Discussion of:

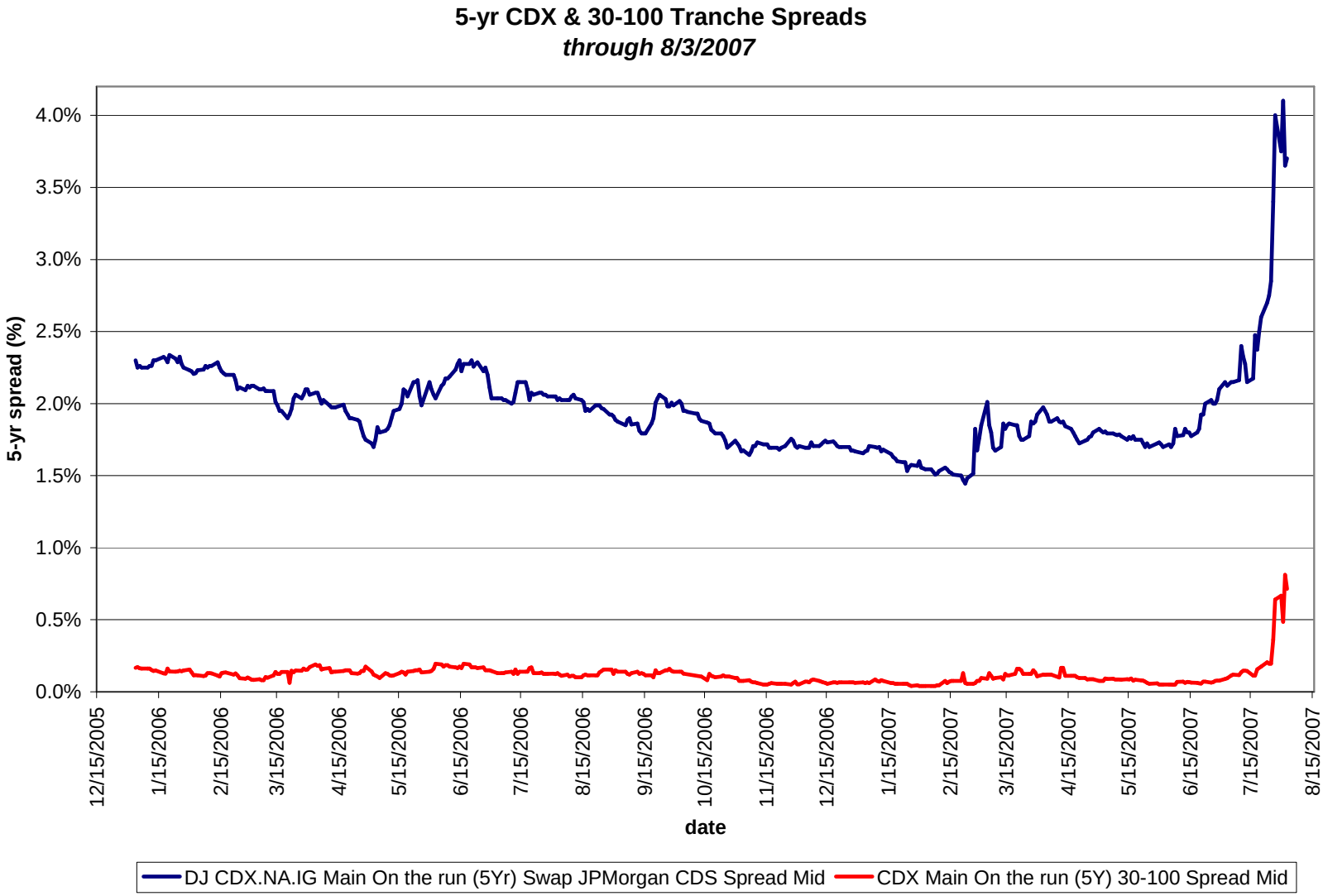
Value and Momentum Everywhere

