

# Common Factors in Trend Following: Some Research In Progress

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# Overview

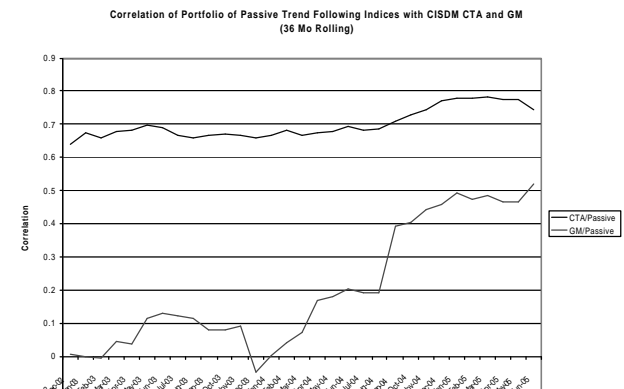
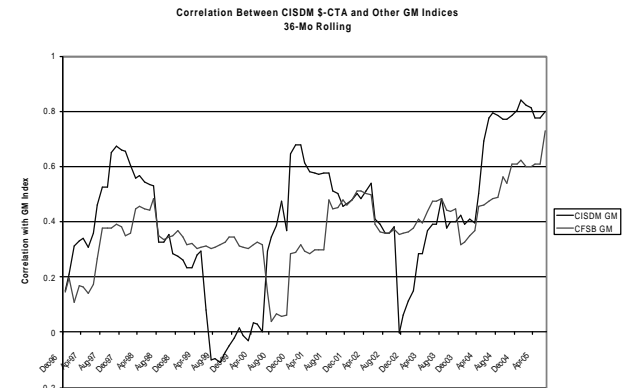
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- Increasing Commonality of Returns for CTA's and Global Macro
- Common Sources of Return to Trend Following
- Trading Strategies to Identify and Exploit Common Factors to Trend Following

# Observation: Increasing Correlation Between Trend Following and Global Macro

- Correlation between CISDM CTA-\$ and CISDM and CFSB GM Indices Increasing Since 2000
- Correlation between CISDM Passive Trend Following indices and CISDM CTA-\$ is stable
- Correlation between CISDM Passive Trend Following Indices and CISDM GM is increasing

	CISDM CTA-\$	CISDM GM	CFSB GM	CISDM CTA-TF	CISDM Pass TF
Annualized Return	7.5%	6.3%	13.4%	10.5%	0.7%
Annualized Vol	8.5%	4.1%	5.4%	15.0%	3.0%
Annualized Sharpe	0.526	0.808	1.920	0.502	



# Proposition: Trend Following as 'Theme Extraction'?

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- Global Macro managers look to identify market themes and make corresponding bets
  - Typically involve identifying which assets will be more correlated (because of the presence of a theme)
  - Typically momentum bets
- Traditionally, focus of research on trend following is on predictability of individual price series
- However, anyone who has managed a TF portfolio will recognize that the portfolio of individual positions will often express directional bets on a few related themes (dollar devaluation, fed tightening, commodity driven inflation, etc.)
- These bets are thus often similar to Global Macro positions
- Can we think of trend following as a mechanism for systematically identifying macro themes?

# Trendfollowing and Market Factors

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## Setup

- Daily data on TF and underlying returns across three complexes: currencies, interest rates, physicals, 1/2000-8/2005
  - 18 contracts, 6 per complex
- TF contract returns are before TC but include no collateral return

<b>Complex</b>	<b>Contracts</b>					
Currencies	<i>Yen</i>	<i>Euro</i>	<i>Pound</i>	<i>Aussie</i>	<i>Canadian</i>	<i>Peso</i>
Rates	<i>Treasuries</i>	<i>Bunds</i>	<i>Gilts</i>	<i>Eurodollar</i>	<i>Euribor</i>	<i>Short Sterling</i>
Physicals	<i>Crude</i>	<i>Natural Gas</i>	<i>Gold</i>	<i>Copper</i>	<i>Corn</i>	<i>Sugar</i>

