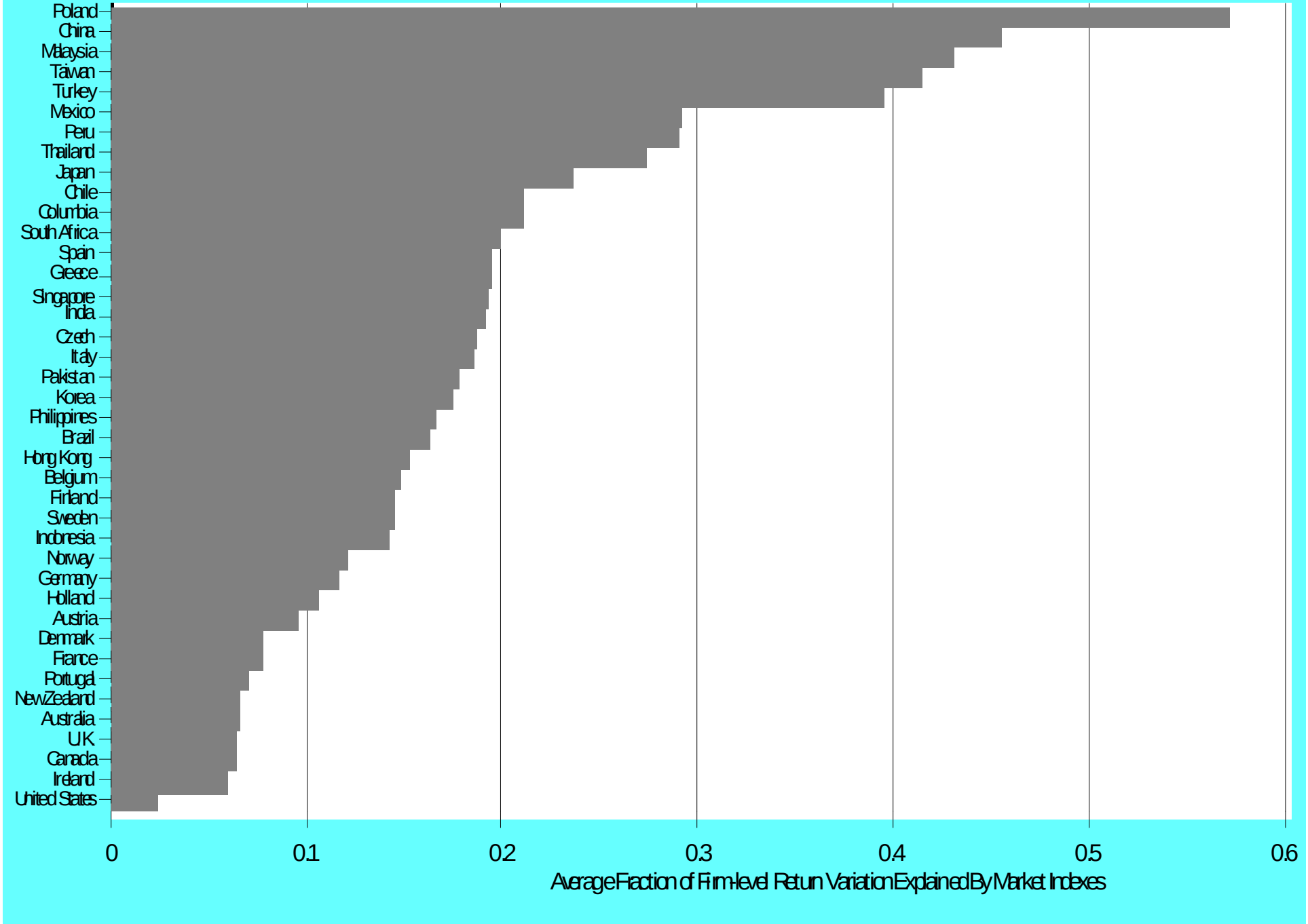
Openness and Firm-specific Information in Stock Returns

Randall Morck

Fan Yang

Bernard Yeung

Figure 4b


Poland
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Peru
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Japan
Chile
Columbia
South Africa
Spain
Greece
Singapore
India
Czech
Italy
Pakistan
Korea
Philippines
Brazil
Hong Kong
Belgium
Finland
Sweden
Indonesia
Norway
Germany
Holland
Austria
Denmark
France
Portugal
New Zealand
Australia
U.K.
Canada
Ireland
United States
0
0.1
0.2
0.3
0.4
0.5
0.6
Average Fraction of Firm-level Return Variation Explained By Market Indexes

Market Model R^2

- A high $R^2 = \frac{SSM}{SSM + SSE} = \frac{\sigma_m^2}{\sigma_m^2 + \sigma_\varepsilon^2}$

  can be due either to a high σ_m^2 or a low
- When institutions are extremely poor, σ_m^2 is very high
- When institutions are above a certain threshold, further decline in R^2 is due to higher σ_ε^2 in the countries with the highest rated institutions

Market Model R^2

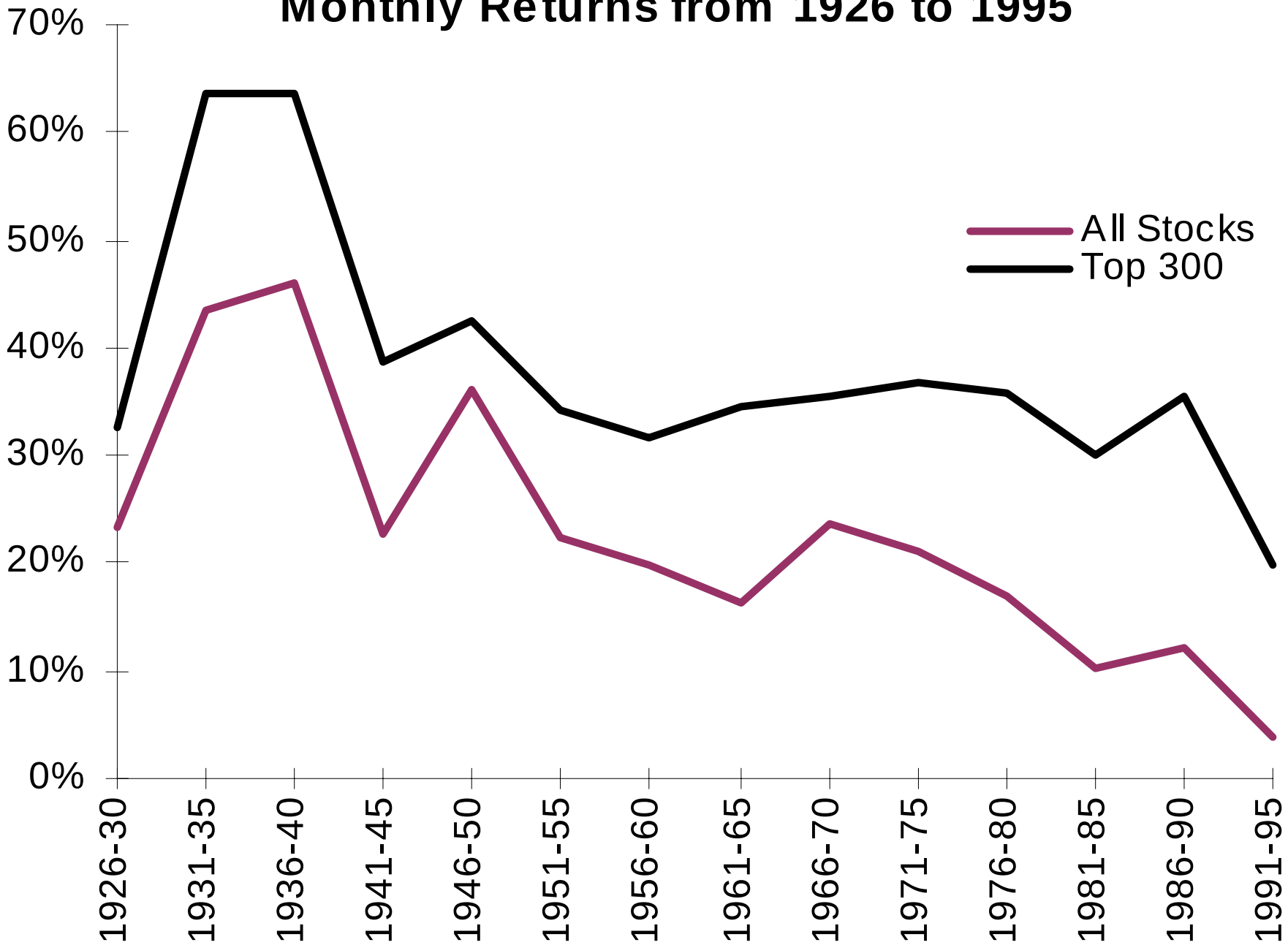
- After controlling exhaustively for fundamentals co-movement, stock prices move together more where the quality of institutions is lower
  - Government officials don't respect private property
  - Outsider investors' property rights are poorly protected against corporate insiders

