

# **Time Varying Synchronicity in Individual Stock Returns: A Cross-Country Comparison**

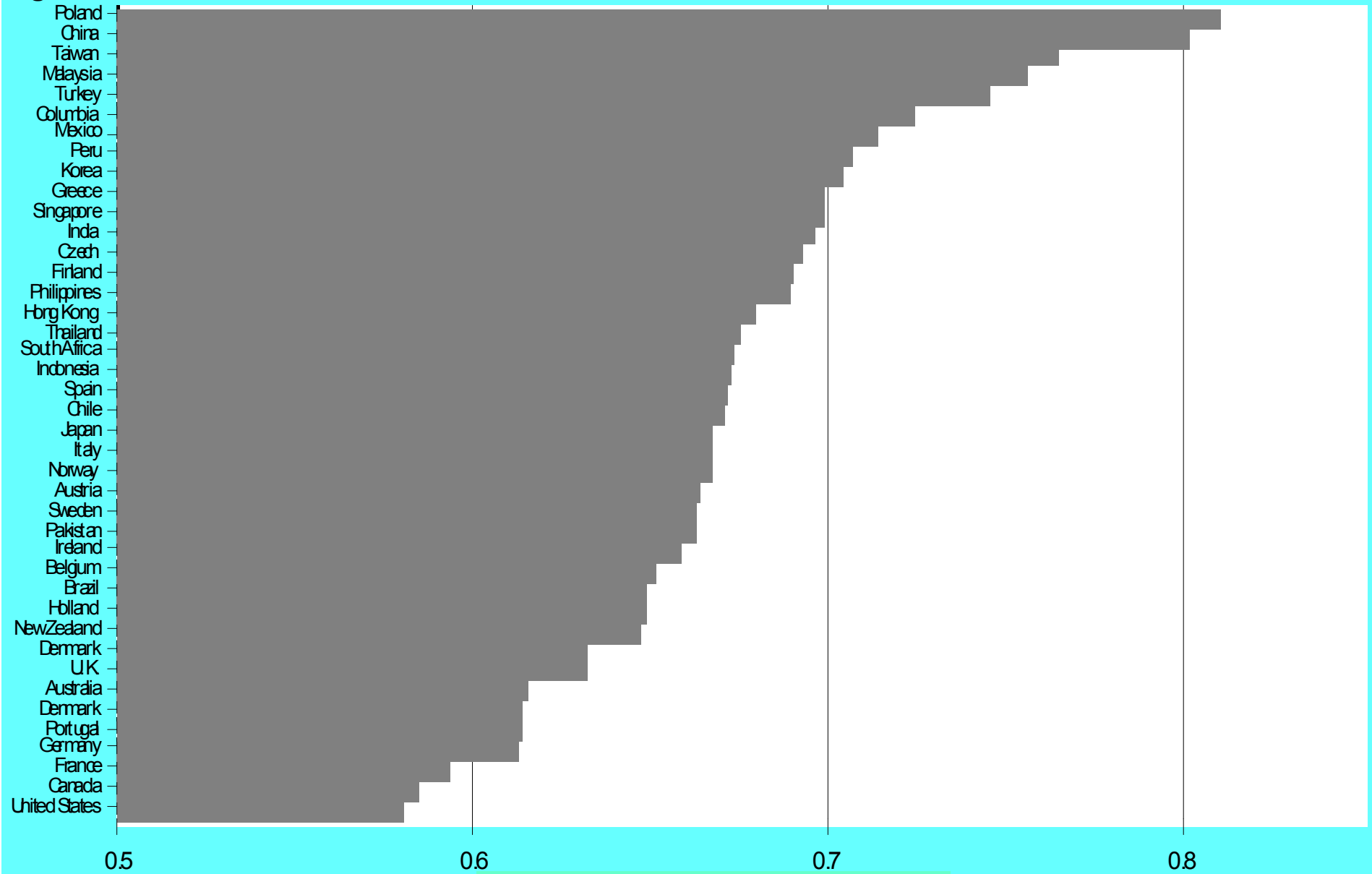
Kan Li, Randall Morck, Fan Yang ,  
and Bernard Yeung

- Daily stock returns data from the Shanghai stock exchange



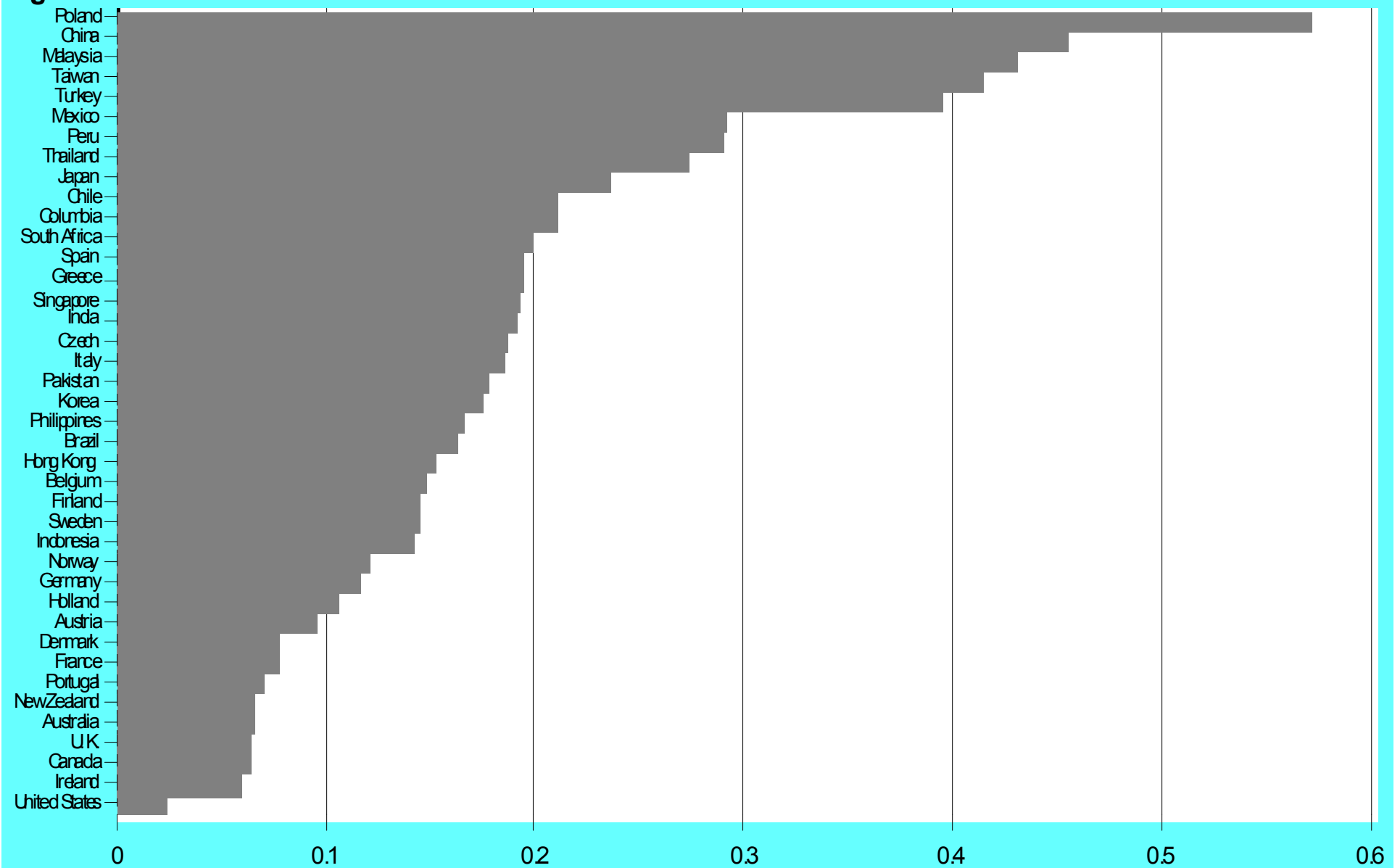


Figure 4a



$$f_j = \frac{\max[n_{up}, n_{down}]}{n_{up} + n_{down}}, \quad 1995 \text{ data}$$

