

Table 1 Countries and Weights of Capitalization

This table reports the information of the countries whose MSCI indices are investigated in the paper. The third column shows the equity market capitalization in millions of U.S. dollars of these countries as of the end of year 2002 obtained from the World Federation of Exchanges. The fourth column presents the weight of each country as a fraction of the total market value of these countries. (Unit: Million in USD, %)

Panel A: Developed Countries

Country	Symbol	Market Capitalization	Global Weight (%)	Area
Australia	AUS	380,087	1.73	Oceania
Austria	AUT	33,578	0.15	C/W Europe
Belgium	BEL	26,034	0.12	C/W Europe
Canada	CAN	570,223	2.59	N. America
Switzerland	CHE	547,020	2.49	C/W Europe
Germany	DEU	686,014	3.12	C/W Europe
Denmark	DNK	76,750	0.35	C/W Europe
Spain	ESP	461,560	2.10	C/W Europe
Finland	FIN	138,833	0.63	N. Europe
France	FRA	1,538,654	7.00	C/W Europe
U.K.	GBR	1,800,658	8.19	C/W Europe
Hong Kong	HKG	463,055	2.11	E. Asia
Ireland	IRL	59,938	0.27	C/W Europe
Italy	ITA	477,075	2.17	C/W Europe
Japan	JPN	2,069,299	9.41	E. Asia
Netherlands	NLD	123,496	0.56	C/W Europe
Norway	NOR	68,103	0.31	N. Europe
New Zealand	NZL	21,715	0.10	Oceania
Singapore	SGP	101,554	0.46	E. Asia
Sweden	SWE	179,117	0.81	N. Europe
U.S.A.	USA	11,055,578	50.27	N. America
Total		20,878,340	94.94	

Panel B: Emerging Markets

Country	Symbol	Market Capitalization	Global Weight (%)	Area
Argentina	ARG	16,548.6	0.08	L. America
Brazil	BRA	126,761.5	0.58	L. America
Chile	CHL	49,827.7	0.23	L. America
Greece	GRC	66,040.0	0.30	S. Europe
Indonesia	IDN	30,067.0	0.14	E. Asia
Korea, S.	KOR	215,662.3	0.98	E. Asia
Malaysia	MAL	122,892.4	0.56	E. Asia
Mexico	MEX	103,941.2	0.47	L. America
Philippines	PHL	18,182.9	0.08	E. Asia
Portugal	PRT	21,760.8	0.10	C/W Europe
Thailand	THL	45,405.9	0.21	E. Asia
Turkey	TUR	34,216.7	0.16	S. Europe
Taiwan	TWN	261,311.2	1.19	E. Asia
Total		1,112,618	5.06	

Table 2 The Summary Statistics of Markets

The summary statistics of the annualized returns of the MSCI indices from 21 developed countries and 13 developing countries from Jan. 1988 to Dec. 2004 is reported. The global systematic risk, β_G , is computed by utilizing the Sharpe-Lintner CAPM model. The risk-adjusted performance indices are Sharpe ratio and Treynor ratio, respectively. The Jarque-Bera and Augmented Dickey-Fuller are the statistics of tests for normality and unit-root, respectively. * and ** denote the statistical significance of 5% and 1%, respectively.

Panel A: Developed Countries

Country	Mean	β_G	Sharpe	Treynor	Max	Min	Std. Dev.	Skewness	Kurtosis	Jarque-Bera	ADF test
World	0.062	1.000	0.018	0.009	1.266	-1.734	0.501	-0.535	3.666	13.503 **	-1.013 **
AUS	0.071	0.765	0.028	0.023	1.888	-1.988	0.646	-0.225	3.413	3.162 *	-1.073 **
AUT	0.080	0.635	0.034	0.042	2.704	-3.200	0.798	-0.372	4.888	34.990 **	-0.911 **
BEL	0.083	0.800	0.048	0.037	2.654	-2.501	0.628	-0.366	5.847	73.433 **	-0.936 **
CAN	0.074	0.889	0.035	0.024	1.614	-2.968	0.611	-0.942	5.836	98.521 **	-0.906 **
CHE	0.105	0.830	0.087	0.063	1.829	-2.053	0.601	-0.315	4.010	12.042 **	-0.955 **
DEU	0.076	1.133	0.030	0.021	2.424	-3.349	0.785	-0.691	5.363	63.715 **	-1.061 **
DNK	0.114	0.815	0.095	0.075	1.648	-1.737	0.645	-0.273	2.966	2.547 *	-1.087 **
ESP	0.075	1.139	0.029	0.019	2.326	-2.943	0.767	-0.394	4.251	18.579 **	-1.017 **
FIN	0.091	1.360	0.032	0.028	3.365	-4.588	1.167	-0.287	4.220	15.443 **	-0.837 **
FRA	0.093	1.015	0.058	0.039	2.267	-2.006	0.683	-0.261	3.712	6.628	-1.069 **
GBR	0.062	0.882	0.017	0.011	1.656	-1.335	0.550	0.051	3.047	0.107 **	-1.030 **
HKG	0.090	1.059	0.040	0.035	3.405	-4.130	0.947	-0.195	5.133	39.983 **	-0.942 **
IRL	0.083	0.961	0.044	0.032	2.003	-2.356	0.695	-0.347	3.979	12.238 **	-1.027 **
ITA	0.054	0.925	0.001	0.001	2.328	-2.515	0.816	-0.032	3.141	0.204	-1.119 **
JPN	-0.012	1.160	-0.081	-0.056	2.599	-2.592	0.810	0.100	3.377	1.550	-0.978 **
NLD	0.081	0.952	0.047	0.030	1.459	-2.354	0.598	-0.962	5.179	71.843 **	-1.104 **
NOR	0.088	1.020	0.043	0.034	1.845	-3.925	0.814	-0.683	4.960	48.528 **	-0.996 **
NZL	0.019	0.775	-0.042	-0.043	2.890	-2.739	0.808	-0.150	4.041	9.976 **	-1.081 **
SGP	0.064	1.049	0.013	0.010	2.742	-2.770	0.870	-0.483	5.175	48.173 **	-0.980 **
SWE	0.116	1.353	0.071	0.047	2.466	-3.055	0.893	-0.526	4.020	18.262 **	-0.955 **
USA	0.094	0.837	0.083	0.049	1.269	-1.814	0.498	-0.570	3.807	16.588 **	-1.038 **

Panel B: Emerging Markets

Country	Mean	β_G	Sharpe	Treynor	Max	Min	Std. Dev.	Skewness	Kurtosis	Jarque-Bera	ADF test
ARG	0.144	0.624	0.049	0.146	8.036	-5.827	1.850	0.621	6.613	124.1 **	-0.968 **
BRA	0.138	1.617	0.041	0.053	7.137	-13.280	2.068	-1.365	11.958	745.5 **	-1.145 **
CHL	0.135	0.634	0.094	0.130	2.342	-4.128	0.878	-0.432	5.105	44.0 **	-0.841 **
GRC	0.099	0.784	0.039	0.059	5.283	-3.075	1.196	0.886	6.068	106.7 **	-0.939 **
IDN	0.050	0.864	-0.001	-0.003	7.948	-6.297	1.782	0.424	7.077	147.4 **	-0.831 **
KOR	0.040	1.193	-0.010	-0.011	6.409	-4.497	1.357	0.342	5.889	74.9 **	-0.955 **
MAL	0.046	0.895	-0.006	-0.007	4.861	-4.334	1.114	-0.206	6.444	102.3 **	-0.655 **
MEX	0.194	1.091	0.119	0.129	3.049	-5.034	1.189	-0.907	5.706	90.2 **	-0.915 **
PHL	0.020	0.910	-0.028	-0.036	4.321	-4.158	1.168	-0.009	4.632	22.6 **	-0.777 **
PRT	0.020	0.826	-0.041	-0.040	3.001	-2.582	0.790	0.071	3.938	7.6 **	-0.948 **
THL	0.031	1.296	-0.015	-0.017	4.307	-4.996	1.454	-0.386	4.649	28.2 **	-0.802 **
TUR	0.069	1.257	0.007	0.012	6.529	-6.381	2.113	0.049	3.644	3.6 *	-0.911 **
TWN	0.050	0.887	-0.003	-0.004	4.577	-4.926	1.382	-0.035	4.039	9.2 **	-0.886 **

Table 3 The Coefficients of Correlation Between the Markets

The averages of coefficients of correlation of each country with other countries of different groups are reported. The DC, EM, and All are the mean of coefficients of correlation with developed countries, emerging markets, and all countries, respectively. The averages with nations of different regions are also reported.

Panel A: Developed Countries

Country	DC	EM	All	Latin America	North America	East Asia	C./W Europe	North Europe	South Europe	Oceania
AUS	0.462	0.315	0.404	0.317	0.552	0.386	0.409	0.495	0.209	0.679
AUT	0.394	0.268	0.344	0.173	0.271	0.290	0.469	0.343	0.328	0.339
BEL	0.487	0.225	0.384	0.174	0.450	0.239	0.595	0.419	0.268	0.289
CAN	0.511	0.353	0.449	0.357	0.747	0.416	0.467	0.560	0.270	0.533
CHE	0.515	0.248	0.410	0.180	0.492	0.286	0.592	0.465	0.273	0.393
DEU	0.576	0.296	0.466	0.237	0.566	0.311	0.658	0.582	0.360	0.388
DNK	0.501	0.237	0.397	0.207	0.494	0.254	0.570	0.519	0.259	0.325
ESP	0.562	0.342	0.475	0.365	0.551	0.331	0.608	0.588	0.346	0.496
FIN	0.413	0.230	0.341	0.233	0.514	0.244	0.395	0.545	0.256	0.384
FRA	0.564	0.290	0.456	0.269	0.576	0.297	0.638	0.556	0.343	0.385
GBR	0.575	0.261	0.451	0.233	0.589	0.321	0.607	0.570	0.262	0.496
HKG	0.413	0.368	0.395	0.343	0.533	0.476	0.368	0.394	0.177	0.422
IRL	0.509	0.284	0.420	0.236	0.493	0.315	0.556	0.501	0.316	0.428
ITA	0.447	0.242	0.366	0.207	0.422	0.243	0.504	0.484	0.307	0.311
JPN	0.377	0.218	0.314	0.167	0.372	0.291	0.374	0.373	0.134	0.377
NLD	0.611	0.308	0.492	0.261	0.625	0.344	0.679	0.593	0.323	0.472
NOR	0.522	0.308	0.438	0.331	0.549	0.321	0.544	0.533	0.287	0.491
NZL	0.402	0.293	0.359	0.227	0.413	0.358	0.370	0.427	0.245	0.679
SGP	0.441	0.415	0.431	0.356	0.542	0.543	0.383	0.428	0.245	0.495
SWE	0.561	0.332	0.471	0.309	0.610	0.351	0.578	0.614	0.370	0.508
USA	0.525	0.341	0.453	0.373	0.747	0.384	0.517	0.555	0.257	0.432

Panel B: Emerging Markets

Country	DC	EM	All	Latin America	North America	East Asia	C./W Europe	North Europe	South Europe	Oceania
ARG	0.151	0.210	0.173	0.305	0.257	0.161	0.122	0.153	0.212	0.233
BRA	0.276	0.235	0.261	0.304	0.313	0.217	0.258	0.331	0.243	0.274
CHL	0.296	0.314	0.303	0.354	0.415	0.342	0.256	0.318	0.240	0.259
GRC	0.314	0.211	0.277	0.203	0.240	0.160	0.386	0.311	0.333	0.250
IDN	0.242	0.273	0.253	0.212	0.302	0.373	0.197	0.208	0.155	0.321
KOR	0.296	0.241	0.276	0.187	0.349	0.359	0.236	0.322	0.126	0.371
MAL	0.328	0.321	0.325	0.250	0.377	0.472	0.278	0.293	0.174	0.320
MEX	0.334	0.294	0.320	0.383	0.475	0.333	0.280	0.361	0.187	0.322
PHL	0.318	0.337	0.325	0.284	0.402	0.469	0.266	0.237	0.168	0.396
PRT	0.443	0.224	0.363	0.204	0.371	0.212	0.515	0.449	0.404	0.351
THL	0.343	0.356	0.347	0.288	0.434	0.510	0.278	0.266	0.179	0.438
TUR	0.241	0.215	0.232	0.239	0.287	0.172	0.245	0.297	0.333	0.204
TWN	0.239	0.264	0.248	0.282	0.287	0.337	0.201	0.228	0.137	0.210

Table 4 Efficient Frontier of All Countries

In Panel A, the maxima of Sharpe ratio and Treynor ratio, i.e., MSR and MTR, as well as the annualized standard deviation and the weight of each country of the most efficient portfolio (MEP) composed by the markets of all countries with different constraints are reported. In Panel B, the annualized return and standard deviation, as well as their global market systematic risk, Sharpe ratio, and Treynor ratio of minimum-variance portfolio (MVP) composed by the markets of each area with different constraints are reported. The statistics of Without Restriction (NR) are the results of the optimum of Lagrangian:

$$\min_{\{w, \phi, \eta\}} \frac{1}{2} w^T V w + \phi (E(R_p) - w^T E) + \eta (1 - w^T 1).$$

The statistics of Short-sell Restriction are the results of the optimum of above Lagrangian plus the follow constraint:

$$0 \leq w_i \leq 1, \text{ for all } i.$$

The statistics of Short-sell and Over-weighted Restrictions are the results of the optimum of Lagrangian including Short-sell Restriction plus the follow constraint:

$$0 \leq w_i \leq 3w_i(Cap),$$

where $w_i(Cap)$ is the weights of world market capitalization of market i .