# Trendfollowing and Market Factors

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## ○ Statistical Setup

- If trendfollowing is capturing market factors, we should see that in a correlation between the factors and returns to trendfollowing
  - Returns to Trend Following are proxied by equal weighted portfolios of contracts in each complex
- Principal Components is used to construct six orthogonal factors for each complex
  - Each factor is represented by positions in the six contracts associated with the complex
  - Positions can be long or short
- Factors are estimated daily, on data through T-1, based on a specified time horizons
  - Horizons:
    - Currencies: 30 to 100 day
    - Rates: 20 to 250 day
    - Physicals: 25 to 150 day
- Returns are out of sample based on factor weights
- Factors are identified A-F in decreasing order of significance, both in terms of explaining variability and in terms of vol

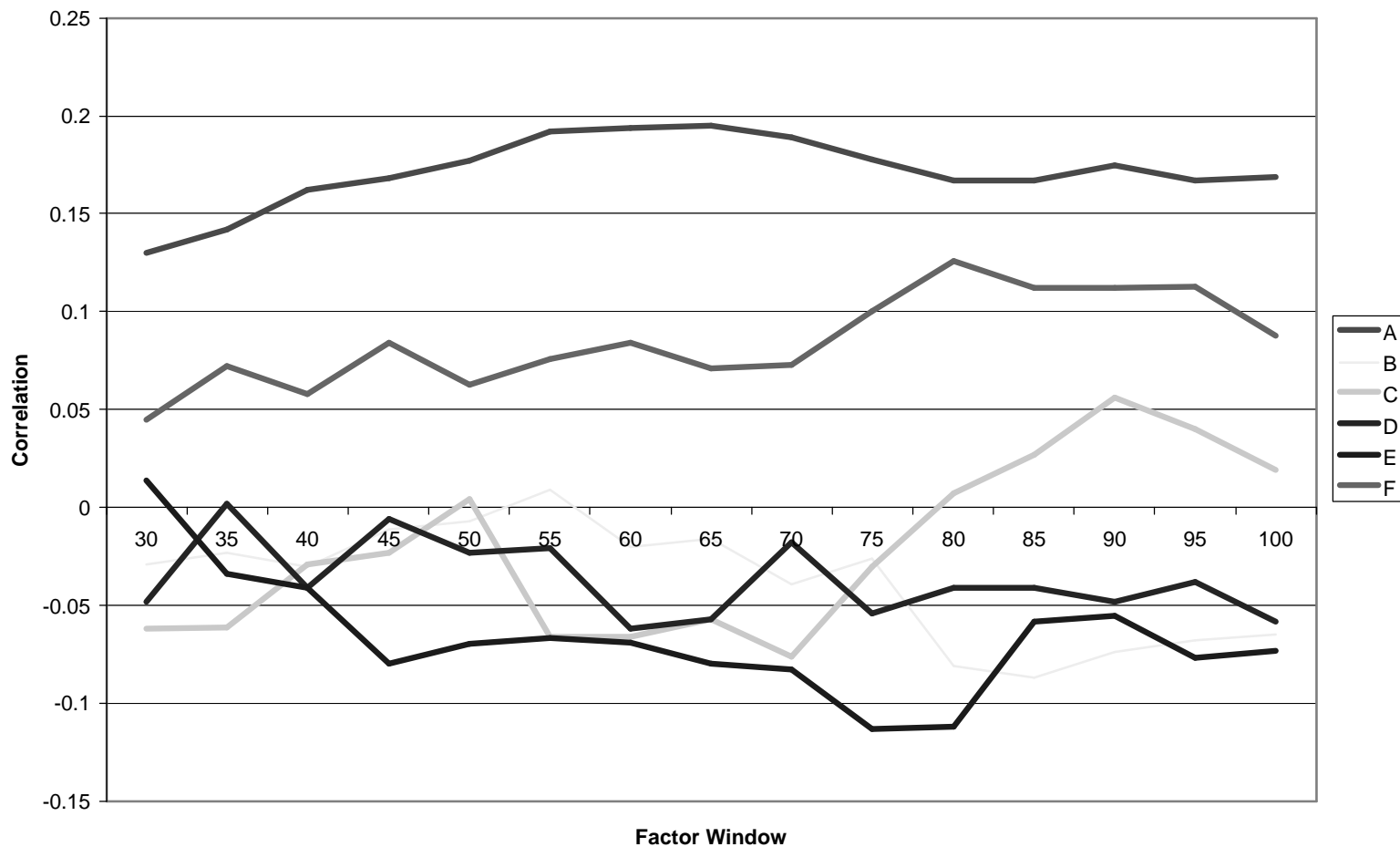
# Trendfollowing and Market Factors: Initial Results

