Market Risk Premium and Risk-Free Rate used for 59 countries in 2018: a survey

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ABSTRACT

This paper contains the statistics of a survey about the Risk-Free Rate (**RF**) and the Market Risk Premium (**MRP**) used in 2018 for **59 countries**. We got answers for 73 countries, but we only report the results for 59 countries with more than 5 answers.

The change between 2015 and 2018 of the average **Km** (RF + MRP) used was higher than 1% for 22 countries (see table 5).

Most of the respondents use for European countries a RF higher than the yield of the 10-year Government bonds. Due to "Quantitative Easing", the RF and the MRP reported for some countries are negatively correlated (Spain, Germany, Netherlands, Norway). The coefficient of variation (standard deviation / average) of Km is lower than the one of MRP and RF for 35 countries.

For the first time of this survey, 11 respondents provided -without being asked for- a different MRP for Spain and Catalonia (on average, 6,7% for Spain and 11,3% for Catalonia).

JEL Classification: G12, G31, M21

Keywords: equity premium; required equity premium; expected equity premium; risk-free rate; heterogeneous expectations

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https://ssrn.com/abstract=3155709

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1. Market Risk Premium (MRP), Risk Free Rate (R_F) and Km [R_F + MRP] used in 2018 in 59 countries

We sent a short email (see exhibit 1) on March, 2018 to more 20,000 email addresses of finance and economic professors, analysts and managers of companies obtained from previous correspondence, papers and webs of companies and universities. We asked about the Risk Free Rate and the Market Risk Premium (**MRP**) **used *"to calculate the required return to equity in different countries"***.

By April 4, 2018, we had received 2,238 emails. 251 persons answered that they do not use MRP for different reasons (see table 1). The remaining emails had specific Risk Free Rates and MRPs used in 2018 for one or more countries.[1] We would like to sincerely thank everyone who took the time to answer us.

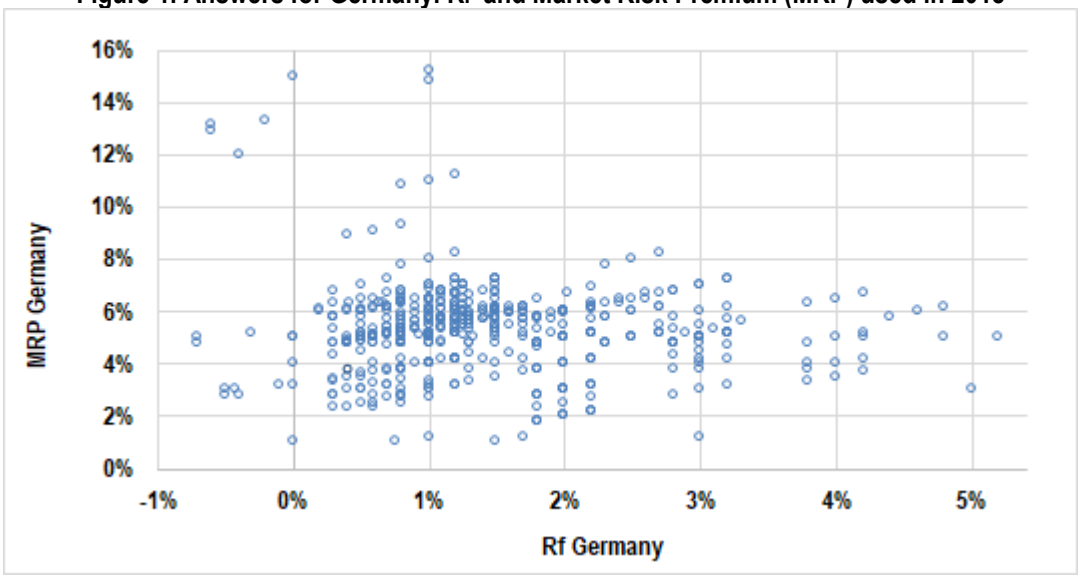
Table 1. MRP and R_F used in 2018: 2,238 emails

	Total
Answers reported (MRP figures)	**4,368**
Outliers	**18**
Answers for 14 countries with less than 6 answers	**34**
Only MRP or RF (not both)	**37**
Answers that do not provide figures	**251**

Table 2 contains the statistics of the **MRP** used in 2018 **for 59 countries**. We got answers for 73 countries, but we only report the results for 59 countries with more than 5 answers. **Table 3** contains the statistics of the Risk-Free Rate (**RF**) used in 2018 in the 59 countries and **Table 4** contains the statistics of **Km** (required return to equity: Km = Risk-Free Rate + MRP).

Figure 1 is a graphic representation of the answers (MRP and RF) we got for Germany.

Figure 1. Answers for Germany. R_F and Market Risk Premium (MRP) used in 2018



[1] We considered 18 of them as outliers because they provided a very small MRP (for example, below 0%) or a very high MRP (for example, 32% for the USA).

Table 2. Market Risk Premium (MRP) used for 59 countries in 2018

MRP	Number of Answers	Average	St. Dev.	Median	MAX	min	St.Dev. / Average
USA	1348	5,4%	1,7%	5,2%	17,8%	1,3%	32,1%
Spain	675	6,7%	2,4%	6,2%	20,0%	0,8%	36,2%
Germany	528	5,3%	1,7%	5,2%	15,2%	1,0%	32,5%
Argentina	73	13,9%	4,7%	16,3%	20,2%	1,9%	34,3%
Australia	74	6,6%	1,4%	7,1%	10,2%	3,3%	20,8%
Austria	56	6,2%	0,7%	6,4%	7,2%	4,2%	10,5%
Belgium	53	6,2%	0,8%	6,4%	7,2%	3,3%	12,5%
Bolivia	6	6,6%	2,9%	6,6%	9,4%	3,8%	43,3%
Brazil	100	8,4%	2,3%	8,6%	15,2%	2,3%	26,9%
Bulgaria	8	7,5%	1,3%	7,7%	9,5%	5,0%	16,8%
Canada	77	5,8%	0,7%	6,0%	7,2%	4,1%	12,7%
Chile	72	6,1%	1,1%	6,2%	8,2%	3,1%	17,7%
China	95	6,3%	2,8%	7,0%	13,2%	0,6%	43,4%
Colombia	72	8,7%	3,7%	7,9%	25,2%	3,8%	42,6%
Czech Republic	63	5,9%	0,7%	6,0%	8,2%	4,8%	12,3%
Denmark	53	6,0%	0,8%	6,2%	7,2%	3,8%	12,9%
Ecuador	7	9,0%	3,5%	8,0%	12,8%	5,5%	38,7%
Egypt	9	10,9%	4,5%	12,6%	15,2%	4,8%	41,6%
Estonia	7	5,1%	1,0%	5,2%	6,1%	3,0%	20,4%
Finland	53	5,9%	0,8%	6,0%	7,2%	3,8%	13,0%
France	83	5,9%	1,6%	6,4%	8,8%	1,3%	27,3%
Greece	42	15,8%	3,1%	16,9%	18,2%	6,8%	19,7%
Hong Kong	21	5,8%	1,0%	6,0%	7,2%	3,8%	16,8%
Hungary	42	7,9%	1,2%	8,4%	9,0%	4,8%	15,5%
India	64	7,9%	2,1%	8,3%	13,7%	2,3%	26,7%
Indonesia	39	8,8%	1,0%	9,0%	11,9%	5,0%	11,8%
Iran	15	22,1%	25,4%	8,0%	70,2%	4,8%	115,1%
Ireland	49	6,5%	0,6%	6,7%	7,2%	4,2%	9,7%
Israel	51	5,8%	1,3%	6,4%	7,0%	2,8%	21,6%
Italy	108	6,1%	1,2%	6,4%	10,0%	2,1%	20,0%
Japan	57	5,7%	2,6%	5,9%	12,0%	0,3%	45,4%
Korea (South)	48	6,4%	1,0%	6,6%	8,2%	3,2%	15,8%
Malaysia	10	7,1%	1,5%	6,6%	10,0%	5,0%	20,8%
Mexico	123	8,5%	3,5%	8,0%	20,2%	2,8%	40,5%
Netherlands	81	5,8%	0,7%	6,0%	6,8%	3,5%	11,6%
New Zealand	42	5,8%	0,9%	5,8%	9,5%	4,6%	15,0%
Norway	52	5,7%	0,9%	6,1%	6,8%	3,8%	15,0%
Pakistan	9	11,5%	3,9%	12,6%	15,5%	6,3%	34,1%
Panama	14	8,4%	2,5%	7,4%	12,2%	5,6%	29,4%
Peru	91	7,3%	2,8%	7,6%	20,2%	2,8%	38,9%
Phillipines	6	5,1%	2,4%	5,6%	7,5%	2,0%	47,4%
Poland	64	6,0%	1,3%	6,3%	9,2%	1,3%	21,2%
Portugal	58	7,2%	1,2%	7,7%	8,4%	3,4%	17,3%
Qatar	10	6,9%	1,2%	6,9%	9,0%	5,0%	17,6%
Romania	31	7,0%	1,8%	6,9%	10,2%	3,8%	26,4%
Russia	61	8,7%	3,2%	8,0%	20,2%	3,8%	37,4%
Singapore	10	5,2%	1,5%	5,2%	7,2%	3,2%	28,6%
Slovakia	9	6,6%	1,1%	6,1%	8,2%	5,4%	17,0%
Slovenia	16	7,2%	0,8%	7,1%	8,7%	5,8%	11,7%
South Africa	40	6,9%	1,7%	7,6%	8,2%	2,8%	24,0%
Sri Lanka	6	8,0%	2,5%	8,1%	10,5%	5,6%	30,7%
Sweden	58	7,1%	1,6%	6,9%	11,2%	2,9%	22,8%
Switzerland	43	6,9%	1,0%	7,2%	7,9%	4,0%	14,3%
Taiwan	30	4,9%	1,5%	5,6%	6,8%	1,8%	31,3%

