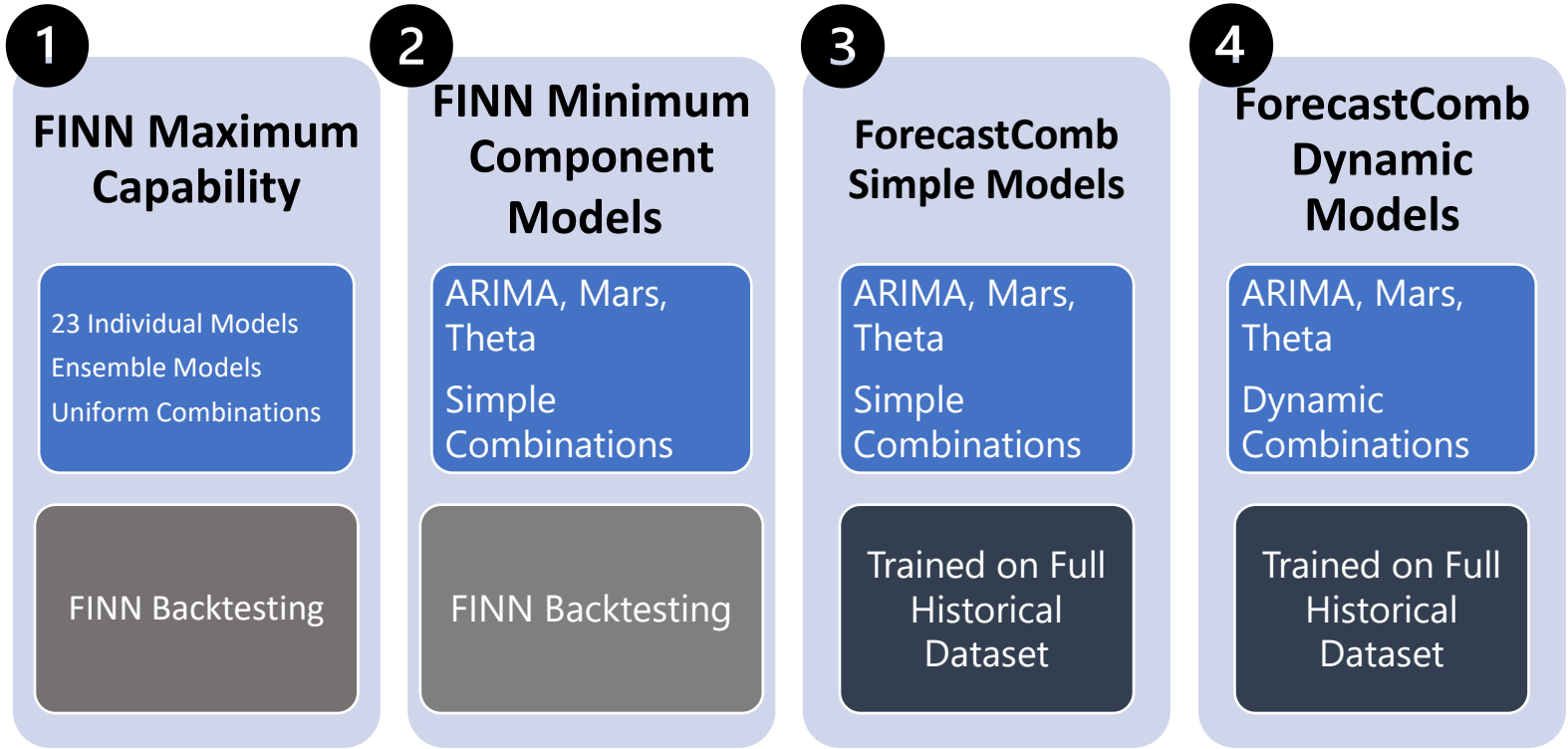
Experiment Design

How do we compare effectiveness of dynamic models to FINNs current functionality?

Do dynamic combinations yield forecasts with lower MAPE's compared to what FINN is capable of today?