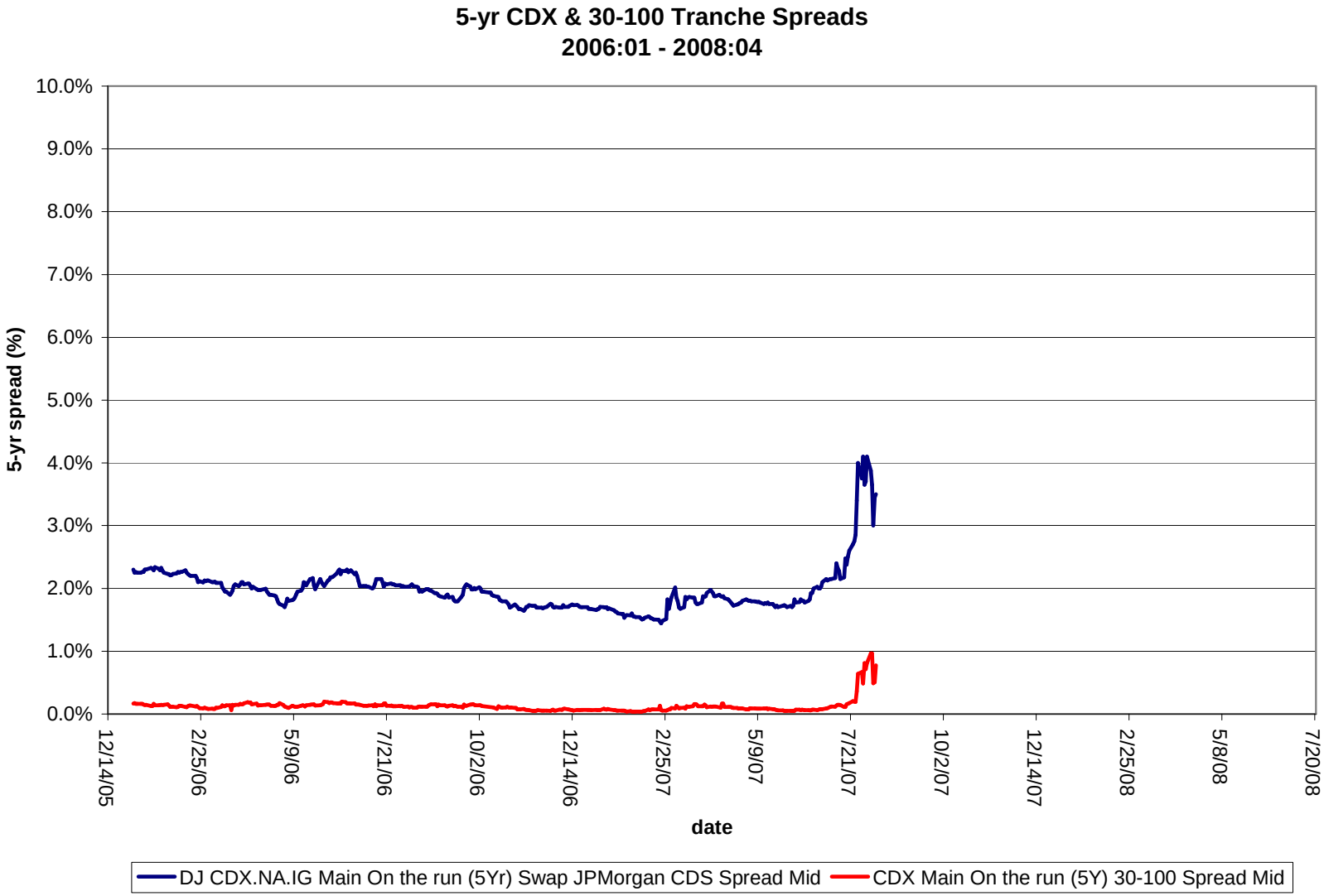
by Cliff Asness, Toby Moskowitz and Lasse Pedersen

