

Firm-Level Evidence on International Stock Market Comovement

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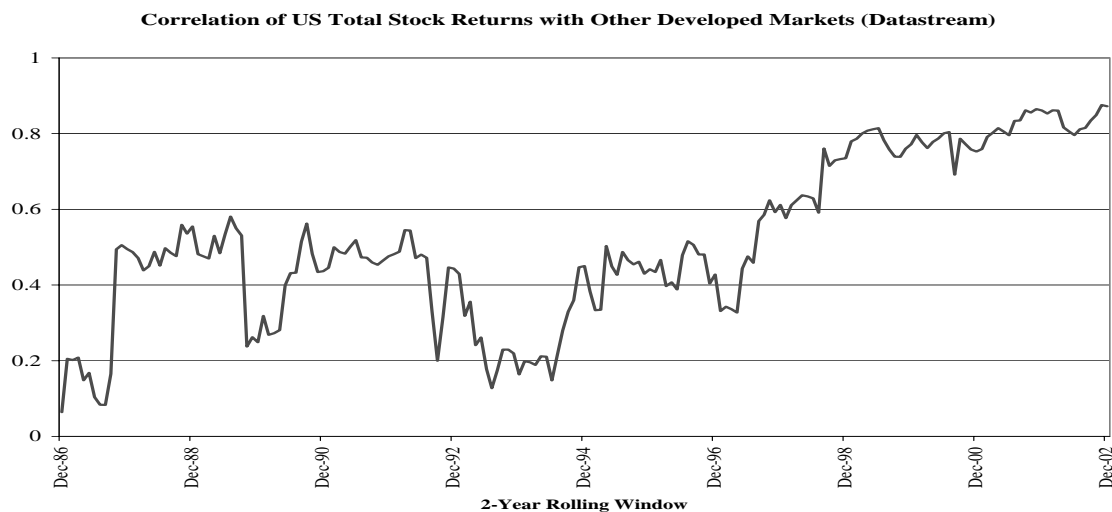
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Motivation

- Firms are becoming more international.
- Comovement across national stock markets has increased recently.
- To what extent is the increase in stock market comovement driven by firms becoming more international?



Questions

1. Is there a **cross-sectional** link between the exposure of returns to global and country-specific shocks (the stock market β s) and the degree to which firms are international?
2. Has this link become stronger **over time**?
3. Has the importance of global and country-specific shocks changed? Can we relate their evolution to fundamentals?

How Do We Measure The Stock Market β s?

- We use a factor model that decomposes movements in stock returns into global, country-specific and industry-specific factors, plus an idiosyncratic component:

$$R_{nt} = \mu_n + \beta_n^g f_t^g + \sum_{c=1}^C \beta_n^c f_t^c + \sum_{i=1}^I \beta_n^i f_t^i + \epsilon_{nt}, \quad (1)$$

- Maximum Likelihood estimates via EM algorithm (Lehman and Modest 85) under normality assumptions.

*How Do We Measure The Degree To Which Firms Are
International?*

1. Industry affiliation: **traded vs non-traded** (Griffin & Karolyi 98, Dominguez & Tesar 01).
2. **Accounting variables**: International sales, income, and assets ratios (Cavaglia, Cho, & Singer 01, Diermeier & Solnik 00).
3. **Sales β s**: we apply the factor model to the growth rates of total sales for our panel of firms, and obtain the effective exposure of each firm to global, country-, and industry-specific shocks.

Data

- U.S.\$ denominated monthly excess returns over US T-bill for 1,239 firms in 20 developed and emerging markets from 85:1 - 02:2 (source: Datastream).
 - cover 34 % of global stock market in capitalization terms in 2000.
- For the same sample, annual total sales from 1985-2001 (source: Worldscope).
- Firms belong to one of 40 Datastream industries.
- Annual balance sheet data on international sales, income, and assets ratios from Worldscope.

*Is There A Link Between The Stock Market β s
And The Degree To Which Firms Are International?*

$$\text{Var}(R_{nt}) = \beta_n^g{}^2 + \beta_n^c{}^2 + \beta_n^i{}^2 + \sigma_n^2$$

Variance Decomposition of International Stock Returns (in %)

	global	country	industry
All firms	6.92	32.24	7.01
Top Quartile International Sales	11.32	25.59	6.70
Bottom Quartile International Sales	3.91	34.34	7.15

How Quantitatively Important Is This Link?

