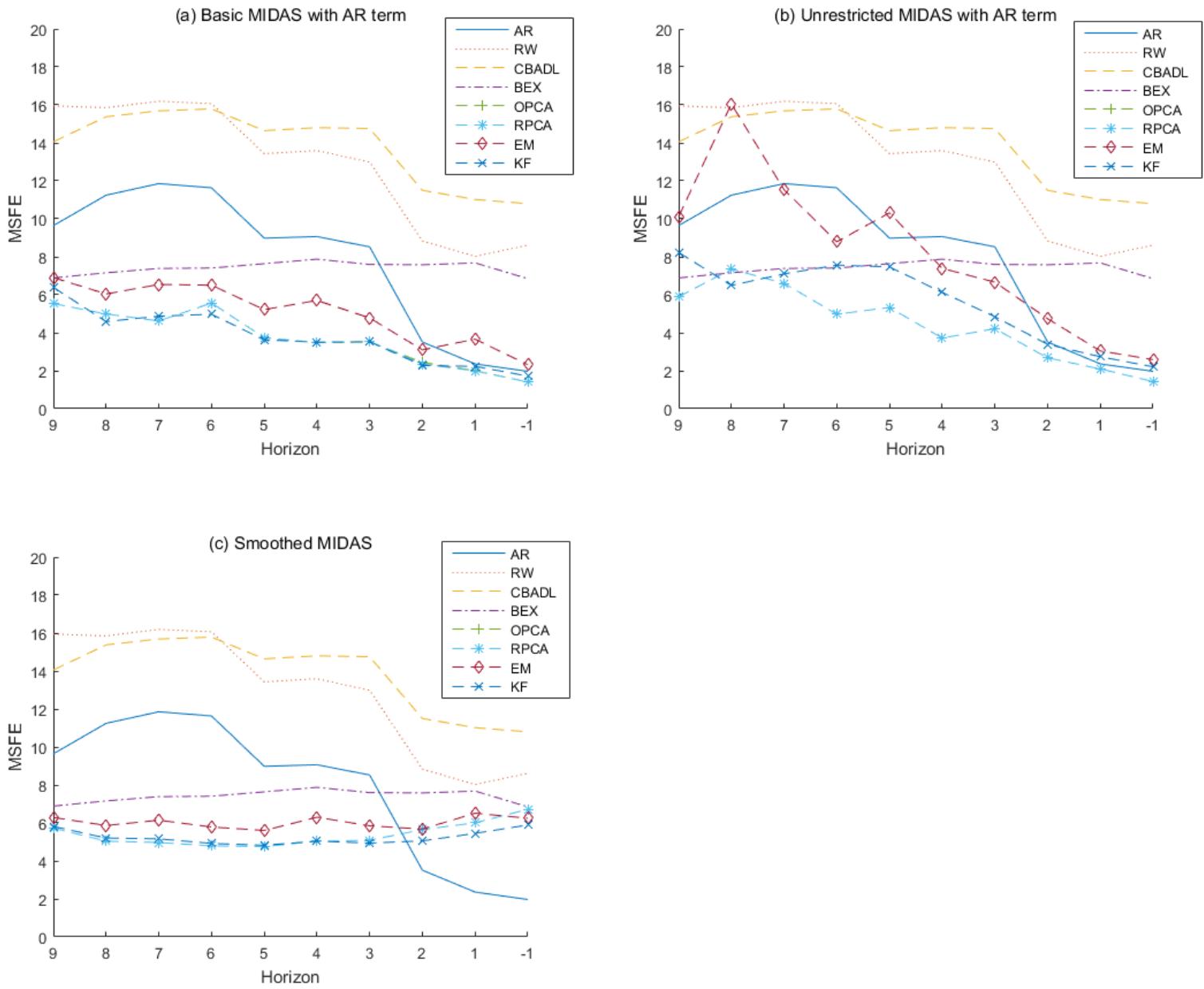
\* Notes: See notes to Figure A1.

