

# **Should emerging market investors diversify abroad despite superior domestic performance?**

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# Plan of the talk

- Motivation
- Survey of the literature
  - The home bias puzzle
- Methodology
  - Testing for mean-variance spanning
- Description of the data
- Discussion of the results
- Main application:
  - Investing pension money

# Home bias puzzle

- French and Poterba (1991)
  - U.S. investors tend to hold much more domestic assets than in a diversified world market portfolio
- De Santis and Gerard (1997)
  - The expected gain from international diversification to a U.S. investor is 2.11% p.a.
- Explanations :
  - Transaction costs (1-4% p.a.)
  - Perceived riskiness (asymmetric information)
  - Presence of the omitted asset (human capital)

## Home bias puzzle (cont.)

- Glassman and Riddick (2001)
  - No single explanation can fully account for the observed home asset bias
- DeRoos, Nijman, and Werker (2001)
  - The diversification benefits from investing in emerging markets become much weaker after accounting short sale constraints & transaction costs
- Driessen and Laeven (2003)
  - The international diversification benefits are larger for developing and higher risk countries

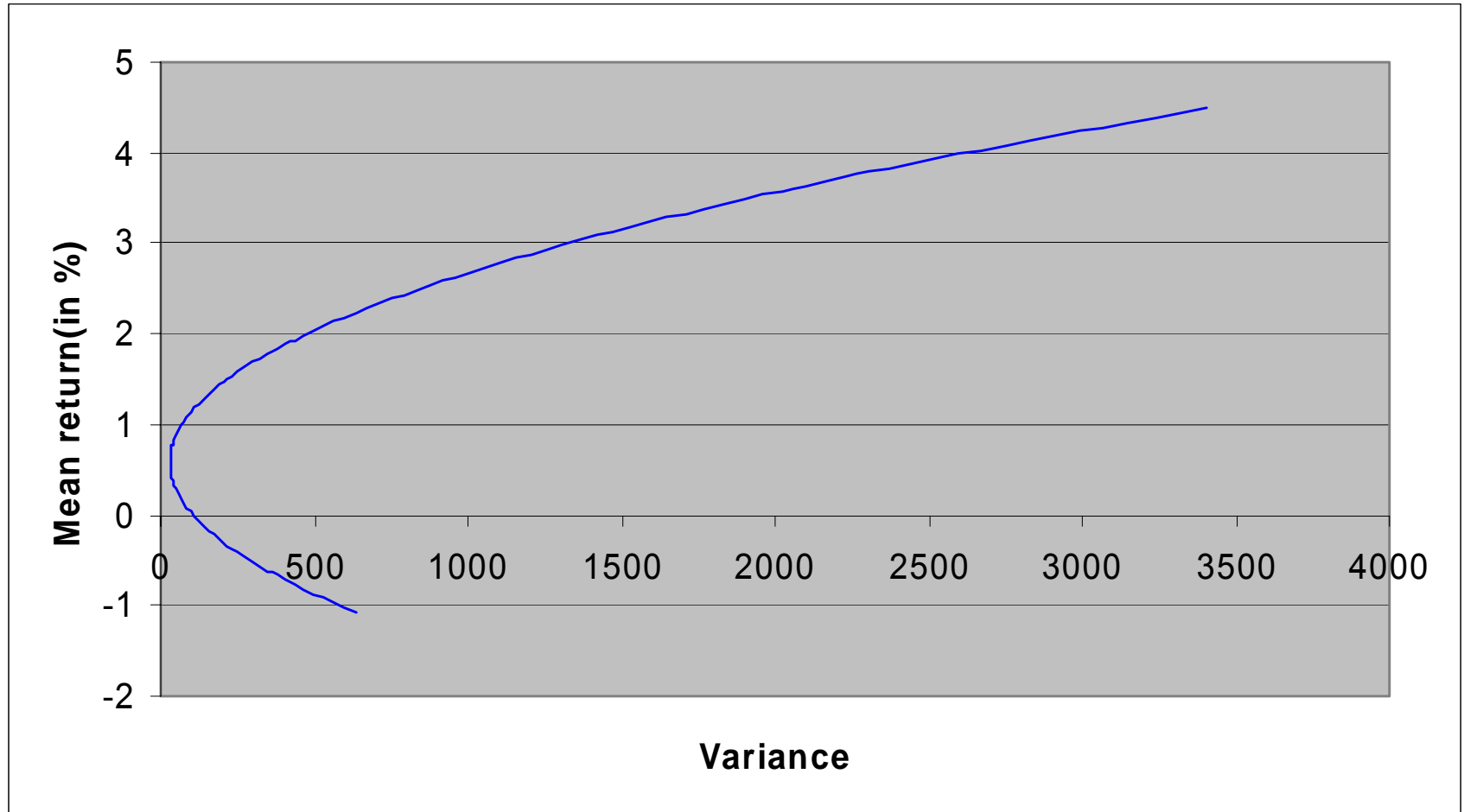
# How to measure diversification?