    Morck, Yeung and Yu (2000)
  - Poor accounting standards
    - Low quality corporate reporting
  - Freedom of information
    - Government control or ownership of the media

    Bushman, Piotroski, and Smith (2001)
  - Insider trading laws are weaker

    Beny (2000)

Figure 3: Average R2 Across Stocks Based on Monthly Returns from 1926 to 1995



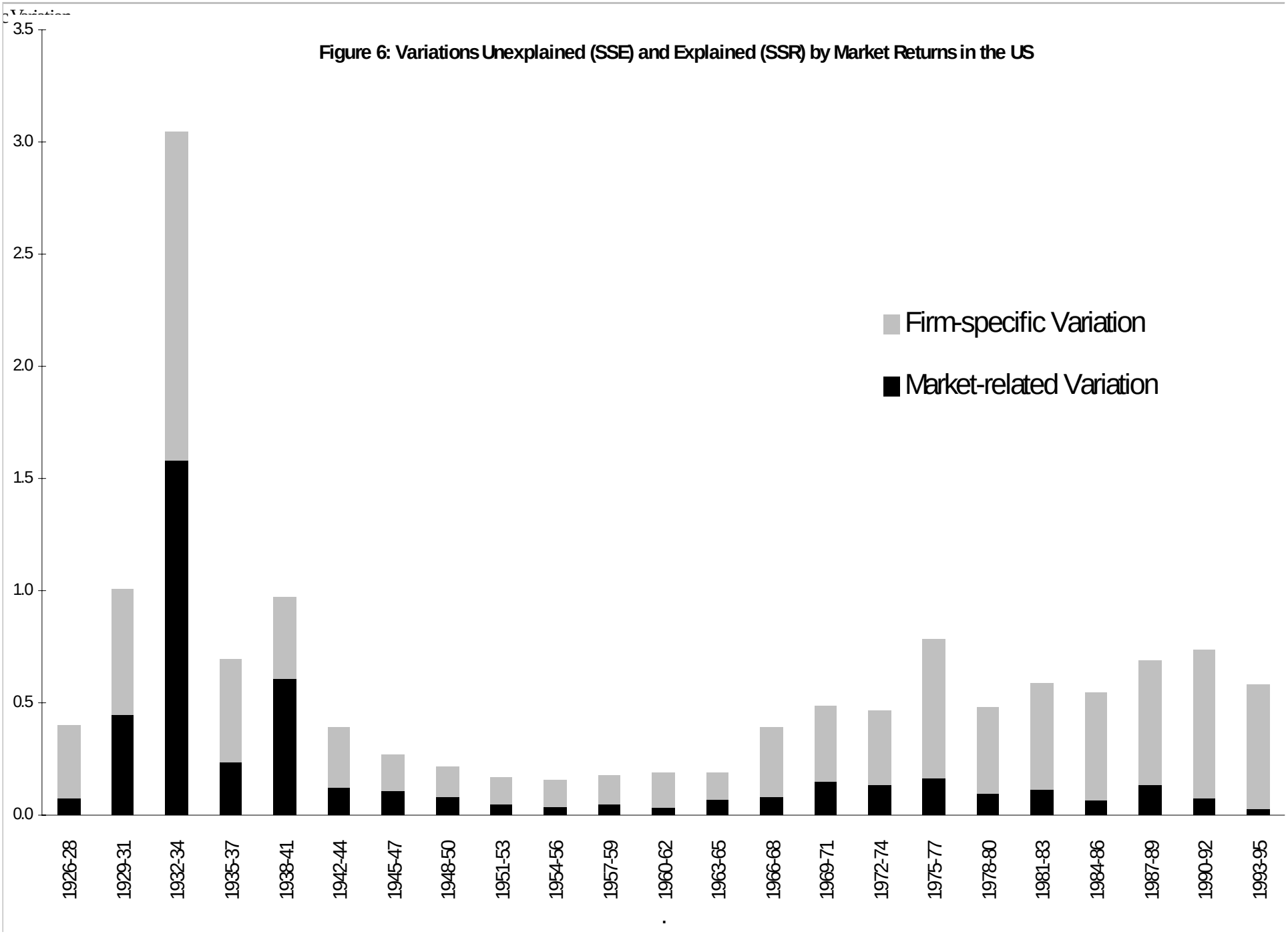


Figure 6: Variations Unexplained (SSE) and Explained (SSR) by Market Returns in the US
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
Firm-specific Variation
Market-related Variation
1926-28
1929-31
1932-34
1935-37
1938-41
1942-44
1945-47
1948-50
1951-53
1954-56
1957-59
1960-62
1963-65
1966-68
1969-71
1972-74
1975-77
1978-80
1981-83
1984-86
1987-89
1990-92
1993-95

Market Model R^2

- US firms' stock returns better predict future changes in earnings when they contain more firm-specific variation

  Durnev, Morck, Yeung, and Zarowin (2001)

- US firms' stock prices move together less following changes in US disclosure rules that affected those firms

  Durnev, Fox, Morck, and Yeung (2001)