Panel A: The Most Efficient Portfolio (MEP)

Without Restriction			Short-sell Restriction			Short-sell and Over-weight Restrictions		
	Max Sharpe	Max Treynor		Max Sharpe	Max Treynor		Max Sharpe	Max Treynor
Value	0.1439	0.1295	Value	0.1439	0.1295	Value	0.0920	0.0530
St. Dev.	0.6123	1.0866	St. Dev.	0.6123	1.0866	St. Dev.	0.4915	0.4915
Weight			Weight			Weight		
ARG	0.0000	0.0000	ARG	0.0000	0.0000	ARG	0.0023	0.0023
BRA	0.0000	0.0000	BRA	0.0000	0.0000	BRA	0.0173	0.0173
CHL	0.1943	0.1288	CHL	0.1943	0.1288	CHL	0.0068	0.0068
GRC	0.0000	0.0000	GRC	0.0000	0.0000	GRC	0.0090	0.0090
IDN	0.0000	0.0000	IDN	0.0000	0.0000	IDN	0.0000	0.0000
KOR	0.0000	0.0000	KOR	0.0000	0.0000	KOR	0.0000	0.0000
MAL	0.0000	0.0000	MAL	0.0000	0.0000	MAL	0.0000	0.0000
MEX	0.3075	0.8712	MEX	0.3075	0.8712	MEX	0.0142	0.0142
PHL	0.0000	0.0000	PHL	0.0000	0.0000	PHL	0.0000	0.0000
PRT	0.0000	0.0000	PRT	0.0000	0.0000	PRT	0.0000	0.0000
THL	0.0000	0.0000	THL	0.0000	0.0000	THL	0.0000	0.0000
TUR	0.0000	0.0000	TUR	0.0000	0.0000	TUR	0.0000	0.0000
TWN	0.0000	0.0000	TWN	0.0000	0.0000	TWN	0.0000	0.0000
AUS	0.0000	0.0000	AUS	0.0000	0.0000	AUS	0.0000	0.0000
AUT	0.0000	0.0000	AUT	0.0000	0.0000	AUT	0.0000	0.0000
BEL	0.0000	0.0000	BEL	0.0000	0.0000	BEL	0.0000	0.0000
CAN	0.0000	0.0000	CAN	0.0000	0.0000	CAN	0.0000	0.0000
CHE	0.2047	0.0000	CHE	0.2047	0.0000	CHE	0.0746	0.0746
DEU	0.0000	0.0000	DEU	0.0000	0.0000	DEU	0.0000	0.0000
DNK	0.2935	0.0000	DNK	0.2935	0.0000	DNK	0.0105	0.0105
ESP	0.0000	0.0000	ESP	0.0000	0.0000	ESP	0.0000	0.0000
FIN	0.0000	0.0000	FIN	0.0000	0.0000	FIN	0.0000	0.0000
FRA	0.0000	0.0000	FRA	0.0000	0.0000	FRA	0.0000	0.0000
GBR	0.0000	0.0000	GBR	0.0000	0.0000	GBR	0.0000	0.0000

HKG	0.0000	0.0000	HKG	0.0000	0.0000	HKG	0.0000	0.0000
IRL	0.0000	0.0000	IRL	0.0000	0.0000	IRL	0.0000	0.0000
ITA	0.0000	0.0000	ITA	0.0000	0.0000	ITA	0.0000	0.0000
JPN	0.0000	0.0000	JPN	0.0000	0.0000	JPN	0.0000	0.0000
NLD	0.0000	0.0000	NLD	0.0000	0.0000	NLD	0.0000	0.0000
NOR	0.0000	0.0000	NOR	0.0000	0.0000	NOR	0.0000	0.0000
NZL	0.0000	0.0000	NZL	0.0000	0.0000	NZL	0.0000	0.0000
SGP	0.0000	0.0000	SGP	0.0000	0.0000	SGP	0.0000	0.0000
SWE	0.0000	0.0000	SWE	0.0000	0.0000	SWE	0.0244	0.0244
USA	0.0000	0.0000	USA	0.0000	0.0000	USA	0.8409	0.8409

Panel B: The Minimum-Variance Portfolio (MVP)

All 34 Countries	Return	St. Dev	Sharpe	β_G	Treynor
Without Restriction	0.084	0.438	0.071	0.814	0.038
With No Short-Sell Restriction	0.084	0.438	0.071	0.814	0.038
With No Short-Sell and Over-weight Restriction	0.077	0.452	0.054	0.866	0.028

Table 5 Efficient Frontier of European Countries

In Panel A, the maxima of Sharpe ratio and Treynor ratio, i.e., MSR and MTR, as well as the annualized standard deviation and the weight of each country of the most efficient portfolio (MEP) composed by the markets of European countries with different constraints are reported. In Panel B, the annualized return and standard deviation, as well as their global market systematic risk, Sharpe ratio, and Treynor ratio of minimum-variance portfolio (MVP) composed by the markets of each area with different constraints are reported. The statistics of Without Restriction (NR) are the results of the optimum of Lagrangian:

$$\min_{\{w, \phi, \eta\}} \frac{1}{2} w^T V w + \phi (E(R_p) - w^T E) + \eta (1 - w^T 1).$$

The statistics of Short-sell Restriction (SR) are the results of the optimum of above Lagrangian pluses the follow constraint:

$$0 \leq w_i \leq 1, \text{ for all } i.$$

The statistics of Short-sell and Over-weighted Restrictions are the results of the optimum of Lagrangian including Short-sell Restriction pluses the follow constraint:

$$0 \leq w_i \leq 3w_i(Cap),$$

where $w_i(Cap)$ is the weights of world market capitalization of market i .

Panel A: The Most Efficient Portfolio (MEP)

Without Restriction			Short-sell Restriction			Short-sell and Over-weight Restrictions		
	Max Sharpe	Max Treynor		Max Sharpe	Max Treynor		Max Sharpe	Max Treynor
Value	0.1027	0.0682	Value	0.1027	0.0682	Value	0.0768	0.0468
St. Dev.	0.5667	0.5548	St. Dev.	0.5667	0.5548	St. Dev.	0.5874	0.6041
Weight			Weight			Weight		
AUT	0.0000	0.0000	AUT	0.0000	0.0000	AUT	0.0147	0.0000
BEL	0.0000	0.0000	BEL	0.0000	0.0000	BEL	0.0123	0.0000
CHE	0.3603	0.4537	CHE	0.3603	0.4537	CHE	0.2589	0.2589
DEU	0.0000	0.0000	DEU	0.0000	0.0000	DEU	0.0000	0.0000
DNK	0.5693	0.4988	DNK	0.5693	0.4988	DNK	0.0363	0.0363
ESP	0.0000	0.0000	ESP	0.0000	0.0000	ESP	0.0000	0.0000
FIN	0.0000	0.0000	FIN	0.0000	0.0000	FIN	0.0163	0.0000
FRA	0.0000	0.0000	FRA	0.0000	0.0000	FRA	0.4848	0.5888
GBR	0.0000	0.0000	GBR	0.0000	0.0000	GBR	0.0000	0.0000
GRC	0.0000	0.0225	GRC	0.0000	0.0225	GRC	0.0313	0.0313
IRL	0.0000	0.0000	IRL	0.0000	0.0000	IRL	0.0284	0.0000
ITA	0.0000	0.0000	ITA	0.0000	0.0000	ITA	0.0000	0.0000
NLD	0.0000	0.0000	NLD	0.0000	0.0000	NLD	0.0000	0.0000
NOR	0.0000	0.0000	NOR	0.0000	0.0000	NOR	0.0322	0.0000
PRT	0.0000	0.0000	PRT	0.0000	0.0000	PRT	0.0000	0.0000
SWE	0.0704	0.0250	SWE	0.0704	0.0250	SWE	0.0848	0.0848
TUR	0.0000	0.0000	TUR	0.0000	0.0000	TUR	0.0000	0.0000

Panel B: The Minimum-Variance Portfolio (MVP)

Europe	Return	St. Dev	Sharpe	β_G	Treynor
Without Restriction	0.078	0.499	0.051	0.837	0.030
With No Short-Sell Restriction	0.078	0.499	0.051	0.837	0.030
With No Short-Sell and Over-weight Restriction	0.077	0.508	0.047	0.867	0.027

Table 6 Efficient Frontier of East Asian Countries

In Panel A, the maxima of Sharpe ratio and Treynor ratio, i.e., MSR and MTR, as well as the annualized standard deviation and the weight of each country of the most efficient portfolio (MEP) composed by the markets of East Asian countries with different constraints are reported. In Panel B, the annualized return and standard deviation, as well as their global market systematic risk, Sharpe ratio, and Treynor ratio of minimum-variance portfolio (MVP) composed by the markets of each area with different constraints are reported. The statistics of Without Restriction (NR) are the results of the optimum of Lagrangian:

$$\min_{\{w, \phi, \eta\}} \frac{1}{2} w^T V w + \phi (E(R_p) - w^T E) + \eta (1 - w^T 1).$$

The statistics of Short-sell Restriction (SR) are the results of the optimum of above Lagrangian pluses the follow constraint:

$$0 \leq w_i \leq 1, \text{ for all } i.$$

The statistics of Short-sell and Over-weighted Restrictions are the results of the optimum of Lagrangian including Short-sell Restriction pluses the follow constraint:

$$0 \leq w_i \leq 3w_i(Cap),$$

where $w_i(Cap)$ is the weights of world market capitalization of market i .

Panel A: The Most Efficient Portfolio (MEP)

Without Restriction			Short-sell Restriction			Short-sell and Over-weight Restrictions		
	Max Sharpe	Max Treynor		Max Sharpe	Max Treynor		Max Sharpe	Max Treynor
Value	0.0396	0.0354	Value	0.0396	0.0354	Value	0.0160	0.0168
St. Dev.	0.9465	0.9465	St. Dev.	0.9465	0.9465	St. Dev.	0.8405	0.8405
Weight			Weight			Weight		
HKG	1.0000	1.0000	HKG	1.0000	1.0000	HKG	0.4175	0.4175
IDN	0.0000	0.0000	IDN	0.0000	0.0000	IDN	0.0271	0.0271
JPN	0.0000	0.0000	JPN	0.0000	0.0000	JPN	0.0000	0.0000
KOR	0.0000	0.0000	KOR	0.0000	0.0000	KOR	0.1174	0.1174
MAL	0.0000	0.0000	MAL	0.0000	0.0000	MAL	0.1108	0.1108
PHL	0.0000	0.0000	PHL	0.0000	0.0000	PHL	0.0000	0.0000
SGP	0.0000	0.0000	SGP	0.0000	0.0000	SGP	0.0916	0.0916
THL	0.0000	0.0000	THL	0.0000	0.0000	THL	0.0000	0.0000
TWN	0.0000	0.0000	TWN	0.0000	0.0000	TWN	0.2356	0.2356

Panel B: The Minimum-Variance Portfolio (MVP)

East Asia	Return	St. Dev	Sharpe	β_G	Treynor
Without Restriction	0.024	0.678	-0.042	1.035	-0.028
With No Short-Sell Restriction	0.024	0.678	-0.042	1.035	-0.028
With No Short-Sell and Over-weight Restriction	0.022	0.681	-0.046	1.063	-0.029

Table 7 Efficient Frontier of North American Countries

In Panel A, the maxima of Sharpe ratio and Treynor ratio, i.e., MSR and MTR, as well as the annualized standard deviation and the weight of each country of the most efficient portfolio (MEP) composed by the markets of North American countries with different constraints are reported. In Panel B, the annualized return and standard deviation, as well as their global market systematic risk, Sharpe ratio, and Treynor ratio of minimum-variance portfolio (MVP) composed by the markets of each area with different constraints are reported. The statistics of Without Restriction (NR) are the results of the optimum of Lagrangian:

$$\min_{\{w, \phi, \eta\}} \frac{1}{2} w^T V w + \phi (E(R_p) - w^T E) + \eta (1 - w^T 1).$$

The statistics of Short-sell Restriction (SR) are the results of the optimum of above Lagrangian plus the follow constraint:

$$0 \leq w_i \leq 1, \text{ for all } i.$$

The statistics of Short-sell and Over-weighted Restrictions are the results of the optimum of Lagrangian including Short-sell Restriction plus the follow constraint:

$$0 \leq w_i \leq 3w_i(Cap),$$

where $w_i(Cap)$ is the weights of world market capitalization of market i .