Cross-sectional Bin Regressions of the Stock Market Betas

	int'l sales ratio	sales β	Adj R ²
global β	.191 (8.88)		.859
global β		.768 (6.62)	.507
country β	-.151 (-2.55)		.263
country β		.722 (11.55)	.803

*We Now Allow The Importance Of The Global, Country, And
Industry Shocks To Change Over Time*

$$\text{Var}(R_{nt}) = \beta_n^g \sigma_{\xi_l^g}^2 + \beta_n^c \sigma_{\xi_l^c}^2 + \beta_n^i \sigma_{\xi_l^i}^2 + \sigma_n^2$$

Variance Decomposition of International Stock Returns Over Time (in %)

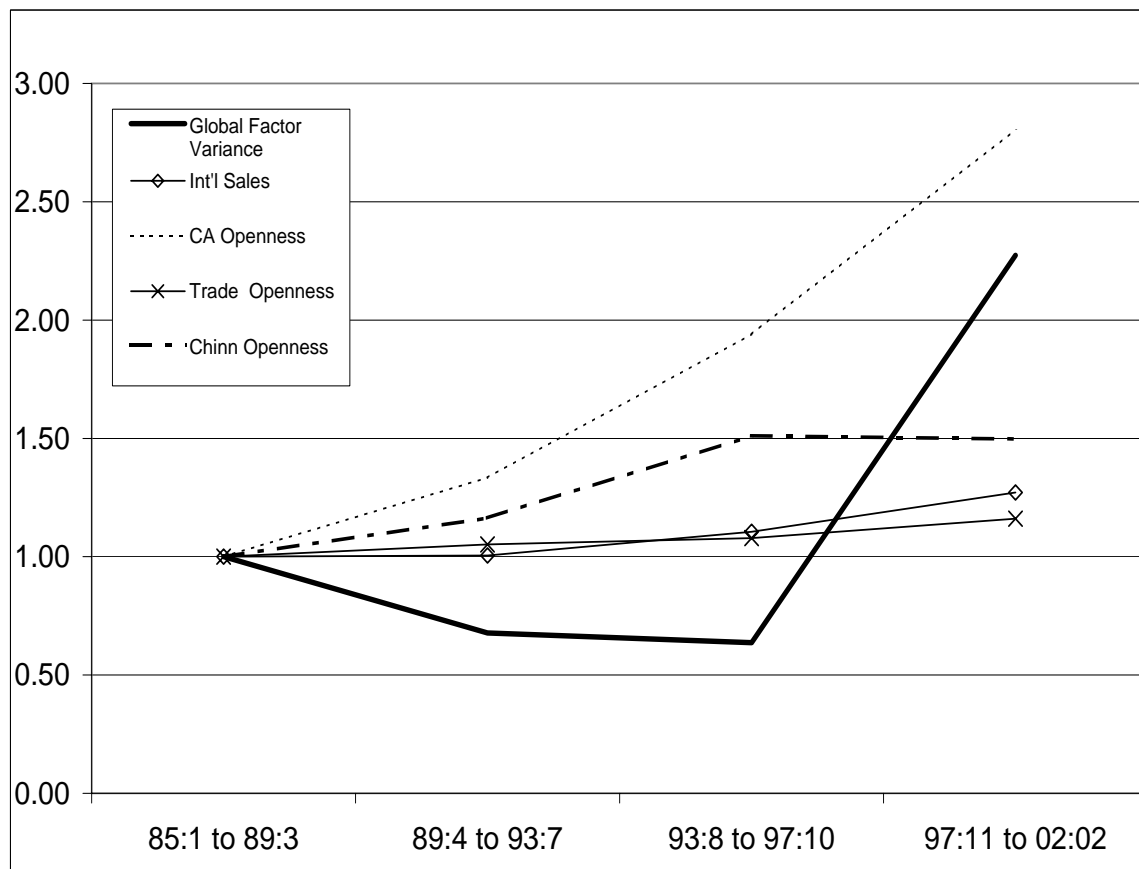
	All firms			Top Quartile Int'l Sales			Bottom Quartile Int'l Sales		
	G	C	I	G	C	I	G	C	I
85:1-89:3	4.26	29.61	9.57	6.56	34.33	5.19	3.17	26.67	10.47
89:4-93:7	2.02	41.97	4.27	3.39	30.56	4.05	1.17	45.16	4.41
93:8-97:10	2.72	30.90	5.41	4.62	21.42	6.17	1.54	35.40	5.47
97:11-02:02	16.49	29.46	8.73	24.27	21.34	8.22	10.98	31.98	9.15

Has The Link Between The Stock Market β s And The Degree To Which Firms Are International Increased Over Time?

Cross-sectional Bin Regressions of the Stock Market Betas Over Time

		int'l sales ratio	sales β
global β	85:1-89:3	.123**	.634**
	89:4-93:7	.088**	.430**
	93:8-97:10	.079**	.403**
	97:11-02:02	.280**	1.440**
country β	85:1-89:3	.181**	.794**
	89:4-93:7	-.154*	1.050**
	93:8-97:10	-.123**	.628**
	97:11-02:02	-.191**	.911**

Changes In The Importance Of The Global Shock vs Fundamentals



Changes In The Importance Of Country Shocks vs Fundamentals

period:	int'l sales ratio	Global sales β	CA openness	Trade openness
89:4-93:7	-.0001	-1.394	-.2722	-.0026*
93:8-97:10	-.0114**	.7543	-.2878**	.0004
97:11-02:02	-.0168**	-9.900**	-.0115	.0033**

Conclusions

- There is a large and significant link between the stock market β s and the extent to which firms are international.
- Over time this link has become stronger - international stock market comovement has gone up more for firms that are more diversified across countries.
- This is a reflection of the increased importance of global shocks - which we find hard to map into fundamentals - and of the decreased importance of country shocks over time - a decrease that is stronger for countries that are open and where firms are more international.