Thailand	46	8,9%	3,0%	8,3%	20,2%	6,3%	34,2%
Turkey	54	7,7%	2,4%	8,1%	15,2%	3,8%	31,0%
United Kingdom	89	5,5%	1,1%	5,9%	7,2%	2,3%	20,5%
Uruguay	39	8,3%	1,1%	8,2%	11,0%	5,0%	13,4%
Venezuela	33	16,9%	3,0%	17,9%	21,0%	7,0%	17,9%

Table 3. Risk Free Rate (R_F) used for 59 countries in 2018

R_F	Number of Answers	**Average**	**St. Dev.**	Median	MAX	min	**St.Dev. / Average**
USA	1348	2,8%	0,8%	2,8%	7,0%	-0,3%	30,0%
Spain	675	2,1%	1,1%	1,8%	6,2%	-0,1%	52,3%
Germany	528	1,4%	1,0%	1,2%	5,2%	-0,7%	67,6%
Argentina	73	9,3%	4,9%	10,4%	25,9%	2,0%	52,8%
Australia	74	3,1%	0,5%	3,0%	5,0%	2,4%	14,7%
Austria	56	2,0%	1,1%	1,8%	6,2%	0,7%	54,1%
Belgium	53	1,6%	0,4%	1,7%	2,4%	0,8%	26,6%
Bolivia	6	3,0%	1,1%	3,0%	4,2%	1,8%	37,0%
Brazil	100	7,3%	2,3%	7,2%	10,7%	2,0%	31,9%
Bulgaria	8	2,8%	1,2%	2,9%	5,0%	1,3%	44,9%
Canada	77	2,9%	0,5%	2,9%	4,2%	1,8%	17,7%
Chile	72	4,1%	0,7%	4,3%	5,0%	1,8%	15,9%
China	95	3,8%	0,4%	3,8%	4,7%	2,3%	11,7%
Colombia	72	6,7%	1,4%	6,7%	10,2%	3,9%	20,6%
Czech Republic	63	2,6%	0,6%	2,8%	3,3%	0,8%	21,4%
Denmark	53	1,6%	0,5%	1,7%	2,7%	0,5%	30,4%
Ecuador	7	3,6%	1,4%	3,8%	6,0%	2,1%	38,8%
Egypt	9	10,0%	3,5%	10,0%	14,2%	5,8%	34,7%
Estonia	7	2,1%	0,9%	1,8%	4,0%	1,3%	43,5%
Finland	53	1,7%	0,6%	1,8%	2,7%	0,6%	33,4%
France	83	1,6%	0,7%	1,6%	3,2%	0,3%	41,7%
Greece	42	4,8%	1,6%	5,0%	6,4%	0,4%	33,2%
Hong Kong	21	2,2%	0,6%	2,0%	3,7%	1,7%	25,9%
Hungary	42	3,6%	0,9%	3,8%	4,9%	1,3%	25,7%
India	64	6,8%	0,7%	6,7%	8,2%	4,8%	9,6%
Indonesia	39	6,8%	0,9%	7,2%	7,8%	4,0%	13,7%
Iran	15	12,6%	4,9%	13,0%	20,2%	6,8%	39,1%
Ireland	49	1,6%	0,4%	1,7%	2,4%	0,7%	25,0%
Israel	51	1,9%	0,7%	2,0%	4,0%	0,0%	39,6%
Italy	108	2,3%	0,5%	2,2%	3,4%	1,3%	21,0%
Japan	57	0,3%	0,8%	0,4%	1,7%	-2,6%	231,1%
Korea (South)	48	2,4%	0,3%	2,5%	3,2%	1,3%	14,2%
Malaysia	10	4,2%	1,0%	4,1%	6,0%	3,0%	24,8%
Mexico	123	6,8%	1,3%	7,0%	8,7%	1,5%	19,3%
Netherlands	81	1,7%	0,9%	1,7%	4,0%	-0,7%	56,3%
New Zealand	42	3,1%	0,4%	3,1%	3,7%	2,0%	11,7%
Norway	52	2,4%	0,7%	2,4%	4,7%	1,0%	28,9%
Pakistan	9	6,7%	1,2%	6,2%	9,5%	5,8%	18,4%
Panama	14	4,0%	0,7%	4,0%	5,0%	2,0%	16,7%
Peru	91	5,3%	1,4%	5,5%	8,2%	2,6%	25,6%
Phillipines	6	5,3%	1,4%	5,3%	6,7%	3,8%	26,3%
Poland	64	3,4%	0,7%	3,5%	5,2%	1,0%	20,2%
Portugal	58	3,2%	0,9%	3,6%	4,4%	1,0%	29,4%
Qatar	10	3,4%	0,6%	3,3%	5,0%	2,8%	18,1%

Romania	31	5,2%	1,7%	4,7%	7,7%	2,0%	32,2%
Russia	61	7,8%	1,5%	8,2%	9,6%	3,8%	19,6%
Singapore	10	2,3%	0,3%	2,3%	2,7%	1,8%	11,9%
Slovakia	9	2,5%	0,8%	2,8%	3,2%	1,3%	30,8%
Slovenia	16	4,1%	2,6%	3,9%	8,5%	0,8%	64,3%
South Africa	40	7,6%	1,8%	8,1%	9,3%	2,3%	23,3%
Sri Lanka	6	9,2%	1,3%	9,2%	10,6%	7,8%	14,4%
Sweden	58	1,8%	0,8%	1,9%	3,8%	0,2%	41,9%
Switzerland	43	1,1%	0,5%	1,2%	1,8%	0,0%	46,4%
Taiwan	30	1,7%	0,8%	1,8%	3,2%	0,5%	48,0%
Thailand	46	3,5%	1,6%	3,0%	8,2%	2,1%	46,3%
Turkey	54	10,3%	2,8%	10,8%	13,2%	-0,2%	26,9%
United Kingdom	89	2,0%	0,5%	2,0%	3,2%	0,8%	25,5%
Uruguay	39	5,3%	1,8%	4,7%	12,0%	4,2%	33,5%
Venezuela	33	11,7%	1,4%	11,9%	14,0%	6,0%	11,9%