Panel A: The Most Efficient Portfolio (MEP)

Without Restriction			Short-sell Restriction			Short-sell and Over-weight Restrictions		
	Max Sharpe	Max Treynor		Max Sharpe	Max Treynor		Max Sharpe	Max Treynor
Value	0.0826	0.0492	Value	0.0826	0.0492	Value	0.0826	0.0492
St. Dev.	0.4983	0.4983	St. Dev.	0.4983	0.4983	St. Dev.	0.4983	0.4983
Weight			Weight			Weight		
CAN	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000
USA	1.0000	1.0000		1.0000	1.0000		1.0000	1.0000

Panel B: The Minimum-Variance Portfolio (MVP)

North America	Return	St. Dev	Sharpe	β_G	Treynor
Without Restriction	0.092	0.496	0.078	0.843	0.046
With No Short-Sell Restriction	0.092	0.496	0.078	0.843	0.046
With No Short-Sell and Over-weight Restriction	0.092	0.496	0.078	0.843	0.046

Table 8 Efficient Frontier of Latin American Countries

In Panel A, the maxima of Sharpe ratio and Treynor ratio, i.e., MSR and MTR, as well as the annualized standard deviation and the weight of each country of the most efficient portfolio (MEP) composed by the markets of Latin American countries with different constraints are reported. In Panel B, the annualized return and standard deviation, as well as their global market systematic risk, Sharpe ratio, and Treynor ratio of minimum-variance portfolio (MVP) composed by the markets of each area with different constraints are reported. The statistics of Without Restriction (NR) are the results of the optimum of Lagrangian:

$$\min_{\{w, \phi, \eta\}} \frac{1}{2} w^T V w + \phi (E(R_p) - w^T E) + \eta (1 - w^T 1).$$

The statistics of Short-sell Restriction are the results of the optimum of above Lagrangian pluses the follow constraint:

$$0 \leq w_i \leq 1, \text{ for all } i.$$

The statistics of Short-sell and Over-weighted Restrictions are the results of the optimum of Lagrangian including Short-sell Restriction pluses the follow constraint:

$$0 \leq w_i \leq 3w_i(Cap),$$

where $w_i(Cap)$ is the weights of world market capitalization of market i .

Panel A: The Most Efficient Portfolio (MEP)

Without Restriction			Short-sell Restriction			Short-sell and Over-weight Restrictions		
	Max Sharpe	Max Treynor		Max Sharpe	Max Treynor		Max Sharpe	Max Treynor
Value	0.1287	0.1302	Value	0.1287	0.1302	Value	0.0830	0.1297
St. Dev.	0.8941	0.8235	St. Dev.	0.9060	0.8235	St. Dev.	0.9080	0.8671
Weight			Weight			Weight		
ARG	0.0000	0.0366	ARG	0.0000	0.0366	ARG	0.0000	0.0124
BRA	0.0000	0.0000	BRA	0.0000	0.0000	BRA	0.0000	0.0000
CHL	0.4436	0.7257	CHL	0.4175	0.7257	CHL	0.4315	0.5032
MEX	0.5564	0.2377	MEX	0.5825	0.2377	MEX	0.5685	0.4844

Panel B: The Minimum-Variance Portfolio (MVP)

Latin America	Return	St. Dev	Sharpe	β_G	Treynor
Without Restriction	0.150	0.824	0.117	0.742	0.130
With No Short-Sell Restriction	0.150	0.824	0.117	0.742	0.130
With No Short-Sell and Over-weight Restriction	0.149	0.857	0.112	0.846	0.125

Table 9 Efficient Frontier of Oceania Countries

In Panel A, the maxima of Sharpe ratio and Treynor ratio, i.e., MSR and MTR, as well as the annualized standard deviation and the weight of each country of the most efficient portfolio (MEP) composed by the markets of Oceania countries with different constraints are reported. In Panel B, the annualized return and standard deviation, as well as their global market systematic risk, Sharpe ratio, and Treynor ratio of minimum-variance portfolio (MVP) composed by the markets of each area with different constraints are reported. The statistics of Without Restriction (NR) are the results of the optimum of Lagrangian:

$$\min_{\{w, \phi, \eta\}} \frac{1}{2} w^T V w + \phi (E(R_p) - w^T E) + \eta (1 - w^T 1).$$

The statistics of Short-sell Restriction (SR) are the results of the optimum of above Lagrangian plus the follow constraint:

$$0 \leq w_i \leq 1, \text{ for all } i.$$

The statistics of Short-sell and Over-weighted Restrictions (SOR) are the results of the optimum of Lagrangian including Short-sell Restriction plus the follow constraint:

$$0 \leq w_i \leq 3w_i(Cap),$$

where $w_i(Cap)$ is the weights of world market capitalization of market i .

Panel A: The Most Efficient Portfolio (MEP)

Without Restriction			Short-sell Restriction			Short-sell and Over-weight Restrictions		
	Max Sharpe	Max Treynor		Max Sharpe	Max Treynor		Max Sharpe	Max Treynor
Value	0.0278	0.0235	Value	0.0278	0.0235	Value	0.0278	0.0235
St. Dev.	0.6456	0.6456	St. Dev.	0.6456	0.6456	St. Dev.	0.6456	0.6456
Weight			Weight			Weight		
AUS	1.0000	1.0000	AUS	1.0000	1.0000	AUS	1.0000	1.0000
NZL	0.0000	0.0000	NZL	0.0000	0.0000	NZL	0.0000	0.0000

Panel B: The Minimum-Variance Portfolio (MVP)

Oceania	Return	St. Dev	Sharpe	β_G	Treynor
Without Restriction	0.062	0.637	0.014	0.767	0.012
With No Short-Sell Restriction	0.062	0.637	0.014	0.767	0.012
With No Short-Sell and Over-weight Restriction	0.060	0.637	0.011	0.767	0.009

Table 10 Efficient Frontier of European and East Asian Countries

In Panel A, the maxima of Sharpe ratio and Treynor ratio, i.e., MSR and MTR, as well as the annualized standard deviation and the weight of each country of the most efficient portfolio (MEP) composed by the markets of European and East Asian countries with different constraints are reported. In Panel B, the annualized return and standard deviation, as well as their global market systematic risk, Sharpe ratio, and Treynor ratio of minimum-variance portfolio (MVP) composed by the markets of each area with different constraints are reported. The statistics of Without Restriction (NR) are the results of the optimum of Lagrangian:

$$\min_{\{w, \phi, \eta\}} \frac{1}{2} w^T V w + \phi (E(R_p) - w^T E) + \eta (1 - w^T 1).$$

The statistics of Short-sell Restriction (SR) are the results of the optimum of above Lagrangian pluses the follow constraint:

$$0 \leq w_i \leq 1, \text{ for all } i.$$

The statistics of Short-sell and Over-weighted Restrictions are the results of the optimum of Lagrangian including Short-sell Restriction pluses the follow constraint:

$$0 \leq w_i \leq 3w_i(Cap),$$

where $w_i(Cap)$ is the weights of world market capitalization of market i .

Panel A: The Most Efficient Portfolio (MEP)

Without Restriction			Short-sell Restriction			Short-sell and Over-weight Restrictions		
	Max Sharpe	Max Treynor		Max Sharpe	Max Treynor		Max Sharpe	Max Treynor
Value	0.1026	0.0677	Value	0.1026	0.0677	Value	0.0726	0.0424
St. Dev.	0.5531	0.5695	St. Dev.	0.5531	0.5695	St. Dev.	0.5893	0.5893
Weight			Weight			Weight		
GRC	0.0139	0.0000	GRC	0.0139	0.0000	GRC	0.0205	0.0205
IDN	0.0000	0.0000	IDN	0.0000	0.0000	IDN	0.0000	0.0000
KOR	0.0000	0.0000	KOR	0.0000	0.0000	KOR	0.0000	0.0000
MAL	0.0000	0.0000	MAL	0.0000	0.0000	MAL	0.0000	0.0000
PHL	0.0000	0.0000	PHL	0.0000	0.0000	PHL	0.0000	0.0000
PRT	0.0000	0.0000	PRT	0.0000	0.0000	PRT	0.0000	0.0000
THL	0.0000	0.0000	THL	0.0000	0.0000	THL	0.0000	0.0000
TUR	0.0000	0.0000	TUR	0.0000	0.0000	TUR	0.0000	0.0000
TWN	0.0000	0.0000	TWN	0.0000	0.0000	TWN	0.0000	0.0000
AUT	0.0000	0.0000	AUT	0.0000	0.0000	AUT	0.0000	0.0000
BEL	0.0000	0.0000	BEL	0.0000	0.0000	BEL	0.0081	0.0081
CHE	0.4186	0.3376	CHE	0.4186	0.3376	CHE	0.1698	0.1698
DEU	0.0000	0.0000	DEU	0.0000	0.0000	DEU	0.0000	0.0000
DNK	0.5129	0.5835	DNK	0.5129	0.5835	DNK	0.0238	0.0238
ESP	0.0000	0.0000	ESP	0.0000	0.0000	ESP	0.0000	0.0000
FIN	0.0000	0.0000	FIN	0.0000	0.0000	FIN	0.0431	0.0431
FRA	0.0000	0.0000	FRA	0.0000	0.0000	FRA	0.4775	0.4775
GBR	0.0000	0.0000	GBR	0.0000	0.0000	GBR	0.0000	0.0000
HKG	0.0250	0.0000	HKG	0.0250	0.0000	HKG	0.1437	0.1437
IRL	0.0000	0.0000	IRL	0.0000	0.0000	IRL	0.0186	0.0186
ITA	0.0000	0.0000	ITA	0.0000	0.0000	ITA	0.0000	0.0000
JPN	0.0000	0.0000	JPN	0.0000	0.0000	JPN	0.0000	0.0000

NLD	0.0000	0.0000	NLD	0.0000	0.0000	NLD	0.0182	0.0182
NOR	0.0000	0.0000	NOR	0.0000	0.0000	NOR	0.0211	0.0211
SGP	0.0000	0.0000	SGP	0.0000	0.0000	SGP	0.0000	0.0000
SWE	0.0297	0.0789	SWE	0.0297	0.0789	SWE	0.0556	0.0556

Panel B: The Minimum-Variance Portfolio (MVP)

East Asia and Europe Portfolio	Return	St. Dev	Sharpe	β_G	Treynor
Without Restriction	0.0680	0.4868	0.0308	0.8744	0.0172
With No Short-Sell Restriction	0.0680	0.4868	0.0308	0.8744	0.0172
With No Short-Sell and Over-weight Restriction	0.0635	0.4966	0.0211	0.8986	0.0117

Table 11 Efficient Frontier of European and North American Countries

In Panel A, the maxima of Sharpe ratio and Treynor ratio, i.e., MSR and MTR, as well as the annualized standard deviation and the weight of each country of the most efficient portfolio (MEP) composed by the markets of European and North American countries with different constraints are reported. In Panel B, the annualized return and standard deviation, as well as their global market systematic risk, Sharpe ratio, and Treynor ratio of minimum-variance portfolio (MVP) composed by the markets of each area with different constraints are reported. The statistics of Without Restriction (NR) are the results of the optimum of Lagrangian:

$$\min_{\{w, \phi, \eta\}} \frac{1}{2} w^T V w + \phi (E(R_p - w^T E) + \eta(1 - w^T \mathbf{1})).$$

The statistics of Short-sell Restriction (SR) are the results of the optimum of above Lagrangian pluses the follow constraint:

$$0 \leq w_i \leq 1, \text{ for all } i.$$

The statistics of Short-sell and Over-weighted Restrictions (SOR) are the results of the optimum of Lagrangian including Short-sell Restriction pluses the follow constraint:

$$0 \leq w_i \leq 3w_i(\text{Cap}),$$

where $w_i(\text{Cap})$ is the weights of world market capitalization of market i .

