Discussion of John Ammer, Clara Vega and Jon Wongswan paper "Do Fundamentals Explain the International Impact of U.S. Interest Rates? Evidence at the Firm Level "

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The usual disclaimers apply.

Contribution

- Effects of US monetary policy shocks on "*foreign*" (US listed) equity returns at firm level
- Questions of paper
  - Do foreign equities react to US policy shocks?
  - Is this response different from US firms?
  - What are the determinants/channels of these two?
- Why is it important?
  - Global transmission of common/US-specific shocks and underlying transmission mechanism
- Neat contribution to literature

Empirical approach

- Identification of monetary policy shocks & transmission
  - Target surprise (TS), not path surprise (PS), from fed funds futures (Kuttner 2001; Gürkaynak, Sack and Swanson 2005)
  - Daily and hourly response, Feb 1994 – Dec. 2006
  - ~ 11,000 US firms; ~ 1500 foreign firms listed in US
- Estimation:

$$R_{it} = \beta_{D0} + \beta_{DTS} TS_t + \beta_{F0} I(FF)_i + \beta_{FTS} TS_t * I(FF)_i + \varepsilon_{it}$$

$$R_{it} = \beta_{D0} + \beta_{D1} TS_t + \beta_{DX} TS_t * X_{it} + \beta_{F0} I(FF)_i + \beta_{F1} TS_t * I(FF)_i + \beta_{FX} TS_t * X_{it} * I(FF)_i + \varepsilon_{it}$$

Channels

- Determinants and channels of transmission
  1. Demand channel – foreign sales, sector-specific effects
  2. Credit channel – financial constraints, credit rating
  3. Portfolio channel – US ownership in foreign firm, share of firm's equity traded in US
  4. Foreign interest rate channel – sensitivity of foreign interest rates to US interest rates
  5. Integration with US – US CAPM beta over past year

Findings

- Foreign firms react about as strongly as US firms
- Foreign firms are different
- All channels are relevant, except credit channel
  - Many – though not all – estimates hold qualitatively also when extending model

Main query: Dimension & interpretation

- Dimension is huge – 5 channels, 20-30 variables
- What is the main message to take away?
- What is economic significance?
  - Difference in foreign firms' response rather small (~5 b.p.) (Table 3: -0.63 vs. -0.68 to 25 b.p. shock)
  - How important are the asymmetries via channels?
- Large dimension makes it hard to pin down causality
  - Determinants often strongly correlated …

Table 12: Correlation of determinants

	Panel B: Hourly Return			
Target Surprise	0.108***	5.77	0.1167***	6.26
TS × Ext. Finance Dependence	-0.0084	-0.47	0.0151	0.89
TS × Market to Book Ratio	-0.0022***	-4.37	-0.0012**	-2.36
TS × Debt to Market Capital Ratio	0.0404***	2.87	0.0124	0.88
TS × log(market capital)	-0.0126***	-6.66	-0.0044**	-2.25
TS × Inv. Grade Rating	0.021***	2.94	0.0094	1.35
TS × Non-Inv. Grade Rating	-0.0052	-0.77	-0.0071	-1.06
TS × Dividend Dummy	0.0097	1.36	-0.009	-1.3
TS × Dividend Yield	0.0017	1.04	-0.0001	-0.08
TS × Analyst Coverage	-0.0013***	-2.76	-0.0012**	-2.56
TS × FX Exposure	-0.0047***	-3.59	-0.0037***	-2.86
TS × LC Short-Term Interest Rate	-0.1134***	-7.75	-0.0424***	-3.6
TS × US-Local Trading Volume Ratio	-0.0354***	-4.8	-0.019***	-2.67
TS × Regime	0.0213***	2.61	0.0186**	2.32
TS × Junk Spread	-0.0262***	-8.4	-0.0274***	-8.88
TS × Time Trend	0.0959***	5.35	0.0848***	4.75
TS × US CAPM Beta			-0.0767***	-15.76
Adj. R^2	8.66%		10.80%	

Main query: Dimension & interpretation

- Size of coefficient changes frequently substantially – depending on specification and controls
- Table 12: CAPM beta important determinant
  - Yet Table 12 does not control for sector effects – what would estimates look like?
- Correlation across channels makes it very hard to provide an interpretation about the channels
  - Especially CAPM beta likely to be highly correlated e.g. with proxy for interest rate channel (interest rate exposure)

Two potential ways forward

1. Reduce dimension

   - E.g. use single composite measure for financial constraint (Rajan & Zingales 1997, Whited & Wu 2004) etc.
   - Use of matching models

- Foreign firms are different
  - Foreign firms more heavily represented in some industries
  - Foreign firms are "financially healthier"

→ Is partial analysis of the various tables still valid when controlling for all relevant differences?