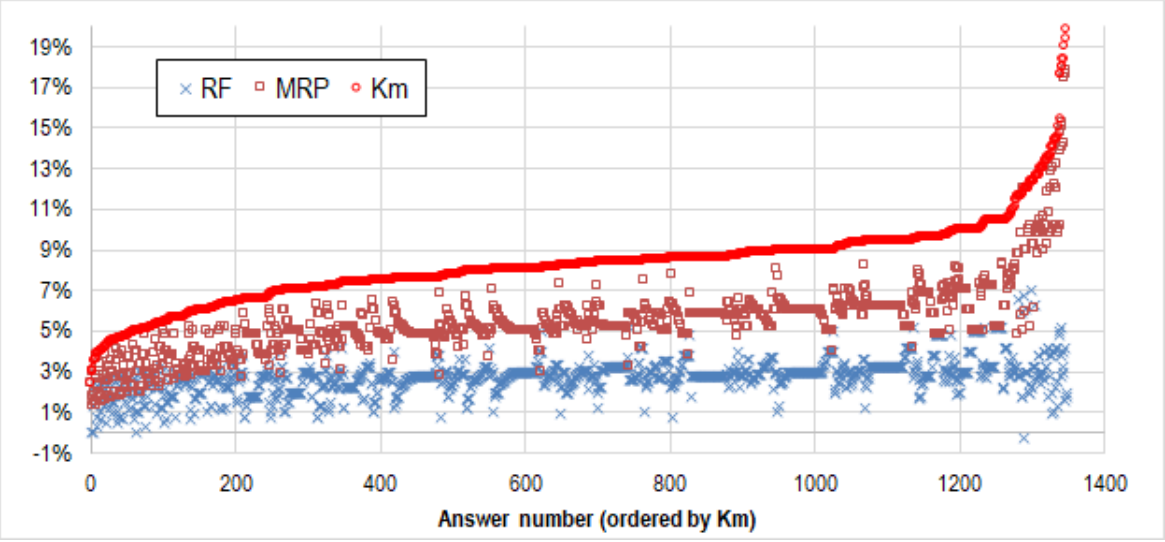
Table 4. Km [Required return to equity (market): R_F + MRP)] used for 59 countries in 2018

Km	Number of Answers	**Average**	**St. Dev.**	Median	MAX	min	**St.Dev. / Average**
USA	1348	8,2%	2,0%	8,3%	19,8%	2,4%	23,9%
Spain	675	8,8%	2,5%	8,5%	21,2%	1,9%	27,8%
Germany	528	6,7%	1,9%	6,8%	16,2%	1,0%	28,3%
Argentina	73	23,1%	6,8%	26,2%	43,5%	8,6%	29,4%
Australia	74	9,7%	1,5%	10,0%	14,4%	7,1%	15,2%
Austria	56	8,2%	1,3%	8,2%	12,4%	4,9%	15,6%
Belgium	53	7,8%	1,1%	8,1%	9,2%	4,1%	14,2%
Bolivia	6	9,6%	1,8%	9,6%	11,6%	7,6%	18,7%
Brazil	100	15,7%	3,0%	15,2%	21,4%	10,5%	19,2%
Bulgaria	8	10,3%	1,2%	10,0%	13,0%	9,1%	11,6%
Canada	77	8,7%	1,1%	9,0%	10,4%	6,1%	12,4%
Chile	72	10,2%	1,2%	10,5%	12,4%	7,1%	12,0%
China	95	10,1%	2,7%	10,6%	17,4%	4,3%	27,2%
Colombia	72	15,4%	4,4%	14,6%	35,4%	10,1%	28,7%
Czech Republic	63	8,5%	1,0%	8,5%	11,4%	6,1%	11,9%
Denmark	53	7,6%	1,0%	7,8%	9,0%	4,9%	13,3%
Ecuador	7	12,5%	4,4%	14,0%	17,0%	7,6%	34,7%
Egypt	9	20,9%	3,1%	19,0%	25,4%	18,2%	15,0%
Estonia	7	7,2%	0,8%	7,0%	8,3%	6,1%	10,8%
Finland	53	7,6%	1,0%	7,8%	9,0%	4,5%	12,9%
France	83	7,4%	1,9%	7,9%	10,4%	2,6%	24,9%
Greece	42	20,6%	4,2%	21,3%	24,2%	10,6%	20,2%
Hong Kong	21	8,0%	0,7%	8,0%	9,4%	6,6%	8,9%
Hungary	42	11,4%	1,5%	12,1%	13,1%	7,7%	13,6%
India	64	14,7%	2,2%	15,1%	20,6%	8,6%	14,6%
Indonesia	39	15,6%	1,2%	16,1%	16,9%	12,1%	7,9%
Iran	15	34,7%	26,5%	25,0%	85,4%	14,6%	76,3%
Ireland	49	8,2%	1,0%	8,4%	9,4%	4,9%	11,8%
Israel	51	7,7%	1,7%	8,4%	9,4%	3,0%	21,8%
Italy	108	8,4%	1,5%	8,6%	13,0%	3,8%	17,6%
Japan	57	6,0%	2,0%	6,1%	11,3%	1,6%	34,1%

Korea (South)	48	8,8%	1,2%	9,0%	11,4%	5,4%	13,1%
Malaysia	10	11,3%	0,8%	11,1%	13,0%	10,1%	7,4%
Mexico	123	15,3%	3,7%	15,0%	28,4%	7,9%	24,4%
Netherlands	81	7,4%	1,1%	7,7%	9,9%	4,2%	15,0%
New Zealand	42	8,9%	0,8%	8,8%	11,6%	7,3%	9,1%
Norway	52	8,1%	1,1%	8,4%	9,9%	6,1%	13,2%
Pakistan	9	18,2%	3,0%	18,6%	21,7%	13,6%	16,3%
Panama	14	12,4%	2,3%	11,7%	16,2%	9,4%	18,3%
Peru	91	12,6%	3,5%	12,7%	28,4%	6,6%	27,4%
Phillipines	6	10,4%	1,1%	10,6%	11,7%	8,7%	10,9%
Poland	64	9,4%	1,6%	9,6%	14,4%	4,1%	17,2%
Portugal	58	10,4%	1,8%	10,9%	12,6%	4,9%	17,4%
Qatar	10	10,3%	1,1%	10,4%	12,2%	8,8%	10,9%
Romania	31	12,2%	2,7%	11,6%	17,9%	7,2%	22,1%
Russia	61	16,4%	3,7%	16,6%	28,4%	10,4%	22,5%
Singapore	10	7,5%	1,4%	7,8%	9,4%	5,3%	18,7%
Slovakia	9	9,1%	1,7%	9,1%	11,4%	6,7%	19,0%
Slovenia	16	11,2%	3,2%	10,7%	17,2%	8,1%	28,2%
South Africa	40	14,5%	3,0%	15,7%	17,1%	6,0%	20,6%
Sri Lanka	6	17,2%	1,2%	17,3%	18,7%	15,8%	7,0%
Sweden	58	8,9%	2,2%	8,7%	14,6%	5,1%	24,2%
Switzerland	43	8,0%	1,4%	8,5%	9,5%	4,0%	17,7%
Taiwan	30	6,6%	1,3%	6,7%	9,4%	3,6%	19,7%
Thailand	46	12,3%	4,4%	11,3%	28,4%	8,4%	35,5%
Turkey	54	18,0%	4,3%	18,8%	28,4%	3,6%	24,1%
United Kingdom	89	7,5%	1,4%	7,9%	9,4%	3,1%	18,9%
Uruguay	39	13,7%	1,8%	13,0%	18,8%	9,5%	13,4%
Venezuela	33	28,5%	3,2%	29,7%	32,3%	18,5%	11,2%

2. Distribution of the answers for the USA

Figure 2. Answers for USA. RF, and Market Risk Premium (MRP) and Km used in 2018



3. Changes from 2015 to 2017, and to 2018

In this section, we compare the results of 2018 with the results of similar surveys published in 2015 (see https://ssrn.com/abstract=2598104) and 2017 (https://ssrn.com/abstract=2954142).