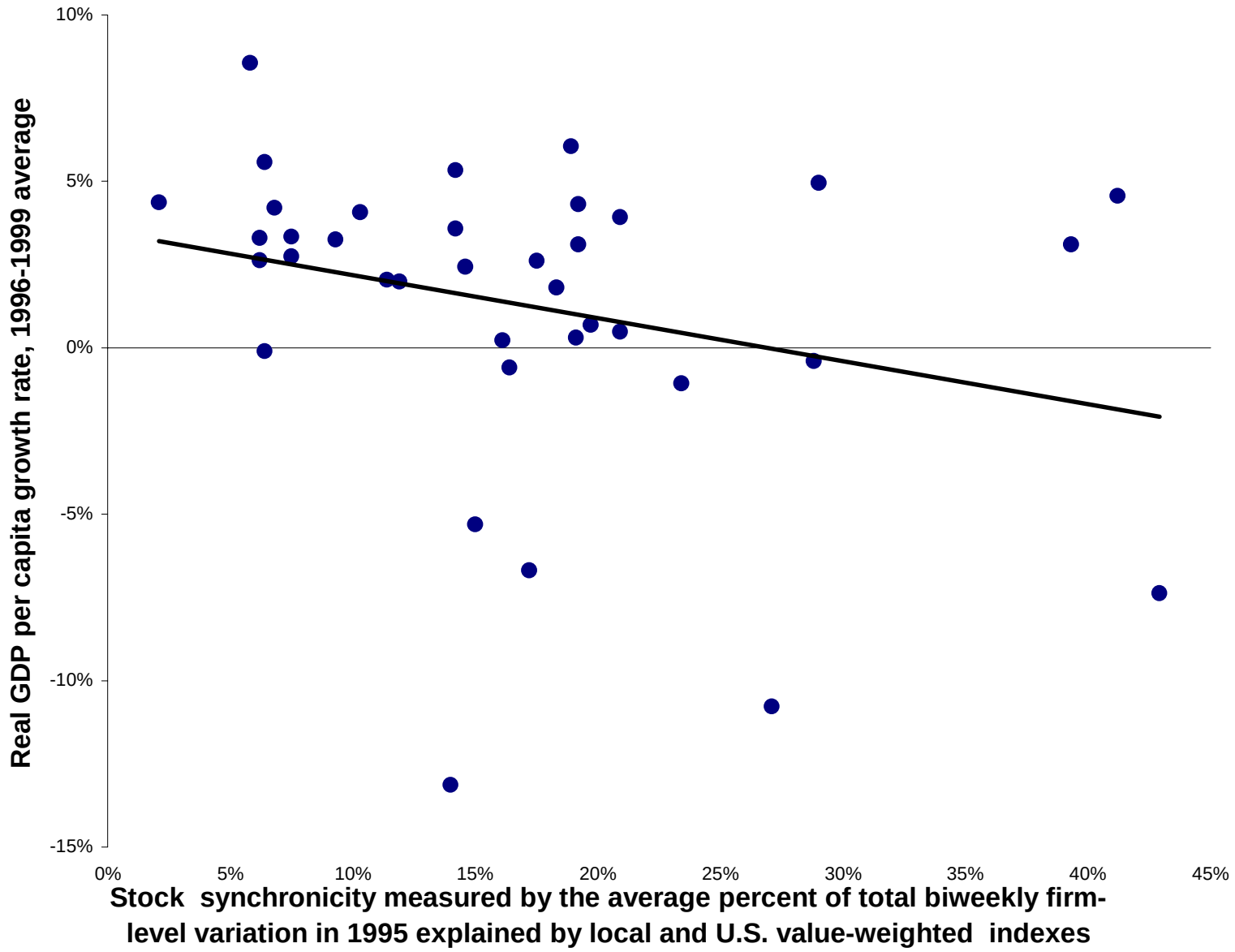
What We Think Is Going On

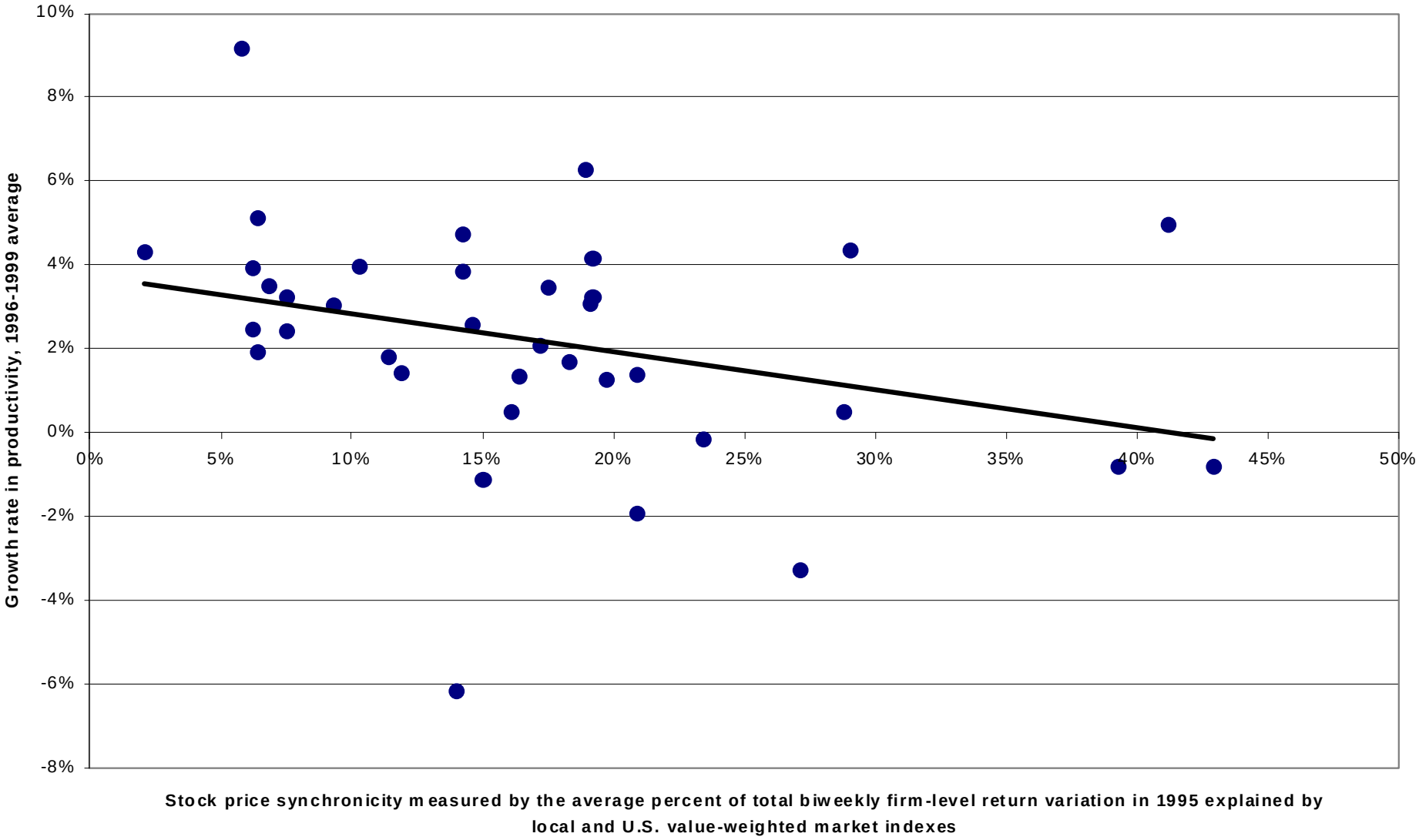
- Countries with weaker institutions have:
  - More synchronous fundamentals?
    - Yes, but this is clearly not the whole story
  - More noise traders?
    - Widespread market euphoria followed by widespread gloom
    - Noisy feedback could cause synchronous fundamentals and distort capital allocation?
      - Keynes (1933), De Long et al. (1988), Shleifer (1999)
  - Fewer information arbitrageurs
    - Information is harder to gather and interpret
    - Lower returns to trading on proprietary (not inside) information
    - Absence of informed feedback from markets means less efficient capital allocation?
      - Grossman (1972), French and Roll (1986), Roll (1988)

Why This Is Important

- The Functional Form of the Efficient Markets Hypothesis
  - The stock market is functionally efficient if stock price changes lead to an efficient microeconomic allocation of capital
  - This is the aspect of the ‘efficient markets hypothesis’ that matters to the macroeconomy

James Tobin


10%
5%
0%
-5%
-10%
-15%
Real GDP per capita growth rate, 1996-1999 average
0%
5%
10%
15%
20%
25%
30%
35%
40%
45%
Stock synchronicity measured by the average percent of total biweekly firm-level variation in 1995 explained by local and U.S. value-weighted indexes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-6%
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25%
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35%
40%
45%
50%
Growth rate in productivity, 1996-1999 average
Stock price synchronicity measured by the average percent of total biweekly firm-level return variation in 1995 explained by local and U.S. value-weighted market indexes