- Correlations
- Cointegration
- The efficient frontier in the mean-variance space
  - Measure statistical and economic significance of the diversification benefits

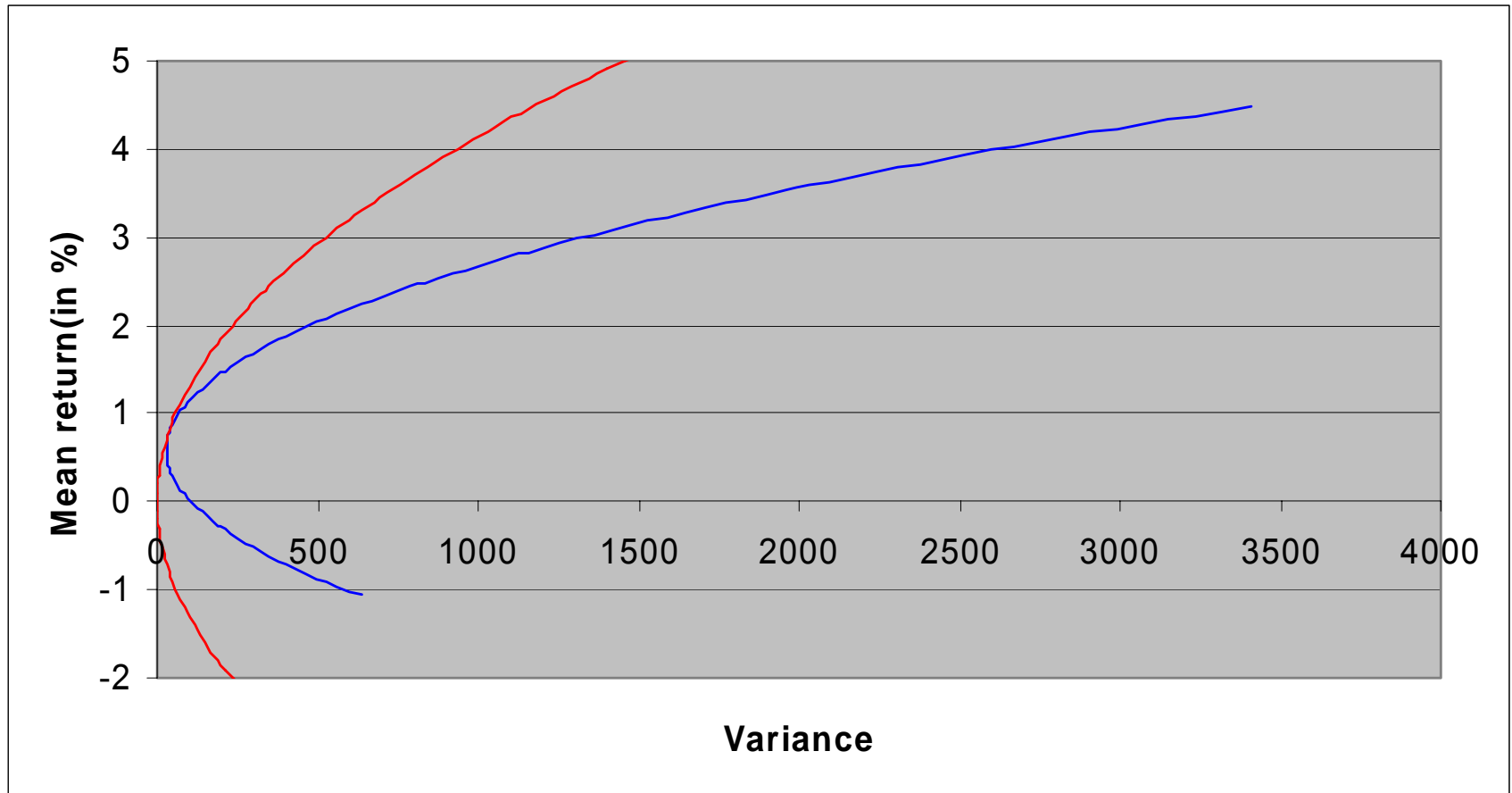
# Methodology

- Analysis of the international diversification benefits in the mean-variance space
  - Does the addition of the foreign stock indices lead to the shift of the local mean-variance frontier ?
- Mean-variance spanning :
  - The new frontier coincides with the old one
- Mean-variance intersection :
  - There is one common point between the old and new frontiers

# Mean-variance spanning



# Mean-variance intersection





## Methodology (cont.)

- Regression-based test :

$$r_t = \alpha + \beta R_t + \varepsilon_t,$$

- where  $R$  and  $r$  denote returns of old and new assets

- Restrictions for mean-variance spanning :

$$\mu_r = \beta \mu_R, l_N = \beta l_K$$

- $\mu$ : vector of expected returns
- $l$ : vector of ones

- Extensions of the basic model

- Short-sale constraints on old assets
- Transaction costs
- Conditional model : betas linearly dependent on instruments

## Description of the data

- Sample period : January 1999 – December 2003
  - Concentrate on the post-crisis period
- Russian most liquid stocks traded in three major stock exchanges : RTS, MICEX, and MSE