Table 5. Market Risk Premium (MRP), Risk Free Rate (RF) and Km
Averages of the surveys of 2018, 2017 and 2015

	Average 2018			Average 2017			Average 2015		
	Km	RF	MRP	Km	RF	MRP	Km	RF	MRP
USA	8,2%	2,8%	5,4%	8,2%	2,5%	5,7%	7,9%	2,4%	5,5%
Spain	8,8%	2,1%	6,7%	8,8%	2,2%	6,6%	8,1%	2,2%	5,9%
Germany	6,7%	1,4%	5,3%	7,2%	1,4%	5,7%	6,6%	1,3%	5,3%
France	7,4%	1,6%	5,9%	8,3%	1,8%	6,5%	7,2%	1,5%	5,6%
United Kingdom	7,5%	2,0%	5,5%	8,1%	2,2%	5,9%	7,2%	2,1%	5,2%
Italy	8,4%	2,3%	6,1%	9,0%	2,6%	6,4%	7,0%	1,5%	5,4%
Canada	8,7%	2,9%	5,8%	9,0%	3,0%	6,0%	8,3%	2,3%	5,9%
Portugal	10,4%	3,2%	7,2%	11,1%	3,5%	7,6%	7,3%	1,6%	5,7%
Switzerland	8,0%	1,1%	6,9%	8,4%	1,3%	7,1%	6,5%	1,1%	5,4%
Belgium	7,8%	1,6%	6,2%	8,1%	1,7%	6,4%	6,7%	1,3%	5,5%
Sweden	8,9%	1,8%	7,1%	8,5%	1,7%	6,8%	6,5%	1,1%	5,4%
Denmark	7,6%	1,6%	6,0%	7,6%	1,6%	6,1%	6,8%	1,3%	5,5%
Finland	7,6%	1,7%	5,9%	7,6%	1,7%	5,9%	6,9%	1,2%	5,7%
Japan	6,0%	0,3%	5,7%	6,3%	0,3%	6,0%	6,6%	0,7%	5,8%
Norway	8,1%	2,4%	5,7%	8,4%	2,3%	6,1%	6,8%	1,4%	5,5%
Brazil	15,7%	7,3%	8,4%	18,0%	9,0%	9,0%	16,5%	9,0%	7,5%
Ireland	8,2%	1,6%	6,5%	8,4%	1,7%	6,7%	6,7%	1,3%	5,5%
China	10,1%	3,8%	6,3%	10,8%	3,3%	7,5%	12,6%	4,5%	8,1%
Mexico	15,3%	6,8%	8,5%	16,0%	6,7%	9,3%	12,2%	4,3%	8,0%
Russia	16,4%	7,8%	8,7%	16,5%	8,7%	7,7%	17,1%	7,4%	9,7%
India	14,7%	6,8%	7,9%	15,0%	6,5%	8,5%	15,8%	7,4%	8,4%
South Africa	14,5%	7,6%	6,9%	15,0%	7,5%	7,5%	15,9%	8,2%	7,7%
Australia	9,7%	3,1%	6,6%	10,3%	3,0%	7,3%	9,2%	3,1%	6,0%
Chile	10,2%	4,1%	6,1%	10,8%	4,5%	6,2%	10,4%	3,9%	6,5%
Uruguay	13,7%	5,3%	8,3%	12,5%	4,5%	8,0%	10,6%	3,6%	7,1%
Poland	9,4%	3,4%	6,0%	9,8%	3,4%	6,4%	7,9%	2,7%	5,2%
Peru	12,6%	5,3%	7,3%	13,0%	5,5%	7,6%	11,2%	4,0%	7,2%
Czech Republic	8,5%	2,6%	5,9%	8,7%	2,5%	6,2%	7,4%	1,8%	5,6%
Indonesia	15,6%	6,8%	8,8%	16,1%	7,2%	8,9%	16,4%	7,5%	8,9%
Israel	7,7%	1,9%	5,8%	8,4%	1,9%	6,5%	6,1%	0,9%	5,2%
Korea (South)	8,8%	2,4%	6,4%	9,0%	2,4%	6,6%	8,5%	2,3%	6,2%
Netherlands	7,4%	1,7%	5,8%	7,7%	1,7%	6,0%	7,6%	1,8%	5,9%
New Zealand	8,9%	3,1%	5,8%	8,5%	2,9%	5,6%	9,5%	2,9%	6,6%
Thailand	12,3%	3,5%	8,9%	11,2%	3,0%	8,2%	16,0%	8,7%	7,3%
Turkey	18,0%	10,3%	7,7%	18,5%	10,5%	8,0%	17,2%	7,8%	9,3%
Austria	8,2%	2,0%	6,2%	8,0%	1,6%	6,4%	8,4%	2,8%	5,7%
Greece	20,6%	4,8%	15,8%	20,9%	4,8%	16,2%	29,3%	15,0%	14,3%
Colombia	15,4%	6,7%	8,7%	14,1%	6,6%	7,6%	12,1%	3,8%	8,3%
Hungary	11,4%	3,6%	7,9%	12,0%	3,6%	8,4%	9,5%	0,6%	8,8%
Venezuela	28,5%	11,7%	16,9%	28,9%	11,5%	17,4%	23,1%	3,5%	19,6%
Argentina	23,1%	9,3%	13,9%	26,7%	10,5%	16,3%	35,5%	12,6%	22,9%

4. Previous surveys

Previous surveys. Market risk premium used

2008	http://ssrn.com/abstract=1344209
2010	http://ssrn.com/abstract=1606563; http://ssrn.com/abstract=1609563
2011	http://ssrn.com/abstract=1822182; http://ssrn.com/abstract=1805852
2012	http://ssrn.com/abstract=2084213
2013	http://ssrn.com/abstract=914160
2014	http://ssrn.com/abstract=1609563
2015	https://ssrn.com/abstract=2598104
2016	https://ssrn.com/abstract=2776636
2017	https://ssrn.com/abstract=2954142

Welch (2000) performed two surveys with finance professors in 1997 and 1998, asking them what they thought the Expected MRP would be over the next 30 years. He obtained 226 replies, ranging from 1% to 15%, with an average arithmetic EEP of 7% above T-Bonds.[2] Welch (2001) presented the results of a survey of 510 finance and economics professors performed in August 2001 and the consensus for the 30-year arithmetic EEP was 5.5%, much lower than just 3 years earlier. In an update published in 2008 Welch reports that the MRP "used in class" in December 2007 by about 400 finance professors was on average 5.89%, and 90% of the professors used equity premiums between 4% and 8.5%.

Johnson et al (2007) report the results of a survey of 116 finance professors in North America done in March 2007: 90% of the professors believed the Expected MRP during the next 30 years to range from 3% to 7%.

Graham and Harvey (2007) indicate that U.S. CFOs reduced their average EEP from 4.65% in September 2000 to 2.93% by September 2006 (st. dev. of the 465 responses = 2.47%). In the 2008 survey, they report an average EEP of 3.80%, ranging from 3.1% to 11.5% at the tenth percentile at each end of the spectrum. They show that average EEP changes through time. Goldman Sachs (O'Neill, Wilson and Masih 2002) conducted a survey of its global clients in July 2002 and the average long-run EEP was 3.9%, with most responses between 3.5% and 4.5%.