	1996-1999 Average real per capita growth in GDP							
logit(R^2)	**-0.014**	**-0.012**	**-0.014**	-0.012	-0.009	**-0.013**	-0.007	-0.011
	(0.02)	(0.10)	(0.05)	(0.11)	(0.19)	(0.10)	(0.17)	(0.14)
Market capitalization	-	-	-	0.014	-	-	-	0.006
				(0.48)				(0.77)
Bank credit	-	-	-	**-0.060**	-	-	-	**-0.052**
				(0.03)				(0.07)
Rule of law index	-	-	-		0.003	0.002	0.001	0.002
					(0.18)	(0.67)	(0.72)	(0.73)
Per capita GDP, 1996	-	-0.008	**-0.019**	**-0.023**	-	**-0.023**	-0.009	**-0.023**
		(0.12)	(0.03)	(0.01)		(0.03)	(0.21)	(0.03)
Average years of schooling	-	0.006	0.029	0.032	-	-0.042	0.010	0.034
		(0.72)	(0.34)	(0.26)		(0.15)	(0.62)	(0.26)
Inflation	-	-	0.007	-0.008	-	-	-0.034	-0.011
			(0.55)	(0.52)			(0.37)	(0.85)
Trade	-	-	0.008	0.013	-	-	0.002	0.006
			(0.48)	(0.31)			(0.81)	(0.66)
Government size	-	-	**-0.040**	-0.027	-	-	-0.032	-0.124
			(0.10)	(0.27)			(0.77)	(0.49)
F-statistics	**5.660**	**3.210**	**2.698**	**2.966**	**3.850**	**2.922**	1.410	**2.190**
	(0.02)	(0.04)	(0.03)	(0.01)	(0.03)	(0.04)	(0.24)	(0.05)
R^2-adjusted	0.115	0.155	0.220	0.303	0.137	0.175	0.074	0.333

	1996-1999 Average real per capita productivity growth							
logit(R^2)	**-0.019**	**-0.018**	**-0.017**	-0.013	**-0.012**	-0.011	-0.011	**-0.012**
	(0.06)	(0.05)	(0.09)	(0.14)	(0.10)	(0.21)	(0.17)	(0.09)
Market capitalization	-	-		0.010	-	-	-	0.001
				(0.44)				(0.92)
Bank credit	-	-	-	**-0.041**	-	-	-	**-0.034**
				(0.03)				(0.06)
Rule of law index	-	-	-	-	0.004	0.001	0.003	0.002
					(0.23)	(0.91)	(0.63)	(0.60)
Per capita GDP, 1996	-	**-0.021**	-0.005	-0.009	-	-0.008	**-0.021**	-0.010
		(0.01)	(0.32)	(0.10)		(0.21)	(0.05)	(0.14)
Average years of schooling	-	0.044	0.011	-0.014	-	-0.006	0.032	0.011
		(0.12)	(0.56)	(0.45)		(0.74)	(0.30)	(0.56)
Inflation	-	-	-0.006	**-0.017**	-		-0.028	**-0.063**
			(0.43)	(0.05)			(0.63)	(0.10)
Trade	-	-	0.003	0.001	-		0.006	0.003
			(0.73)	(0.92)			(0.61)	(0.74)
Government size	-	-	-0.007	-0.002	-	-	-0.209	-0.033
			(0.66)	(0.92)			(0.24)	(0.77)
F-statistics	**3.930**	**3.930**	1.700	**2.256**	**3.850**	2.344	**2.040**	**1.810**
	(0.05)	(0.02)	(0.15)	(0.05)	(0.03)	(0.07)	(0.08)	(0.10)
R^2-adjusted	0.075	0.196	0.105	0.218	0.137	0.192	0.168	0.169

Functional Efficiency and R^2

- Countries with lower R^2s grow faster

  Durnev, Morck and Yeung (2002)

- Countries with lower R^2s better direct capital towards growing industries and away from declining industries

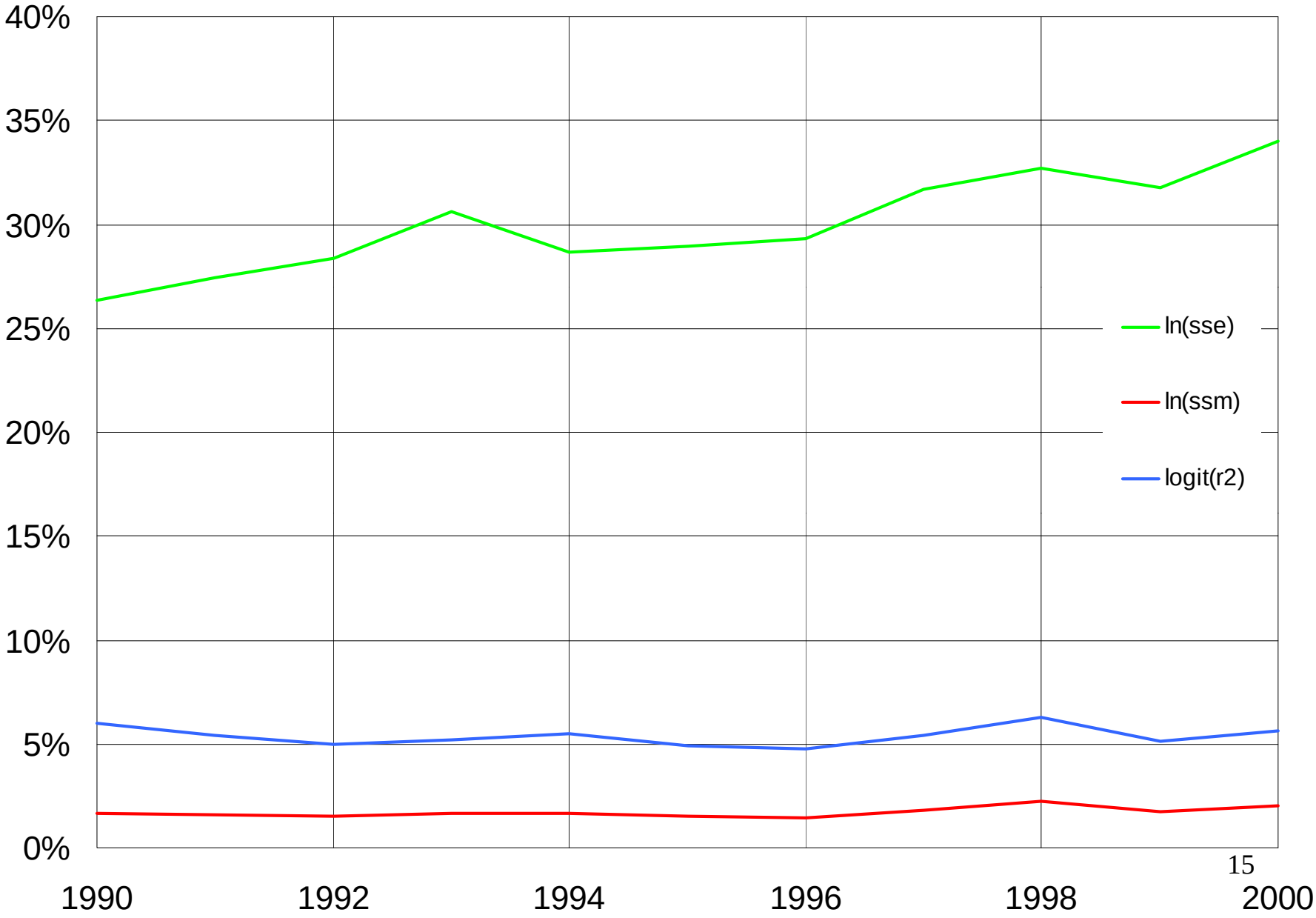
  Wurgler (2000)

- Capital expenditure in US industries with lower R^2s is closer to firm value maximizing levels

  Durnev, Morck and Yeung (2000)

- Working hypothesis: Can we tentatively interpret market model R^2 as an index of functional efficiency?