Figure 4b



Average Fraction of Individual Return Variation Associated with the Market

Average Market Model  $R^2$

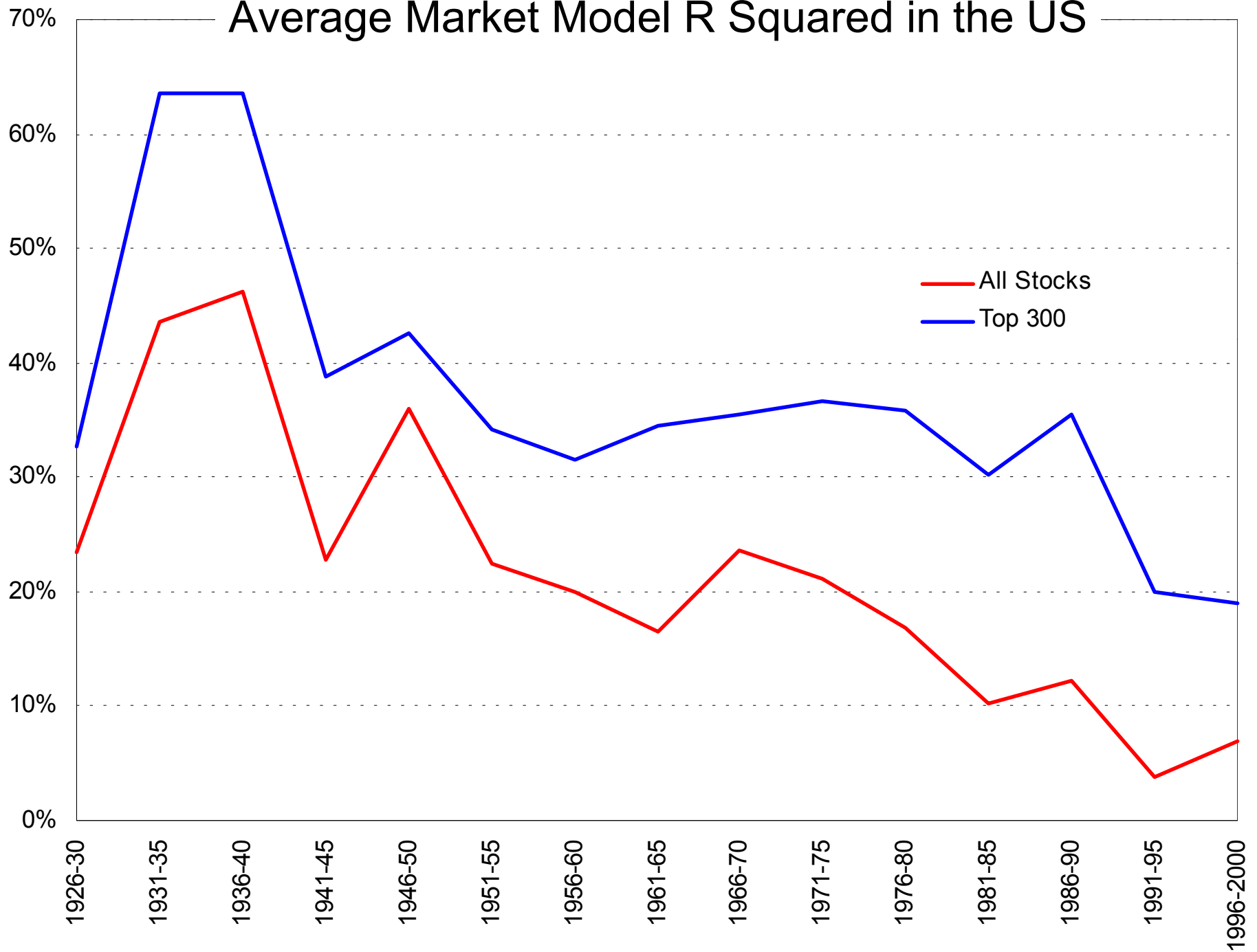
**Table 2. Some Possible Explanations for More Stock Price Comovement in Emerging Economies**

This is a subset of a much longer list investigated by Morck *et al.* (2000). A variable “explains higher emerging market synchronicity” if including it a regression explaining synchronicity makes *per capita* GDP insignificant.

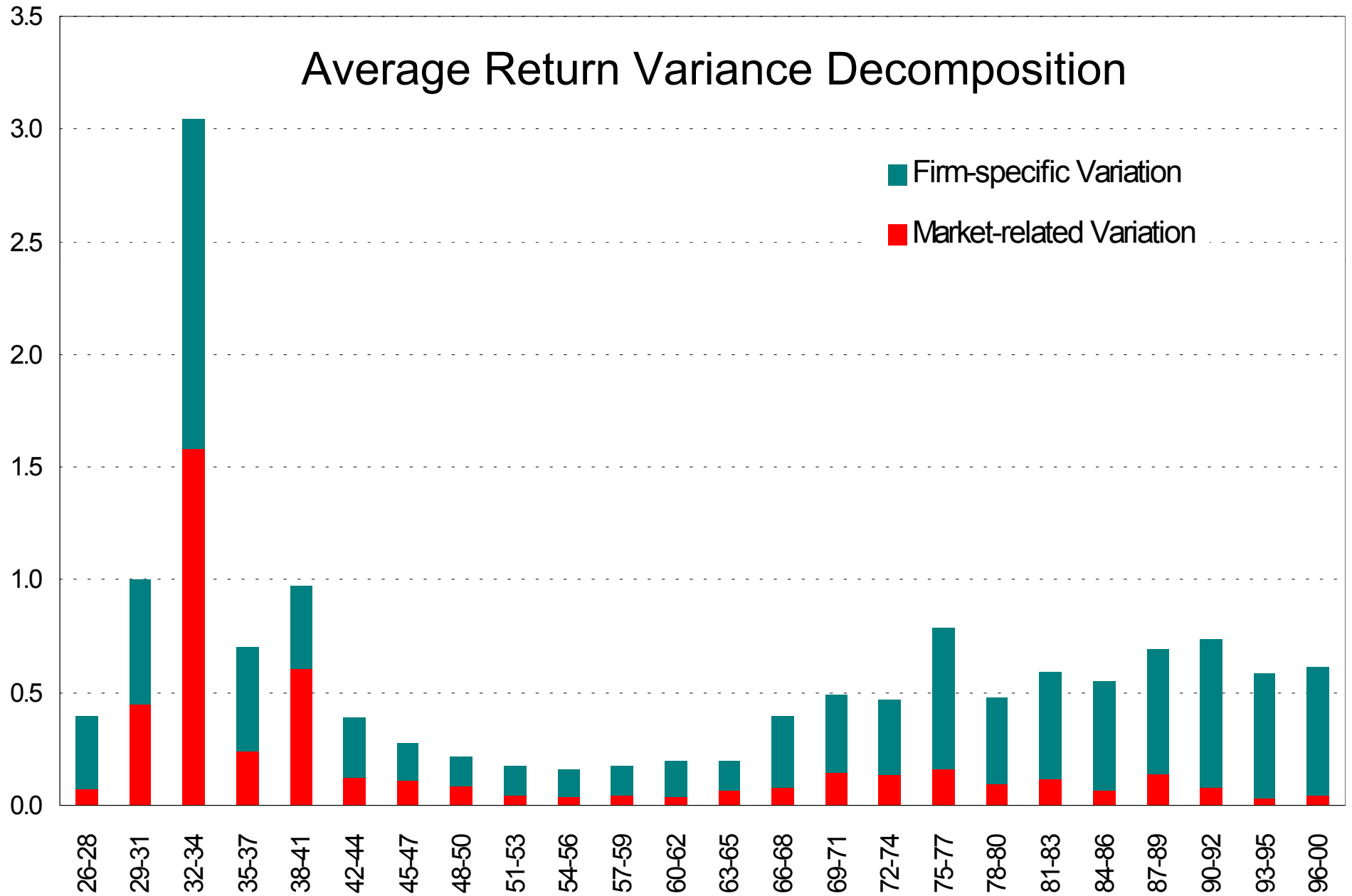
Proxy for fundamentals synchronicity	Supporting Story	Problems with Supporting Story	Explains high emerging market synchronicity?
Number of listings	Stock markets with many listed securities attract a more diverse range of companies.	Ireland and Denmark have substantially fewer listed stocks than many emerging markets; yet display synchronicity comparable to the U.S.	No.
Country size	Natural disasters and other Acts of God affect most firms in smaller countries, but not in larger countries	The U.S. and Ireland have similarly low synchronicity. China and Poland exhibit similar high synchronicity	No.
Country diversification	Poor countries depend on only a few industries, so their listed stocks naturally move together	Many small rich countries are even more specialized than many poor countries	No.
Dominant firms	Poor country economies may be highly dependent on a small number of key firms, whose fortunes affect those of most other firms	This is also true of Holland (Phillips) and Finland (Nokia), yet stocks in these countries move quite independently	No.
Dependence on natural resources	Poor countries depend on natural resource extraction and are buffeted by commodity price fluctuations	Poor countries with resource dependent economies and other poor countries have roughly equally synchronous stock returns	No.
Corporate groups	Companies in poor economies are organized into corporate groups via pyramids or cross holdings	This is also true of many rich countries, such as Sweden, yet their move quite independently	No.
Macroeconomic instability	Poor countries have less stable macroeconomic policies and this causes synchronous fluctuations in stocks	Poor countries with more stable inflation, money supply growth, etc. do not exhibit less returns synchronicity	No.
General instability	Poor countries are prone to economic crises of various sorts, and these induce synchronicity in their stocks	Poor countries with more stable economic growth rates do not exhibit less returns synchronicity	No.
Earnings comovement	General	Estimated with error	No.
All of the above	General		No.