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- Correlations between daily factor returns and trendfollowing portfolios are mildly positive
  - Stronger for Rates (~43%), Weaker for Currencies (~20%), and not significant for Physicals (~15%)
  - Correlations are generally stronger with the most significant market factor
- Correlations are similar in magnitude to correlations between equally weighted portfolio of contracts and trendfollowing on those contracts:
  - Currencies: 13%
  - Rates: 39%
  - Physicals: 22%
- Results are mildly disappointing

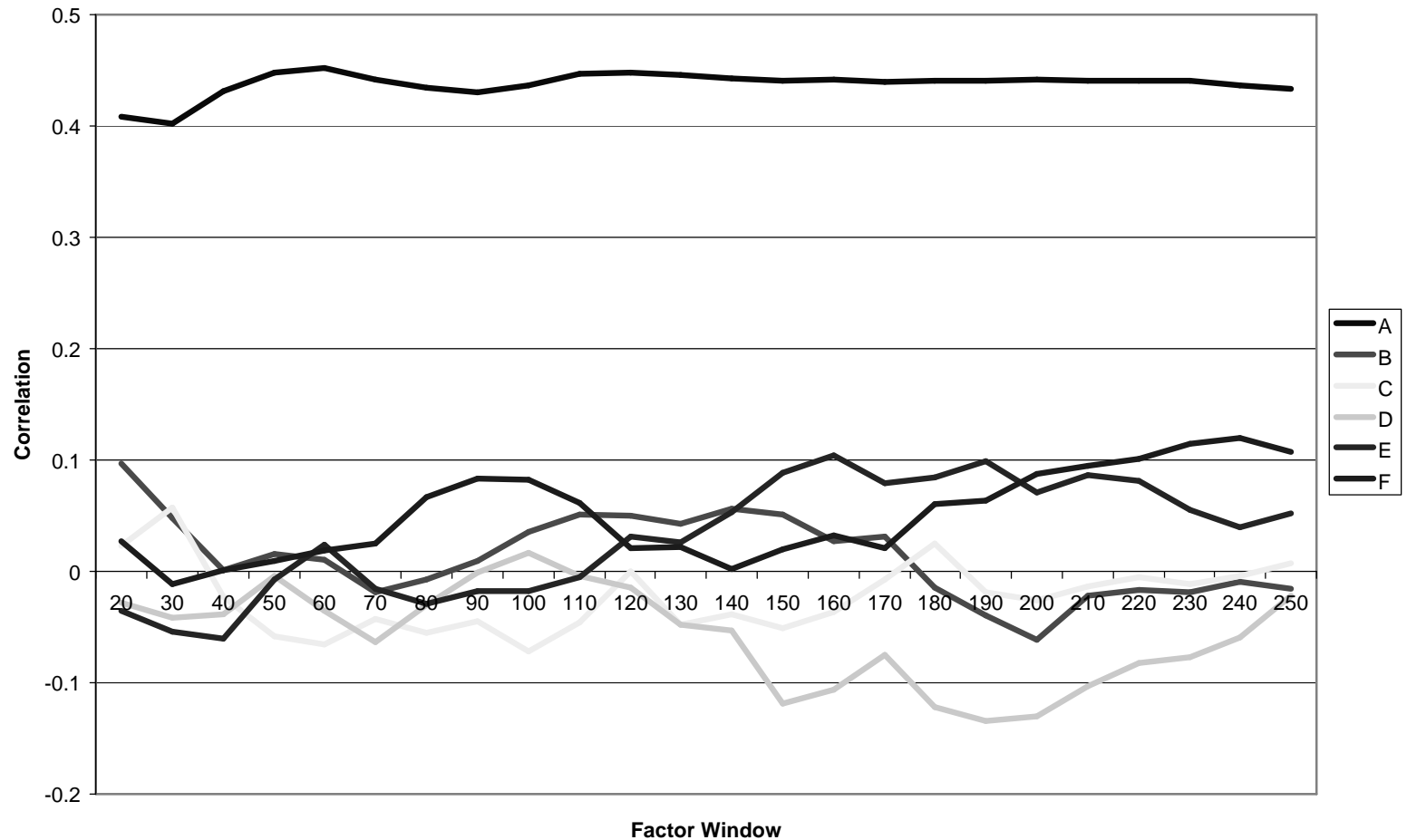
# Trendfollowing and Market Factors: Initial Results--Currencies