Figure A 7: MSFEs of Factor-MIDAS Models with One Factor ( $r = 1$ )\*



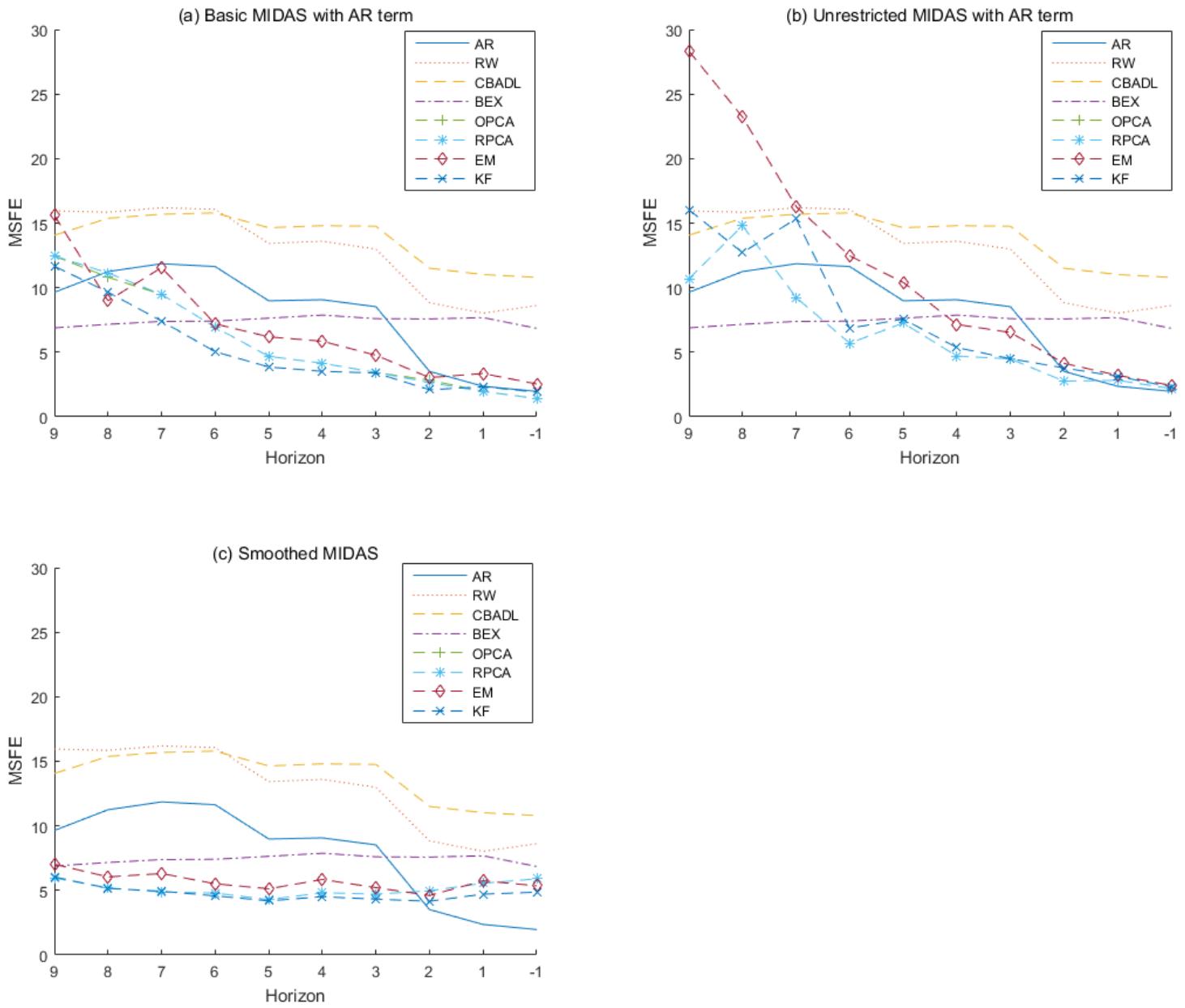
\* Notes: See the Notes to Figure A1.