See Morck *et al.* (2000) for statistical test details.

# Average Market Model R Squared in the US



# Average Return Variance Decomposition



# Who Cares?

## Portfolio Management

Diversification, option valuation, etc.	Campbell <i>et al.</i> (2001)
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## Institutions

Shareholder rights, sound institutions	Morck <i>et al.</i> (2000)
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Insider trading laws	Beny (2002)
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Accounting standards, free press	Bushman <i>et al.</i> (2001)
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Short sales allowed	Goetzmann and Masso (2002)
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Enhanced disclosure	Durnev <i>et al.</i> (2002)
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## Market Efficiency

Earnings response coefficients	Durnev <i>et al.</i> (2003)
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Functional-form market efficiency	Wurgler (2000), Durnev <i>et al.</i> (2002)
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Economic growth/creative destruction	Durnev <i>et al.</i> (2002)
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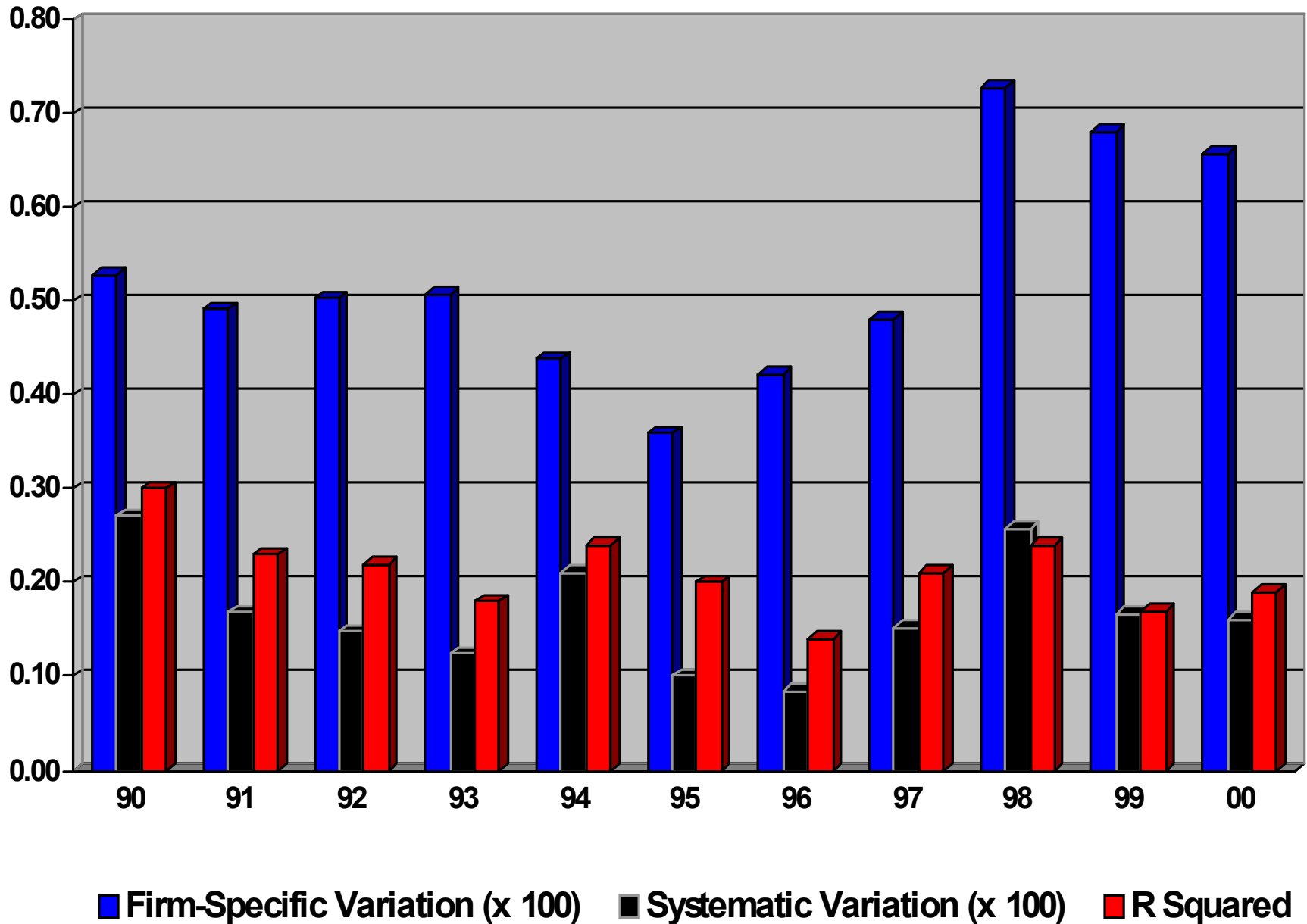
# Summary