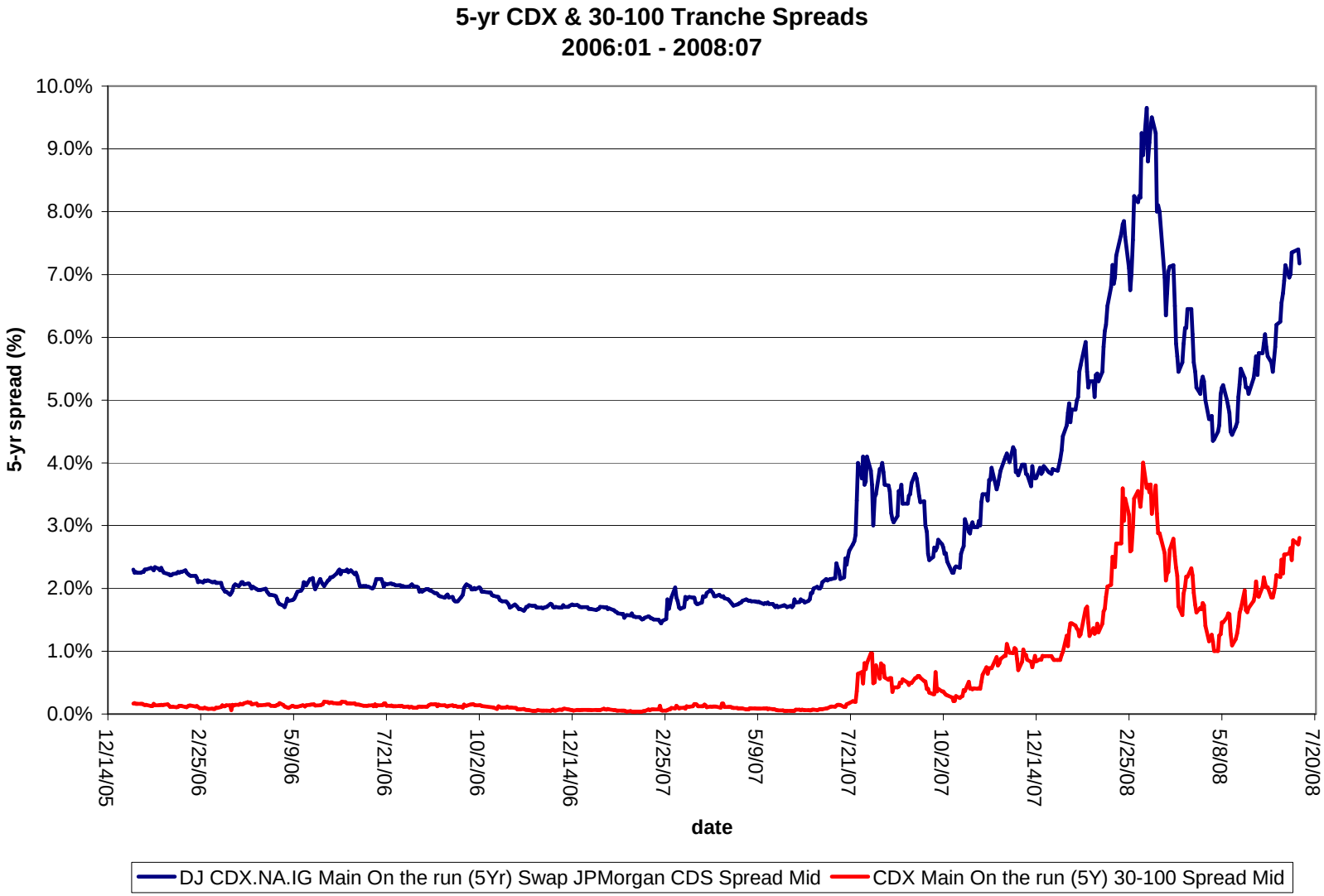
Kent Daniel[1]

[1]Goldman Sachs Asset Management
Quantitative Investment Strategies

2008 NBER-APSI
July 11, 2008


5-yr CDX & 30-100 Tranche Spreads
through 8/3/2007
4.0%
3.5%
3.0%
2.5%
2.0%
1.5%
1.0%
0.5%
0.0%
5-yr spread (%)
12/15/2005
1/15/2006
2/15/2006
3/15/2006
4/15/2006
5/15/2006
6/15/2006
7/15/2006
8/15/2006
9/15/2006
10/15/2006
11/15/2006
12/15/2006
1/15/2007
2/15/2007
3/15/2007
4/15/2007
5/15/2007
6/15/2007
7/15/2007
8/15/2007
date
DJ CDX.NA.IG Main On the run (5Yr) Swap JPMorgan CDS Spread Mid
CDX Main On the run (5Y) 30-100 Spread Mid