Currencies: Correlation Between TF Portfolio and Return Factors



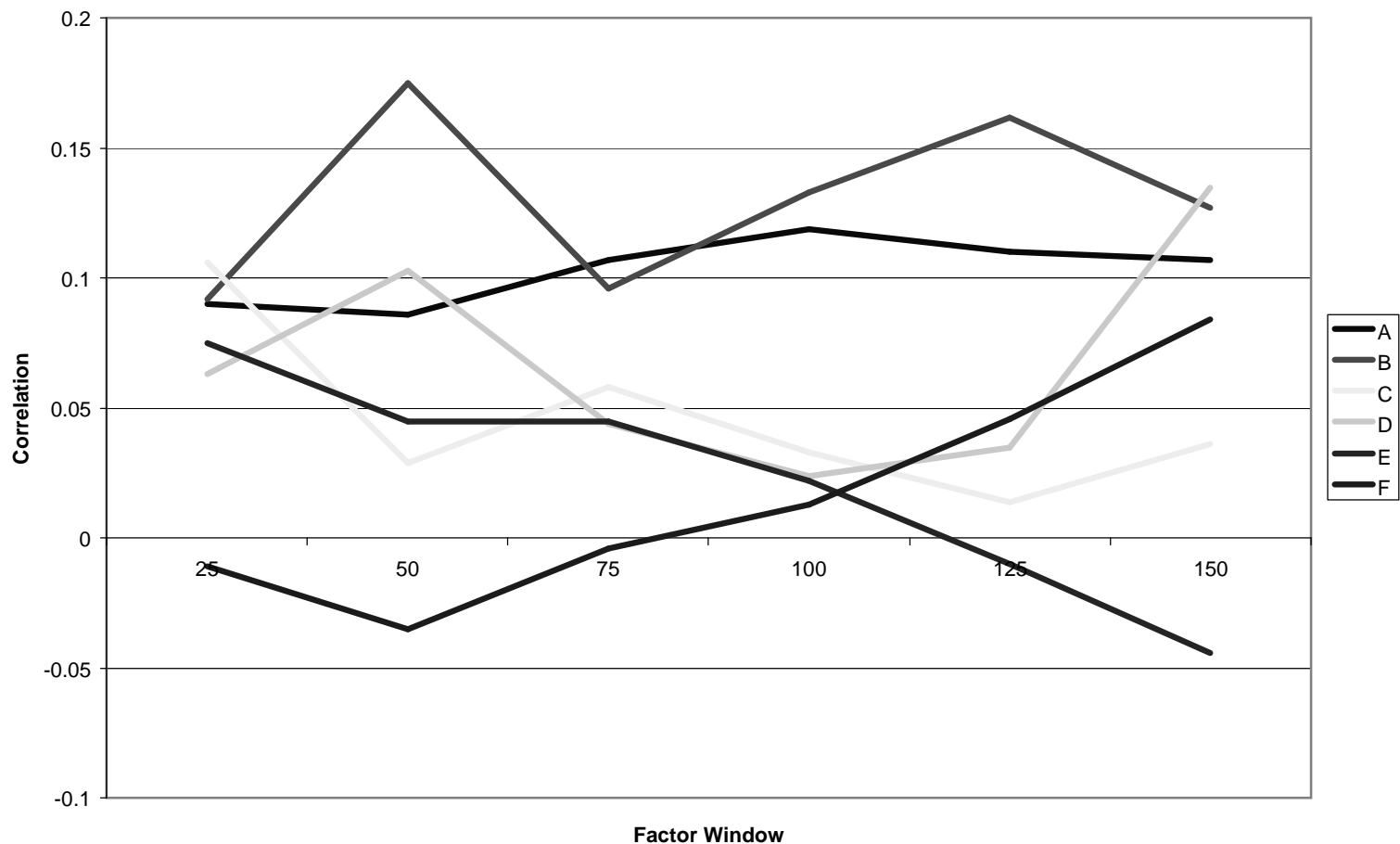
# Trendfollowing and Market Factors: Initial Results--Rates