More asynchronous stock returns are

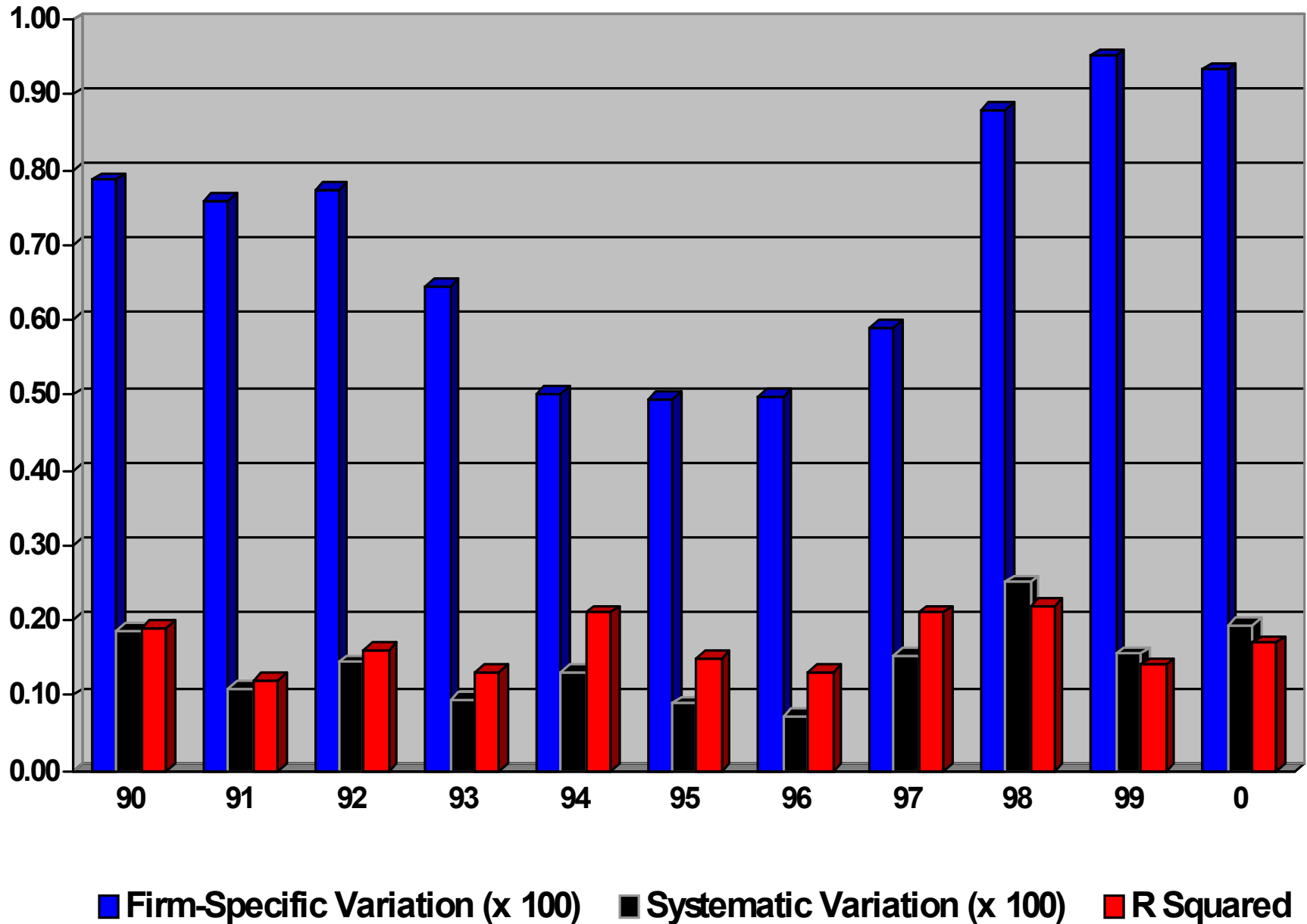
1. A feature of a better developed stock market?
2. A sign that capital is better allocated?

We take these as working hypotheses, not as facts, though we think the evidence supporting these statements is increasingly persuasive

# Worldwide Averages Across Markets



# Worldwide Averages Across Stocks



**Panel A. Panel regressions with country fixed effects**

Dependent variable is logistic transformation of market model  $R^2$

Regression	8a.1	8a.2	8a.3	8a.4	8a.5	8a.6	8a.7
Trade openness	.07 (.72)		2.13 (2.66)				-1.54 (3.82)
Trade openness x good government		-.00 (.03)	-.10 (.12)				.12 (.21)
Capital openness				-.40* (.24)		2.92* (1.56)	2.47 (1.83)
Capital openness x good government					-.02** (.01)	-.16** (.07)	-.13 (.09)
F Statistic for openness terms	.01	.01	.33	2.70*	3.84**	3.71**	.85
Regression $R^2$	.6371	.6371	.6380	.5955	.5986	.6079	.6046

Dependent variable is logarithm of average firm-specific variation

Regression	8a.8	8a.9	8a.10	8a.11	8a.12	8a.13	8a.14
Trade openness	2.13*** (.68)		4.98** (2.52)				1.28 (3.91)
Trade openness x good government		.09*** (.03)	-.14 (.12)				.05 (.21)
Capital openness				1.25*** (.23)		.82 (1.50)	.31 (1.87)
Capital openness x good government					.06*** (.01)	.02 (.07)	.04 (.09)
F Statistic for openness terms	9.82***	7.23***	5.60***	29.3***	29.0***	14.6***	6.20***
Regression $R^2$	.6449	.6416	.6467	.5059	.5051	.5062	.4734

Dependent variable is logarithm of average systematic variation

Regression	8a.15	8a.16	8a.17	8a.18	8a.19	8a.20	8a.21
Trade openness	2.21** (.98)		7.11** (3.61)				-.26 (5.63)
Trade openness x good government		.08* (.05)	-.24 (.16)				.18 (.30)
Capital openness				.85** (.35)		3.74* (2.24)	2.78 (2.69)
Capital openness x good government					.04** (.02)	-.14 (.11)	-.09 (.13)
F Statistic for openness terms	5.12**	3.22*	3.57**	5.95**	4.84**	3.84**	3.46***
Regression $R^2$	.6149	.6122	.6178	.4530	.4490	.4592	.5033

Sample	300	300	300	167	167	167	141
Degrees of freedom	267	267	266	149	149	148	121

**Panel B. Panel regressions with country and year fixed effects**

Dependent variable is logistic transformation of market model $R^2$							
Regression	8b.1	8b.2	8b.3	8b.4	8b.5	8b.6	8b.7
Trade openness	2.16*** (.76)		3.18 (2.19)				-.75 (3.31)
Trade openness x good government		.09*** (.04)	-.05 (.11)				.17 (.18)
Capital openness				-.43* (.27)		3.19** (1.44)	3.76** (1.66)
Capital openness x good government					-.03** (.01)	-.17*** (.07)	-.19** (.08)
F Statistic for openness terms	8.12***	6.21***	4.18**	2.61	4.22**	4.63***	2.69**
Regression $R^2$	.7675	.7658	.7677	.7811	.7818	.7158	.7815
Dependent variable is logarithm of average firm-specific variation							
Regression	8b.8	8b.9	8b.10	8b.11	8b.12	8b.13	8b.14
Trade openness	.68 (.76)		6.05*** (2.17)				1.07 (3.63)
Trade openness x good government		-.00 (.04)	-.28*** (.10)				.04 (.20)
Capital openness				.83*** (.27)		-.32 (1.46)	-1.07 (1.82)
Capital openness x good government					.04*** (.01)	.054 (.07)	.09 (.09)
F Statistic for openness terms	.81	.00	3.88**	9.84***	10.5***	5.22***	2.42**
Regression $R^2$	.7444	.7436	.7511	.5997	.6881	.6888	.5922
Dependent variable is logarithm of average systematic variation							
Regression	8b.15	8b.16	8b.17	8b.18	8b.19	8b.20	8b.21
Trade openness	2.83*** (1.01)		9.24*** (2.90)				.32 (4.83)
Trade openness x good government		.09* (.05)	-.33** (.14)				.20 (.26)
Capital openness				.40 (.37)		2.87 (2.05)	2.70 (2.42)
Capital openness x good government					.01 (.02)	-.12 (.09)	-.10 (.12)
F Statistic for openness terms	7.86***	3.27*	6.76***	1.16	.70	1.33	2.58**
Regression $R^2$	.7603	.7561	.7653	.6153	.6140	.6194	.6719
Sample	300	300	300	167	167	167	141
Degrees of freedom	258	258	257	139	139	138	112