Figure A 8: MSFEs of Factor-MIDAS Models with Two Factors ( $r = 2$ )\*



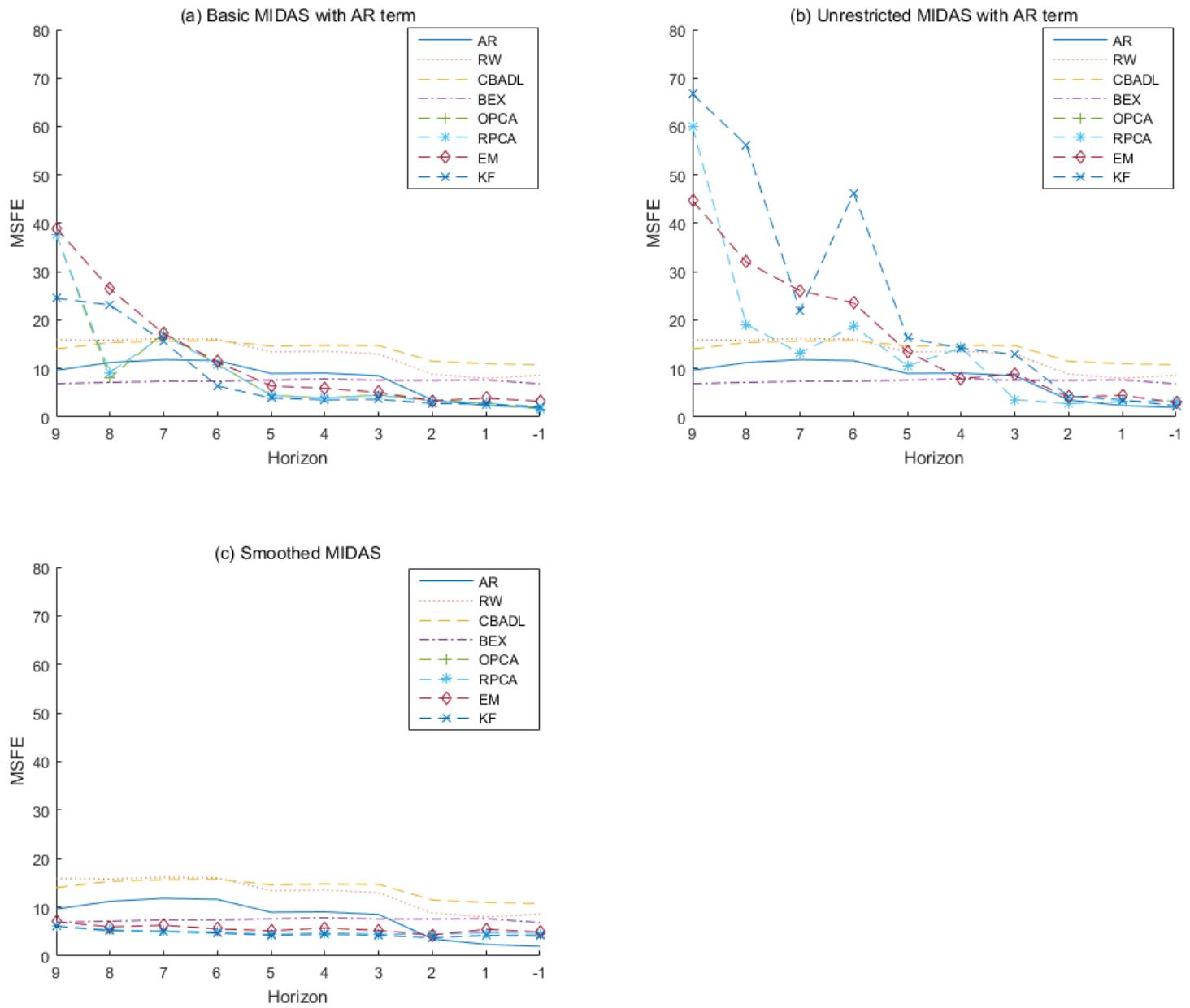
\* Notes: See the Notes to Figure A1.