Panel A: The Most Efficient Portfolio (MEP)

Without Restriction			Short-sell Restriction			Short-sell and Over-weight Restrictions		
	Max Sharpe	Max Treynor		Max Sharpe	Max Treynor		Max Sharpe	Max Treynor
Value	0.1068	0.0674	Value	0.1068	0.0674	Value	0.0892	0.0892
St. Dev.	0.4861	0.5876	St. Dev.	0.4861	0.5876	St. Dev.	0.4835	0.0892
Weight			Weight			Weight		
GRC	0.0054	0.0000	GRC	0.0054	0.0000	GRC	0.0110	0.0110
PRT	0.0000	0.0000	PRT	0.0000	0.0000	PRT	0.0000	0.0000
TUR	0.0000	0.0000	TUR	0.0000	0.0000	TUR	0.0000	0.0000
AUT	0.0000	0.0000	AUT	0.0000	0.0000	AUT	0.0000	0.0000
BEL	0.0000	0.0000	BEL	0.0000	0.0000	BEL	0.0000	0.0000
CAN	0.0000	0.0000	CAN	0.0000	0.0000	CAN	0.0000	0.0000
CHE	0.2493	0.2222	CHE	0.2493	0.2222	CHE	0.0913	0.0913
DEU	0.0000	0.0000	DEU	0.0000	0.0000	DEU	0.0000	0.0000
DNK	0.3952	0.6557	DNK	0.3952	0.6557	DNK	0.0128	0.0128
ESP	0.0000	0.0000	ESP	0.0000	0.0000	ESP	0.0000	0.0000
FIN	0.0000	0.0000	FIN	0.0000	0.0000	FIN	0.0000	0.0000
FRA	0.0000	0.0000	FRA	0.0000	0.0000	FRA	0.0000	0.0000
GBR	0.0000	0.0000	GBR	0.0000	0.0000	GBR	0.0000	0.0000
IRL	0.0000	0.0000	IRL	0.0000	0.0000	IRL	0.0000	0.0000
ITA	0.0000	0.0000	ITA	0.0000	0.0000	ITA	0.0000	0.0000
NLD	0.0000	0.0000	NLD	0.0000	0.0000	NLD	0.0000	0.0000
NOR	0.0000	0.0000	NOR	0.0000	0.0000	NOR	0.0000	0.0000
SWE	0.0000	0.1222	SWE	0.0000	0.1222	SWE	0.0299	0.0299
USA	0.3501	0.0000	USA	0.3501	0.0000	USA	0.8550	0.8550

Panel B: The Minimum-Variance Portfolio (MVP)

Europe and North America Portfolio	Return	St. Dev	Sharpe	β_G	Treynor
Without Restriction	0.0886	0.4490	0.0793	0.8132	0.0438
With No Short-Sell Restriction	0.0886	0.4490	0.0793	0.8132	0.0438
With No Short-Sell and Over-weight Restriction	0.0845	0.4598	0.0684	0.8517	0.0369

Table 12 Efficient Frontier of European and Latin American Country

In Panel A, the maxima of Sharpe ratio and Treynor ratio, i.e., MSR and MTR, as well as the annualized standard deviation and the weight of each country of the most efficient portfolio (MEP) composed by the markets of European and Latin American countries with different constraints are reported. In Panel B, the annualized return and standard deviation, as well as their global market systematic risk, Sharpe ratio, and Treynor ratio of minimum-variance portfolio (MVP) composed by the markets of each area with different constraints are reported. The statistics of Without Restriction (NR) are the results of the optimum of Lagrangian:

$$\min_{\{w, \phi, \eta\}} \frac{1}{2} w^T V w + \phi (E(R_p) - w^T E) + \eta (1 - w^T 1).$$

The statistics of Short-sell Restriction (SR) are the results of the optimum of above Lagrangian pluses the follow constraint:

$$0 \leq w_i \leq 1, \text{ for all } i.$$

The statistics of Short-sell and Over-weighted Restrictions (SOR) are the results of the optimum of Lagrangian including Short-sell Restriction pluses the follow constraint:

$$0 \leq w_i \leq 3w_i(Cap),$$

where $w_i(Cap)$ is the weights of world market capitalization of market i .

Panel A: The Most Efficient Portfolio (MEP)

Without Restriction			Short-sell Restriction			Short-sell and Over-weight Restrictions		
	Max Sharpe	Max Treynor		Max Sharpe	Max Treynor		Max Sharpe	Max Treynor
Value	0.1439	0.1294	Value	0.1439	0.1294	Value	0.0909	0.0538
St. Dev.	0.6053	1.1389	St. Dev.	0.6053	1.1389	St. Dev.	0.5883	0.6014
Weight			Weight			Weight		
ARG	0.0000	0.0000	ARG	0.0000	0.0000	ARG	0.0075	0.0075
BRA	0.0000	0.0000	BRA	0.0000	0.0000	BRA	0.0554	0.0573
CHL	0.1945	0.0612	CHL	0.1945	0.0612	CHL	0.0225	0.0225
GRC	0.0000	0.0000	GRC	0.0000	0.0000	GRC	0.0299	0.0299
MEX	0.2963	0.9388	MEX	0.2963	0.9388	MEX	0.0470	0.0470
PRT	0.0000	0.0000	PRT	0.0000	0.0000	PRT	0.0000	0.0000
TUR	0.0000	0.0000	TUR	0.0000	0.0000	TUR	0.0000	0.0000
AUT	0.0000	0.0000	AUT	0.0000	0.0000	AUT	0.0152	0.0000
BEL	0.0000	0.0000	BEL	0.0000	0.0000	BEL	0.0118	0.0000
CHE	0.2157	0.0000	CHE	0.2157	0.0000	CHE	0.2473	0.2473
DEU	0.0000	0.0000	DEU	0.0000	0.0000	DEU	0.0000	0.0000
DNK	0.2935	0.0000	DNK	0.2935	0.0000	DNK	0.0347	0.0347
ESP	0.0000	0.0000	ESP	0.0000	0.0000	ESP	0.0000	0.0000
FIN	0.0000	0.0000	FIN	0.0000	0.0000	FIN	0.0000	0.0000
FRA	0.0000	0.0000	FRA	0.0000	0.0000	FRA	0.3902	0.4728
GBR	0.0000	0.0000	GBR	0.0000	0.0000	GBR	0.0000	0.0000
IRL	0.0000	0.0000	IRL	0.0000	0.0000	IRL	0.0271	0.0000
ITA	0.0000	0.0000	ITA	0.0000	0.0000	ITA	0.0000	0.0000
NLD	0.0000	0.0000	NLD	0.0000	0.0000	NLD	0.0062	0.0000
NOR	0.0000	0.0000	NOR	0.0000	0.0000	NOR	0.0242	0.0000
SWE	0.0000	0.0000	SWE	0.0000	0.0000	SWE	0.0810	0.0810

Panel B: The Minimum-Variance Portfolio (MVP)

Latin America and Europe Portfolio	Return	St. Dev	Sharpe	β_G	Treynor
Without Restriction	0.0896	0.4774	0.0767	0.8016	0.0457
With No Short-Sell Restriction	0.0896	0.4774	0.0767	0.8016	0.0457
With No Short-Sell and Over-weight Restriction	0.0830	0.4995	0.0600	0.8672	0.0346

Table 13 Efficient Frontier of European and Oceania Countries

In Panel A, the maxima of Sharpe ratio and Treynor ratio, i.e., MSR and MTR, as well as the annualized standard deviation and the weight of each country of the most efficient portfolio (MEP) composed by the markets of European and Oceania countries with different constraints are reported. In Panel B, the annualized return and standard deviation, as well as their global market systematic risk, Sharpe ratio, and Treynor ratio of minimum-variance portfolio (MVP) composed by the markets of each area with different constraints are reported. The statistics of Without Restriction (NR) are the results of the optimum of Lagrangian:

$$\min_{\{w, \phi, \eta\}} \frac{1}{2} w^T V w + \phi (E(R_p) - w^T E) + \eta (1 - w^T 1).$$

The statistics of Short-sell Restriction (SR) are the results of the optimum of above Lagrangian pluses the follow constraint:

$$0 \leq w_i \leq 1, \text{ for all } i.$$

The statistics of Short-sell and Over-weighted Restrictions are the results of the optimum of Lagrangian including Short-sell Restriction pluses the follow constraint:

$$0 \leq w_i \leq 3w_i(Cap),$$

where $w_i(Cap)$ is the weights of world market capitalization of market i .

Panel A: The Most Efficient Portfolio (MEP)

Without Restriction			Short-sell Restriction			Short-sell and Over-weight Restrictions		
	Max Sharpe	Max Treynor		Max Sharpe	Max Treynor		Max Sharpe	Max Treynor
Value	0.1026	0.0681	Value	0.1026	0.0681	Value	0.0757	0.0462
St. Dev.	0.5682	0.5559	St. Dev.	0.5682	0.5559	St. Dev.	0.5799	0.6083
	Weight			Weight			Weight	
GRC	0.0000	0.0193	GRC	0.0000	0.0193	GRC	0.0290	0.0290
PRT	0.0000	0.0000	PRT	0.0000	0.0000	PRT	0.0000	0.0000
TUR	0.0000	0.0000	TUR	0.0000	0.0000	TUR	0.0000	0.0000
AUS	0.0000	0.0000	AUS	0.0000	0.0000	AUS	0.0387	0.0000
AUT	0.0000	0.0000	AUT	0.0000	0.0000	AUT	0.0147	0.0000
BEL	0.0000	0.0000	BEL	0.0000	0.0000	BEL	0.0114	0.0000
CHE	0.3482	0.4435	CHE	0.3482	0.4435	CHE	0.2398	0.2398
DEU	0.0000	0.0000	DEU	0.0000	0.0000	DEU	0.0000	0.0000
DNK	0.5769	0.5069	DNK	0.5769	0.5069	DNK	0.0337	0.0337
ESP	0.0000	0.0000	ESP	0.0000	0.0000	ESP	0.0000	0.0000
FIN	0.0000	0.0000	FIN	0.0000	0.0000	FIN	0.0157	0.0000
FRA	0.0000	0.0000	FRA	0.0000	0.0000	FRA	0.4823	0.6190
GBR	0.0000	0.0000	GBR	0.0000	0.0000	GBR	0.0000	0.0000
IRL	0.0000	0.0000	IRL	0.0000	0.0000	IRL	0.0263	0.0000
ITA	0.0000	0.0000	ITA	0.0000	0.0000	ITA	0.0000	0.0000
NLD	0.0000	0.0000	NLD	0.0000	0.0000	NLD	0.0000	0.0000
NOR	0.0000	0.0000	NOR	0.0000	0.0000	NOR	0.0299	0.0000
NZL	0.0000	0.0000	NZL	0.0000	0.0000	NZL	0.0000	0.0000
SGP	0.0000	0.0000	SGP	0.0000	0.0000	SGP	0.0000	0.0000
SWE	0.0750	0.0303	SWE	0.0750	0.0303	SWE	0.0785	0.0785

Panel B: The Minimum-Variance Portfolio (MVP)

Europe and Oceania Portfolio	Return	St. Dev	Sharpe	β_G	Treynor
Without Restriction	0.0793	0.4771	0.0552	0.8113	0.0325
With No Short-Sell Restriction	0.0793	0.4771	0.0552	0.8113	0.0325
With No Short-Sell and Over-weight Restriction	0.0757	0.4885	0.0466	0.8500	0.0268

Table 14 Efficient Frontier of East Asian and North American Countries

In Panel A, the maxima of Sharpe ratio and Treynor ratio, i.e., MSR and MTR, as well as the annualized standard deviation and the weight of each country of the most efficient portfolio (MEP) composed by the markets of East Asian and North American countries with different constraints are reported. In Panel B, the annualized return and standard deviation, as well as their global market systematic risk, Sharpe ratio, and Treynor ratio of minimum-variance portfolio (MVP) composed by the markets of each area with different constraints are reported. The statistics of Without Restriction (NR) are the results of the optimum of Lagrangian:

$$\min_{\{w, \phi, \eta\}} \frac{1}{2} w^T V w + \phi (E(R_p) - w^T E) + \eta (1 - w^T 1).$$

The statistics of Short-sell Restriction (SR) are the results of the optimum of above Lagrangian pluses the follow constraint:

$$0 \leq w_i \leq 1, \text{ for all } i.$$

The statistics of Short-sell and Over-weighted Restrictions are the results of the optimum of Lagrangian including Short-sell Restriction pluses the follow constraint:

$$0 \leq w_i \leq 3w_i(Cap),$$

where $w_i(Cap)$ is the weights of world market capitalization of market i .