Canada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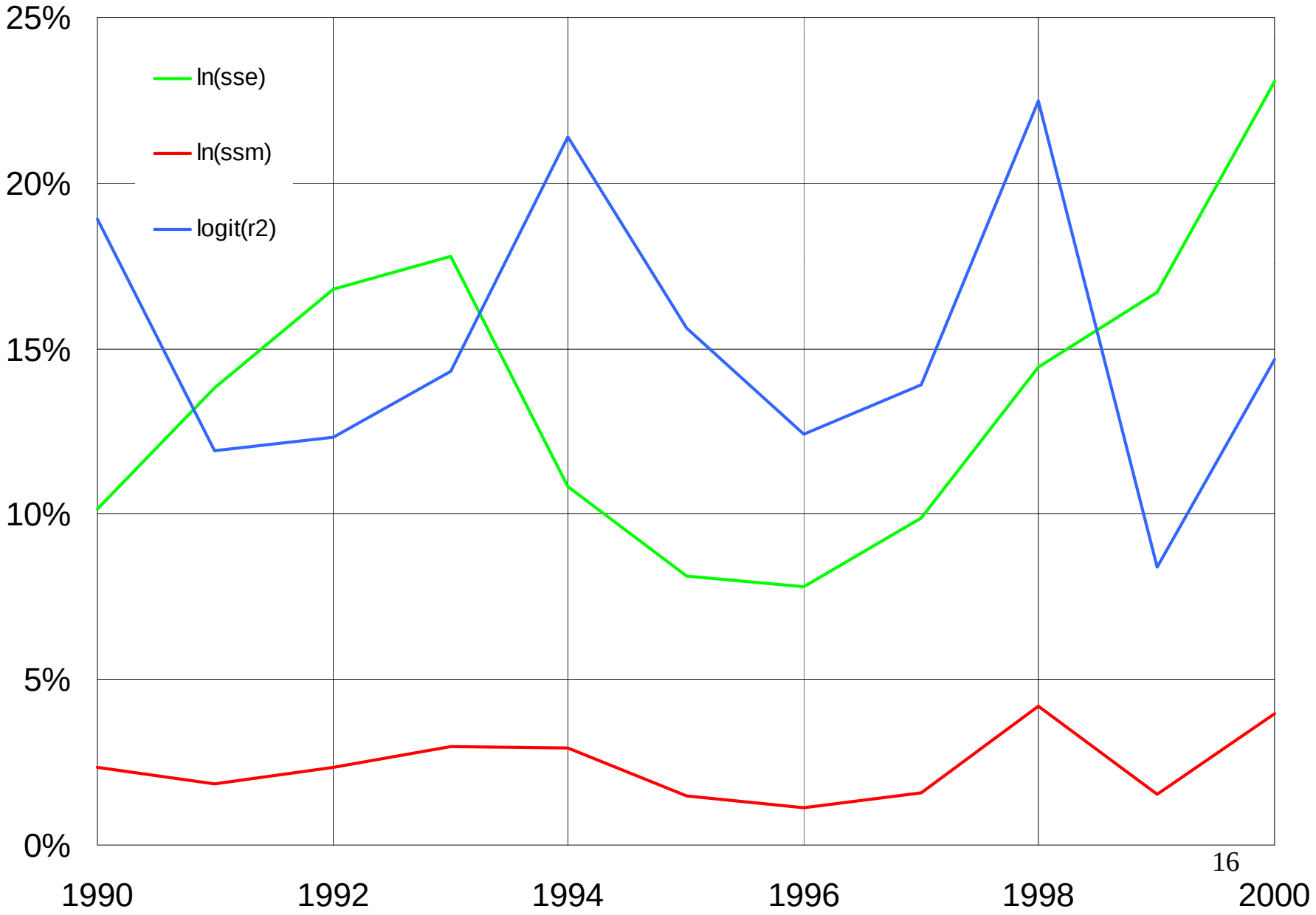
ln(sse)
ln(ssm)
logit(r2)

Sweden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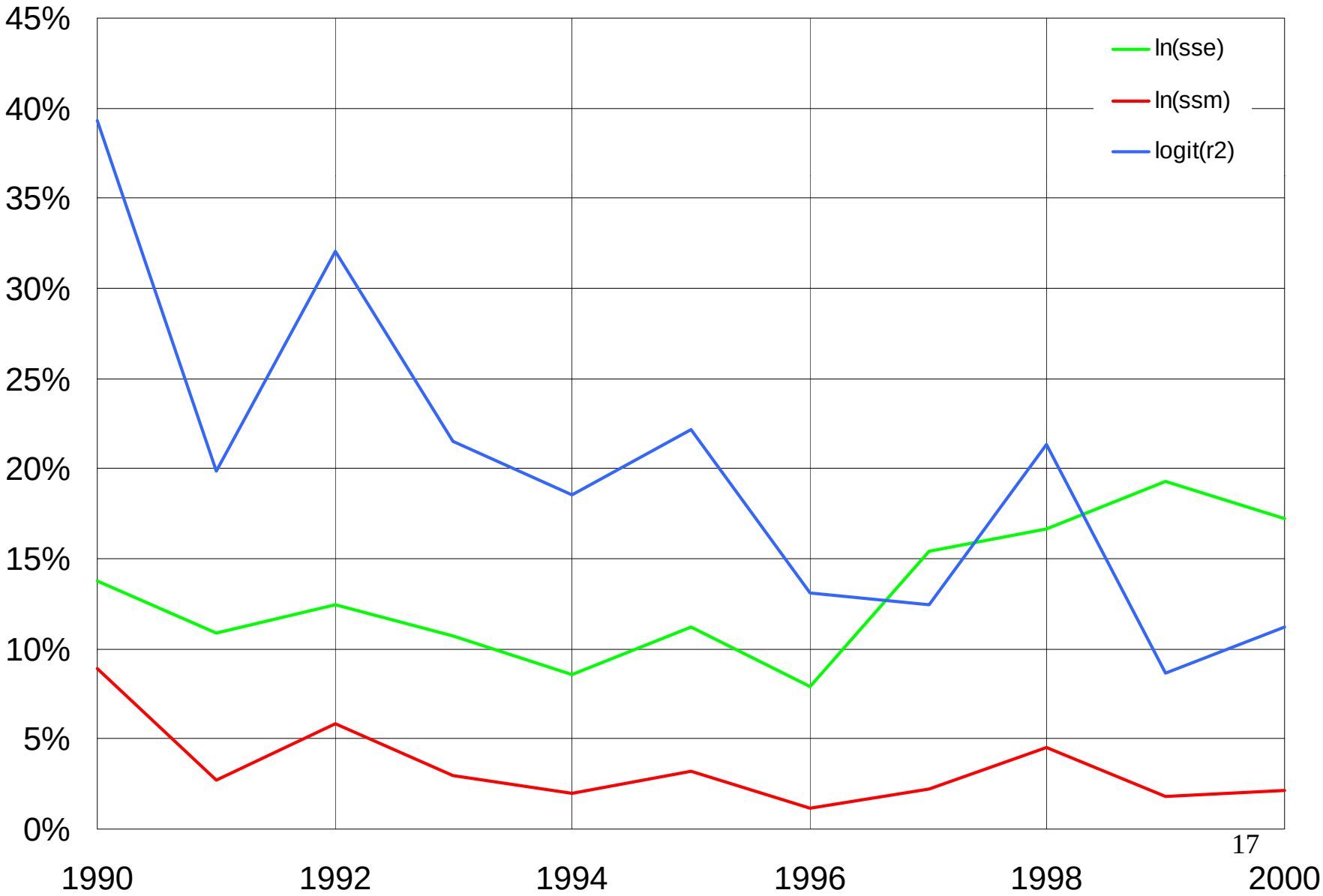
Japan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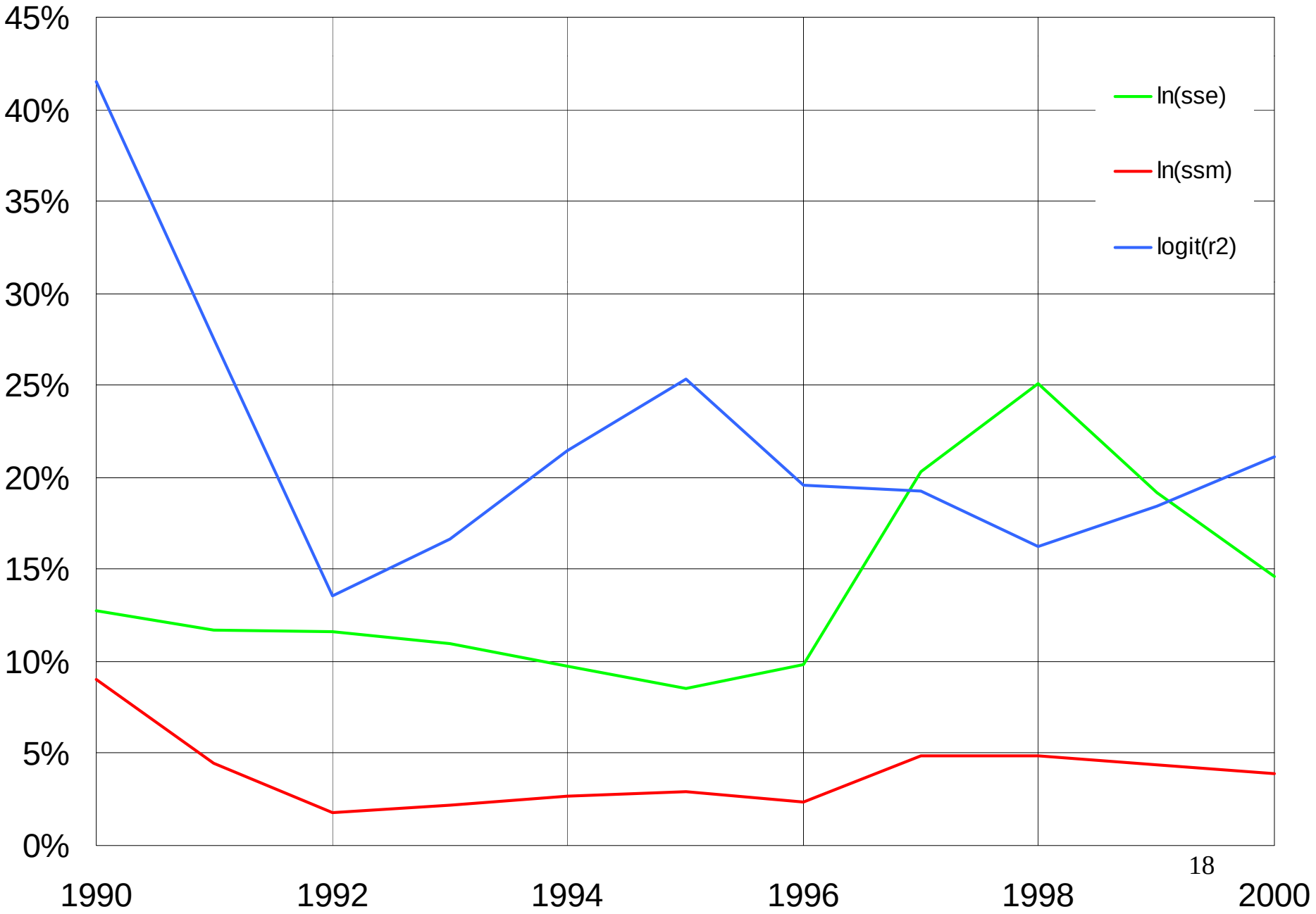
ln(ssm)
logit(r2)