Interest Rates: Correlation Between TF Portfolio and Return Factors



# Trendfollowing and Market Factors: Initial Results--Physicals

Physicals: Correlation of Portfolio of Trend Following and Return Factors





# Common Factors to Trend Following

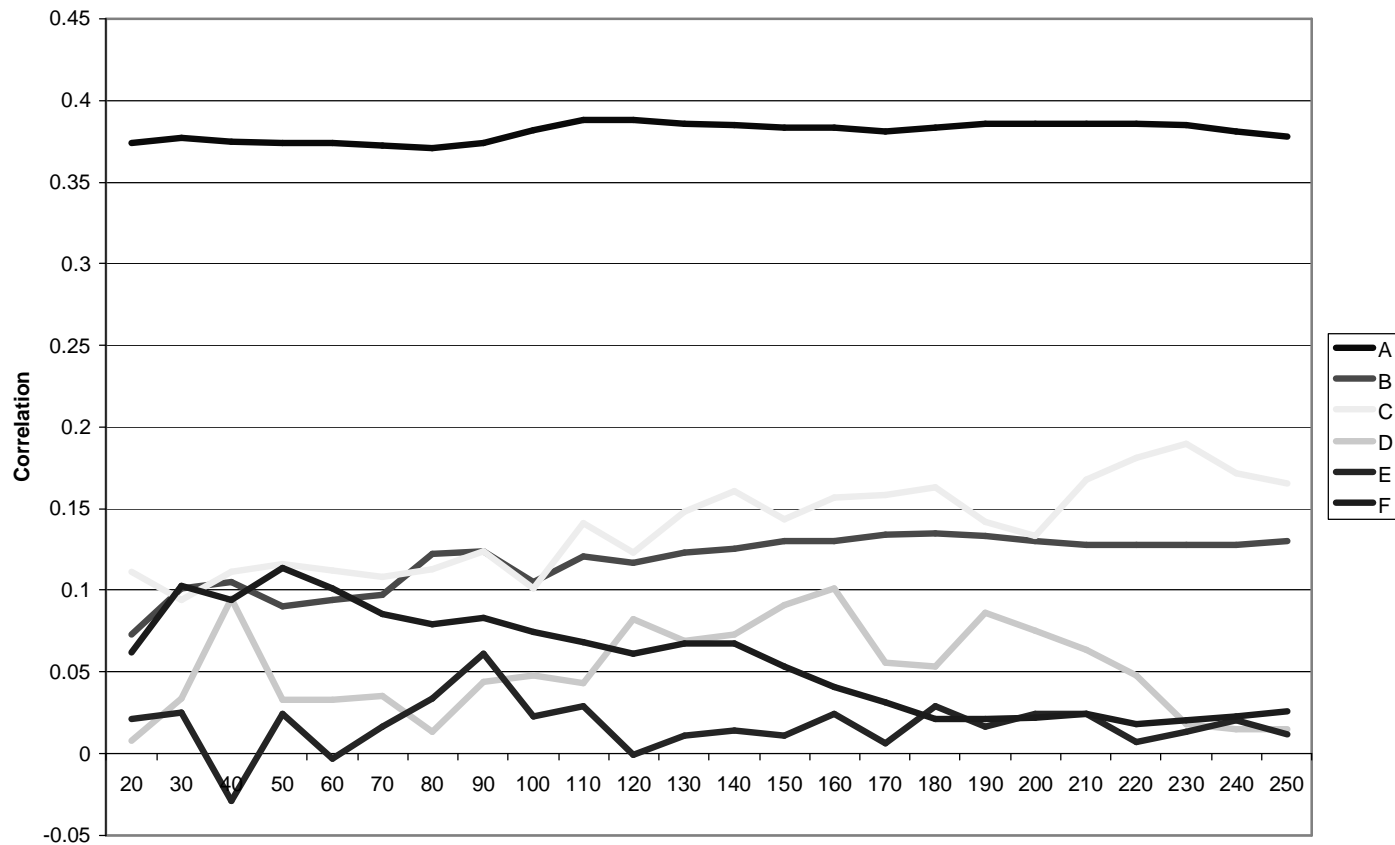
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- Instead of trying to establish a link between market factors and trend positions, can we identify common factors in trend driven positions?
- Conduct factor analysis as before, but this time we decompose returns to trend following of particular complexes
- Correlations between Trend Following factors and equally weighted portfolios of contracts are similar in magnitude to correlations between return factors and trendfollowing portfolios