Two potential ways forward

2. Focus on specific question

- From specific theories or open empirical questions

- Example: how has transmission process changed over time and why?
  - "junk spread": neg. coef. → higher transmission when stress [?]
  - "time trend": positive coef. → smaller transmission over time [?]

- Is this interpretation valid?
  - Many determinants exhibit a time trend and increased over time: CAPM beta, market cap., external financial dependence, FX exposure, foreign interest rate sensitivity, trading volume …
  - Can say little: transmission may actually have become stronger

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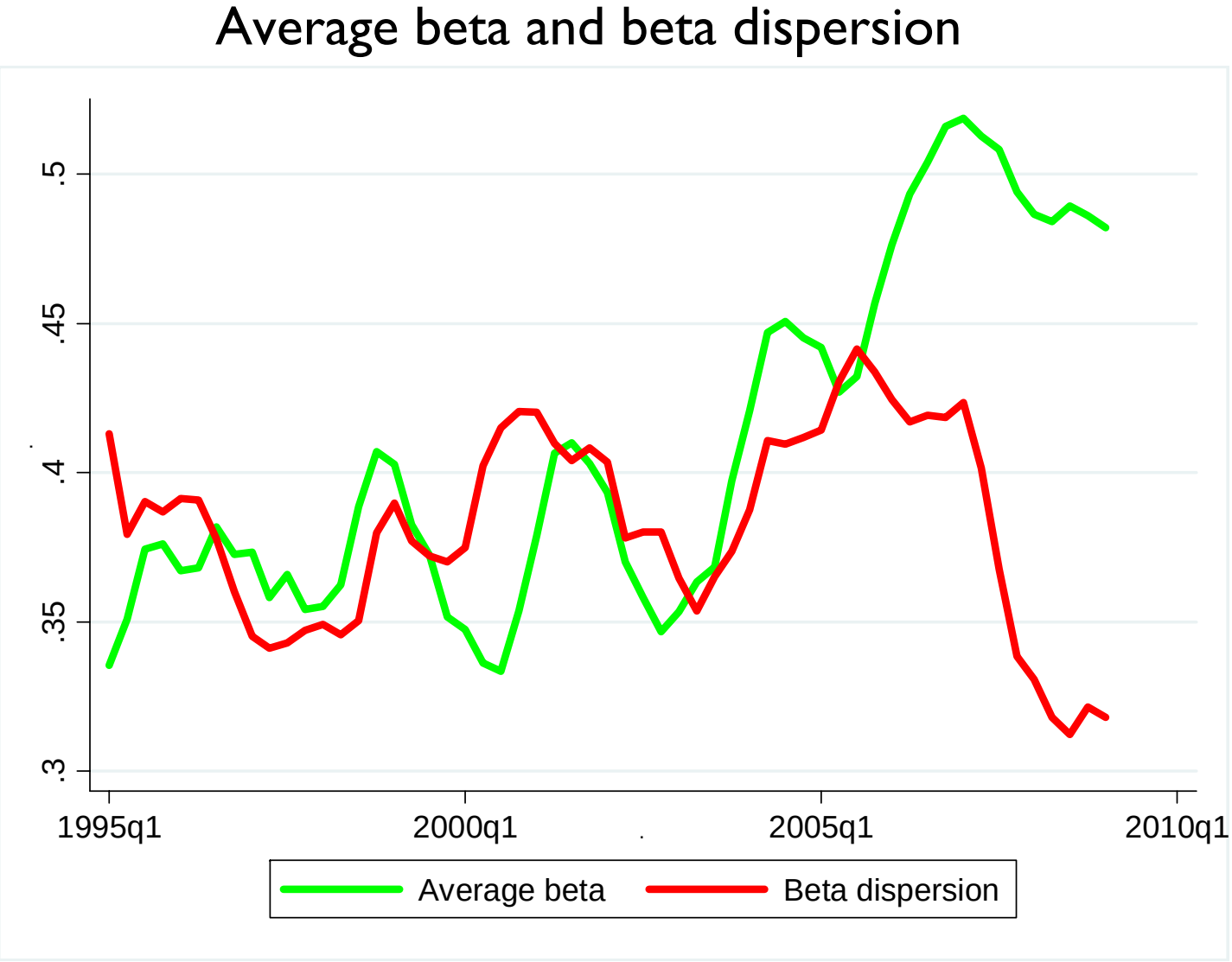
Integration with US markets – CAPM *beta*

$$R_{i,t} = E_{t-1}(R_{i,t}) + \beta_{i,t}^{US} R_t^{US} + \beta_{i,t}^{RG} R_t^{RG} + e_{i,t}$$