Thailand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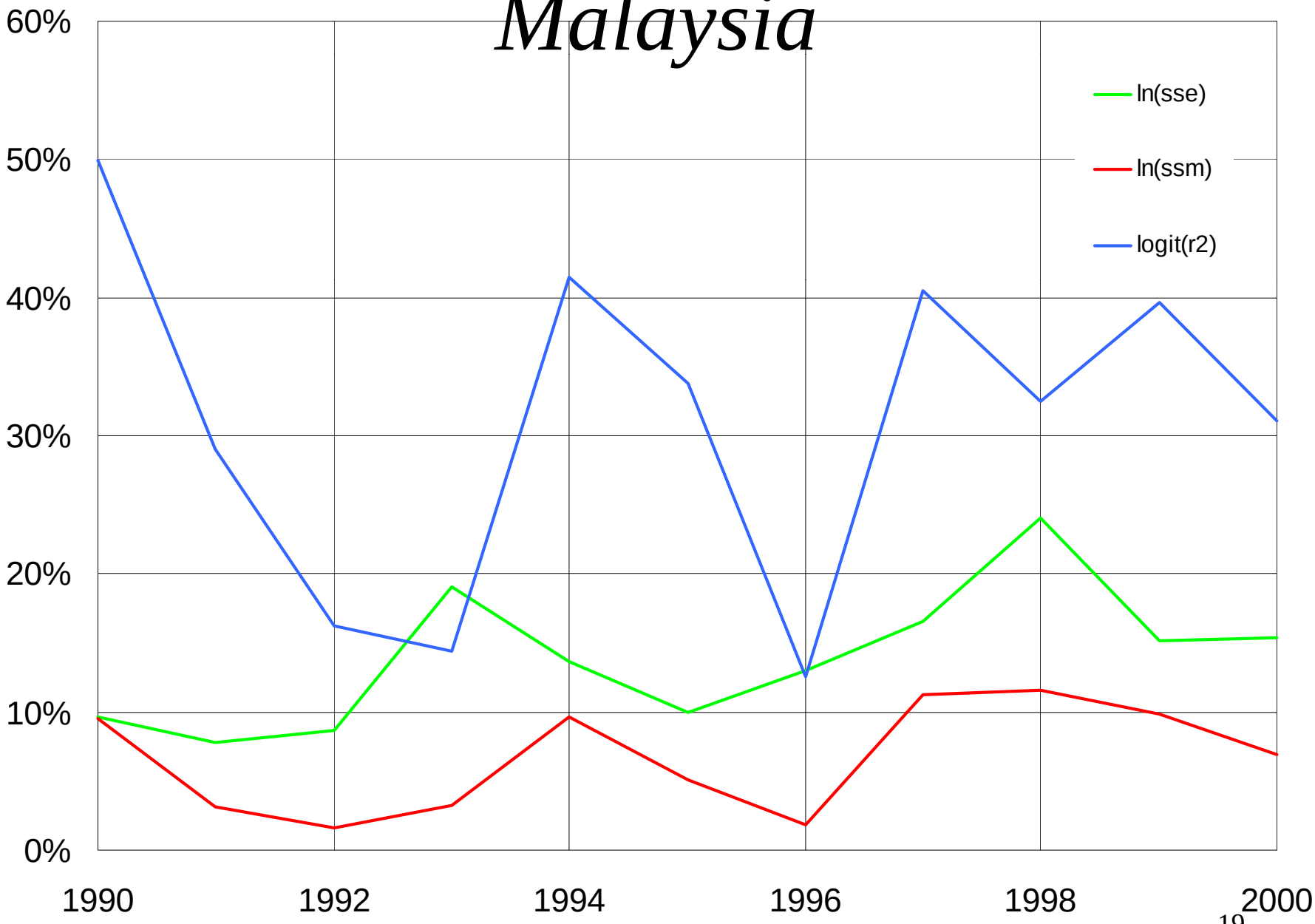
Malaysia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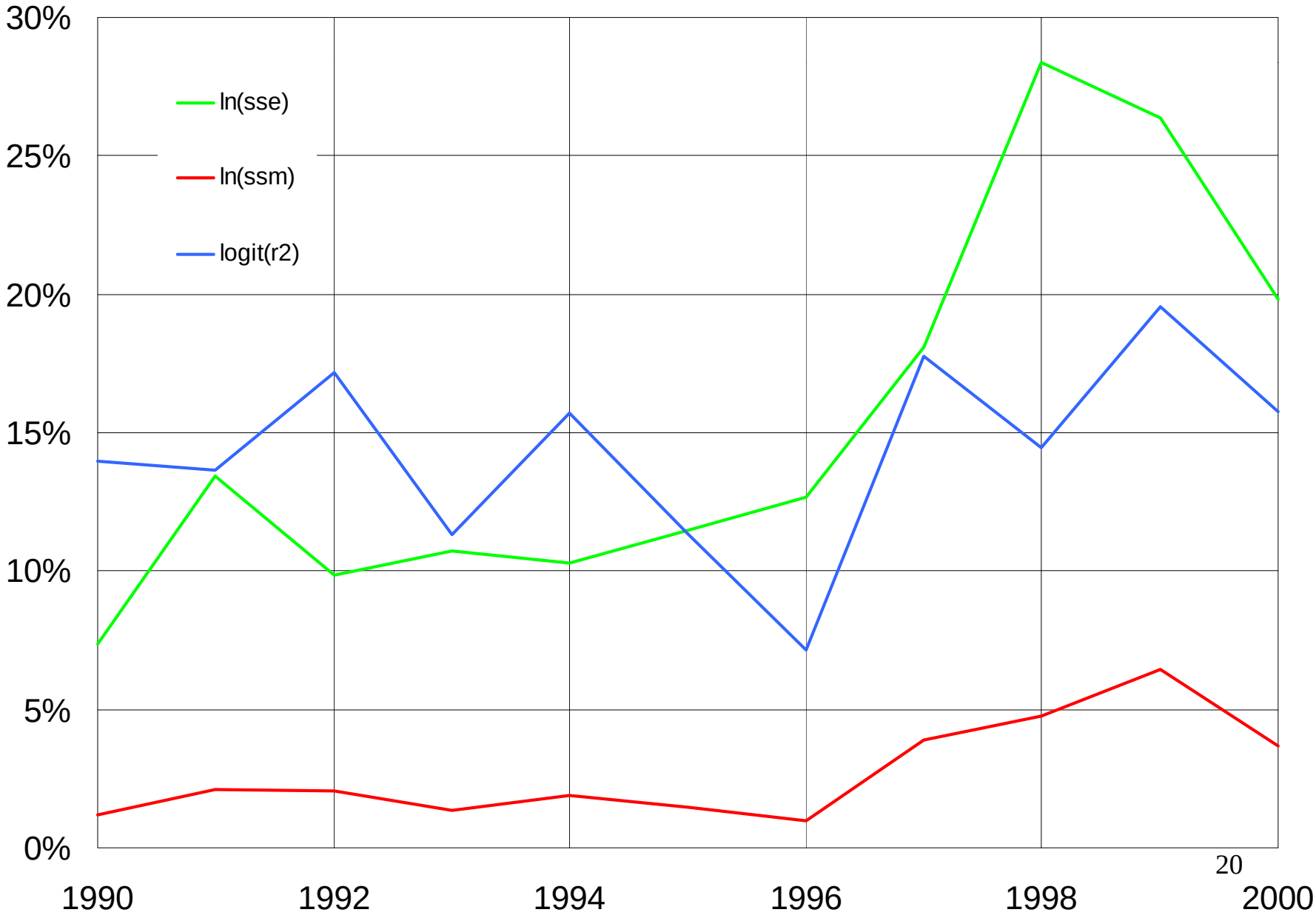
ln(sse)
ln(ssm)
logit(r2)