Panel A: The Most Efficient Portfolio (MEP)

Without Restriction			Short-sell Restriction			Short-sell and Over-weight Restrictions		
	Max Sharpe	Max Treynor		Max Sharpe	Max Treynor		Max Sharpe	Max Treynor
Value	0.0826	0.0492	Value	0.0826	0.0492	Value	0.0826	0.0492
St. Dev.	0.4983	0.4983	St. Dev.	0.4983	0.4983	St. Dev.	0.4983	0.4983
Weight			Weight			Weight		
IDN	0.0000	0.0000	IDN	0.0000	0.0000	IDN	0.0000	0.0000
KOR	0.0000	0.0000	KOR	0.0000	0.0000	KOR	0.0000	0.0000
MAL	0.0000	0.0000	MAL	0.0000	0.0000	MAL	0.0000	0.0000
PHL	0.0000	0.0000	PHL	0.0000	0.0000	PHL	0.0000	0.0000
THL	0.0000	0.0000	THL	0.0000	0.0000	THL	0.0000	0.0000
TWN	0.0000	0.0000	TWN	0.0000	0.0000	TWN	0.0000	0.0000
CAN	0.0000	0.0000	CAN	0.0000	0.0000	CAN	0.0000	0.0000
HKG	0.0000	0.0000	HKG	0.0000	0.0000	HKG	0.0000	0.0000
JPN	0.0000	0.0000	JPN	0.0000	0.0000	JPN	0.0000	0.0000
SGP	0.0000	0.0000	SGP	0.0000	0.0000	SGP	0.0000	0.0000
USA	1.0000	1.0000	USA	1.0000	1.0000	USA	1.0000	1.0000

Panel B: The Minimum-Variance Portfolio (MVP)

East Asia and North America Portfolio	Return	St. Dev	Sharpe	β_G	Treynor
Without Restriction	0.0750	0.4782	0.0460	0.8916	0.0247
With No Short-Sell Restriction	0.0750	0.4782	0.0460	0.8916	0.0247
With No Short-Sell and Over-weight Restriction	0.0751	0.4783	0.0461	0.8917	0.0247

Table 15 Efficient Frontier of East Asian and Latin American Countries

In Panel A, the maxima of Sharpe ratio and Treynor ratio, i.e., MSR and MTR, as well as the annualized standard deviation and the weight of each country of the most efficient portfolio (MEP) composed by the markets of East Asian and Latin countries with different constraints are reported. In Panel B, the annualized return and standard deviation, as well as their global market systematic risk, Sharpe ratio, and Treynor ratio of minimum-variance portfolio (MVP) composed by the markets of each area with different constraints are reported. The statistics of Without Restriction (NR) are the results of the optimum of Lagrangian:

$$\min_{\{w, \phi, \eta\}} \frac{1}{2} w^T V w + \phi (E(R_p) - w^T E) + \eta (1 - w^T \mathbf{1}).$$

The statistics of Short-sell Restriction (SR) are the results of the optimum of above Lagrangian plus the follow constraint:

$$0 \leq w_i \leq 1, \text{ for all } i.$$

The statistics of Short-sell and Over-weighted Restrictions are the results of the optimum of Lagrangian including Short-sell Restriction plus the follow constraint:

$$0 \leq w_i \leq 3w_i(Cap),$$

where $w_i(Cap)$ is the weights of world market capitalization of market i .

Panel A: The Most Efficient Portfolio (MEP)

Without Restriction			Short-sell Restriction			Short-sell and Over-weight Restrictions		
	Max Sharpe	Max Treynor		Max Sharpe	Max Treynor		Max Sharpe	Max Treynor
Value	0.1286	0.1295	Value	0.1286	0.1295	Value	0.0494	0.0398
St. Dev.	0.9126	0.9560	St. Dev.	0.9126	0.9560	St. Dev.	0.8063	0.8440
	Weight			Weight			Weight	
ARG	0.0000	0.0000	ARG	0.0000	0.0000	ARG	0.0135	0.0135
BRA	0.0000	0.0000	BRA	0.0000	0.0000	BRA	0.1036	0.1036
CHL	0.4042	0.3233	CHL	0.4042	0.3233	CHL	0.0407	0.0407
IDN	0.0000	0.0000	IDN	0.0000	0.0000	IDN	0.0000	0.0539
KOR	0.0000	0.0000	KOR	0.0000	0.0000	KOR	0.0246	0.0000
MAL	0.0000	0.0000	MAL	0.0000	0.0000	MAL	0.1523	0.0131
MEX	0.5959	0.6767	MEX	0.5959	0.6767	MEX	0.1004	0.1004
PHL	0.0000	0.0000	PHL	0.0000	0.0000	PHL	0.0000	0.0000
THL	0.0000	0.0000	THL	0.0000	0.0000	THL	0.0000	0.0000
TWN	0.0000	0.0000	TWN	0.0000	0.0000	TWN	0.0853	0.2135
HKG	0.0000	0.0000	HKG	0.0000	0.0000	HKG	0.3783	0.3783
JPN	0.0000	0.0000	JPN	0.0000	0.0000	JPN	0.0183	0.0000
SGP	0.0000	0.0000	SGP	0.0000	0.0000	SGP	0.0830	0.0830

Panel B: The Minimum-Variance Portfolio (MVP)

East Asia and Latin America Portfolio	Return	St. Dev	Sharpe	β_G	Treynor
Without Restriction	0.0561	0.6147	0.0050	0.9431	0.0033
With No Short-Sell Restriction	0.0561	0.6147	0.0050	0.9431	0.0033
With No Short-Sell and Over-weight Restriction	0.0410	0.6553	-0.0183	1.0618	-0.0113

Table 16 Efficient Frontier of East Asian and Oceania Country

In Panel A, the maxima of Sharpe ratio and Treynor ratio, i.e., MSR and MTR, as well as the annualized standard deviation and the weight of each country of the most efficient portfolio (MEP) composed by the markets of East Asian and Oceania countries with different constraints are reported. In Panel B, the annualized return and standard deviation, as well as their global market systematic risk, Sharpe ratio, and Treynor ratio of minimum-variance portfolio (MVP) composed by the markets of each area with different constraints are reported. The statistics of Without Restriction (NR) are the results of the optimum of Lagrangian:

$$\min_{\{w, \phi, \eta\}} \frac{1}{2} w^T V w + \phi (E(R_p) - w^T E) + \eta (1 - w^T 1).$$

The statistics of Short-sell Restriction (SR) are the results of the optimum of above Lagrangian pluses the follow constraint:

$$0 \leq w_i \leq 1, \text{ for all } i.$$

The statistics of Short-sell and Over-weighted Restrictions (SOR) are the results of the optimum of Lagrangian including Short-sell Restriction pluses the follow constraint:

$$0 \leq w_i \leq 3w_i(Cap),$$

where $w_i(Cap)$ is the weights of world market capitalization of market i .

Panel A: The Most Efficient Portfolio (MEP)

Without Restriction			Short-sell Restriction			Short-sell and Over-weight Restrictions		
	Max Sharpe	Max Treynor		Max Sharpe	Max Treynor		Max Sharpe	Max Treynor
Value	0.0401	0.0354	Value	0.0401	0.0354	Value	0.0270	0.0211
St. Dev.	0.8944	0.9465	St. Dev.	0.8944	0.9465	St. Dev.	0.7239	0.7239
Weight			Weight			Weight		
IDN	0.0000	0.0000	IDN	0.0000	0.0000	IDN	0.0242	0.0242
KOR	0.0000	0.0000	KOR	0.0000	0.0000	KOR	0.0000	0.0000
MAL	0.0000	0.0000	MAL	0.0000	0.0000	MAL	0.0056	0.0056
PHL	0.0000	0.0000	PHL	0.0000	0.0000	PHL	0.0000	0.0000
THL	0.0000	0.0000	THL	0.0000	0.0000	THL	0.0000	0.0000
TWN	0.0000	0.0000	TWN	0.0000	0.0000	TWN	0.2102	0.2102
AUS	0.0828	0.0000	AUS	0.0828	0.0000	AUS	0.3058	0.3058
HKG	0.9172	1.0000	HKG	0.9172	1.0000	HKG	0.3725	0.3725
JPN	0.0000	0.0000	JPN	0.0000	0.0000	JPN	0.0000	0.0000
NZL	0.0000	0.0000	NZL	0.0000	0.0000	NZL	0.0000	0.0000
SGP	0.0000	0.0000	SGP	0.0000	0.0000	SGP	0.0817	0.0817

Panel B: The Minimum-Variance Portfolio (MVP)

East Asia and Oceania Portfolio	Return	St. Dev	Sharpe	β_G	Treynor
Without Restriction	0.0436	0.5751	-0.0163	0.8926	-0.0105
With No Short-Sell Restriction	0.0436	0.5751	-0.0163	0.8926	-0.0105
With No Short-Sell and Over-weight Restriction	0.0362	0.5977	-0.0281	0.9787	-0.0171

Table 17 Efficient Frontier of North American and Latin American Countries
 In Panel A, the maxima of Sharpe ratio and Treynor ratio, i.e., MSR and MTR, as well as the annualized standard deviation and the weight of each country of the most efficient portfolio (MEP) composed by the markets of North American and Latin American countries with different constraints are reported. In Panel B, the annualized return and standard deviation, as well as their global market systematic risk, Sharpe ratio, and Treynor ratio of minimum-variance portfolio (MVP) composed by the markets of each area with different constraints are reported. The statistics of Without Restriction (NR) are the results of the optimum of Lagrangian:

$$\min_{\{w, \phi, \eta\}} \frac{1}{2} w^T V w + \phi (E(R_p) - w^T E) + \eta (1 - w^T 1).$$

The statistics of Short-sell Restriction (SR) are the results of the optimum of above Lagrangian pluses the follow constraint:

$$0 \leq w_i \leq 1, \text{ for all } i.$$

The statistics of Short-sell and Over-weighted Restrictions (SOR) are the results of the optimum of Lagrangian including Short-sell Restriction pluses the follow constraint:

$$0 \leq w_i \leq 3w_i(Cap),$$

where $w_i(Cap)$ is the weights of world market capitalization of market i .

Panel A: The Most Efficient Portfolio (MEP)

Without Restriction			Short-sell Restriction			Short-sell and Over-weight Restrictions		
	Max Sharpe	Max Treynor		Max Sharpe	Max Treynor		Max Sharpe	Max Treynor
Value	0.1296	0.1295	Value	0.1296	0.1295	Value	0.0899	0.0531
St. Dev.	0.7512	0.9782	St. Dev.	0.7512	0.9782	St. Dev.	0.5109	0.5065
Weight			Weight			Weight		
ARG	0.0000	0.0000	ARG	0.0000	0.0000	ARG	0.0042	0.0042
BRA	0.0000	0.0000	BRA	0.0000	0.0000	BRA	0.0319	0.0215
CHL	0.3271	0.2863	CHL	0.3271	0.2863	CHL	0.0125	0.0125
MEX	0.4271	0.7137	MEX	0.4271	0.7137	MEX	0.0262	0.0262
CAN	0.0000	0.0000	CAN	0.0000	0.0000	CAN	0.0000	0.0000
USA	0.2459	0.0000	USA	0.2459	0.0000	USA	0.9252	0.9356

Panel B: The Minimum-Variance Portfolio (MVP)

North America and Latin America Portfolio	Return	St. Dev	Sharpe	β_G	Treynor
Without Restriction	0.0964	0.4899	0.0885	0.8219	0.0528
With No Short-Sell Restriction	0.0964	0.4899	0.0885	0.8219	0.0528
With No Short-Sell and Over-weight Restriction	0.0923	0.4943	0.0795	0.8404	0.0468

Table 18 Efficient Frontier of North American and Oceania Country

In Panel A, the maxima of Sharpe ratio and Treynor ratio, i.e., MSR and MTR, as well as the annualized standard deviation and the weight of each country of the most efficient portfolio (MEP) composed by the markets of North American and Oceania countries with different constraints are reported. In Panel B, the annualized return and standard deviation, as well as their global market systematic risk, Sharpe ratio, and Treynor ratio of minimum-variance portfolio (MVP) composed by the markets of each area with different constraints are reported. The statistics of Without Restriction (NR) are the results of the optimum of Lagrangian:

$$\min_{\{w, \phi, \eta\}} \frac{1}{2} w^T V w + \phi (E(R_p) - w^T E) + \eta (1 - w^T 1).$$

The statistics of Short-sell Restriction (SR) are the results of the optimum of above Lagrangian plus the follow constraint:

$$0 \leq w_i \leq 1, \text{ for all } i.$$

The statistics of Short-sell and Over-weighted Restrictions (SOR) are the results of the optimum of Lagrangian including Short-sell Restriction plus the follow constraint:

$$0 \leq w_i \leq 3w_i(Cap),$$

where $w_i(Cap)$ is the weights of world market capitalization of market i .