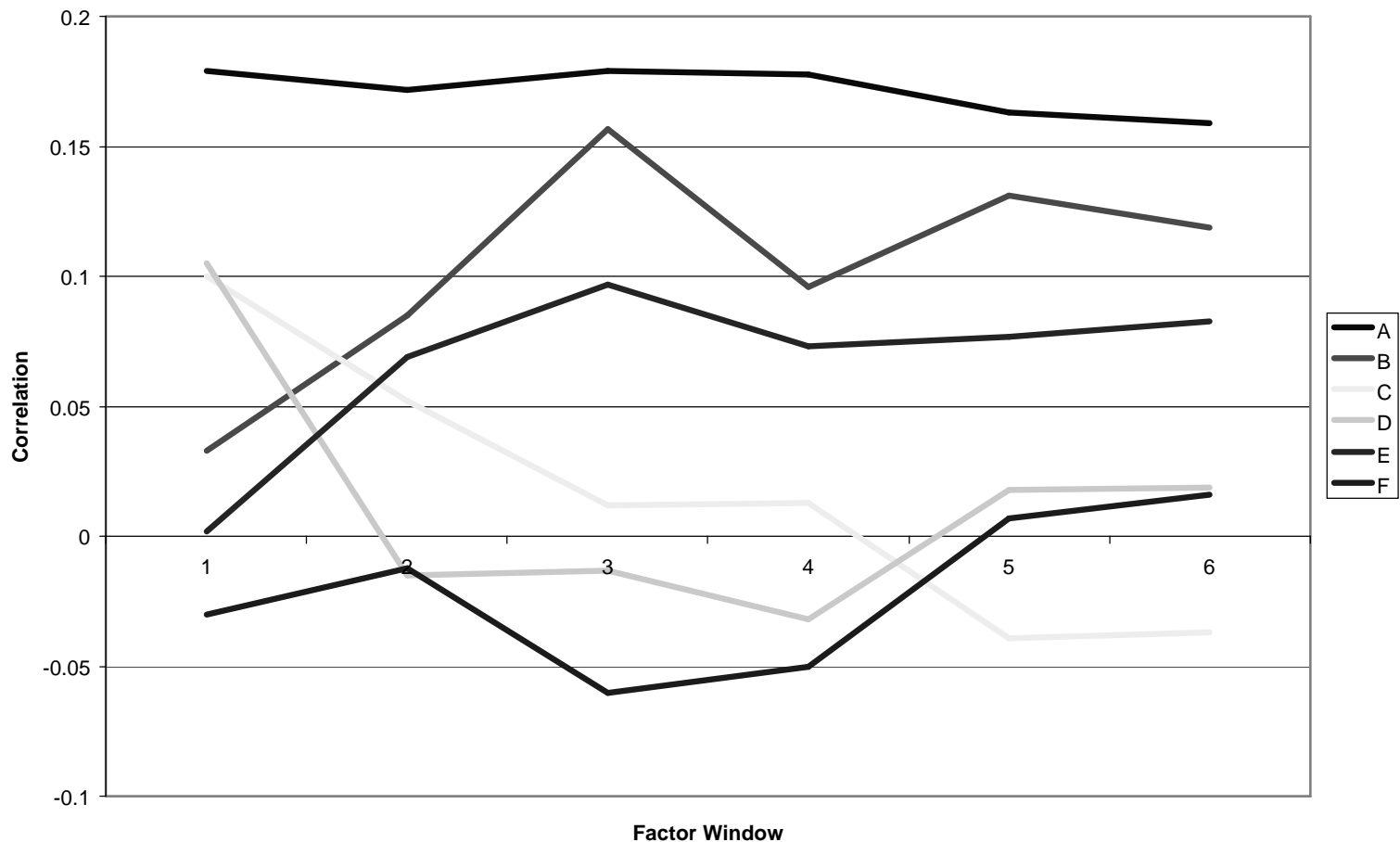
# Common Factors in Trend Following: Initial Result: Rates