  - If the stock is traded in several exchanges, we selected the data from the most liquid one
  - Both common and preferred stocks are included
  - Returns are dividend-adjusted
  - Weekly frequency, dollar-denominated
- Russian 30-day T-bills (GKO's)

## Description of the data (cont.)

- Old assets :
  - 12 most liquid Russian stocks
    - AKM industry indices
  - 30-day T-bill (GKO) index
- New assets : two sets of MSCI indices
  - Developed / Emerging
  - Europe / North America / Pacific / Latin America
- Instruments in conditional regressions :
  - Ruble-dollar exchange rate
  - Oil price

# Summary statistics

	1999-2003		1999	2000	2001	2002	2003
	mean	st.dev.	mean	mean	mean	mean	mean
<b>MSCI Developed</b>	-0.39%	16.91%	23.91%	-15.31%	-16.53%	-21.44%	25.17%
<b>MSCI Emerging</b>	10.15%	20.33%	47.25%	-36.41%	2.20%	-2.97%	35.55%
<b>MSCI Europe</b>	-0.01%	18.69%	18.79%	-8.54%	-21.34%	-18.31%	29.35%
<b>MSCI North America</b>	-0.53%	19.87%	20.95%	-13.42%	-10.11%	-25.15%	22.67%
<b>MSCI Pacific</b>	3.61%	19.88%	46.55%	-32.61%	-29.50%	-9.11%	28.23%
<b>MSCI Latin America</b>	12.47%	26.07%	47.23%	-12.43%	3.09%	-24.96%	43.03%
<b>S&amp;P-RUX</b>	42.18%	42.08%	73.50%	1.29%	53.77%	32.68%	41.48%
<b>GKO</b>	15.62%	15.03%	22.62%	37.78%	4.66%	7.62%	9.58%

