Global Aging: More Headwinds for U.S. Stocks?

Technical Appendix

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This technical appendix provides some details of our methodology in studying the correlations between demography and equity values, presents some additional statistical results for the G-7 countries, China, and Korea, and describes the data used in the *FRBSF Economic Letter* 2014-38, "Global Aging: More Headwinds for U.S. Stocks?" by Zheng Liu, Mark M. Spiegel, and Bing Wang. http://www.frbsf.org/economic-research/publications/economic-letter/2014/december/baby-boomers-retirement-stocks-aging.

Statistical Methods:

Regression A: P/E ratio on M/O ratio
log(P/E ratio) = a + b*log(M/O ratio)
M/O ratio is defined as: (Population age 40-49)/(Population age 60-69)

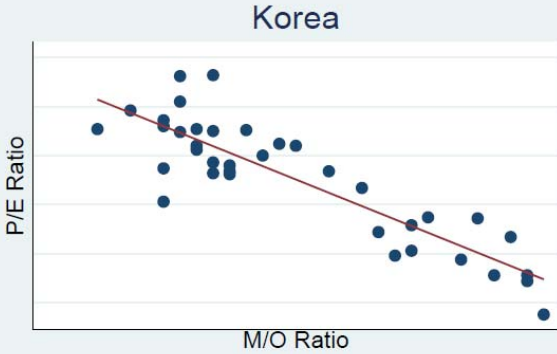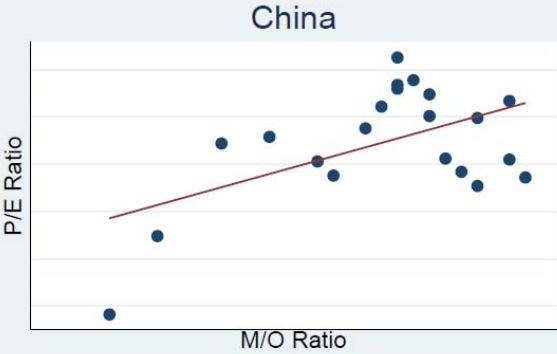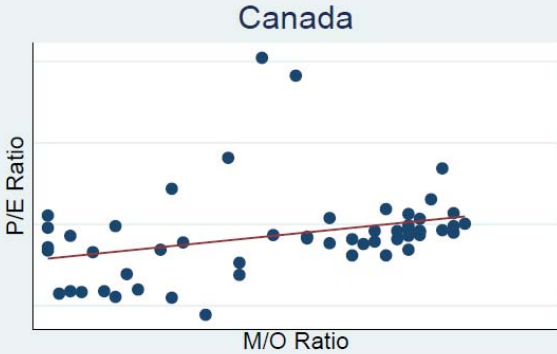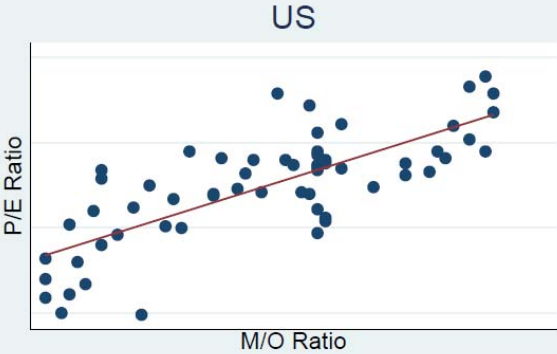| P/E	Coefficient on M/O		Constant		R2
U.S.	1.47	***	2.07	***	0.58
	(0.16)		(0.08)		
Canada	1.40	**	2.08	***	0.10
	(0.57)		(0.33)		
France	1.39		2.24	***	0.06
	(0.93)		(0.34)		
Germany	-0.61		2.89	***	0.05
	(0.42)		(0.14)		
Italy	-3.01	*	3.68	***	0.12
	(1.67)		(0.41)		
Japan	-0.78	**	3.60	***	0.11
	(0.31)		(0.17)		
U.K.	0.42		2.40	***	0.01
	(0.47)		(0.14)		
China	4.69	**	-0.53		0.29
	(1.69)		(1.36)		
Korea	-6.79	***	8.03	***	0.77
	(0.62)		(0.53)		

Notes:
Statistical significance denoted by * for 0.10, ** for 0.05, *** for 0.01.
Standard errors below each coefficient in parentheses.

Additional results on the correlations between P/E ratios and M/O ratios

P/E Ratios vs. Dependency Ratios

Regression B: P/E ratio on proportion of retirees in total population

log(P/E ratio) = a + b*log(Proportion of retirees)

Proportion of retirees is defined as: (Population age 65+)/(Total population).

P/E	Coefficient on Retirees		Constant		R2
U.S.	-1.49	***	-2.16		0.12
	(0.53)		(1.75)		
Canada	0.85		4.84	***	0.11
	(0.34)		(0.79)		
France	1.44		5.50	***	0.06
	(0.90)		(1.74)		
Germany	0.26		3.21	***	0.01
	(0.58)		(1.07)		
Italy	-0.62		1.88		0.02
	(0.81)		(1.45)		
Japan	0.82	***	5.11	***	0.34
	(0.16)		(0.37)		
U.K.	1.67	***	5.76	***	0.23
	(0.41)		(0.79)		
China	1.34		6.81	**	0.07
	(1.14)		(3.04)		
Korea	1.13	***	5.50	***	0.45
	(0.21)		(0.61)		

Notes:

Statistical significance denoted by * for 0.10, ** for 0.05, *** for 0.01.

Standard errors below each coefficient in parentheses.

Data sources

M/O ratio and proportion of retirees:
Population data and projections for G7 countries and China and Korea
Source: Haver (U.S.), UN World Population Prospects 2012 (other countries).
Note: For U.S., data are available through 2013, with projections from 2014–2030.
For other countries, data are available through 2010, with projections from 2011–2030.

P/E ratio:
Price-to-earnings ratio data for stock exchanges in the following countries and available for the following time ranges:
U.S. (S&P 500): 1954–2013
Canada (S&P/TSX): 1956–2013
France: 1971–2013
Germany: 1969–2013
Italy: 1984–2013
Japan (Tokyo Stock Exchange): 1956–2013
U.K. (FTSE): 1954–2013
China (Shanghai Stock Exchange): 1990–2013
Korea: 1974–2013
Source: Bloomberg (U.S. and China), Global Financial Data (other countries).