Rates: Correlation of Portfolio Returns with Trend Following Factors



# Common Factors in Trend Following: Initial Result: Physicals

Physicals: Correlation Between Portfolio of Returns and TF Factors



# Another Approach to Understanding the Common Factors in Trend Following: Trading Strategies as Diagnostics

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- If common factors to trend following are economically important, then we may be able to develop trading strategies to understand and exploit them
- Simple trading strategies based on momentum or mean reversion
  - Momentum: Buy factor if P/L to factor is *positive* over lookback period
  - Mean Reversion: Buy factor if P/L to factor is *negative* over lookback period
  - Each complex may be traded differently, but all factors within complex are traded the same
    - For example, currency factors can be traded in mean reversion and interest rates using momentum, etc.
    - Net trades are the sum of all positions across factors
    - Lookback period corresponds to factor estimation window

# Trading Strategy Results: Currencies

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- Results suggests the presence of residual momentum in currency trendfollowing at the ~70 day horizon

Currency IR's Momentum							
	A	B	C	D	E	F	Portfolio
30	0.395	0.285	-0.535	0.164	0.157	-0.726	0.1
35	0.429	0.209	-0.155	-0.37	0.624	-0.496	0.253
40	0.427	0.086	-0.557	-0.109	0.24	0.103	0.159
45	0.087	-0.045	-0.837	-0.179	0.677	0.083	-0.127
50	0.289	0.493	-0.681	-0.042	-0.001	-0.21	0.068
55	-0.093	0.505	-0.888	0.341	0.191	-0.73	-0.198
60	-0.102	-0.2	-0.607	0.699	0.498	-0.155	-0.066
65	-0.195	0.094	0.424	0.645	-0.232	0.097	0.224
70	0.086	0.082	0.284	0.82	0.039	0.201	0.511
75	0.278	0.169	-0.411	0.854	0.401	0.056	0.464
80	0.273	-0.154	0.25	0.432	-0.256	0	0.266
85	-0.099	0.055	-0.19	0.171	-0.754	0.412	-0.159
90	-0.027	-0.099	-0.561	-0.033	-0.603	0.39	-0.327
95	0.162	-0.525	-0.122	0.355	-0.493	0.955	0.036
100	0.054	-0.248	0.149	0.628	-0.038	0.744	0.32