# Cross-country correlations

	EUROPE	NORTH AMERICA	PACIFIC	LATIN AMERICA	DEVELOPED	EMERGING	S&P RUX
EUROPE	1.00						
NORTH AMERICA	0.73	1.00					
PACIFIC	0.41	0.39	1.00				
LATIN AMERICA	0.54	0.62	0.44	1.00			
DEVELOPED	0.82	0.92	0.60	0.73	1.00		
EMERGING	0.58	0.60	0.60	0.83	0.75	1.00	
S&P RUX	0.32	0.27	0.22	0.31	0.29	0.42	1.00

# Results: adding MSCI Emerging, Developed indices

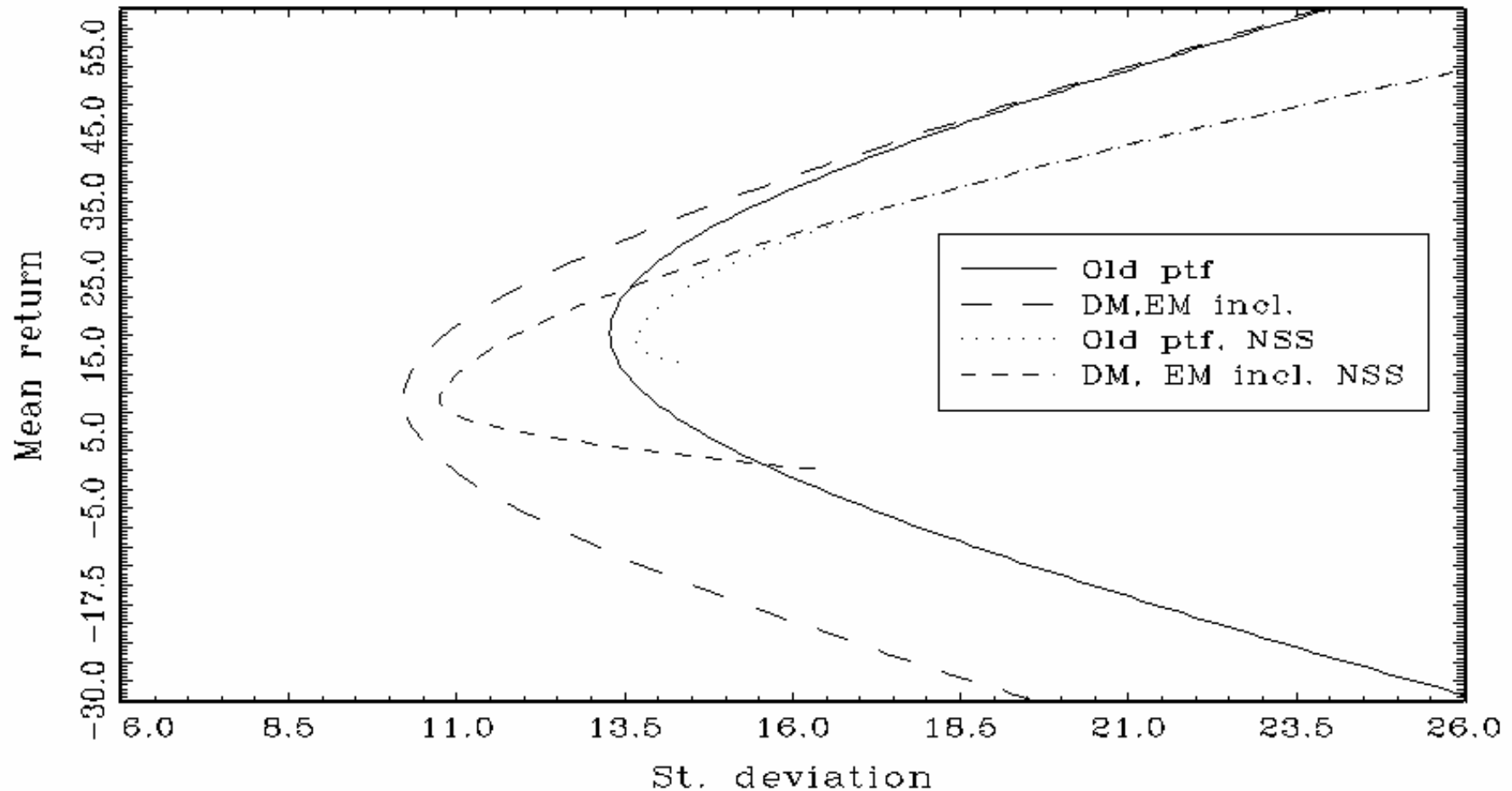
	Unconstrained	No Short Sales
Wald (intersection)	75.980	9.420
p-value	0.000	0.000
Wald (spanning)	126.970	130.680
p-value	0.000	0.000
GMV-L mean, %	17.809	16.941
GMV-L st. deviation, %	13.276	13.672
$\Delta R, \%$	11.388	7.384
$\Delta \sigma, \%$	2.437	1.961