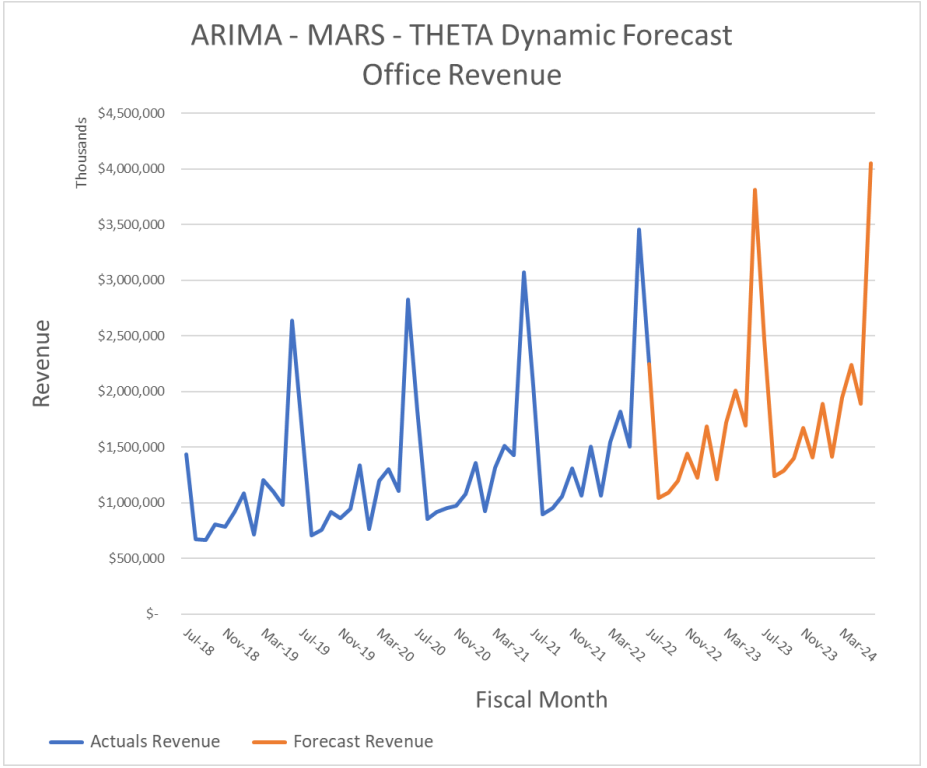


Best MAPE	1	2	3	4
Office Revenue				
C+E Revenue				
Surface Revenue				

Dynamic Combination Performance

ForecastComb Dynamic Models beat ForecastComb Simple models; FINN comparison inconclusive.

Best MAPE	FINN Maximum	FINN Comparison	ForeComb Simple	ForeComb Dynamic
Office Revenue	6.5%	6.4%	13.0%	6.9%
C+E Revenue	8.2%	10.7%	13.7%	7.8%
Surface Revenue	15.6%	20.2%	31.0%	19.0%



- Dynamic models outperformed simple models by 8% on average
- Dynamic models outperformed FINN comparison in C+E Revenue by 3%; negligible differences otherwise

Model Weights:

mars-R1	0.14467073
arima	0.94672869
theta	-0.09949517

NOTE:
FINN MAPE's yielded in a back testing process with selection bias.
ForecastComb MAPE's are yielded from a model trained on all historical data.

Outlook

FINN can gain strength from dynamic forecasts in the quest for a lower MAPE.

Initial tests for dynamic forecasts are promising

- Customized emphasis outperformed uniform emphasis

Learnings:

1. FINN backtesting includes bias for recent observations and immediate forecasts
   - Best Models MAPE not necessarily the lowest MAPE due to this bias
2. Limited component residuals access stunts combinations; requires full implementation

> *"…I would think the number of times the best model is a simple model average could be as high as 75-80%"*
> *- Mike Tokic, FD&E*

FINN Backtesting

Backtest	Train:Test Ratio	Forecast @ T=1	Backtest Weights
1	100/0	$ 455,855	0.4
2	90/10	$ 468,211	0.3
3	70/30	$ 439,130	0.2
4	50/50	$ 488,267	0.05
5	30/70	$ 428,305	0.05

Final Forecast $ 456,460

FINN Backtesting + Dynamic Weights

Backtest	Train:Test Ratio	ARIMA	MARS	THETA	Dynamic Fcst. @ T=1	Backtest Weights
1	100/0	0.3	0.4	0.3	$ 458,952	0.4
2	90/10	0.2	0.3	0.5	$ 475,222	0.3
3	70/30	0.8	0.1	0.1	$ 473,987	0.2
4	50/50	0.7	0.2	0.1	$ 480,626	0.05
5	30/70	0.6	0.3	0.1	$ 426,591	0.05

Final Forecast $ 466,306