Figure A 9: MSFEs of Factor-MIDAS Models with Three Factors ( $r = 3$ )<sup>\*</sup>



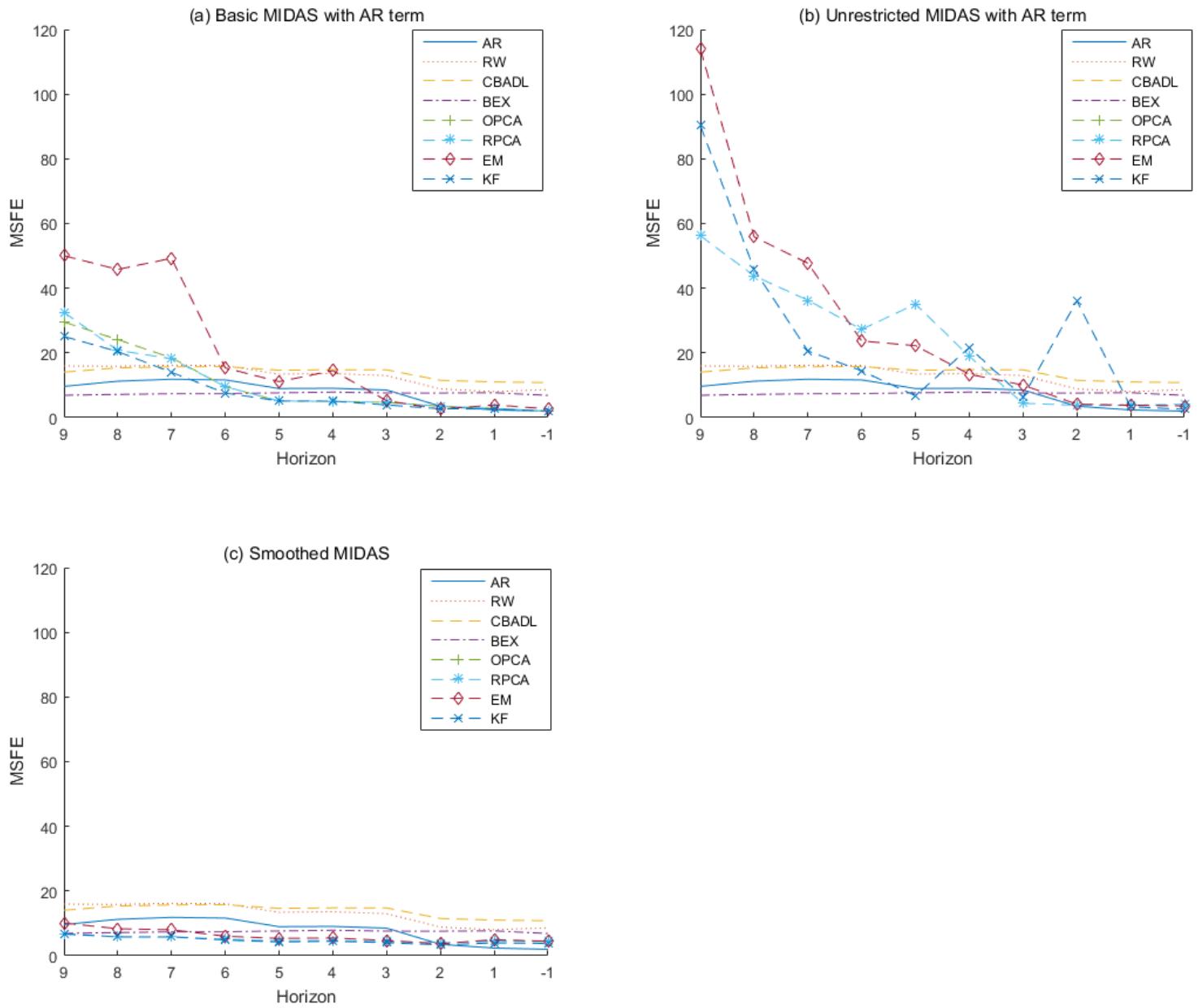
\* Notes: See the Notes to Figure A1.