Panel A: The Most Efficient Portfolio (MEP)

Without Restriction			Short-sell Restriction			Short-sell and Over-weight Restrictions		
	Max Sharpe	Max Treynor		Max Sharpe	Max Treynor		Max Sharpe	Max Treynor
Value	0.0826	0.0492	Value	0.0826	0.0492	Value	0.0826	0.0492
St. Dev.	0.4983	0.4983	St. Dev.	0.4983	0.4983	St. Dev.	0.4983	0.4983
Weight			Weight			Weight		
AUS	0.0000	0.0000	AUS	0.0000	0.0000	AUS	0.0000	0.0000
CAN	0.0000	0.0000	CAN	0.0000	0.0000	CAN	0.0000	0.0000
NOR	0.0000	0.0000	NOR	0.0000	0.0000	NOR	0.0000	0.0000
USA	1.0000	1.0000	USA	1.0000	1.0000	USA	1.0000	1.0000

Panel B: The Minimum-Variance Portfolio (MVP)

North America and Oceania Portfolio	Return	St. Dev	Sharpe	β_G	Treynor
Without Restriction	0.0883	0.4760	0.0742	0.8186	0.0431
With No Short-Sell Restriction	0.0883	0.4760	0.0742	0.8186	0.0431
With No Short-Sell and Over-weight Restriction	0.0906	0.4838	0.0777	0.8331	0.0451

Table 19 Efficient Frontier of Latin American and Oceania Country

In Panel A, the maxima of Sharpe ratio and Treynor ratio, i.e., MSR and MTR, as well as the annualized standard deviation and the weight of each country of the most efficient portfolio (MEP) composed by the markets of Latin American and Oceania countries with different constraints are reported. In Panel B, the annualized return and standard deviation, as well as their global market systematic risk, Sharpe ratio, and Treynor ratio of minimum-variance portfolio (MVP) composed by the markets of each area with different constraints are reported. The statistics of Without Restriction (NR) are the results of the optimum of Lagrangian:

$$\min_{\{w, \phi, \eta\}} \frac{1}{2} w^T V w + \phi (E(R_p) - w^T E) + \eta (1 - w^T 1).$$

The statistics of Short-sell Restriction (SR) are the results of the optimum of above Lagrangian pluses the follow constraint:

$$0 \leq w_i \leq 1, \text{ for all } i.$$

The statistics of Short-sell and Over-weighted Restrictions are the results of the optimum of Lagrangian including Short-sell Restriction pluses the follow constraint:

$$0 \leq w_i \leq 3w_i(Cap),$$

where $w_i(Cap)$ is the weights of world market capitalization of market i .

Panel A: The Most Efficient Portfolio (MEP)

Without Restriction			Short-sell Restriction			Short-sell and Over-weight Restrictions		
	Max Sharpe	Max Treynor		Max Sharpe	Max Treynor		Max Sharpe	Max Treynor
Value	0.1287	0.1295	Value	0.1287	0.1295	Value	0.1170	0.1042
St. Dev.	0.8893	0.9552	St. Dev.	0.8893	0.9552	St. Dev.	0.7812	0.8051
Weight			Weight			Weight		
ARG	0.0000	0.0000	ARG	0.0000	0.0000	ARG	0.0451	0.0681
BRA	0.0000	0.0000	BRA	0.0000	0.0000	BRA	0.0198	0.0357
CHL	0.4547	0.3248	CHL	0.4547	0.3248	CHL	0.2139	0.2139
MEX	0.5453	0.6752	MEX	0.5453	0.6752	MEX	0.4462	0.4462
AUS	0.0000	0.0000	AUS	0.0000	0.0000	AUS	0.2749	0.2361
NZL	0.0000	0.0000	NZL	0.0000	0.0000	NZL	0.0000	0.0000

Panel B: The Minimum-Variance Portfolio (MVP)

Latin America and Oceania Portfolio	Return	St. Dev	Sharpe	β_G	Treynor
Without Restriction	0.0832	0.5817	0.0519	0.7344	0.0411
With No Short-Sell Restriction	0.0832	0.5817	0.0519	0.7344	0.0411
With No Short-Sell and Over-weight Restriction	0.0839	0.5851	0.0529	0.7488	0.0413

Figure 1 Efficient Frontier: Developed Countries vs. Emerging Markets

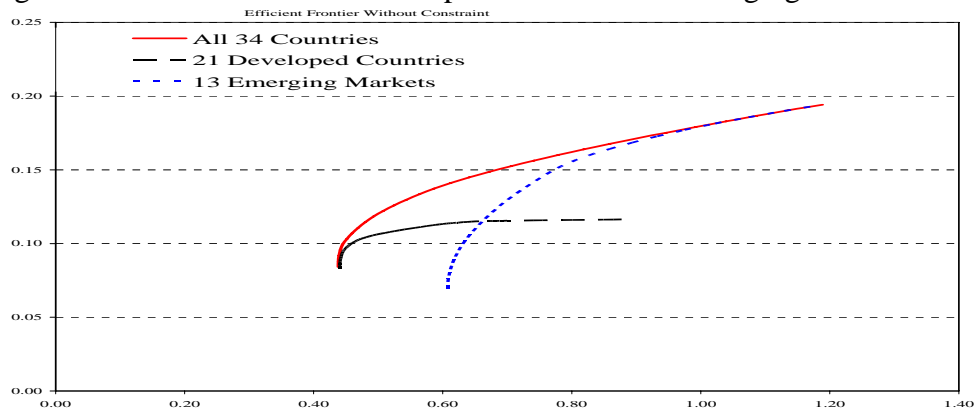
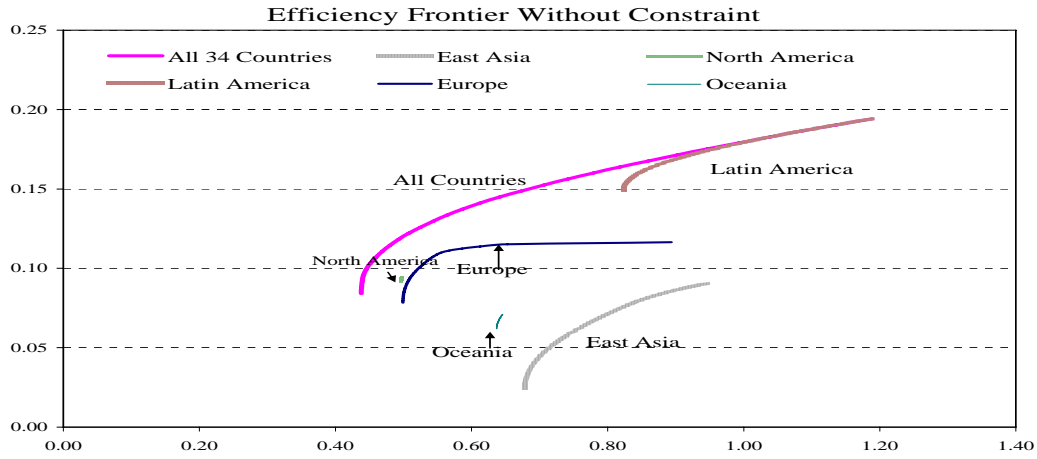
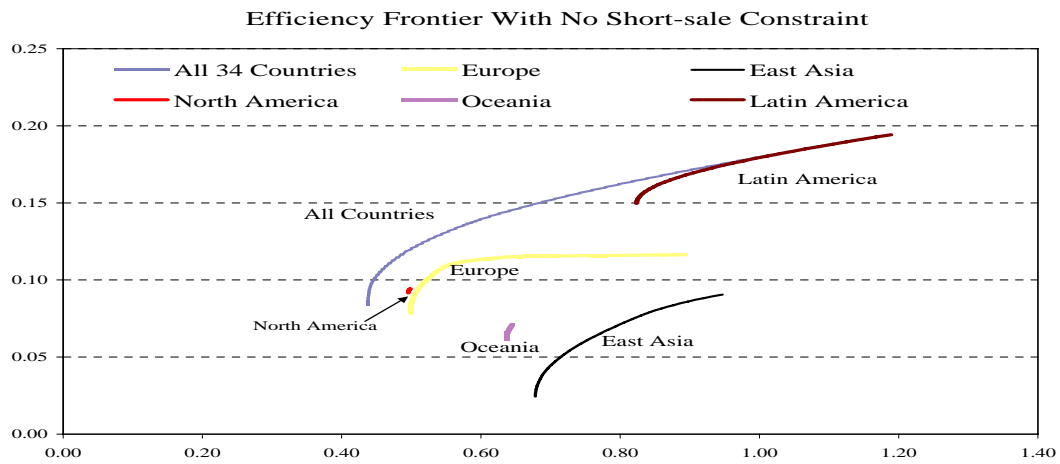


Figure 2 Efficient Frontier: Each Areas and All Countries
 Panel A: Without Constraint