- $R_{i,t}$: return of country-sector portfolio i on date t
- $R^{us}{}_t$: return of US stock market on date t
- $R^{RG}{}_t$: return of regional stock market on date t

(Ehrmann, Fratzscher and Mehl 2009)

Evolution of time-varying US betas



Transmission of US shocks to global equities

- What explains transmission and discrimination?
- Is this transmission any different during the crisis?
- Two sets of common US-specific shocks
  - Key crisis events
  - US macroeconomic news (comparison with pre-crisis)

US macroeconomic news shocks

			Surprise / shock	
Variable	***Definition / Unit***	***Obs.***	***Mean***	***std. dev.***
1. Crisis shocks				
Crisis shocks	+1, -1 indicator variable	6	0.0	--
2. Real activity				
Industrial production	MoM % change	55	-0.189	1.003
GDP	Quarterly YoY % change	20	-0.151	0.330
NF payroll employment	MoM change (100,000)	60	-0.137	0.605
Unemployment	in %	40	-0.007	0.113
Retail sales	in %	56	-0.033	0.716
Workweek	in hours	33	-0.134	0.361
3. Confidence / forward-looking				
NAPM / ISM	index (around 50)	58	-0.006	0.440
Consumer confidence	index (around 100)	60	0.000	0.190
Housing starts	Monthly, in 1000	60	0.004	0.348
4. Net exports				
Trade balance	in USD billion	59	0.011	0.165

Modelling the global transmission of common US shocks

$$R_{i,t} = \alpha + \beta_1 S_t^{US} + \mu_1 X_{i,t} + \mu_2 Z_{i,t} + \varepsilon_{i,t}$$

- S^{US} : vector of US macro news

- X and Z controls similar to those included by Ammer, Vega and Wongswan (2009), though more focus on country risk

Global transmission of US shocks

	Non-US returns					US market returns				
	before crisis		during crisis			before crisis		during crisis		
	coef.	*std. err.*	coef.	*std. err.*	*signific.*	coef.	*std. err.*	coef.	*std. err.*	*signific.*
Crisis events	--		0.928***	*0.151*		--		4.884***	*0.501*	
US macro news:										
GDP	0.175**	*0.085*	1.158***	*0.291*	0.01	-0.094	*0.536*	3.317*	*1.876*	0.09
Consumer confidence	0.014	*0.123*	0.876***	*0.262*	0.01	3.415***	*0.877*	7.705***	*1.28*	0.96
Housing starts	-0.201***	*0.044*	1.030***	*0.268*	0.00	0.014	*0.313*	0.271	*1.267*	0.85
Industrial production	0.056**	*0.024*	0.332***	*0.051*	0.00	0.082	*0.172*	0.724***	*0.202*	0.01
NAPM / ISM	0.051	*0.045*	0.383**	*0.158*	0.04	-0.254	*0.277*	2.132***	*0.714*	0.01
NF payroll employment	0.193***	*0.035*	0.470***	*0.176*	0.14	0.465**	*0.217*	-0.517	*0.507*	0.11
Retail sales	0.056*	*0.028*	0.990***	*0.105*	0.00	0.095	*0.18*	1.717***	*0.398*	0.01
Trade balance	-0.219*	*0.118*	0.221	*0.191*	0.09	0.096	*0.807*	0.069	*1.471*	0.98
Unemployment	-0.483*	*0.282*	-1.753***	*0.372*	0.01	0.086	*1.948*	-5.947**	*2.352*	0.10
Workweek	-0.06	*0.058*	0.411*	*0.245*	0.07	-0.187	*0.412*	1.219	*1.21*	0.30
Observations	156631		60020			355		488		
R-squared	0		0.02			0.02		0.26		