Ilmanen (2003) argues that surveys tend to be optimistic: *"survey-based expected returns may tell us more about hoped-for returns than about required returns".* Damodaran (2008) points out that *"the risk premiums in academic surveys indicate how far removed most academics are from the real world of valuation and corporate finance and how much of their own thinking is framed by the historical risk premiums... The risk premiums that are presented in classroom settings are not only much higher than the risk premiums in practice but also contradict other academic research".*

Table 4 of Fernandez et al (2011a) shows the evolution of the Market Risk Premium used for the USA in 2011, 2010, 2009 and 2008 according to previous surveys (Fernandez et al, 2009, 2010a and 2010b).

Table 6. Comparison of previous surveys

	Surveys of Ivo Welch					Fernandez et al (2009, 2010)			
	Oct 97–Feb 98*	Jan-May 99+	Sep 2001**	Dec. 2007#	January 2009++	US 2008	Europe 2008	US 2009	Europe 2009
Number of answers	226	112	510	360	143	487	224	462	194
Average	**7.2**	**6.8**	**4.7**	**5.96**	**6.2**	**6.3**	**5.3**	**6.0**	**5.3**
Std. Deviation	***2.0***	***2.0***	***2.2***	***1.7***	***1.7***	***2.2***	***1.5***	***1.7***	***1.7***
Max	15	15	20	20		19.0	10.0	12.0	12.0
Q3	8.4	8	6	7.0	7	7.2	6.0	7.0	6.0
Median	7	7	4.5	6.0	6	6.0	5.0	6.0	5.0
Q1	6	5	3	5.0	5	5.0	4.1	5.0	5.3
Min	1.5	1.5	0	2		0.8	1.0	2.0	2.0

* 30-Year Forecast. Welch (2000) First survey + 30-Year Forecast. Welch (2000) Second survey

[2] At that time, the most recent Ibbotson Associates Yearbook reported an arithmetic HEP versus T-bills of 8.9% (1926–1997).

** 30 year Equity Premium Forecast (Geometric). "The Equity Premium Consensus Forecast Revisited" (2001)
# 30-Year Geo Eq Prem Used in class. Welch, I. (2008), "The Consensus Estimate for the Equity Premium by Academic Financial Economists in December 2007". http://ssrn.com/abstract=1084918
++ In your classes, what is the main number you are recommending for long-term CAPM purposes? "Short Academic Equity Premium Survey for January 2009". http://welch.econ.brown.edu/academics/equpdate-results2009.html

Table 7. Estimates of the EEP (Expected Equity Premium) according to other surveys

Authors	Conclusion about EEP	Respondents
Pensions and Investments (1998)	3%	Institutional investors
Graham and Harvey (2007)	Sep. 2000. Mean: 4.65%. Std. Dev. = 2.7%	CFOs
Graham and Harvey (2007)	Sep. 2006. Mean: 2.93%. Std. Dev. = 2.47%	CFOs
Welch update	December 2007. Mean: 5.69%. Range 2% to 12%	Finance professors
O'Neill, Wilson and Masih (2002)	3.9%	Global clients Goldman

The magazine *Pensions and Investments* (12/1/1998) carried out a survey among professionals working for institutional investors: the average EEP was 3%. Shiller[3] publishes and updates an index of investor sentiment since the crash of 1987. While neither survey provides a direct measure of the equity risk premium, they yield a broad measure of where investors or professors expect stock prices to go in the near future. The 2004 survey of the Securities Industry Association (SIA) found that the median EEP of 1500 U.S. investors was about 8.3%. Merrill Lynch surveys more than 300 institutional investors globally in July 2008: the average EEP was 3.5%.

A main difference of this survey with previous ones is that this survey asks about the **Required** MRP, while most surveys are interested in the **Expected** MRP.

5. Expected and Required Equity Premium: different concepts

Fernandez and F. Acín (2015) claim and show that Expected Return and Required Return are two very different concepts. Fernandez (2007, 2009b) claims that the term "equity premium" is used to designate four different concepts:

1. **Historical** equity premium (HEP): historical differential return of the stock market over treasuries.
2. **Expected** equity premium (EEP): expected differential return of the stock market over treasuries.
3. **Required** equity premium (REP): incremental return of a diversified portfolio (the market) over the risk-free rate required by an investor. It is used for calculating the required return to equity.
4. **Implied** equity premium (IEP): the required equity premium that arises from assuming that the market price is correct.

The four concepts (HEP, REP, EEP and IEP) designate different realities. The **HEP** is easy to calculate and is equal for all investors, provided they use the same time frame, the same market index, the same risk-free instrument and the same average (arithmetic or geometric). But the **EEP,** the **REP** and the **IEP** may be different for different investors and are not observable.

The **HEP** is the historical average differential return of the market portfolio over the risk-free debt. The most widely cited sources are Ibbotson Associates and Dimson *et al.* (2007).

Numerous papers and books assert or imply that there is a "market" EEP. However, it is obvious that investors and professors do not share "homogeneous expectations" and have different assessments of the **EEP**. As Brealey et al. (2005, page 154) affirm, *"Do not trust anyone who claims to know what returns investors expect".*

The **REP** is the answer to the following question: What incremental return do I require for investing in a diversified portfolio of shares over the risk-free rate? It is a crucial parameter because the REP is the key to determining the company's required return to equity and the WACC. Different companies may use, and in fact do use, different **REPs**.

[3] See http://icf.som.yale.edu/Confidence.Index

The **IEP** is the implicit REP used in the valuation of a stock (or market index) that matches the current market price. The most widely used model to calculate the IEP is the dividend discount model: the current price per share (P_0) is the present value of expected dividends discounted at the required rate of return (Ke). If d_1 is the dividend per share expected to be received in year 1, and g the expected long term growth rate in dividends per share,

$P_0 = d_1 / (Ke - g)$, which implies: $IEP = d_1/P_0 + g - R_F$ (1)

The estimates of the IEP depend on the particular assumption made for the expected growth (g). Even if market prices are correct for all investors, there is not an IEP common for all investors: there are many pairs (IEP, g) that accomplish equation (1). Even if equation (1) holds for every investor, there are many *required* returns (as many as expected growths, g) in the market. Many papers in the financial literature report different estimates of the IEP with great dispersion, as for example, Claus and Thomas (2001, IEP = 3%), Harris and Marston (2001, IEP = 7.14%) and Ritter and Warr (2002, IEP = 12% in 1980 and -2% in 1999). There is no a common **IEP** for all investors.

For a particular investor, the **EEP** is not necessary equal to the REP (unless he considers that the market price is equal to the value of the shares). Obviously, an investor will hold a diversified portfolio of shares if his EEP is higher (or equal) than his REP and will not hold it otherwise.

We can find out the REP and the EEP of an investor by asking him, although for many investors the REP is not an explicit parameter but, rather, it is implicit in the price they are prepared to pay for the shares. However, it is not possible to determine the REP for the market as a whole, because it does not exist: even if we knew the REPs of all the investors in the market, it would be meaningless to talk of a REP for the market as a whole. There is a distribution of REPs and we can only say that some percentage of investors have REPs contained in a range. The average of that distribution cannot be interpreted as the REP of the market nor as the REP of a representative investor.

Much confusion arises from not distinguishing among the four concepts that the phrase *equity premium* designates: Historical equity premium, Expected equity premium, Required equity premium and Implied equity premium. 129 of the books reviewed by Fernandez (2009b) identify Expected and Required equity premium and 82 books identify Expected and Historical equity premium.

Finance textbooks should clarify the MRP by incorporating distinguishing definitions of the four different concepts and conveying a clearer message about their sensible magnitudes.

6. Conclusion

Most previous surveys have been interested in the Expected MRP, but this survey asks about the Required MRP.

This paper contains the statistics of a survey about the Risk-Free Rate (R_F) and of the Market Risk Premium (MRP) used in 2018 for **59 countries**. We got answers for 73 countries, but we only report the results for 59 countries with more than 5 answers.

The average (R_F) used in 2018 was smaller than the one used in 2015 in 14 countries.