India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ln(sse)
ln(ssm)
logit(r2)
1990
1992
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1996
1998
2000

Changing Synchronicity

	$\Delta \ln(\sigma_{\varepsilon}^{2})$		$\Delta \ln(\sigma_{m}^{2})$		$\Delta \ln\left(\frac{R^{2}}{1-R^{2}}\right)$		
	mean	**median**	**mean**	**median**	**mean**	**median**	**sample**
all countries	0.0339	0.0311	-0.0295	-0.0378	-0.0739	-0.0577	338
	(0.01)	(0.02)	(0.38)	(0.37)	(0.00)	(0.00)	
rich countries	0.0560	0.0544	-0.00412	-0.0421	-0.0721	-0.0619	231
	(0.00)	(0.00)	(0.92)	(0.77)	(0.01)	(0.01)	
poor countries	-0.0139	-0.0358	-0.0842	-0.0273	-0.0777	-0.0511	107
	(0.58)	(0.39)	(0.16)	(0.26)	(0.06)	(0.06)	
difference*	0.0699	0.0902	0.0801	-0.0148	0.00560	-0.01080	338
	(0.02)	(0.01)	(0.27)	(0.43)	(0.91)	(0.96)	

* Probability levels for rejecting the null hypothesis of equal values for rich and poor countries based on F-tests for means and Wilcoxon Rank Sum tests for medians.

Openness and Functional Efficiency?

- Openness, financial development and economic growth

  Various authors

- Openness is associated with better developed capital markets that let upstarts dislodge established dominant players

  Ranjan and Zingales (2001)

- Openness limits governments' ability to subsidize well-connected firms at the expense of firms run by outsiders

  Johnson and Mitton (2002)

- A high ratio of inherited billionaire wealth to GDP is associated with sharply reduced economic growth.
- Openness is associated with a lesser ratio of inherited billionaire wealth to GDP
- The Canada-US FTA, which reduced barriers to capital flow,
  - Reduced elevated capital intensity in old-money firms
  - Caused the share prices of old-money controlled firms to fall relative to those of other comparable firms

  Morck Stangeland and Yeung (2000)

Trade Openness

- The Bhagwati Hypothesis?
  - Trade openness is all you need?
- Data
  - Does trade openness correlate with
    - Lower R^2?
    - Higher σ_ε^2 ?
  - Measure trade openness with
    - Trade barriers index
    - Magnitude of trade relative to GD
  - Specialization effect?

FDI Openness

- FDI lets foreign competitors into product market
  - International M&A is firms in high shareholder rights countries taking over firms in low shareholder rights countries

    Volpin (2001)
  - Poor capital markets no longer work as entry barrier

    Rajan and Zingales (2001)
  - Multinationals want local financial development?
  - Multinationals want better institutions in general, and these allow financial development?
- Data
  - Does FDI openness correlate with
    - Lower R^2?
    - Higher σ_ε^2 ?
  - Measure FDI openness with
    - FDI barriers index
    - Magnitude of FDI relative to GDP
  - Significant correlations

FPI Openness

- FPI openness lets local investors flee poorly functioning capital markets
  - Better institutions needed to keep capital at home and to attract foreign capital
- But, danger of *hot money problems*?
- Data
  - Does FPI openness correlate with
    - Lower R^2?
    - Higher σ_{ε}^{2} ?
  - Measure FPI openness with
    - FPI barriers index
    - Magnitude of FPI relative to GDP
  - Significant correlation

Dependent Variable Is Logistic Transformation Of R^2 Synchronicity Measure, $\log\left[\frac{R^2}{1-R^2}\right]$

Openness Variable Used Is Level Of		Trade Flow / GDP	Foreign Direct Investment / GDP Inward Stock	Foreign Direct Investment / GDP Inward Flow	Foreign Direct Investment / GDP Outward Stock	Foreign Direct Investment / GDP Outward Flow	Foreign Portfolio Investment / GDP Inward Stock	Foreign Portfolio Investment / GDP Inward Flow	Foreign Portfolio Investment / GDP Outward Stock	Foreign Portfolio Investment / GDP Outward Flow
Level Of Log (No. Of Stock Listed)	*Parameter*	**0.29**	**-0.31**	-0.09	**-0.39**	-0.11	**-0.35**	-0.12	**-0.35**	-0.12
	P-Value	**0.00**	**0.01**	0.30	**0.00**	0.19	**0.00**	0.16	**0.00**	0.18
Level Of Log (GDP Per Capita, PPP)	*Parameter*	**-1.62**	**-1.35**	**-0.80**	**-1.16**	**-0.77**	**-0.97**	**-0.83**	**-0.97**	**-0.84**
	P-Value	**0.00**	**0.00**	**0.00**	**0.02**	**0.00**	**0.04**	**0.00**	**0.01**	**0.00**
Openness Effect	*Parameter*	**0.67**	**0.78**	-0.33	0.28	-0.34	-0.07	0.20	-0.09	0.19
	P-Value	**0.03**	**0.09**	0.40	0.29	0.39	0.54	0.53	0.64	0.52
Openness Cross Poor Economy	*Parameter*	-0.03	**-2.35**	**-4.21**	3.88	-0.05	0.30	-0.59	0.18	-2.63
	P-Value	0.93	**0.01**	**0.04**	0.17	0.99	0.73	0.53	0.86	0.51
Implied Openness Effect For Poor Economies	*Parameter*	**0.64**	**-1.57**	**-4.53**	4.16	-0.39	0.23	-0.40	0.09	-2.44
	P-Value	**0.02**	**0.06**	**0.02**	0.14	0.94	0.79	0.65	0.93	0.54
F Statistic And P-Value For Joint Significance Of Openness Variable And Cross Term		**4.57**	**4.02**	**2.90**	3.14	0.37	0.50	0.29	0.12	0.41
		0.01	**0.02**	**0.06**	0.21	0.69	0.78	0.75	0.89	0.66
F Statistic And P-Value For Joint Significance Of Fixed Effects		**15.54**	**12.47**	**14.23**	**13.24**	**14.09**	**13.06**	**13.96**	**13.12**	**13.83**
		0.00	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Robust Standard Errors Used		**No**	**No**	**No**	**Yes**	**No**	**Yes**	**No**	**No**	**No**
Adjusted R2		**0.63**	**0.68**	**0.66**	**0.67**	**0.65**	**0.66**	**0.65**	**0.66**	**0.65**
Model Degrees Of Freedom		**55**	**36**	**47**	**36**	**47**	**36**	**47**	**36**	**47**
Total Degrees Of Freedom		**450**	**263**	**381**	**263**	**381**	**263**	**381**	**263**	**381**