# Trading Strategy Results: Rates

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- Results suggests the presence of residual momentum in rate trendfollowing at the ~100 day horizon

Interest Rate IR's - Momentum							
	A	B	C	D	E	F	Portfolio
20	0.395	0.285	-0.535	0.164	0.157	-0.726	0.1
30	0.324	-0.278	-0.111	1.045	0.111	0.504	0.39
40	0.536	-0.153	0.099	-0.293	-1.195	-0.204	0.16
50	-0.014	-0.118	0.328	-0.316	0.496	0.551	0.087
60	-0.179	-0.423	0.307	0.175	0.418	0.71	-0.085
70	0.078	-0.272	-0.282	-0.654	0.287	0.232	-0.14
80	0.097	0.181	0.187	0.067	-0.114	0.658	0.245
90	0.234	0.051	0.106	0.438	-0.323	0.789	0.342
100	0.33	0.193	0.176	0.355	-0.166	0.426	0.473
110	0.186	0.388	0.477	0.271	-0.206	0.433	0.462
120	0.123	-0.044	0.694	0.841	-0.249	0.651	0.401
130	-0.262	-0.515	-0.118	0.496	0.066	0.625	-0.297
140	-0.331	-0.251	-0.095	0.405	-0.127	0.405	-0.315
150	-0.168	-0.482	0.516	0.182	0.056	0.095	-0.171
160	-0.356	-0.394	0.702	0.231	-0.577	0.205	-0.338
170	-0.387	-0.51	0.694	0.335	0.096	0.141	-0.295
180	-0.533	-0.361	0.77	0.671	-0.331	0.598	-0.31
190	-0.482	-0.689	0.716	0.369	-0.218	0.603	-0.452
200	-0.235	-0.363	0.892	0.195	-0.205	0.099	-0.135
210	-0.009	-0.207	0.891	-0.116	0.265	0.086	0.134
220	0.587	-0.201	0.87	0.216	0.135	0.402	0.712
230	0.383	-0.506	0.827	-0.25	-0.025	0.071	0.28
240	0.428	-0.065	0.577	0.11	0.055	-0.047	0.485
250	0.071	-0.527	0.783	-0.213	0.354	0.075	0.057
260	0.624	-0.774	0.563	-0.121	0.135	0.276	0.392

# Trading Strategy Results: Physicals

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- Results are inconclusive, perhaps because of the heterogeneity of the portfolio (Crude, Sugar, etc)

	Physicals-IR's Mean Reversion						
	A	B	C	D	E	F	Portfolio
25	-0.579	0.09	0.025	-0.249	0.419	-0.34	-0.39
50	-0.05	-0.279	-0.27	-0.482	0.392	-0.171	-0.323
75	-0.203	-0.146	0.171	0.043	-0.706	0.136	-0.261
100	0.317	-0.365	0.76	-0.006	-0.582	0.124	0.234
125	0.23	-0.277	0.383	0.155	-0.142	0.062	0.21
150	-0.012	-0.319	0.266	0.101	-0.798	0.018	-0.227

# Conclusions

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- Increasing Correlation between Trend Following and Market Themes
- Research should focus on the relationship between factors associated with markets and trend following, and not just asset by asset sources of price predictability
- Results indicate the correlation between common market factors and trendfollowing
- Results indicate that there is some residual momentum in trendfollowing that can be diagnosed and exploited using simple trading strategies