5-yr CDX & 30-100 Tranche Spreads
2006:01 - 2008:04
10.0%
9.0%
8.0%
7.0%
6.0%
5.0%
4.0%
3.0%
2.0%
1.0%
0.0%
5-yr spread (%)
12/14/05
2/25/06
5/9/06
7/21/06
10/2/06
12/14/06
2/25/07
5/9/07
7/21/07
10/2/07
12/14/07
2/25/08
5/8/08
7/20/08
date
DJ CDX.NA.IG Main On the run (5Yr) Swap JPMorgan CDS Spread Mid
CDX Main On the run (5Y) 30-100 Spread Mid


5-yr CDX & 30-100 Tranche Spreads
2006:01 - 2008:07
10.0%
9.0%
8.0%
7.0%
6.0%
5.0%
4.0%
3.0%
2.0%
1.0%
0.0%
5-yr spread (%)
12/14/05
2/25/06
5/9/06
7/21/06
10/2/06
12/14/06
2/25/07
5/9/07
7/21/07
10/2/07
12/14/07
2/25/08
5/8/08
7/20/08
date
DJ CDX.NA.IG Main On the run (5Yr) Swap JPMorgan CDS Spread Mid
CDX Main On the run (5Y) 30-100 Spread Mid

Value and Momentum Everywhere

- AMP develop uniform cross-sectional Value and Momentum portfolios in a number of asset classes:
  - Stock-selection strategies:
    - US, UK, Japan, EU
  - Equity country selection
  - Bond country selection
  - Currency selection
  - Commodity selection
- Value strategies are either B/M based (equities), based on past 5-year returns, or yield net of forecast inflation (bonds)
- Momentum strategies are all 2-12 strategies: the return over the last 12-months excluding the last month.
- Only liquid equities (top 37.5% of names) only are included in portfolios. Country baskets, bonds, currencies, and commodity futures are liquid instruments.

Value and Momentum Everywhere

- AMP develop uniform cross-sectional Value and Momentum portfolios in a number of asset classes:
  - Stock-selection strategies:
    - US, UK, Japan, EU
  - Equity country selection
  - Bond country selection
  - Currency selection
  - Commodity selection
- Value strategies are either B/M based (equities), based on past 5-year returns, or yield net of forecast inflation (bonds)
- Momentum strategies are all 2-12 strategies: the return over the last 12-months excluding the last month.
- Only liquid equities (top 37.5% of names) only are included in portfolios. Country baskets, bonds, currencies, and commodity futures are liquid instruments.

Value and Momentum Everywhere

- AMP develop uniform cross-sectional Value and Momentum portfolios in a number of asset classes:
  - Stock-selection strategies:
    - US, UK, Japan, EU
  - Equity country selection
  - Bond country selection
  - Currency selection
  - Commodity selection
- Value strategies are either B/M based (equities), based on past 5-year returns, or yield net of forecast inflation (bonds)
- Momentum strategies are all 2-12 strategies: the return over the last 12-months excluding the last month.
- Only liquid equities (top 37.5% of names) only are included in portfolios. Country baskets, bonds, currencies, and commodity futures are liquid instruments.

Value and Momentum Everywhere

- AMP develop uniform cross-sectional Value and Momentum portfolios in a number of asset classes:
  - Stock-selection strategies:
    - US, UK, Japan, EU
  - Equity country selection
  - Bond country selection
  - Currency selection
  - Commodity selection
- Value strategies are either B/M based (equities), based on past 5-year returns, or yield net of forecast inflation (bonds)
- Momentum strategies are all 2-12 strategies: the return over the last 12-months excluding the last month.
- Only liquid equities (top 37.5% of names) only are included in portfolios. Country baskets, bonds, currencies, and commodity futures are liquid instruments.