Figure A 10: MSFEs of Factor-MIDAS Models with Four Factors ( $r = 4$ )\*



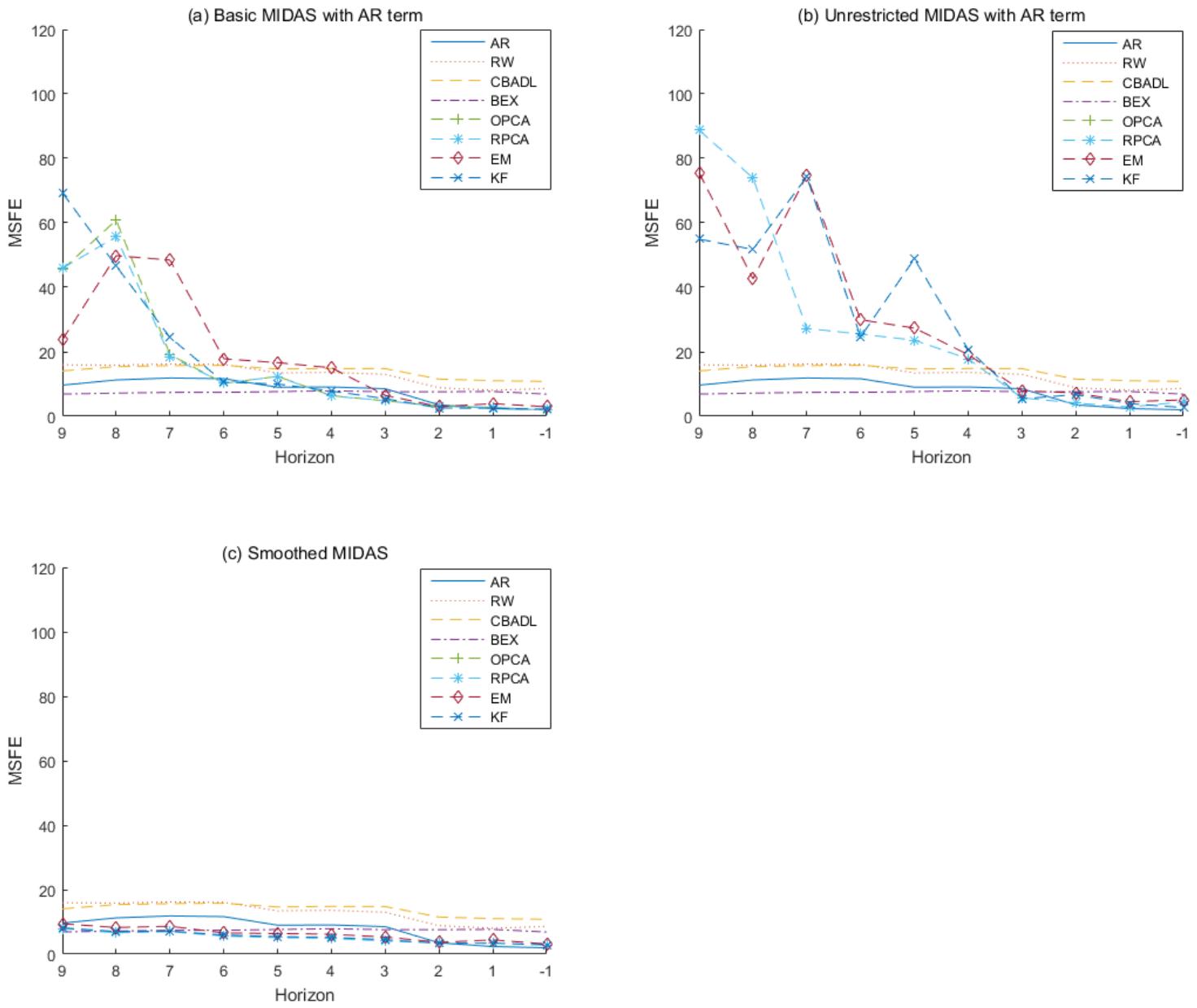
\* Notes: See the Notes to Figure A1.

Figure A 11: MSFEs of Factor-MIDAS Models with Five Factors ( $r = 5$ )\*



\* Notes: See the Notes to Figure A1.

Figure A 12: MSFEs of Factor-MIDAS Models with Six Factors ( $r = 6$ )\*



\* Notes: See the Notes to Figure A1.

In the main paper we note that "As pointed out by a referee, one important area of ongoing research in the current context involves the construction of density forecasts. Although this topic is left to future research, it is useful to note that many types of density forecasts are available to the practitioner. For example, in the following figures, we provide selected kernel density plots, for various values of  $h = 1$ , which are simply based on the distribution of all models' predictions from our experiments. Interestingly, at least based on these naive figures, it appears that downside risk is greater than upside risk, prior to the Great Recession around 2008."

Figure A 13: Kernel Density of all factor MIDAS permutation