**Panel C. Panel regressions with country and year fixed effects as well as crisis dummy variables**

Dependent variable is logistic transformation of market model  $R^2$

Regression	8.15a	8.16a	8.17a	8.18a	8.19a	8.20a	8.21a
Trade openness	2.06** (.75)		2.60 (2.29)				-1.49 (3.26)
Trade openness x good government		.09*** (.04)	-.03 (.11)				.20 (.18)
Capital openness				-.50* (.26)		2.90** (1.42)	3.32** (1.64)
Capital openness x good government					-.03** (.01)	-.16** (.07)	-.17** (.08)
Peso Crisis Dummy	.68*** (.19)	.68*** (.19)	.68*** (.19)	.61*** (.24)	.61*** (.23)	.59*** (.23)	.61*** (.22)
Asian Crisis Dummy	.07 (.12)	.11 (.12)	.06 (.12)	.21 (.17)	.21 (.17)	.18 (.17)	.14 (.17)
Real Crisis Dummy	.14 (.21)	.16 (.21)	.13 (.21)	.37 (.27)	.36 (.27)	.34 (.27)	.28 (.25)
F Statistic for openness terms	7.62***	6.36***	3.83**	3.56*	5.32**	4.81***	2.57**
Regression $R^2$	.7792	.7782	.7793	.7199	.7234	.7317	.7550

Dependent variable is logarithm of average firm-specific variation

Regression	8c.8	8c.9	8c.10	8c.11	8c.12	8c.13	8c.14
Trade openness	.19 (.73)		3.07 (2.23)				-1.10 (3.47)
Trade openness x good government		-.01 (.03)	-.15 (.11)				.12 (.19)
Capital openness				.71*** (.26)		-.73 (1.42)	-2.02 (1.74)
Capital openness x good government					.03*** (.01)	.07 (.07)	.13 (.08)
Peso Crisis Dummy	.34* (.18)	.34* (.18)	.34* (.18)	.40* (.23)	.41* (.23)	.41* (.23)	.36 (.23)
Asian Crisis Dummy	.54*** (.11)	.55*** (.11)	.49*** (.12)	.39*** (.17)	.40*** (.17)	.40*** (.17)	.55*** (.18)
Real Crisis Dummy	-.16 (.20)	-.16 (.20)	-.19 (.20)	-.14 (.27)	-.13 (.27)	-.13 (.27)	-.19 (.26)
F Statistic for openness terms	.07	.04	.97	7.49***	8.33***	4.27**	1.96
Regression $R^2$	.7707	.7707	.7724	.6303	.6324	.6331	.6464

Dependent variable is logarithm of average systematic variation

Regression	8c.15	8c.16	8c.17	8c.18	8c.19	8c.20	8c.21
Trade openness	2.25** (.96)		5.67** (2.94)				-2.59 (4.53)
Trade openness x good government		.08* (.05)	-.17 (.14)				.32 (.25)
Capital openness				.21 (.36)		2.17 (1.96)	1.30 (2.27)
Capital openness x good government					.01 (.02)	-.09 (.09)	-.04 (.10)
Peso Crisis Dummy	1.02*** (.24)	1.02*** (.24)	1.02*** (.24)	1.01*** (.32)	1.01*** (.32)	1.00*** (.32)	.97*** (.30)
Asian Crisis Dummy	.61*** (.15)	.65*** (.15)	.54*** (.16)	.60*** (.24)	.61*** (.24)	.58*** (.24)	.69*** (.24)
Real Crisis Dummy	-.02 (.27)	.00 (.27)	-.06 (.27)	.23 (.37)	.23 (.37)	.21 (.37)	.10 (.35)
F Statistic for openness terms	5.49**	3.26*	3.51**	.36	.16	.70	1.93
Regression $R^2$	.7906	.7888	.7918	.6606	.6601	.6632	.7264

Sample	300	300	300	167	167	167	141
Degrees of freedom	255	255	254	136	136	135	109

# Summary

Synchronicity Falls  
Firm-specific Variation Rises

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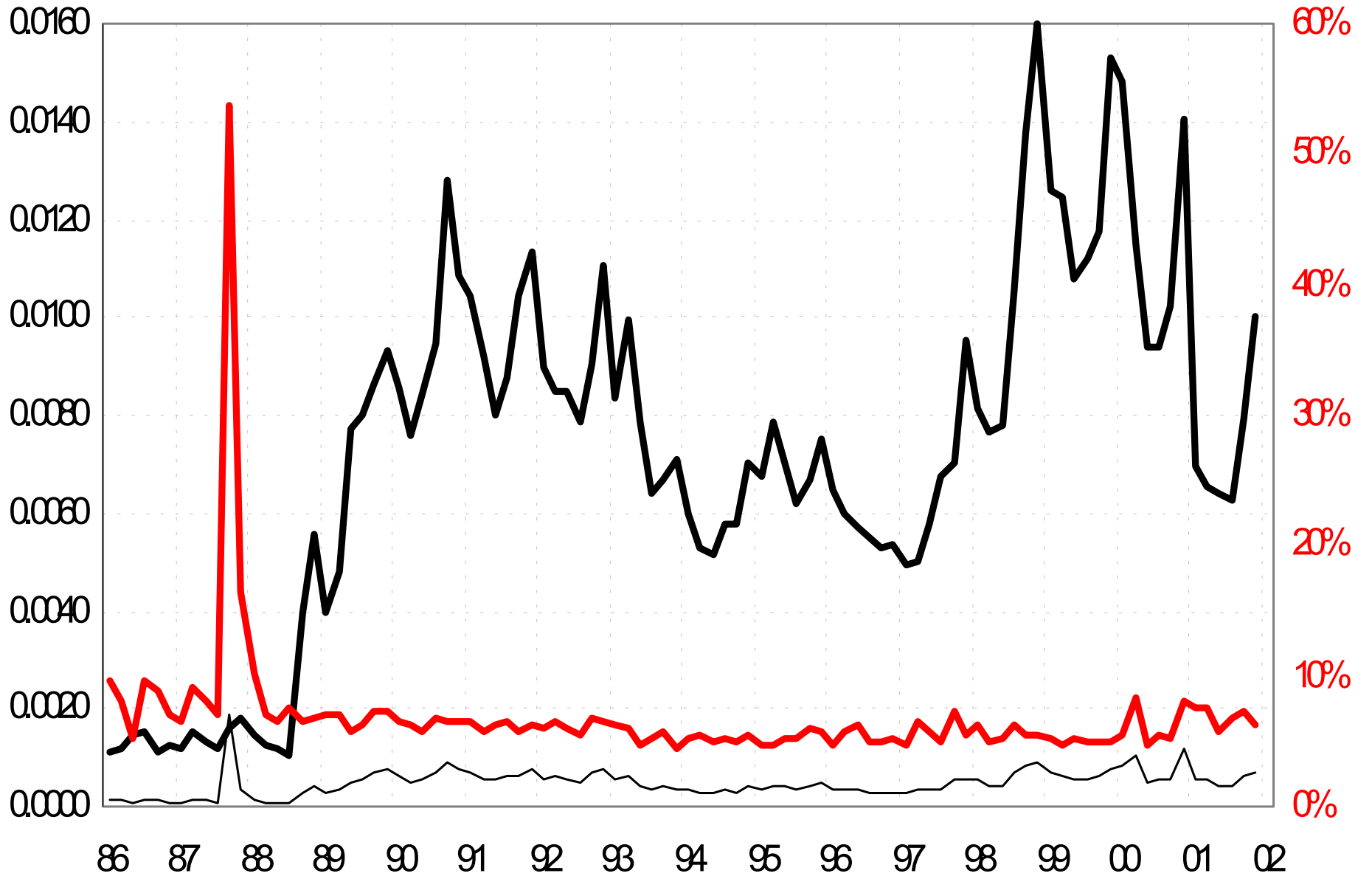
More open  
capital market

Appropriateness  
of openness  
measure?