Key Results

AMP emphasize the following results:

1. Value and momentum work everywhere.
2. Value and momentum strategies are negatively correlated within each asset class, yet each earns a positive premium.
3. Value and momentum returns are correlated across asset classes.
4. Value and momentum returns are positively correlated with innovations in global long-run consumption growth
5. Momentum does well when illiquidity is high or increasing, value does poorly.

Key Results

AMP emphasize the following results:

1. Value and momentum work everywhere.
2. Value and momentum strategies are negatively correlated within each asset class, yet each earns a positive premium.
3. Value and momentum returns are correlated across asset classes.
4. Value and momentum returns are positively correlated with innovations in global long-run consumption growth
5. Momentum does well when illiquidity is high or increasing, value does poorly.

Key Results

AMP emphasize the following results:

1. Value and momentum work everywhere.
2. Value and momentum strategies are negatively correlated within each asset class, yet each earns a positive premium.
3. Value and momentum returns are correlated across asset classes.
4. Value and momentum returns are positively correlated with innovations in global long-run consumption growth
5. Momentum does well when illiquidity is high or increasing, value does poorly.

Key Results

AMP emphasize the following results:

1. Value and momentum work everywhere.
2. Value and momentum strategies are negatively correlated within each asset class, yet each earns a positive premium.
3. Value and momentum returns are correlated across asset classes.
4. Value and momentum returns are positively correlated with innovations in global long-run consumption growth
5. Momentum does well when illiquidity is high or increasing, value does poorly.

Key Results

AMP emphasize the following results:

1. Value and momentum work everywhere.
2. Value and momentum strategies are negatively correlated within each asset class, yet each earns a positive premium.
3. Value and momentum returns are correlated across asset classes.
4. Value and momentum returns are positively correlated with innovations in global long-run consumption growth
5. Momentum does well when illiquidity is high or increasing, value does poorly.

Stock-Selection Strategy Sharpe-Ratios (Table 2A)

	Value SR (t-stat)	Momentum SR (t-stat)	Combo SR (t-stat)	Cor(val,mom)
Panel A: Stock Selection				
U.S. *03/73-02/08*	0.21 (1.23)	0.78 (4.60)	1.13 (6.69)	-0.60
U.K. *12/84-02/08*	0.30 (1.43)	1.26 (6.08)	1.67 (8.05)	-0.61
Japan *02/85-02/08*	0.89 (4.28)	0.23 (1.09)	1.12 (5.41)	-0.53
Continental Europe *02/88-02/08*	0.33 (1.49)	1.12 (4.89)	1.69 (7.41)	-0.53
Global stock selection *02/88-02/08*	**0.40** **(1.78)**	**1.18** **(5.28)**	**2.00** **(8.97)**	**-0.67**

Non Stock-Selection Sharpe-Ratios (Table 2B)

Panel B: Non-Stock Selection				
Equity country selection *02/80-02/08*	0.58 (3.08)	0.68 (3.62)	1.08 (5.70)	-0.41
Bond country selection *01/90-02/08*	0.45 (1.92)	0.41 (1.73)	0.51 (2.19)	0.07
Currency selection *08/80-02/08*	0.44 (2.30)	0.45 (2.35)	0.64 (3.38)	-0.41
Commodity selection *02/80-02/08*	0.30 (1.60)	0.58 (3.05)	0.84 (4.44)	-0.39
All non-stock selection *01/90-02/08*	**0.63** **(2.67)**	**0.96** **(4.09)**	**1.33** **(5.67)**	**-0.38**
All asset selection *01/90-02/08*	**0.64** **(2.73)**	**1.22** **(5.21)**	**2.01** **(8.58)**	**-0.56**

Sharpe-Ratio Magnitude

- Note that the both combination strategies, and the overall strategy, have slightly negative betas w.r.t. the global equity market.
  - Including the global market as a part of a strategy would increase the overall strategy Sharpe-ratio.
- Note that there are a number of well documented anomalies that are not included here:
  - *e.g.,* violations of uncovered interest parity (carry trades)
- Also, there are numerous refinements that would increase the returns:
  - *e.g.,* industry adjustment of valuation ratios, value/momentum interactions.