The change between 2015 and 2018 of the average Market risk premium used was higher than 1% for 12 countries. The change between 2015 and 2018 of the average Km used was higher than 1% for 22 countries (see table 5).

Most of the respondents use for European countries a Risk-Free Rate (R_F) higher than the yield of the 10-year Government bonds.

This survey links with the *Equity Premium Puzzle*: Fernandez et al (2009), argue that the equity premium puzzle may be explained by the fact that many market participants (equity investors, investment banks, analysts, companies…) do not use standard theory (such as a standard representative consumer asset pricing model…) for determining their Required Equity Premium, but rather, they use historical data and advice from textbooks and finance professors. Consequently, ex-ante equity premia have been high, market prices have been consistently undervalued, and the ex-post risk premia has been also high. Many investors use historical data and textbook prescriptions to estimate the required and the expected equity premium, the undervaluation and the high ex-post risk premium are self fulfilling prophecies.

EXHIBIT 1. Mail sent on March 2018

Survey Market Risk Premium and Risk-Free Rate 2018

We are doing a **survey** about the **Market Risk Premium** (MRP or Equity Premium) and **Risk-Free Rate** that companies, analysts, regulators and professors use to calculate the **required return on equity** in different countries.

I would be grateful if you would kindly answer the following 2 questions. No companies, individuals or universities will be identified, and only aggregate data will be made public. I will send you the results in a month.

Best regards and thanks,

Pablo Fernandez. Professor of Finance. IESE Business School. Spain.

2 questions:

1. The Market Risk Premium that I am using in 2018
for USA is: _____ %
for Germany is: _____ %
for_____ is: _____ %
for_____ is: _____ %

2. The Risk-Free rate that I am using in 2018
for USA is: _____ %
for Germany is: _____ %
for _____ is: _____ %
for _____ is: _____ %

EXHIBIT 2. Some comments and webs recommended by respondents

Equity premium: http://pages.stern.nyu.edu/~adamodar/New_Home_Page/datafile/ctryprem.html
http://www.market-risk-premia.com/market-risk-premia.html
http://www.marktrisikoprämie.de/marktrisikopraemien.html

US risk free rate: http://www.treasury.gov/resource-center/data-chart-center/interest-rates/Pages/TextView.aspx?data=yieldYear&year=2015

risk free rate: http://www.basiszinskurve.de/basiszinssatz-gemaess-idw.html
http://www.econ.yale.edu/~shiller/
http://www.cfosurvey.org/pastresults.htm
http://alephblog.com/

The risk free rate are determined on the historical present value-equivalent base interest rates on the basis of a series of payments increasing with the selected growth rate over a period of 1,000 years. For the calculations, the spot rate from year 30 to year 1,000 is updated constantly based upon the valuation date.

Germany

Risk free rate	0.9%	20 y Bund	Investing.com/rates-bonds/germany-20-year-bond-yield (1-1-2018)
Adjustment	1.8%	Credit Suisse	Credit Suisse Global Investment Source book and Yield book 2016 – Range of estimated long term real rate government bonds 1900-2015 - globally diversified
Risk free rate Adjusted	**2.7%**		

I don't use the market risk premium. I use a hurdle rate of return and won't invest in investments that don't achieve that hurdle. I aspire to a 25% rate of return on my investments but will generally settle for 15%.

I use the relevant rate from each country/currency "risk-free" yield curve to discount the respective expected future cash flow: V0 = CF1/(1 + Rf1 + risk prem)^1 + CF2/(1 + Rf2 + risk prem)^2 + ... + CFt/(1 + Rft + risk prem)^t

The Risk-Free rate that I am using in 2018 for USA is: 10 year historical average from date of valuation, US Treasuries 20-year notes.

I use the US Equity premium of Damodaran to avoid explanations or justifications to clients.

We only use ROS (Return on Sales).

Rf: 3%, of which 2% is a premium for the risk of manipulation of the interest rate market operated by the ECB with the Quantitative Easing.

Al tener limitación nacional al hacer inversiones, debemos emplear un tipo de interés sin riesgo alto. Al operar en mercados muy consolidados, con pocos operadores y con fuertes barreras de entrada, la prima de riesgo de mercado es muy alta.

Utilizamos la tasa de las LEBAC como tasa de descuento para proyectos locales
Cuando analizamos el mercado de capitales, por ejemplo el Merval en 2017 fue record mundial con una rentabilidad del 78% en pesos (con máximos de algunas acciones de 446 %), con una inflación del 25% y el dólar el 17%, ¿qué referencia tomar? Los agentes de bolsa y grandes inversores pueden tomar esta tasa, pero la mayoría de los inversores toma como referencia las LEBAC. Se estima para el 2018 una expansión del MERVAL del 14 % en dólares y un 32 % en pesos, siguiendo la tendencia del 2017.
Como la economía argentina está dolarizada, el pequeño inversor va derecho al dólar, por lo que nosotros cuando proponemos una Prima tenemos la opción de dolarizar, para no intervenir con la Tasa de Inflación y generar más ruido (en la industria toman el dólar como parámetro, si suben los costos, mantienen sus márgenes de ganancia, y se traslada a toda la cadena), en ese caso tomamos la tasa en dólares + riesgo país (CAPM), se va 1 o 2 puntos más que las LEBAC, aunque coincido con ustedes q no es lo ideal, por lo menos en nuestra economía.
En función de todo esto:
LEBACS (Títulos de cuenta a corto plazo licitadas x el Bco. Central): 26.75 % (son las tasas más altas del mercado, con riesgo cero ¡¡¡¡¡, con todo lo que esto significa para la Argentina)
Plazo Fijo Banco Nacion: 19.00 % (son las tasas más bajas del mercado, con riesgo cero)
Plazo Fijo Banco Nacion En Dolares: 19.75 % (en Sucursal) y 23.76 % (electrónico)
PRIMA DE RIESGO PAIS:4.18 % (Puntos Básicos)
Negociación De Cheques Pago Diferido (CNV): 26,00 % (Tasa Promedio Según El Mercado Argentino De Valores S.A.)

En anteriores encuestas intenté ofreceros un tipo orientativo pero estos últimos años, después de la "experimentación" de tipos, de diferentes QE con tipos negativos… sólo tengo una certeza, que ya hemos comentado en muchas ocasiones: es muy difícil, o de dudosa utilidad, establecer un tipo de interés sin riesgo. Porque ¿Es normal que la Deuda Griega pague menos que la Deuda de USA? ¿Emisiones de Deuda del gobierno argentino a periodos larguísimos? ¿Deuda alemana o suiza en tipos negativos?…
Respecto a establecer una tasa que sirva como referencia, mantendría dos premisas: 1) El horizonte de inversión (una Tasa de referencia con el mismo plazo); 2) La seguridad en las estimaciones de los flujos de caja futuros del proyecto o inversión: en caso de menor confianza o duda en las estimaciones, mayor tasa de Descuento
Como norma, siempre tenemos en cuenta que la Renta variable ha sido en periodos muy largos el activo más rentable y, por tanto, a muy largo plazo es el Activo de "Menor riesgo"

Fascinating results. It is always interesting how investors and fund managers interpret the risk free rate of countries who have a negative prevailing long-term bond rate.

I am sure you that you are analysing the data and asking more questions that data can answer. It´s time to improve theory! I hope you will advance on it.

In my DCF valuation I use a global perspective of the marginal investor hence a global MRP.

I match rf with currency/inflation of cash flows being discounted and do not rely too much on current interest rates due to imperfections in the market. The MRP is made consistent with the level of interest rate I use in my model (E(Rm)-Rf) end end up with 6%

For equities we use a 10% as a cost of opportunity independently of the level of interest.

Rf: average last 5-year 10 year Treasury

I would like to help you with these two questions, but the problem is that in no any literature sources or analytical reports I met the calculation of Market Risk Premium and Risk Free rate for Uzbekistan.