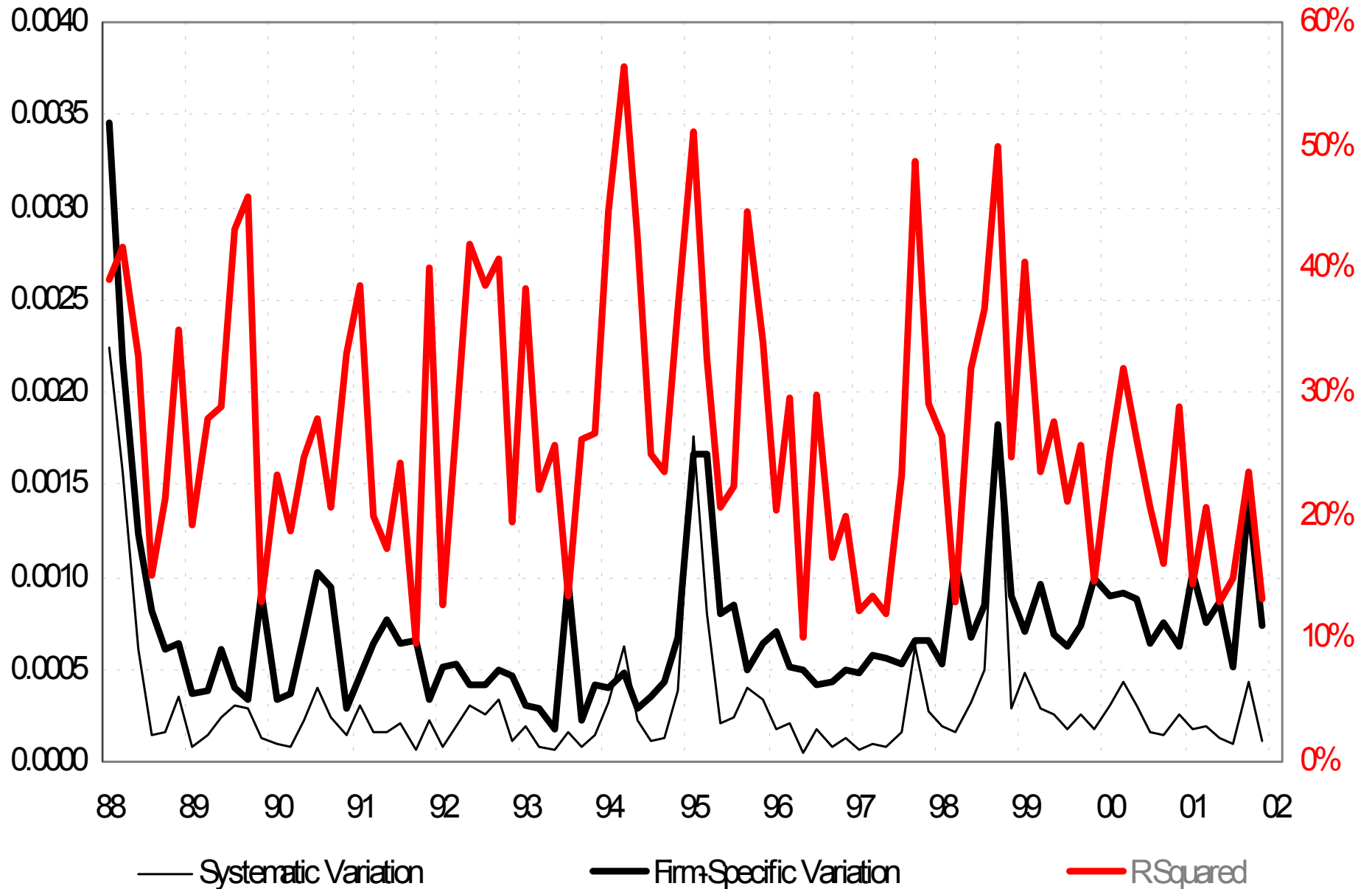
Relationship is stronger  
in countries with sounder  
institutions