Dependent Variable Is logarithm of firm-specific variation, $\log(\sigma_\varepsilon^2)$

Openness Variable Used Is Level Of		Trade Flow / GDP	Foreign Direct Investment / GDP Inward Stock	Foreign Direct Investment / GDP Inward Flow	Foreign Direct Investment / GDP Outward Stock	Foreign Direct Investment / GDP Outward Flow	Foreign Portfolio Investment / GDP Inward Stock	Foreign Portfolio Investment / GDP Inward Flow	Foreign Portfolio Investment / GDP Outward Stock	Foreign Portfolio Investment / GDP Outward Flow
Level Of Log (No. Of Stock Listed)	*Parameter*	0.81	0.13	0.16	0.14	0.17	0.15	0.17	0.14	0.14
	P-Value	0.00	0.12	0.08	0.07	0.06	0.06	0.01	0.06	0.02
Level Of Log (GDP Per Capita, PPP)	*Parameter*	-1.47	-0.14	-0.04	-0.36	-0.08	-0.28	-0.12	-0.36	-0.14
	P-Value	0.00	0.65	0.90	0.13	0.79	0.26	0.50	0.13	0.44
Openness Effect	*Parameter*	0.19	0.96	1.09	1.12	1.10	0.38	1.07	0.66	0.94
	P-Value	0.59	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Openness Cross Poor Economy	*Parameter*	-0.08	-0.42	-1.02	4.12	-2.19	0.68	0.68	1.00	3.63
	P-Value	0.86	0.48	0.40	0.03	0.42	0.33	0.30	0.11	0.19
Implied Openness Effect For Poor Economies	*Parameter*	0.11	0.54	0.06	5.24	-1.08	1.06	1.75	1.66	4.57
	P-Value	0.72	0.33	0.96	0.01	0.69	0.13	0.00	0.01	0.10
F Statistic And P-Value For Joint Significance Of Openness Variable And Cross Term		0.19	10.57	11.24	17.11	10.70	11.65	17.60	20.66	12.04
		0.83	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
F Statistic And P-Value For Joint Significance Of Fixed Effects		7.82	20.05	16.79	22.92	16.28	21.09	17.75	21.72	17.20
		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Robust Standard Errors Used		No	Yes	Yes	No	Yes	No	No	No	No
Adjusted R2		0.50	0.72	0.67	0.75	0.67	0.74	0.69	0.75	0.68
Model Degrees Of Freedom		55	36	47	36	47	36	47	36	47
Total Degrees Of Freedom		450	263	381	263	381	263	381	263	381

Dependent Variable Is logarithm of systematic return variation, log(σ_m^2)

Openness Variable Used Is Level Of		Trade Flow / GDP	Foreign Direct Investment / GDP				Foreign Portfolio Investment / GDP			
			Inward		Outward		Inward		Outward	
			Stock	Flow	Stock	Flow	Stock	Flow	Stock	Flow
Level Of Log (No. Of Stock Listed)	*Parameter*	1.14	-0.19	0.11	-0.24	0.11	-0.20	0.07	-0.20	0.07
	P-Value	0.00	0.27	0.37	0.13	0.37	0.23	0.55	0.22	0.58
Level Of Log (GDP Per Capita, PPP)	*Parameter*	-3.27	-1.58	-0.80	-1.67	-0.86	-1.31	-0.90	-1.39	-0.96
	P-Value	0.00	0.00	0.03	0.00	0.02	0.01	0.01	0.01	0.01
Openness Effect	*Parameter*	1.04	2.73	1.16	2.20	1.36	0.57	1.44	0.93	1.32
	P-Value	0.06	0.00	0.03	0.00	0.01	0.00	0.00	0.00	0.00
Openness Cross Poor Economy	*Parameter*	-0.43	-3.76	-5.44	7.79	-1.20	0.73	-0.99	0.86	0.34
	P-Value	0.54	0.00	0.06	0.05	0.88	0.62	0.45	0.52	0.95
Implied Openness Effect For Poor Economies	*Parameter*	0.61	-1.03	-4.28	9.99	0.16	1.30	0.45	1.79	1.66
	P-Value	0.23	0.35	0.13	0.01	0.98	0.38	0.72	0.18	0.77
F Statistic And P-Value For Joint Significance Of Openness Variable And Cross Term		2.21	12.14	3.57	15.11	3.02	5.67	5.74	8.21	5.38
		0.11	0.00	0.03	0.00	0.05	0.00	0.00	0.00	0.01
F Statistic And P-Value For Joint Significance Of Fixed Effects		10.16	9.51	10.70	10.32	10.51	8.79	10.90	9.51	10.82
		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Robust Standard Errors Used		No	No	No	No	No	No	No	No	No
Adjusted R2		0.54	0.60	0.61	0.61	0.61	0.58	0.62	0.59	0.62
Model Degrees Of Freedom		55	36	47	36	47	36	47	36	47
Total Degrees Of Freedom		450	263	381	263	381	263	381	263	381

Why It Matters

- Corporate governance & the macroeconomy
  - Functional form of the efficient markets hypothesis
  - Corporate governance mechanisms depend on
    - Functional efficiency of the stock market
    - Firm-specific price movements
  - The role of the stock market as an information processing and capital allocating mechanism
    - Sophisticated investors
    - Market depth
    - Valid benchmarks
  - Capital allocation and growth

To Do

- Robustness of our synchronicity estimates
- Panel Econometrics
- Regime change points
- Better and ‘openness’ measures
- Earlier synchronicity data

	Dependent Variable: FDI (real US$) from source to host country (1981-1998, three-year averages, using panel tobit method)			
Host GDP	1.20 (20.11)	1.20 (19.66)	1.00 (19.85)	0.54 (11.06)
Source GDP	1.36 (34.64)	1.56 (19.26)	1.70 (22.30)	1.63 (20.72)
Distance	-1.21 (-23.16)	-1.20 (-21.91)	-1.10 (-21.94)	-1.13 (-23.23)
Common language	0.99 (6.88)	0.98 (6.78)	0.87 (6.47)	0.89 (6.72)
Credit Rating	0.06 (7.12)	0.06 (6.47)		
Specialization		9.77 (2.72)	14.85 (4.38)	12.05 (3.42)
Special*Source GDP		-1.61 (-2.39)	-2.99 (-4.61)	-2.39 (-3.56)
Host Telephone Density			0.65 (14.00)	0.52 (9.63)
Source Telephone Density			3.58 (15.46)	3.52 (14.43)
Host Debt-Equity Ratio				-0.005 (-3.43)
Number of observations	2472 (843)	2472 (843)	2934 (1113)	2326 (632)