The risk free rate that I use depends upon the timing of the future cash flows. I refer to the interest rate swap market and the US treasury market for starters. These days, one has to bear in mind currency volatility as that has a bigger effect on PV than market cost-of-capital.

We use the same Market Risk Premium for any country: 5,75% (source: Damodaran). Only Rf changes.

I am happy that you are asking the second question, because it accounts for what I consider to be a historical anomaly in the reply to the first question. I've concluded that the ERP was recently 3-4 percent. But I think US monetary policy (the various "QE" programs) have in the past couple of years distorted the traditional relationship between expected total market returns and the risk free rate. QE has been driving the US Treasury rate down, while the expected total market return has held steady, leading to a larger than usual market risk premium. This higher market risk premium is not a sign of higher market equity risk, but of the perverse impact of aggressive monetary policy.

For the US in 2015: MRP: 14% (as US equities are even more highly priced than last year).

Interest rates are artificially well below historic levels. Thus, bonds and equities values are artificially inflated.

I do not use "canned" rates applicable for a whole year. The rates I use are time-specific and case-specific, depending on conditions prevailing as of the valuation date.

I must confess I am still surprised with the rates suggested that are at the upper bound of respondent answers.

One hint: It might make sense to ask more precisely about the premium before/after personal income tax. For Germany the premium would differ and I am not sure how people would interpret the question.

The Risk-Free Rate we use is based on rates published by the Federal Reserve. We use the 20 year rate, currently 2.73%. The Equity Risk Premium we use is based on Duff & Phelps Annual Valuation Handbook.

For foreign countries, I generally look at it in dollar terms and assume that purchasing power parity held; hence, I'd use US rates. If I had to do it in a foreign currency, I would use the local 10-year treasury for the risk-free rate. I would use the US equity risk premium, adjust for inflation to real terms, and then adjust for foreign inflation to put it in local nominal terms.

USA. MRP 6.4% - essentially bloomberg/ibbotson number. RF 10 year U.S. treasury yield.

Exijo un mínimo de un 15% de retorno neto de impuestos a cualquier acción, independientemente de su nacionalidad.

No creo que exista un activo libre de riesgo en absoluto. Y menos en estos distorsionados entornos debido a la intervención de los bancos centrales. En mi modesta opinión, creo que nunca sido tan riesgosa la renta fija como lo es ahora.

No creo especialmente en el modelo de CAPM y prefiero usar una cifra basada en el sentido común.

En Uruguay la práctica más aceptada es descontar flujos convertidos a USD dada la debilidad de la moneda local y dolarizacion de la economía.

Exigimos una rentabilidad de fondos propios del 8% (que puede variar según la posibilidad percibida de adjudicación o las ganas de ser competitivos). Pero cuál el tipo libre de riesgo que los financieros consideran, no lo sé.

Exhibit 3. Coefficient of variation (standard deviation / average) of Km, MRP and R_F

	Km	Km	**MRP**	MRP	**RF**	RF	**CV = St. Dev. / Average**		
	Average	*St. Dev.*	Average	*St. Dev.*	Average	*St. Dev.*	**Km**	*MRP*	*RF*
USA	8,2%	*2,0%*	5,4%	*1,7%*	2,8%	*0,8%*	**24%**	*32%*	*30%*
Spain	8,8%	*2,5%*	6,7%	*2,4%*	2,1%	*1,1%*	**28%**	*36%*	*52%*
Germany	6,7%	*1,9%*	5,3%	*1,7%*	1,4%	*1,0%*	**28%**	*32%*	*68%*
Japan	6,0%	*2,0%*	5,7%	*2,6%*	0,3%	*0,8%*	**34%**	*45%*	*231%*
Taiwan	6,6%	*1,3%*	4,9%	*1,5%*	1,7%	*0,8%*	**20%**	*31%*	*48%*
Estonia	7,2%	*0,8%*	5,1%	*1,0%*	2,1%	*0,9%*	**11%**	*20%*	*44%*
France	7,4%	*1,9%*	5,9%	*1,6%*	1,6%	*0,7%*	**25%**	*27%*	*42%*
Netherlands	7,4%	*1,1%*	5,8%	*0,7%*	1,7%	*0,9%*	15%	*12%*	*56%*
Singapore	7,5%	*1,4%*	5,2%	*1,5%*	2,3%	*0,3%*	19%	*29%*	*12%*
United Kingdom	7,5%	*1,4%*	5,5%	*1,1%*	2,0%	*0,5%*	**19%**	*21%*	*25%*
Denmark	7,6%	*1,0%*	6,0%	*0,8%*	1,6%	*0,5%*	13%	*13%*	*30%*
Finland	7,6%	*1,0%*	5,9%	*0,8%*	1,7%	*0,6%*	**13%**	*13%*	*33%*
Israel	7,7%	*1,7%*	5,8%	*1,3%*	1,9%	*0,7%*	22%	*22%*	*40%*
Belgium	7,8%	*1,1%*	6,2%	*0,8%*	1,6%	*0,4%*	14%	*13%*	*27%*
Hong Kong	8,0%	*0,7%*	5,8%	*1,0%*	2,2%	*0,6%*	**9%**	*17%*	*26%*
Switzerland	8,0%	*1,4%*	6,9%	*1,0%*	1,1%	*0,5%*	18%	*14%*	*46%*
Norway	8,1%	*1,1%*	5,7%	*0,9%*	2,4%	*0,7%*	**13%**	*15%*	*29%*
Ireland	8,2%	*1,0%*	6,5%	*0,6%*	1,6%	*0,4%*	12%	*10%*	*25%*
Austria	8,2%	*1,3%*	6,2%	*0,7%*	2,0%	*1,1%*	16%	*10%*	*54%*
Italy	8,4%	*1,5%*	6,1%	*1,2%*	2,3%	*0,5%*	**18%**	*20%*	*21%*
Czech Republic	8,5%	*1,0%*	5,9%	*0,7%*	2,6%	*0,6%*	**12%**	*12%*	*21%*
Canada	8,7%	*1,1%*	5,8%	*0,7%*	2,9%	*0,5%*	**12%**	*13%*	*18%*
Korea (South)	8,8%	*1,2%*	6,4%	*1,0%*	2,4%	*0,3%*	**13%**	*16%*	*14%*
New Zealand	8,9%	*0,8%*	5,8%	*0,9%*	3,1%	*0,4%*	**9%**	*15%*	*12%*