Panel B: With Short-sale Constraint



Panel C: With Short-sale and Over-weight Constraints

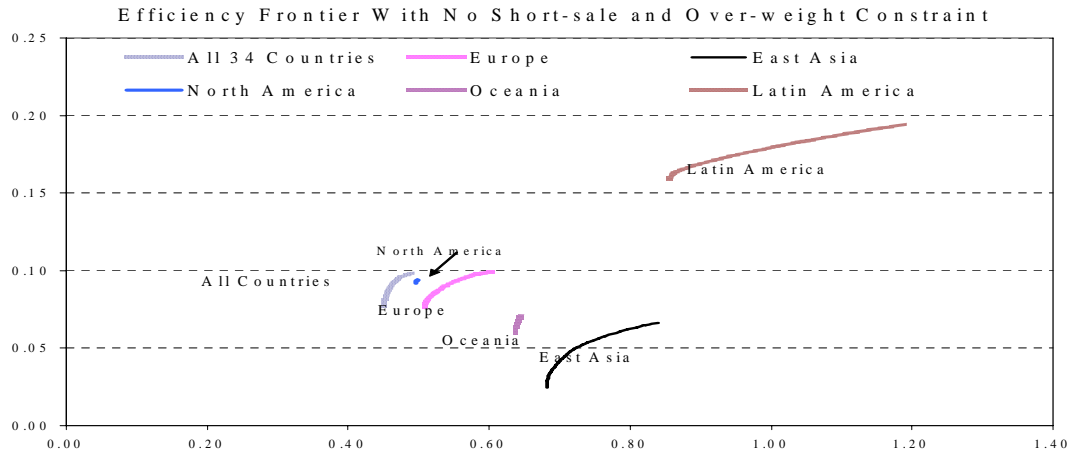


Figure 3 The Mean-Variance Efficiency of All-34-Country Portfolio

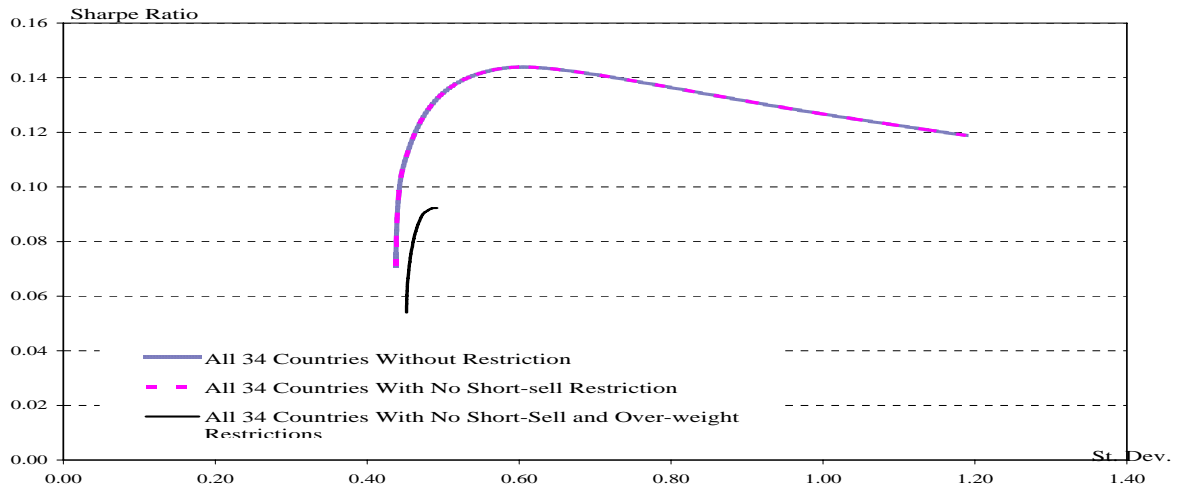


Figure 4 The Mean-Variance Efficiency of European Portfolio



Figure 5 The Mean-Variance Efficiency of East Asian Portfolio

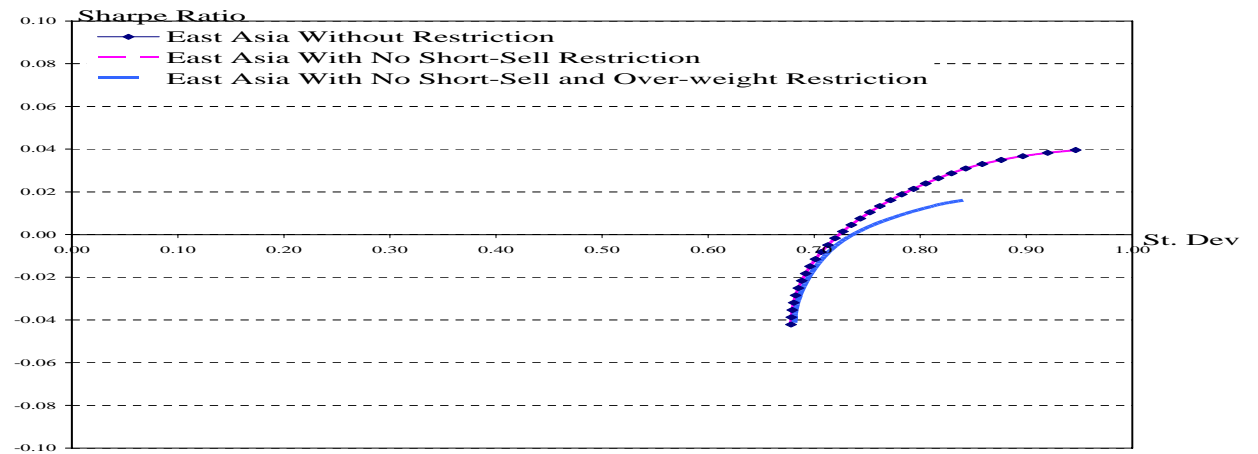


Figure 6 The Mean-Variance Efficiency of North American Portfolio

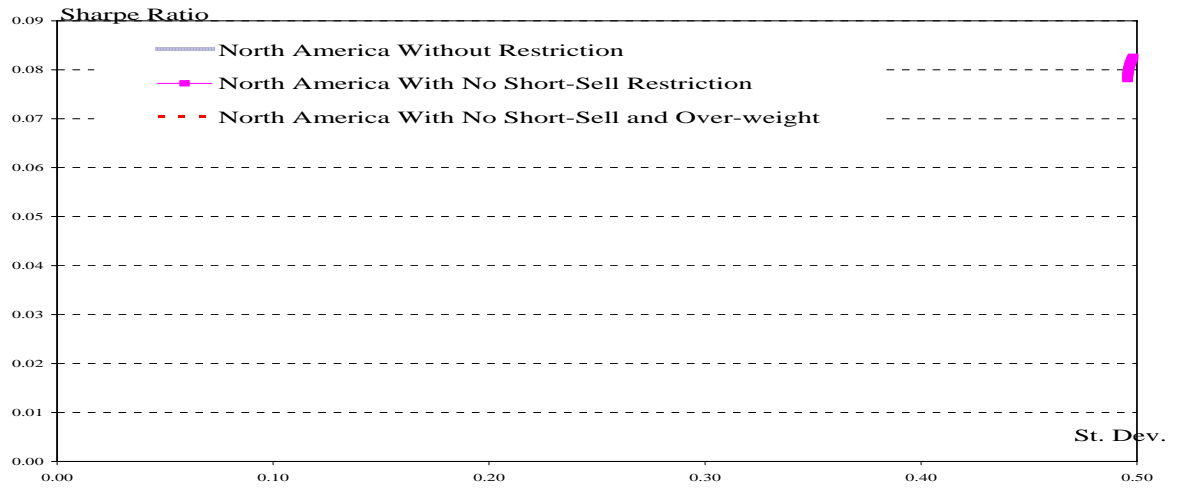


Figure 7 The Mean-Variance Efficiency of Latin American Portfolio

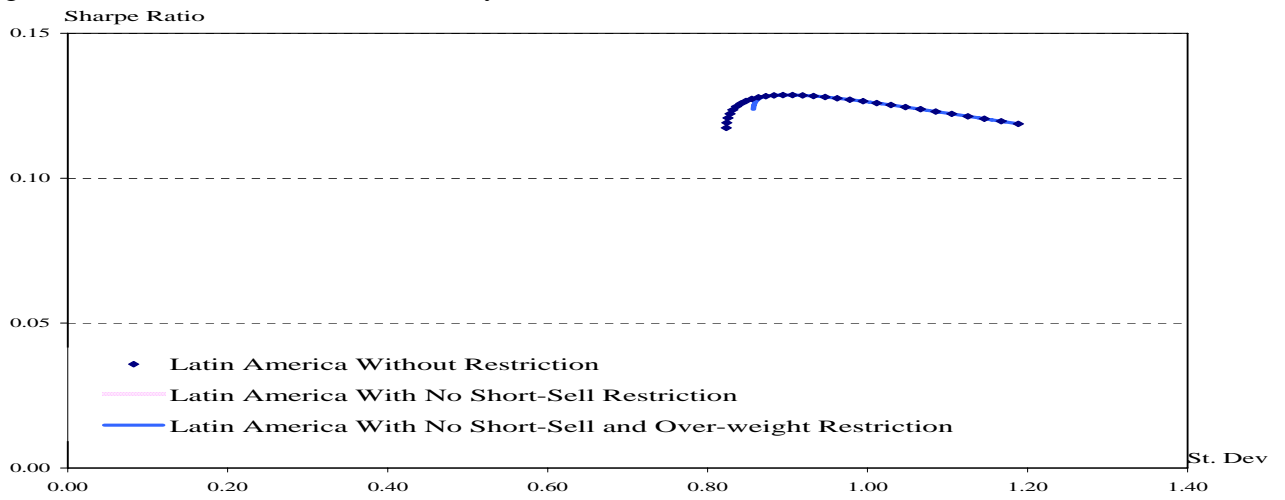


Figure 8 The Mean-Variance Efficiency of Oceania Portfolio

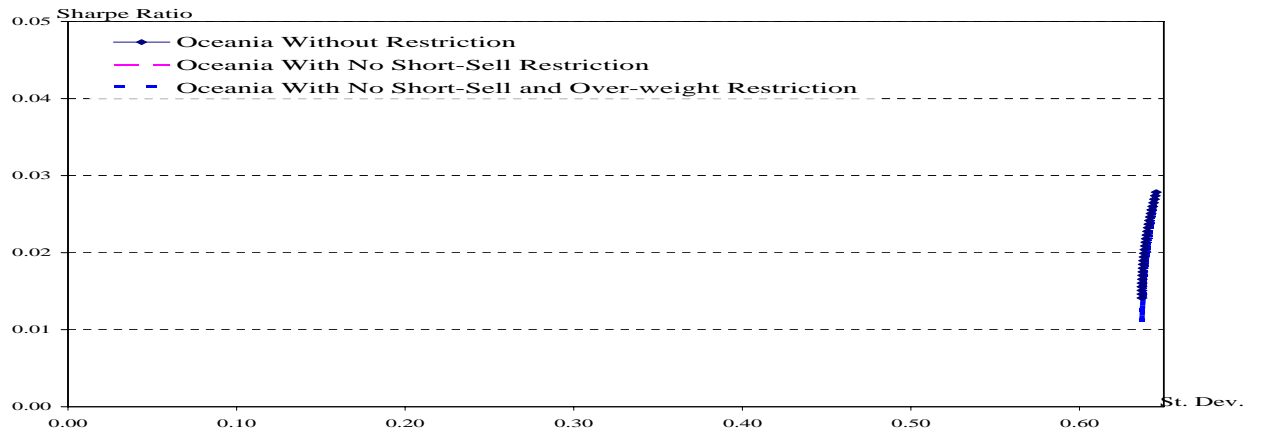


Figure 9 The Mean-Variance Efficiency of Europe and East Asia Portfolio

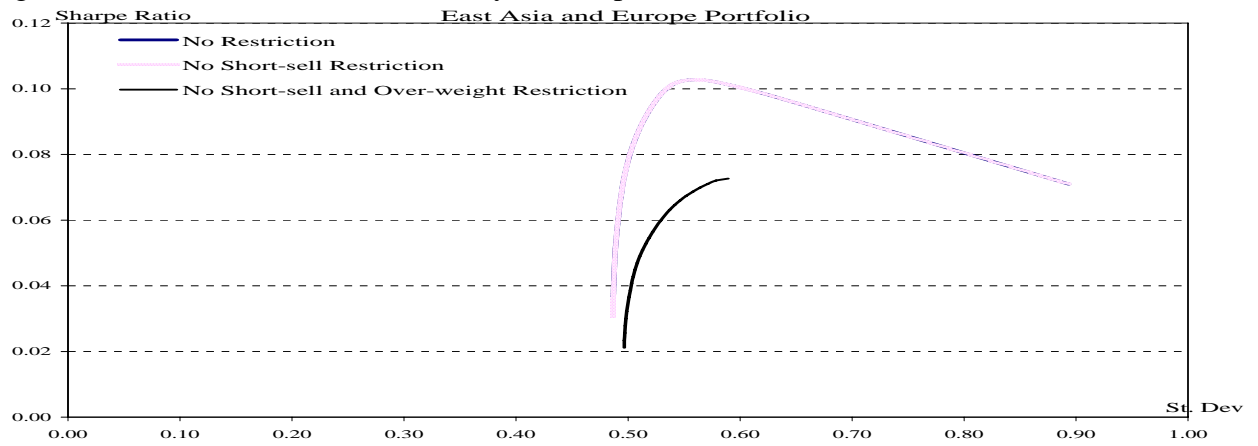


Figure 10 The Mean-Variance Efficiency of North America and Europe Portfolio