Shock transmission & the crisis

- The crisis is different! → 3- to 4-fold increase in the strengths of the US shock transmission to global equity markets (of a given shock)
- Yet also US returns have become more sensitive to a given US shock during crisis

  → explains why US beta from CAPM has been rather stable, yet return dispersion has increased
- Confirmation of role of financial integration as transmission channel for crisis

Estimating the global transmission of US shocks (*difference-in-difference approach*)

$$R_{i,t} = \alpha + \beta_1 S_t + \beta_2 D_t + \beta_3 X_{i,t}$$
$$+ \gamma_1 (S_t * D_t) + \gamma_2 (S_t * X_{i,t}) + \gamma_3 (D_t * X_{i,t})$$
$$+ \delta_1 (S_t * D_t * X_{i,t}) + \omega Z_{i,t} + \varepsilon_{i,t}$$

- $D_t = 1$ during the crisis, 0 otherwise
- Is the time variation in the transmission of shocks dependent on the channels / equity portfolio characteristics?

Global transmission of US shocks & causality (*difference-in-difference results for beta*)

Beta -- comove-ment with US	**Crisis & beta**		**Crisis**		**Beta**		**Common effect**	
Crisis events	--		--		1.091**	*0.418*	0.403	*0.26*
US macro news:								
GDP	1.662***	*0.602*	0.186	*0.421*	-0.161	*0.145*	0.245***	*0.087*
Consumer confidence	1.137**	*0.568*	0.277	*0.332*	0.466**	*0.226*	-0.184	*0.113*
Housing starts	0.967*	*0.503*	0.786**	*0.332*	-0.202**	*0.092*	-0.114**	*0.053*
Industrial production	0.420***	*0.1*	0.073	*0.076*	0.048	*0.044*	0.036	*0.028*
NAPM / ISM	1.531***	*0.343*	-0.411*	*0.221*	0.135	*0.087*	-0.007	*0.065*
NF payroll employment	0.454	*0.379*	0.038	*0.137*	0.292***	*0.058*	0.071**	*0.034*
Retail sales	1.387***	*0.183*	0.286**	*0.124*	0.085*	*0.048*	0.019	*0.036*
Trade balance	-0.526	*0.589*	0.697**	*0.277*	-0.217	*0.249*	-0.126	*0.119*
Unemployment	-3.854***	*1.118*	0.552	*0.687*	-0.749*	*0.412*	-0.141	*0.335*
Workweek	1.761**	*0.688*	-0.336	*0.299*	-0.114	*0.101*	-0.013	*0.072*

3½ other queries

1. Methodology
   - Take CAPM as starting point – i.e. always control for US beta
   - Add Fama-French controls throughout: size factor and value factor (market-to-book ratio already in some specifications)
   - Control always for industry effects as they prove so important
2. How representative are foreign firms?
   - Most likely not very representative: firms that are large, external financial dependence, lots of foreign sales, etc.
   - Beauty of identification has drawback of cautioning interpretation about transmission to "foreign" equity markets

3½ other queries

3. Use of equity returns in USD
   - Heterogeneity in FX exposure across foreign firms large (Adler & Dumas 1984, Dominguez and Tesar 2001 & 2006)
   - To what extent do asymmetric effects reflect differences in equity return response and to what extent in FX response?
   - Should be in local currency throughout (like in Table 13), if possible
- Smaller queries:
   - Why use absolute values of interest rate & FX exposure?
   - Limit analysis to hourly returns
   - Why is average effect smaller than what is usually found in literature? here: 100 b.p. ~2.5% equity market response vs. literature: 100 b.p. ~5-7%

Summary

- Neat contribution to literature
- Main query: How to deal with large dimension and extract message
  - Reduce dimension vs. focus question
- A few queries about methodology and data

APPENDIX

Estimation of exchange rate & interest rate exposures

$$R_{i,t} = \delta_0 + \delta_i \Delta s_{i,t} + \kappa_i R_t^{US} + e_{i,t}$$

$$R_{i,t} = \eta_0 + \eta_i \Delta r_{i,t} + \kappa_i R_t^{US} + e_{i,t}$$

- $R_{i,t}$: return of country-sector portfolio i on date t
- R^{us}_t : return of US stock market on date t
- $S_{i,t}$: bilateral exchange rate change vs. USD on date t
- $r_{i,t}$: change in domestic 3-month interest rate on date t

(Dominguez and Tesar, 2001 & 2006; Amer et al. 2009)