Sweden	8,9%	*2,2%*	7,1%	*1,6%*	1,8%	*0,8%*	24%	*23%*	*42%*
Slovakia	9,1%	*1,7%*	6,6%	*1,1%*	2,5%	*0,8%*	19%	*17%*	*31%*
Poland	9,4%	*1,6%*	6,0%	*1,3%*	3,4%	*0,7%*	**17%**	*21%*	*20%*
Bolivia	9,6%	*1,8%*	6,6%	*2,9%*	3,0%	*1,1%*	**19%**	*43%*	*37%*
Australia	9,7%	*1,5%*	6,6%	*1,4%*	3,1%	*0,5%*	15%	*21%*	*15%*
China	10,1%	*2,7%*	6,3%	*2,8%*	3,8%	*0,4%*	27%	*43%*	*12%*
Chile	10,2%	*1,2%*	6,1%	*1,1%*	4,1%	*0,7%*	**12%**	*18%*	*16%*
Bulgaria	10,3%	*1,2%*	7,5%	*1,3%*	2,8%	*1,2%*	**12%**	*17%*	*45%*
Qatar	10,3%	*1,1%*	6,9%	*1,2%*	3,4%	*0,6%*	**11%**	*18%*	*18%*
Portugal	10,4%	*1,8%*	7,2%	*1,2%*	3,2%	*0,9%*	17%	*17%*	*29%*
Phillipines	10,4%	*1,1%*	5,1%	*2,4%*	5,3%	*1,4%*	**11%**	*47%*	*26%*
Slovenia	11,2%	*3,2%*	7,2%	*0,8%*	4,1%	*2,6%*	28%	*12%*	*64%*
Malaysia	11,3%	*0,8%*	7,1%	*1,5%*	4,2%	*1,0%*	**7%**	*21%*	*25%*
Hungary	11,4%	*1,5%*	7,9%	*1,2%*	3,6%	*0,9%*	**14%**	*16%*	*26%*
Romania	12,2%	*2,7%*	7,0%	*1,8%*	5,2%	*1,7%*	**22%**	*26%*	*32%*
Thailand	12,3%	*4,4%*	8,9%	*3,0%*	3,5%	*1,6%*	36%	*34%*	*46%*
Panama	12,4%	*2,3%*	8,4%	*2,5%*	4,0%	*0,7%*	18%	*29%*	*17%*
Ecuador	12,5%	*4,4%*	9,0%	*3,5%*	3,6%	*1,4%*	**35%**	*39%*	*39%*
Peru	12,6%	*3,5%*	7,3%	*2,8%*	5,3%	*1,4%*	27%	*39%*	*26%*
Uruguay	13,7%	*1,8%*	8,3%	*1,1%*	5,3%	*1,8%*	13%	*13%*	*33%*
South Africa	14,5%	*3,0%*	6,9%	*1,7%*	7,6%	*1,8%*	**21%**	*24%*	*23%*
India	14,7%	*2,2%*	7,9%	*2,1%*	6,8%	*0,7%*	15%	*27%*	*10%*
Mexico	15,3%	*3,7%*	8,5%	*3,5%*	6,8%	*1,3%*	24%	*40%*	*19%*
Colombia	15,4%	*4,4%*	8,7%	*3,7%*	6,7%	*1,4%*	29%	*43%*	*21%*
Indonesia	15,6%	*1,2%*	8,8%	*1,0%*	6,8%	*0,9%*	**8%**	*12%*	*14%*
Brazil	15,7%	*3,0%*	8,4%	*2,3%*	7,3%	*2,3%*	**19%**	*27%*	*32%*
Russia	16,4%	*3,7%*	8,7%	*3,2%*	7,8%	*1,5%*	22%	*37%*	*20%*
Sri Lanka	17,2%	*1,2%*	8,0%	*2,5%*	9,2%	*1,3%*	**7%**	*31%*	*14%*
Turkey	18,0%	*4,3%*	7,7%	*2,4%*	10,3%	*2,8%*	**24%**	*31%*	*27%*
Pakistan	18,2%	*3,0%*	11,5%	*3,9%*	6,7%	*1,2%*	**16%**	*34%*	*18%*
Greece	20,6%	*4,2%*	15,8%	*3,1%*	4,8%	*1,6%*	20%	*20%*	*33%*
Egypt	20,9%	*3,1%*	10,9%	*4,5%*	10,0%	*3,5%*	15%	*42%*	*35%*
Argentina	23,1%	*6,8%*	13,9%	*4,7%*	9,3%	*4,9%*	**29%**	*34%*	*53%*
Venezuela	28,5%	*3,2%*	16,9%	*3,0%*	11,7%	*1,4%*	**11%**	*18%*	*12%*
Iran	34,7%	*26,5%*	22,1%	*25,4%*	12,6%	*4,9%*	76%	*115%*	*39%*

The coefficient of variation (CV = standard deviation / average) of RF is higher than the CV of MRP for 36 countries.

The coefficient of variation (CV = standard deviation / average) of Km is lower than the CV of MRP and the CV of RF for 35 countries.

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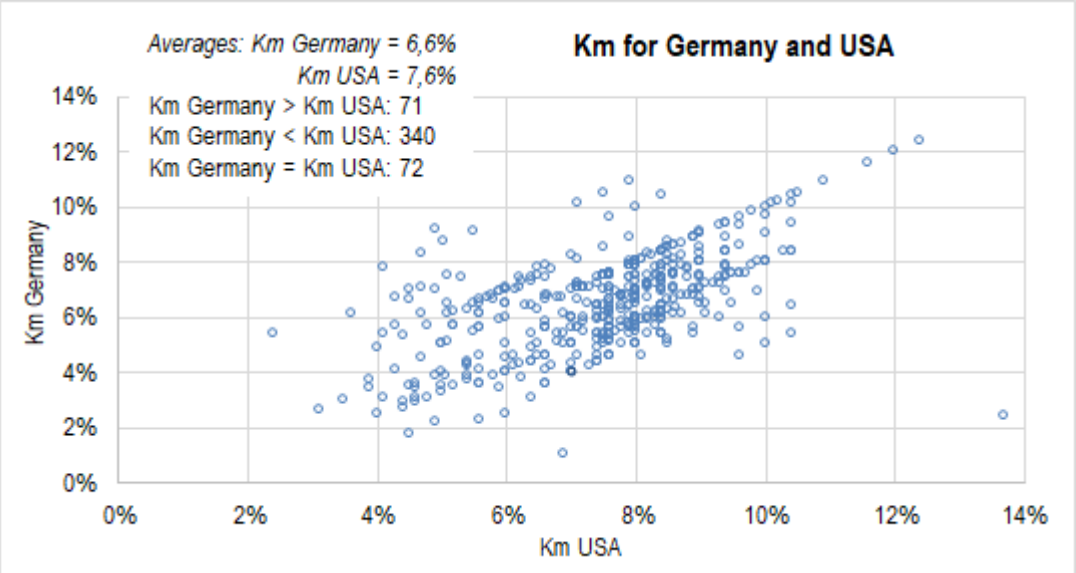

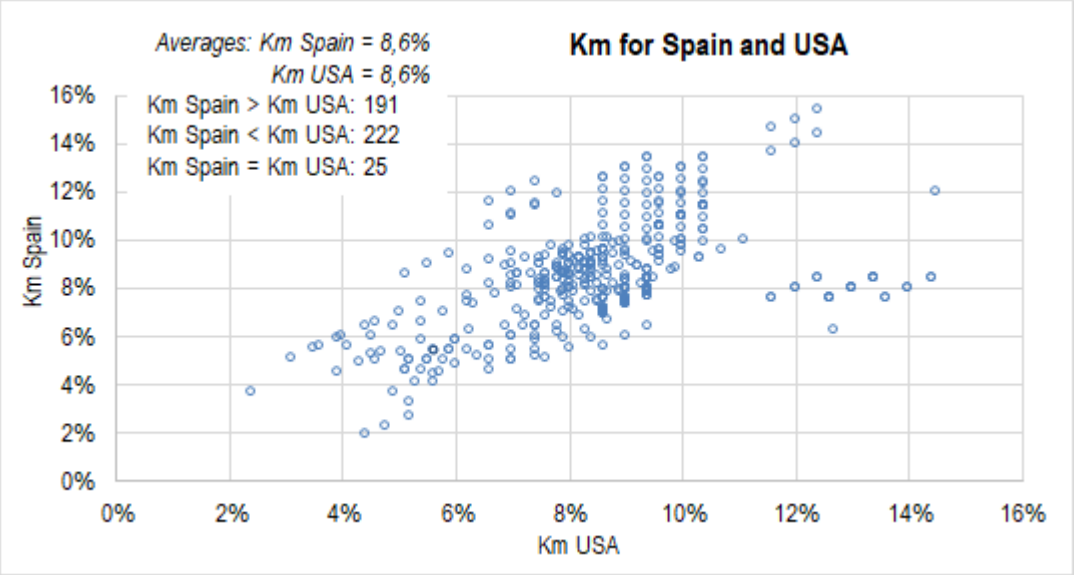
Km for Spain and USA
Averages: Km Spain = 8,6%
Km USA = 8,6%
Km Spain > Km USA: 191
Km Spain < Km USA: 222
Km Spain = Km USA: 25
Km Spain
Km USA
16%
14%
12%
10%
8%
6%
4%
2%
0%
0%
2%
4%
6%
8%
10%
12%
14%
16%