## *Portfolio weights:*

30-day T-bill	0.606	0.625
EM	0.210	0.174
DM	0.149	0.131

# Shift of the local mean-variance frontier

Adding DM, EM indices to the Russian portfolio, 1999–2003



# Results: adding MSCI regional indices

	Unconstrained	No Short Sales
Wald (intersection)	100.900	13.450
p-value	0.000	0.000
Wald (spanning)	208.800	168.240
p-value	0.000	0.000
GMV-L mean, %	17.809	16.941
GMV-L st. deviation, %	13.276	13.672
$\Delta R$ , %	11.908	8.060
$\Delta \sigma$ , %	2.531	2.207

## *Portfolio weights:*

30-day T-bill	0.600	0.602
Europe	-0.020	0.000
North America	0.165	0.115
Pacific	0.157	0.162
Latin America	0.057	0.045



# Results: adding MSCI country indices

	<b>US</b>	<b>UK</b>	<b>Germany</b>	<b>Japan</b>	<b>Brazil</b>
Wald (intersection)	73.080	39.750	19.990	36.150	13.220
p-value	0.000	0.000	0.000	0.000	0.000
Wald (spanning)	102.670	53.770	24.310	45.960	20.100
p-value	0.000	0.000	0.000	0.000	0.000
GMV-L mean,%	17.201	17.201	17.201	17.201	17.201
GMV-L st. deviation,%	13.636	13.636	13.636	13.636	13.636
$\Delta R, \%$	10.660	9.984	7.228	8.788	6.708
$\Delta \sigma, \%$	2.098	1.976	0.952	1.370	0.541
Portfolio weight of the foreign index	0.280	0.309	0.167	0.217	0.095

## Discussing the results

- The spanning hypothesis is strongly rejected for every specification, over 1999-2003 period
  - Despite strong performance of Russia and much weaker performance of the rest of the world
- The optimal share of the foreign stock indices is about 30%
  - Highest portfolio weights for North America and Pacific MSCI indices
- The benefits are especially high for risk-averse investors (pension money managers)

# Robustness checks

- Simulation analysis of the small-sample properties of the spanning test
- These findings are robust
  - Across time: for most of separate years
  - Allowing dynamic management of the local portfolio
    - Using different sets of instruments
  - Imposing short-selling restrictions on local assets
  - Accounting for transaction costs
  - Using ruble-denominated returns
  - Using different sets of local assets

# Investing pension money

- Basic question : which assets can provide "return, diversification, and liquidity" ?
- Candidates :
  - Federal government bonds
  - Regional government bonds
  - Bank deposits
  - Corporate bonds
  - Mortgages
  - Stocks
  - Foreign stocks and bonds

# Current regulation of pension investments

- The maximum portfolio weight of foreign assets
  - 5% in 2004-2005
  - 10% in 2006-2007
  - 15% in 2008-2009
  - 20% after 2010
- No direct investments: only via index funds
- Prohibitive currency operations regulation

## Concluding remarks

- How to reduce risks of pension investments ?
  - On average, private managers of pension money earned zero returns in 2004
- Promote the local market
  - Improve transparency
  - Fight with insider trading
- Weaken foreign investment regulation
  - Direct restrictions
  - Indirect restrictions