Negative Value-Momentum Correlation

- AMP argue that:

  Creating two strategies so opposite in spirit and opposite in construction, and therefore so negatively correlated with each other, and still having them consistently produce positive average returns around the world and across asset classes ... is a rare feat.

Negative Value-Momentum Correlation

- I don't understand why this is a "rare feat."
- Mathematically, for the long/short portfolios V and M with:

$$\begin{aligned} \tilde{r}^e_V &= \beta_V \tilde{m}^* + \tilde{u}, \quad \text{where } \tilde{u} \perp \tilde{m}^* \\ \tilde{r}^e_M &= \beta_M \tilde{m}^* - \tilde{u} \end{aligned}$$

the expected returns and portfolio covariances are:

$$\begin{aligned} E[\tilde{r}^e_V] &= \beta_V E[\tilde{m}^*] \\ E[\tilde{r}^e_M] &= \beta_M E[\tilde{m}^*] \\ cov(\tilde{r}^e_V, \tilde{r}^e_M) &= \beta_V \beta_M \sigma^2_{m*} - \sigma^2_u \end{aligned}$$

- I would guess that $\tilde{u}$ is firm or industry returns.
- Note that this does imply that you get a much higher Sharpe-ratio portfolio when you combine V and M.

Risk Factor Exposures (Table 6A)

- One of the most striking results in the paper is the strong correlation between future 3-year consumption growth and the combination portfolio:

	Global Stock Selection		All Non-Stock Selection		All Asset Selection			
Dependent variable =	Value	Momentum	Value	Momentum	Value	Momentum	Mom - Val	Combo
Panel A: Multivariate regression results on macroeconomic and liquidity risk factors								
Long-run consumption growth	0.011	0.060	0.078	0.045	0.057	0.060	**0.003**	**0.122**
	(0.40)	(2.48)	(2.57)	(1.58)	(2.46)	(2.42)	**(0.07)**	**(6.07)**
Global recession	-0.012	-0.037	-0.006	-0.027	-0.012	-0.036	**-0.025**	**-0.057**
	(-0.68)	(-2.86)	(-0.53)	(-1.30)	(-0.89)	(-2.27)	**(-1.17)**	**(-2.74)**
Market excess return	-0.195	-0.058	0.105	-0.049	-0.058	-0.061	**-0.003**	**-0.160**
	(-2.80)	(-0.44)	(2.14)	(-0.76)	(-1.00)	(-0.56)	**(-0.02)**	**(-1.15)**
US TED spread	-0.033	0.027	-0.008	0.008	-0.026	0.020	**0.046**	**0.006**
	(-4.04)	(4.32)	(-0.76)	(1.49)	(-3.19)	(3.81)	**(3.64)**	**(1.50)**
R-square	21.2%	6.3%	5.5%	1.9%	9.8%	4.8%	6.0%	12.6%

- In this the time-series regression, the t-statistic on future consumption growth 6.07.
  - However, the authors note that the CRRA necessary for consumption to "explain" the premia is 45.
- Also these results suggest that liquidity is not consistently priced across these assets.

Consistent Pricing of Risk

In the AP literature, we often search over strategies for a high SR, and then hunt for the macro variable that can explain this high SR:

$$E[\tilde{m}\tilde{R}_i^e] = 0 \Rightarrow \left(\frac{E[\tilde{R}_i^e]}{\sigma_{Ri}}\right) = -\rho_{i,m}\left(\frac{\sigma_m}{E[\tilde{m}]}\right)$$

However, once a candidate macro variable (*i.e.*, $\tilde{m}$) is identified, it is probably useful to test:

- Can you build other portfolios that are highly correlated with $\tilde{m}$?
  - Do they have correspondingly high returns?

What are the shocks?

- These results raise the question of what mechanism could cause the returns to momentum, in particular, to be strongly correlated with future consumption growth
- Note that the asset weights in the momentum portfolio in each asset class are almost completely uncorrelated at a one-year horizon.
  - For 6-month momentum, which works as well or better, the weight correlation is ≈ 0 at a 6-month horizon.
- *Why is it that bad news about firms that went down over the last 6-12 months is good news for future consumption growth?*

- The answer may be that the link has nothing to do with innovations to the cash flows from these assets, but is rather related to the supply/demand for these assets from "sophisticated" investors.
- We know that more and more hedge-funds and other asset managers are relying on quantitative strategies such as these across numerous asset classes.
- The fortunes of these investors can influence the broader economy.
  - Alternatively, the provision of liquidity to these markets may vary depending on the state of the economy.