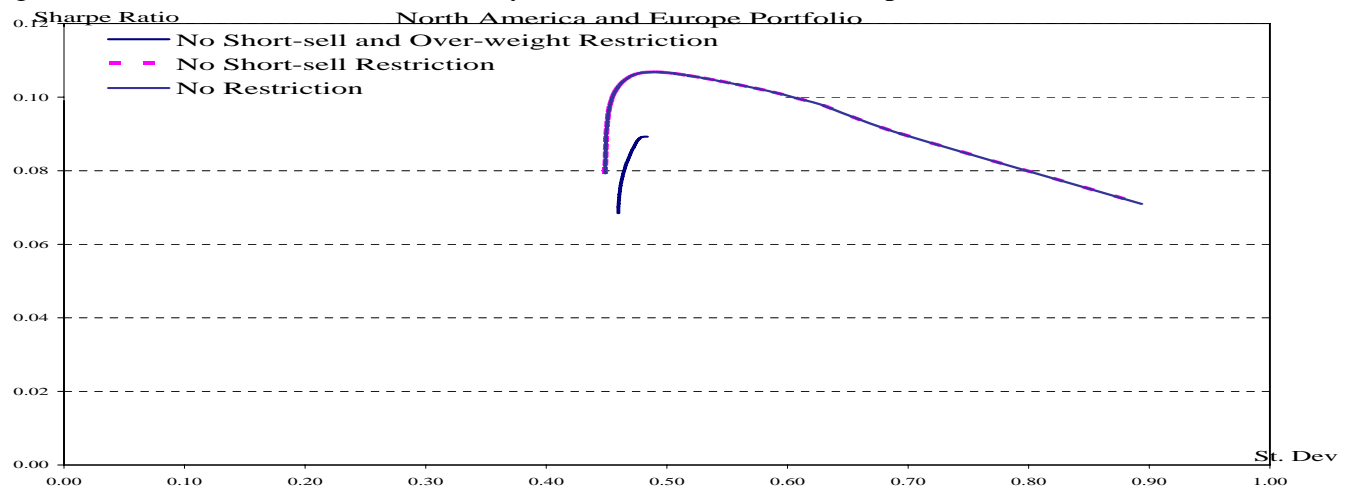


Figure 11 The Mean-Variance Efficiency of Europe and Latin America Portfolio

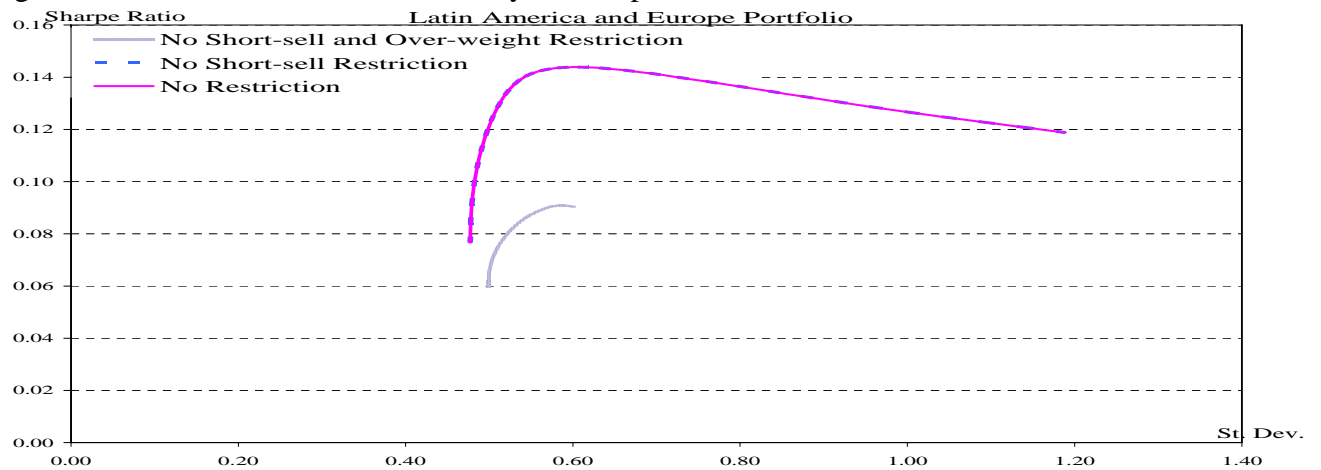


Figure 12 The Mean-Variance Efficiency of Europe and Oceania Portfolio

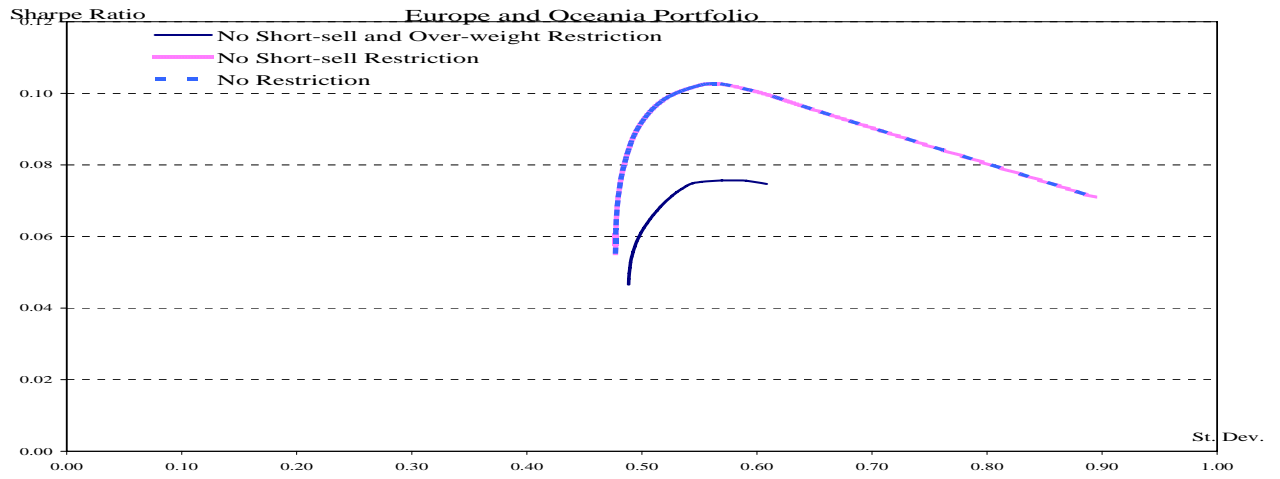


Figure 13 The Mean-Variance Efficiency of East Asia and North America Portfolio

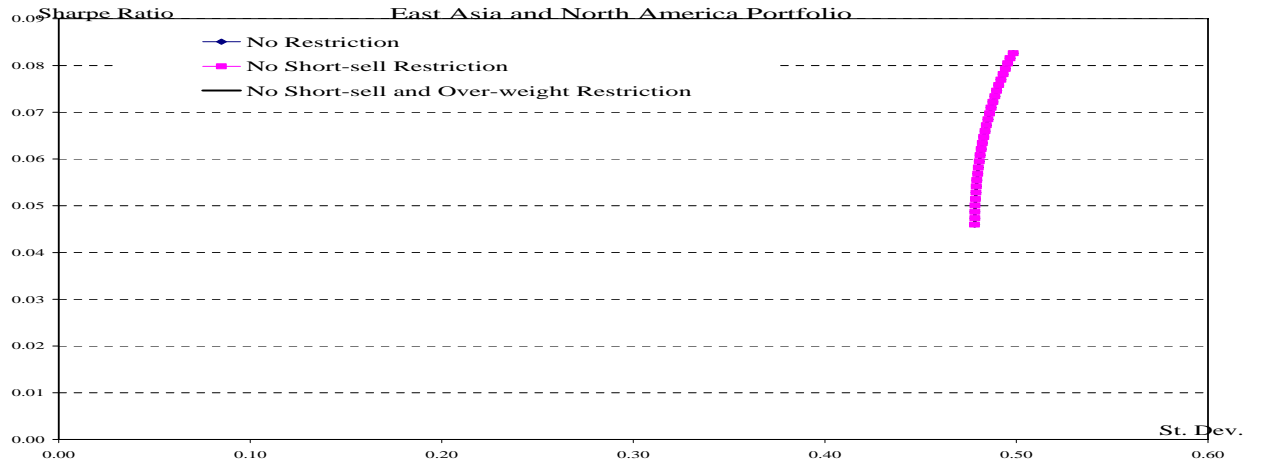


Figure 14 The Mean-Variance Efficiency of Latin America and East Asia Portfolio

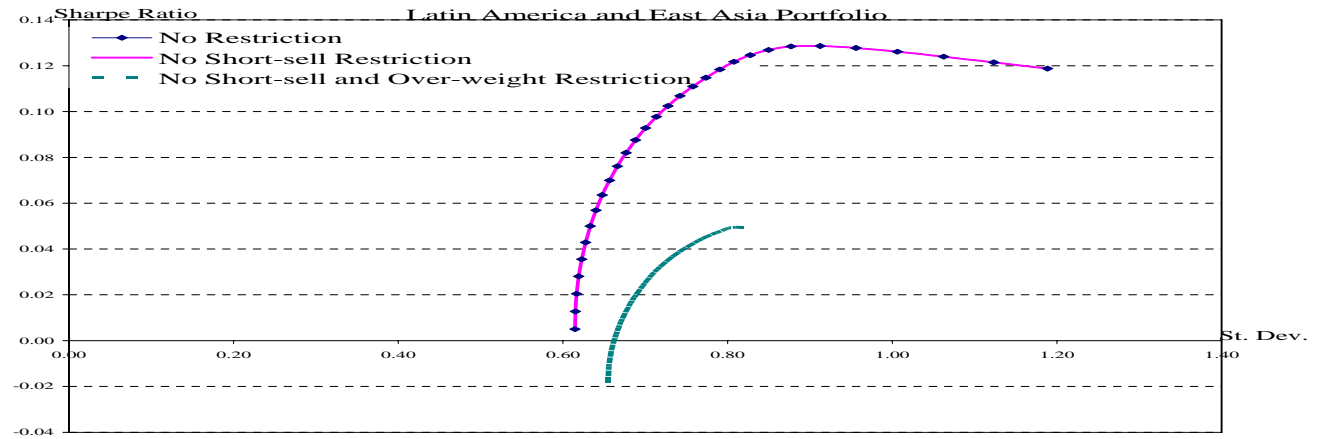


Figure 15 The Mean-Variance Efficiency of East Asia and Oceania Portfolio

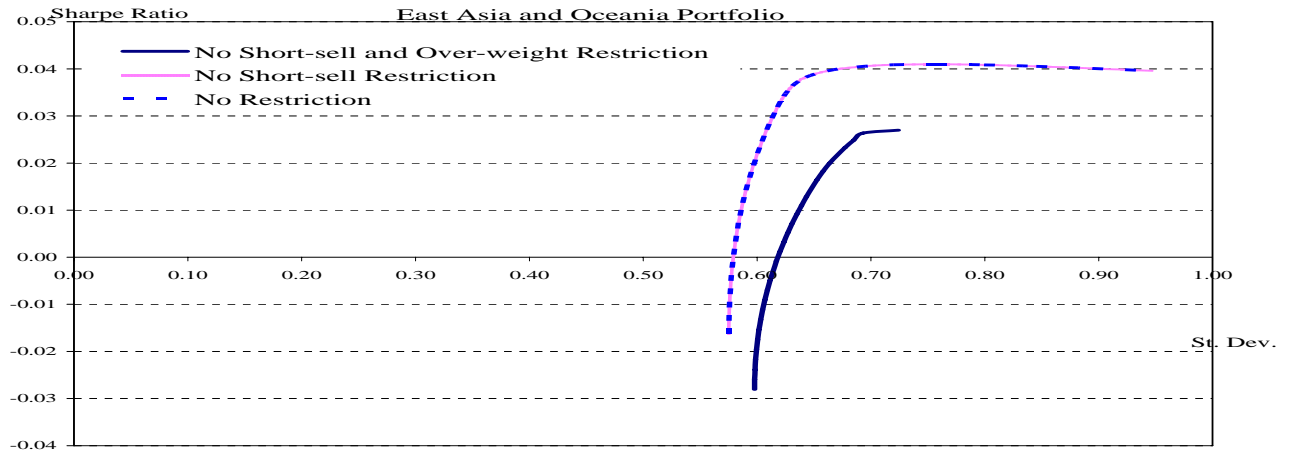


Figure 16 The Mean-Variance Efficiency of North America and Latin America Portfolio

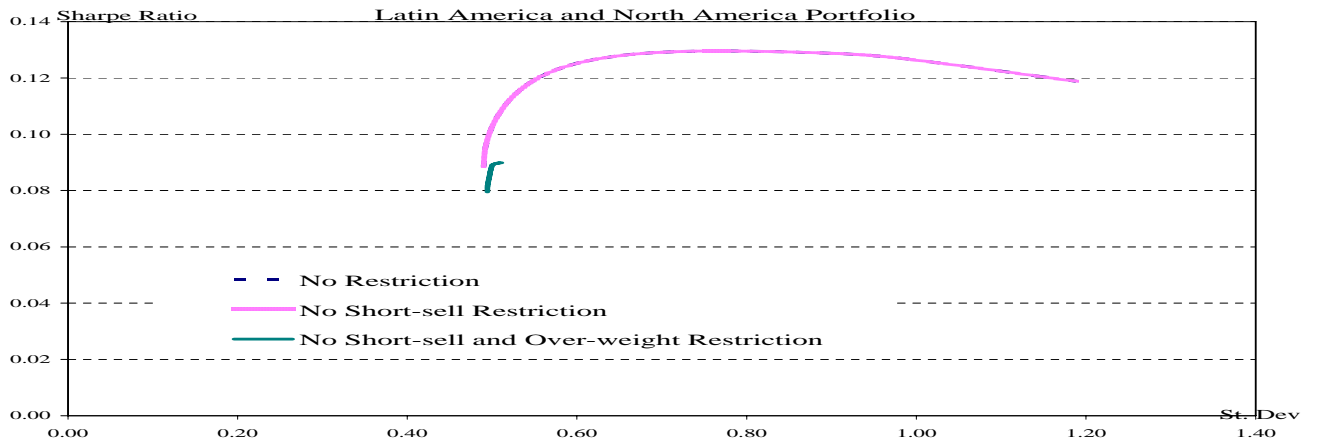


Figure 17 The Mean-Variance Efficiency of North America and Oceania Portfolio

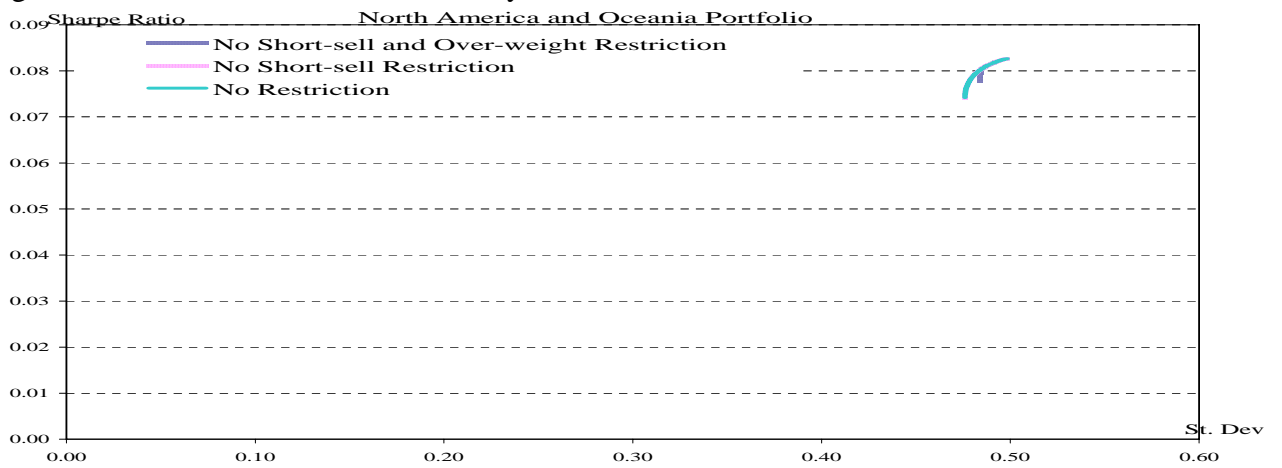


Figure 18 The Mean-Variance Efficiency of Latin America and Oceania Portfolio