The relationship may even  
be inverted if institutions  
are very poor

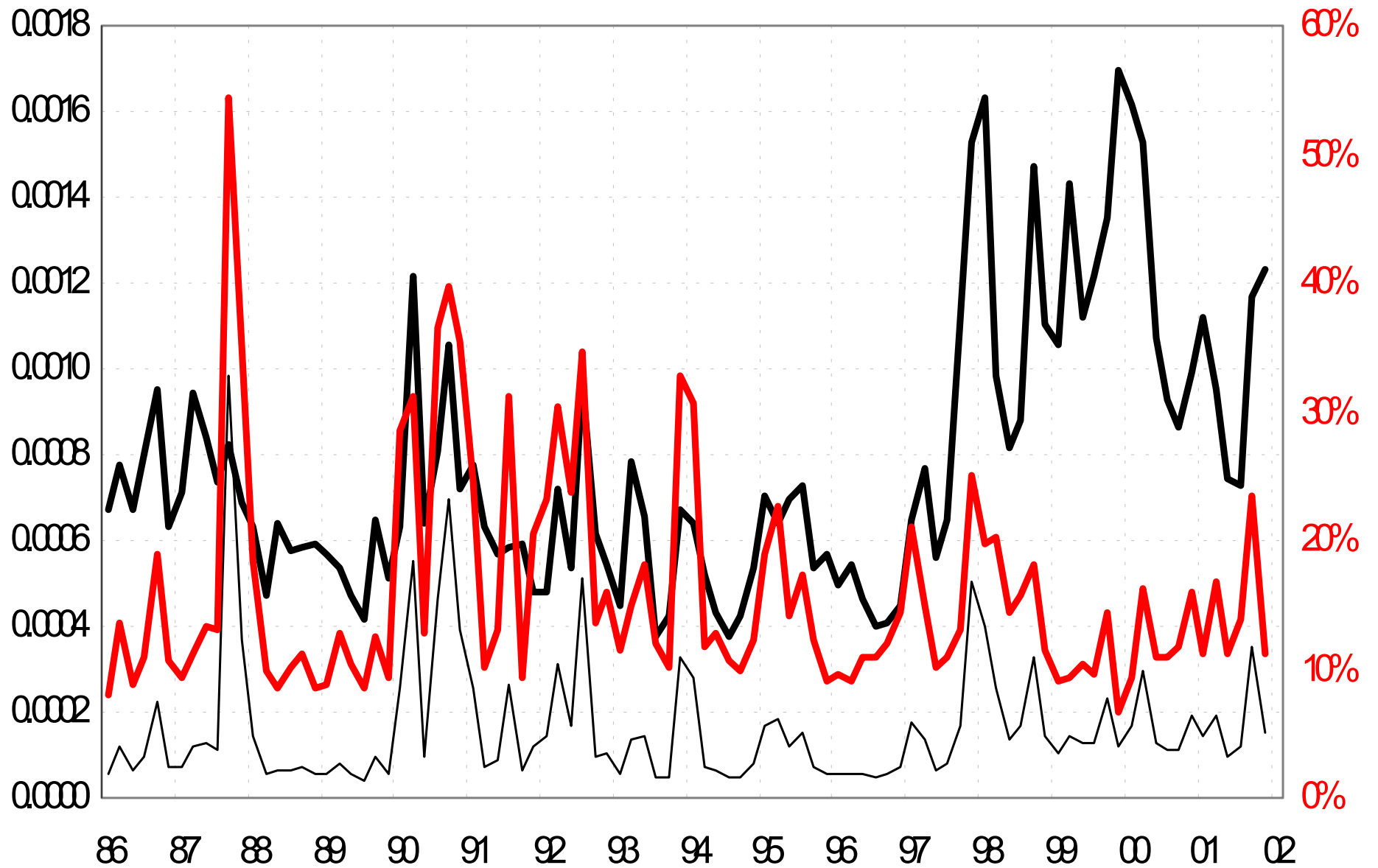
# Canada



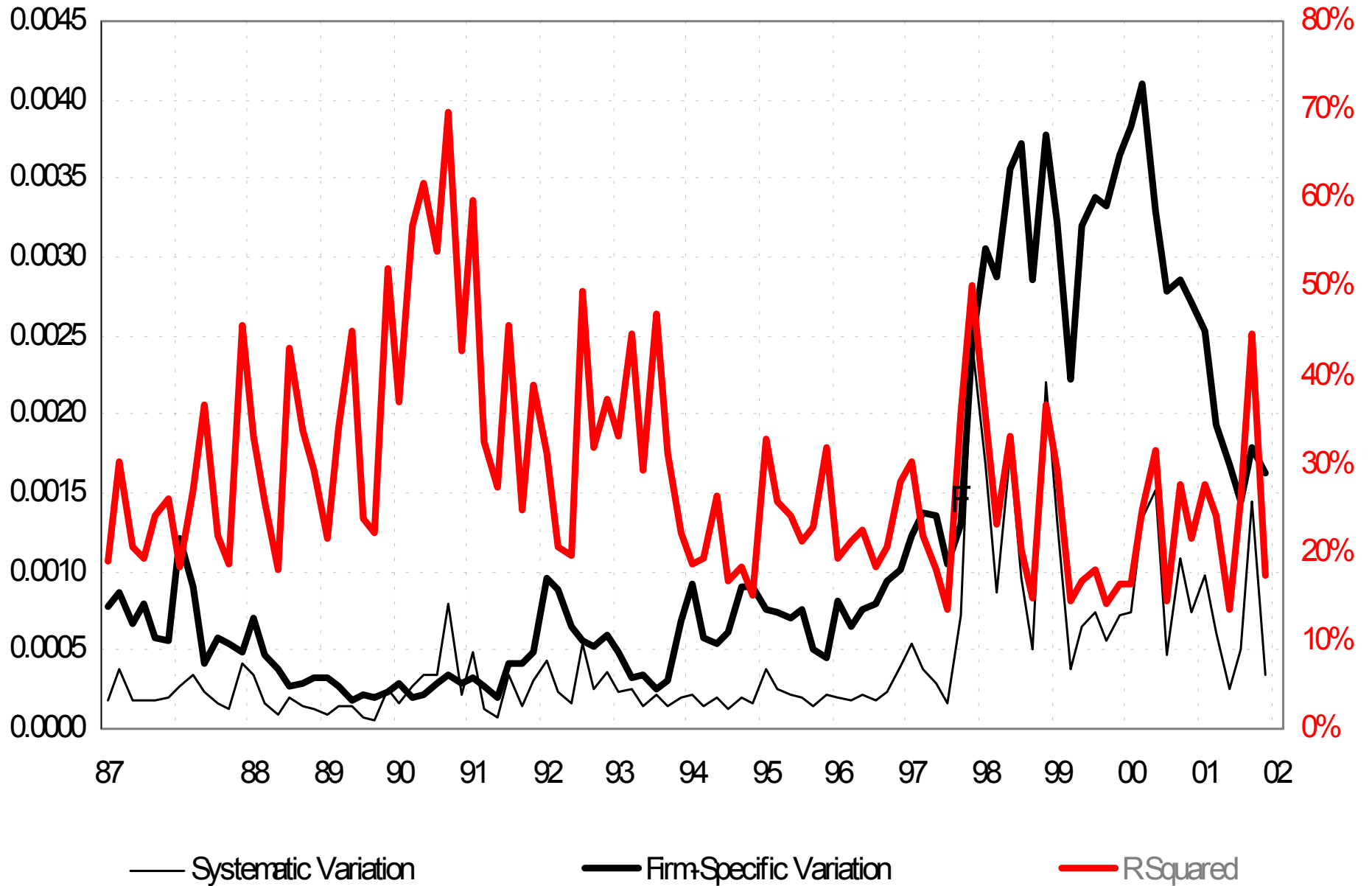
# Mexico



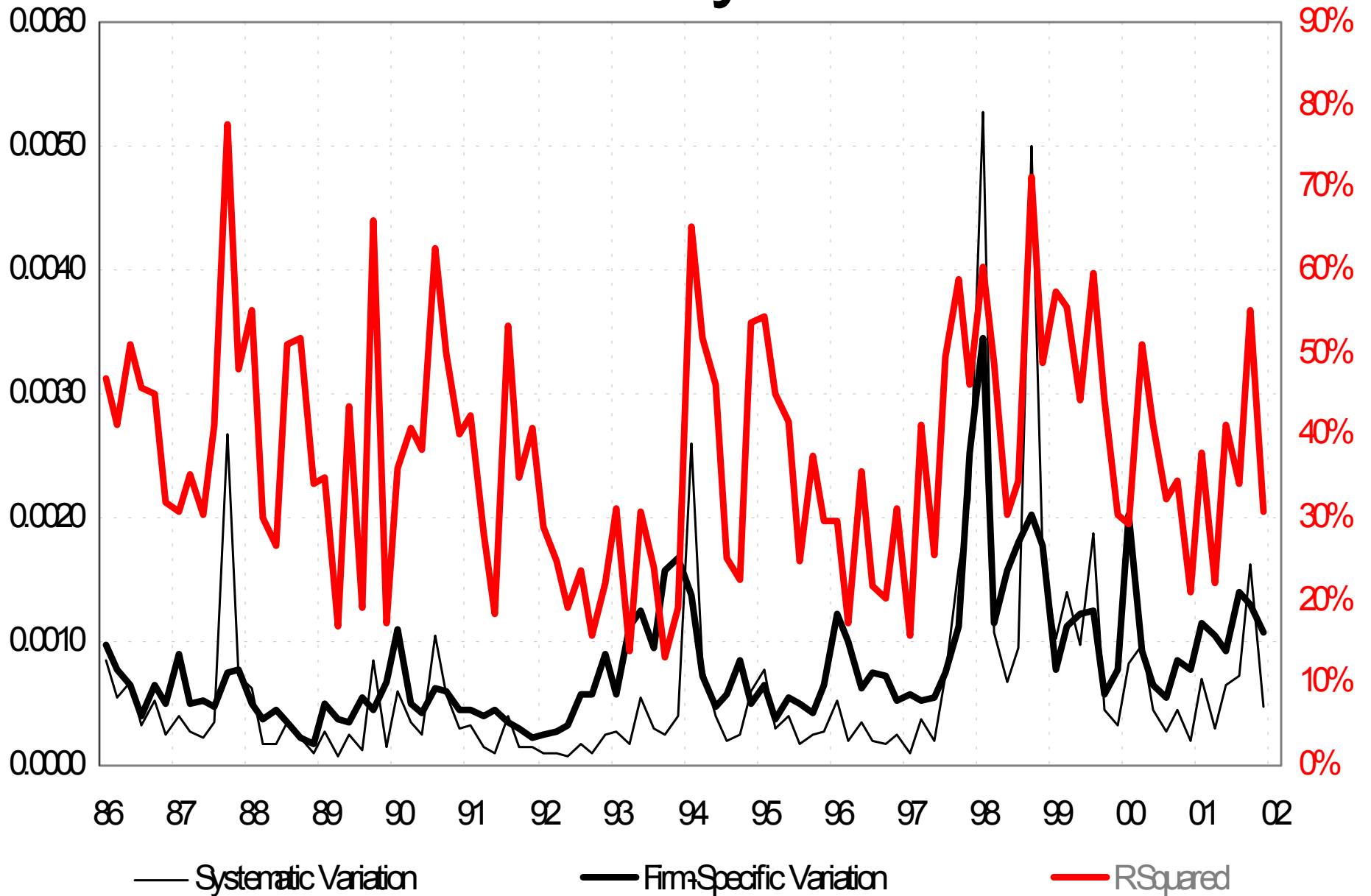
# Japan



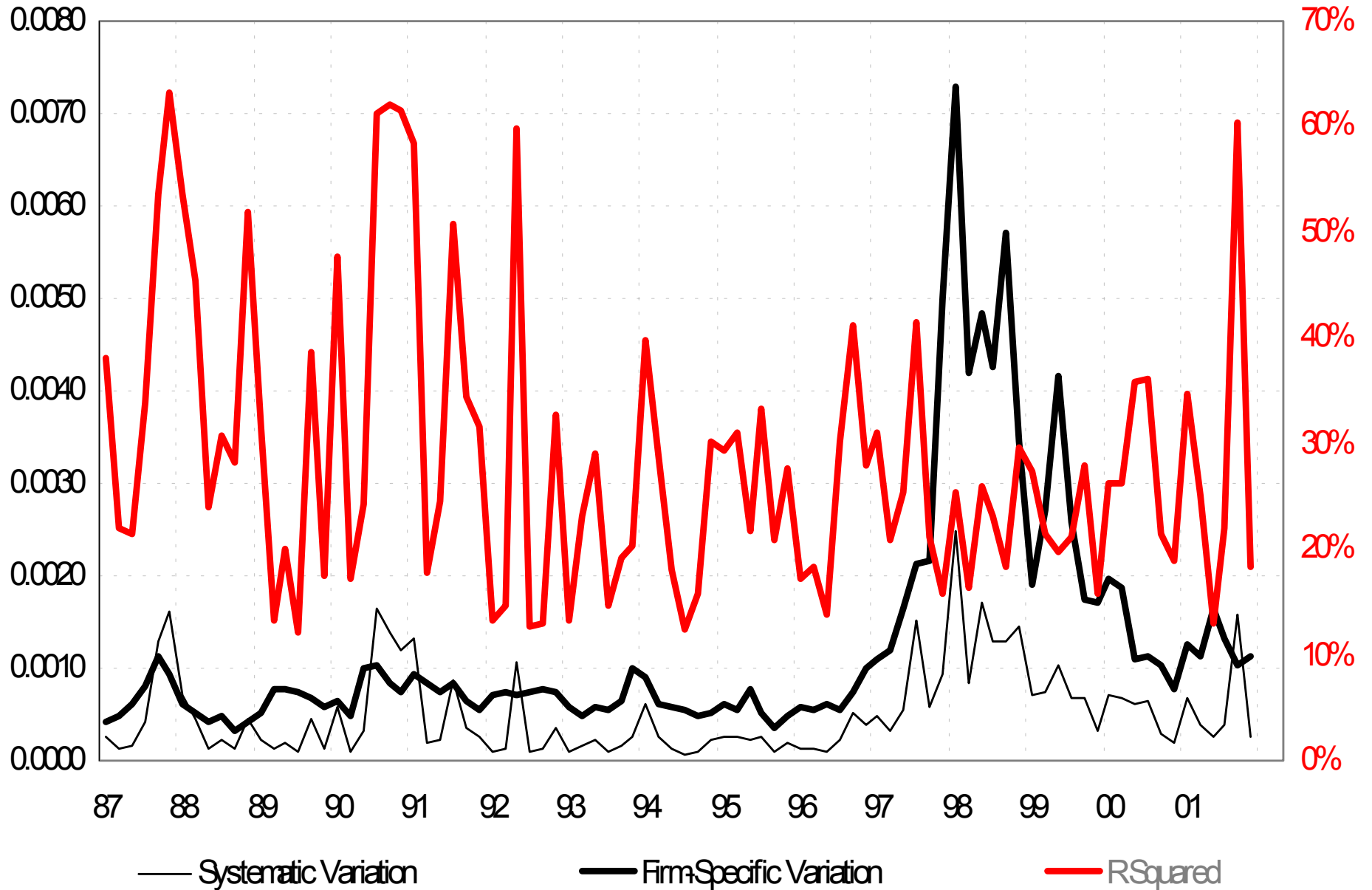
# Korea



# Malaysia



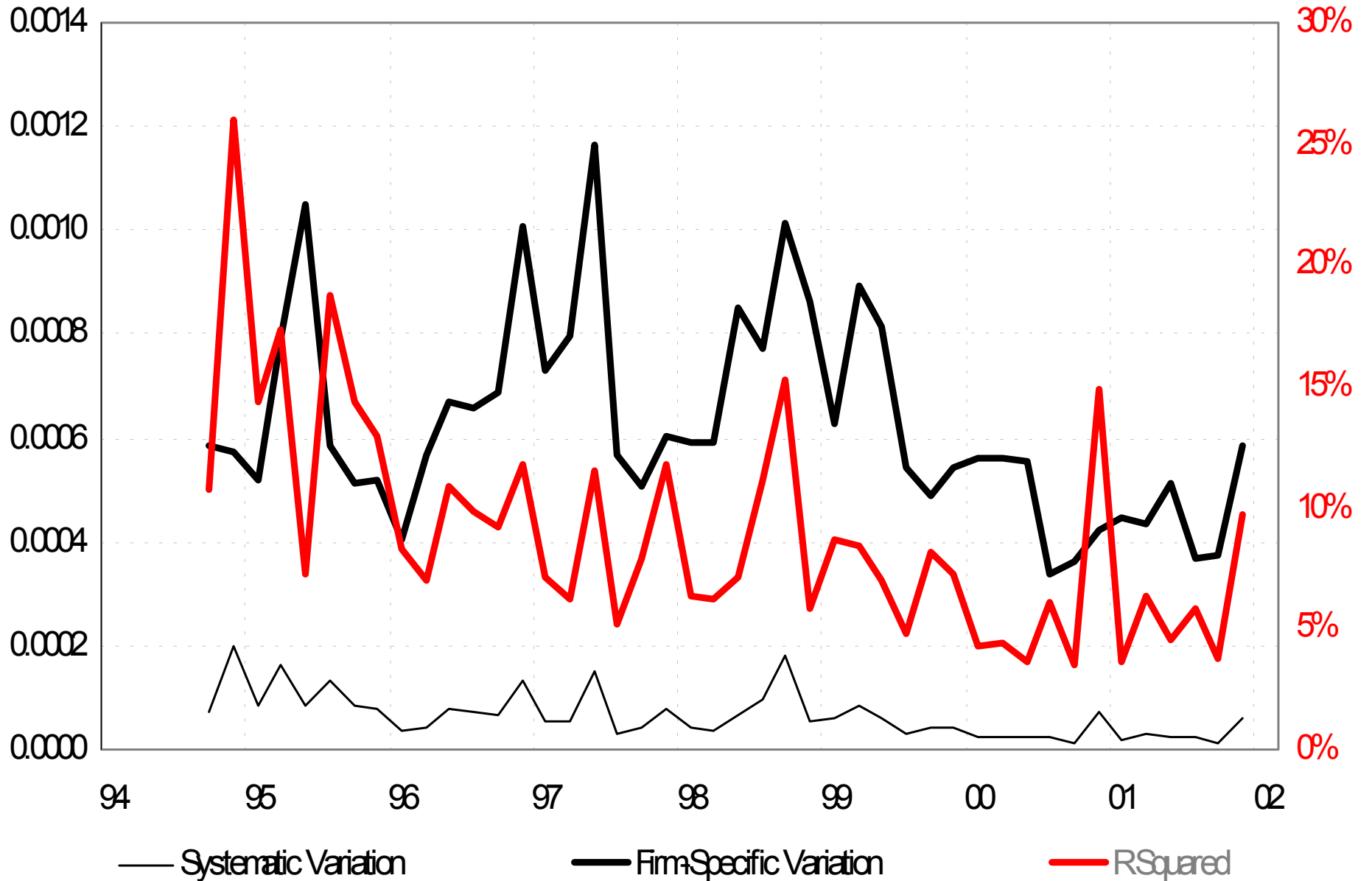
# Thailand



# Poland



# Czech Republic



# Bottom Lines

- Firm-specific variation is rising, and synchronicity falling, in many countries, not just in the US
- The magnitude of the change is related to
  1. Openness of capital markets
  2. Institutional development
- Speculation: Is “asynchronicity” potentially a useful measure of
  - The vigor of economic activity?
  - The functional-form efficiency of the stock market?



***“The price system is just one of those formations which man has learned to use (though he is still very far from having learned to make the best use of it) after he has stumbled upon it without understanding it.”***

Friedrich August von Hayek (1945)