Correlations have increased over time

	Sharpe ratios			Average correlations, ρ			
	Value	Momentum	Combo	ρ(val,val)	ρ(mom,mom)	ρ(val,mom)	ρ(combo,combo)
Panel A: Stock selection strategies							
1990-1999	0.68	1.58	2.67	0.10	0.19	-0.25	0.11
2000-2008	0.27	0.95	1.65	0.55	0.49	-0.42	0.43
Near trough of business cycle	-0.28	0.87	1.37	0.43	0.34	-0.42	0.11
Near peak of business cycle	0.25	1.59	2.06	0.27	0.40	-0.23	0.26
Low future consumption growth	0.26	2.33	2.95	0.19	0.23	-0.30	0.05
High future consumption growth	-0.72	1.63	1.81	0.22	0.29	-0.31	0.06
Low liquidity	-0.34	1.21	1.68	0.59	0.40	-0.49	0.05
High liquidity	1.10	1.04	1.85	0.18	0.36	-0.22	0.29
Panel B: Non-stock selection strategies							
1990-1999	1.07	0.95	1.75	0.08	0.16	-0.11	0.03
2000-2008	0.11	0.96	0.89	0.05	0.16	-0.12	0.10
Near trough of business cycle	1.00	0.67	1.61	0.14	0.22	-0.18	0.02
Near peak of business cycle	1.67	1.01	2.02	0.01	0.18	-0.10	0.07
Low future consumption growth	1.00	-0.06	0.59	0.13	0.22	-0.13	0.10
High future consumption growth	0.29	1.26	1.09	0.01	0.12	-0.06	0.10
Low liquidity	-0.95	1.33	0.30	0.02	0.05	-0.06	0.10
High liquidity	0.71	1.45	2.07	0.15	0.21	-0.14	0.05

- Table 7 suggests that the high correlations are concentrated in the post-2000 period.

Emphasis

- There are a number of differences in the effects across asset-classes/regions that the authors downplay.
  - This is appropriate – their goal here is to emphasize the commonality of the effects across regions.
- It might also be good to highlight the *differences*
  - *e.g.*, Japan and far-east, January, interactions, differing horizons, effect of carry in currencies ...
  - These are perhaps the key to understand the driving forces behind the shock structure.

Effect of Volatility Adjustment

- The vol adjusted currency-value and bond-momentum have very good Sharpe-ratios (Table 2)

Panel B: Non-Stock Selection				
Equity country selection *02/80-02/08*	0.58 (3.08)	0.68 (3.62)	1.08 (5.70)	-0.41
Bond country selection *01/90-02/08*	0.45 (1.92)	0.41 (1.73)	0.51 (2.19)	0.07
Currency selection *08/80-02/08*	0.44 (2.30)	0.45 (2.35)	0.64 (3.38)	-0.41
Commodity selection *02/80-02/08*	0.30 (1.60)	0.58 (3.05)	0.84 (4.44)	-0.39
All non-stock selection *01/90-02/08*	**0.63** **(2.67)**	**0.96** **(4.09)**	**1.33** **(5.67)**	**-0.38**
All asset selection *01/90-02/08*	**0.64** **(2.73)**	**1.22** **(5.21)**	**2.01** **(8.58)**	**-0.56**

Effect of Volatility Adjustment

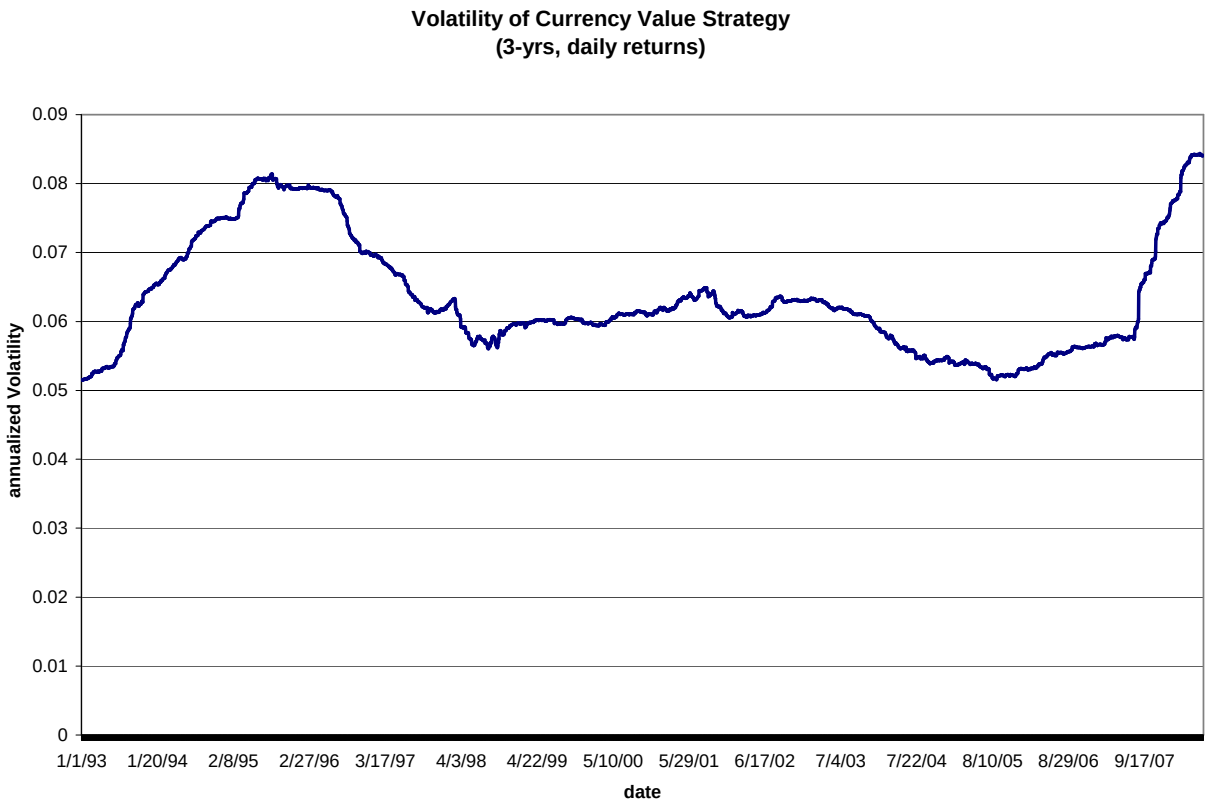
- The non-vol adjusted versions of these strategies are significantly worse (Table 1)

Panel B: Non-Stock Selection

Equity country selection 02/80-02/08					
mean	5.0%	5.1%	8.6%	-0.25	18
(t-stat)	(2.40)	(2.16)	(3.56)		
volatility	11.0%	12.5%	12.9%		
Sharpe	0.45	0.41	0.67		
Bond country selection 01/90-02/08					
mean	0.9%	-0.1%	0.6%	-0.14	10
(t-stat)	(1.41)	(-0.10)	(0.95)		
volatility	2.7%	2.6%	2.6%		
Sharpe	0.33	-0.02	0.22		
Currency selection 08/80-02/08					
mean	0.8%	4.2%	4.4%	-0.48	10
(t-stat)	(0.48)	(2.27)	(2.53)		
volatility	9.3%	9.7%	9.1%		
Sharpe	0.09	0.43	0.48		
Commodity selection 02/80-02/08					
mean	9.3%	6.0%	6.0%	-0.38	27
(t-stat)	(1.77)	(1.18)	(2.44)		
volatility	27.7%	27.0%	12.9%		
Sharpe	0.33	0.22	0.46		

Effect of Volatility Adjustment

- Yet the volatility of the currency strategy is relatively smooth
- *Why does this adjustment make such a large difference?*



References I


Fama, Eugene F., and Kenneth R. French, 1993, Common risk factors in the returns on stocks and bonds, *Journal of Financial Economics* 33, 3–56.