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Passive Portfolio Management by Indexing: A Performance Analysis of High, Medium and Low Capitalization Indices in Mexico

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ABSTRACT

In a passive investing strategy through indexation, the portfolio performance will depend largely on the ability to choose the best index. In this paper, we study the performance of four of the main stock indices in Mexico with the intention of selecting the best one for a passive investing strategy. To solve this question, departing from the *Sortino ratio*, a definition of probability of success substitutes the average excess return over a target and the use of the maximum standard deviation on the negative target return. The new performance measure gives different results to those of the traditional Sortino ratio, with the IPC large cap being the best index for a passive strategy, in terms of risk-reward ratio and return target.

Keywords: CAPM; information ratio; portfolio performance; Sortino ratio.
JEL classification: G11; G14.
MSC2010: 91G10; 91G70.

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Administración pasiva de portafolios mediante indexación: un análisis del desempeño de los índices de alta, mediana y baja capitalización en México

RESUMEN

En una gestión pasiva de inversiones mediante indexación, el desempeño del portafolio dependerá en gran medida de la habilidad para elegir el mejor índice. En este trabajo, se estudia el desempeño de cuatro de los principales índices bursátiles en México con la intención de seleccionar el mejor de ellos para una estrategia de inversión pasiva. Para resolver esta pregunta, a partir de la razón de Sortino, se propone la sustitución del exceso de retorno promedio por una definición de probabilidad de acierto y el uso de la máxima desviación estándar sobre el retorno objetivo negativo. Las nuevas medidas de desempeño arrojan resultados diferentes a los resultados de la medida tradicional de Sortino, siendo el *IPC large cap* el mejor índice para una estrategia pasiva, en términos de su relación riesgo-rendimiento y objetivo de rentabilidad.

Palabras claves: CAPM; ratio de información; desempeño de portafolios; razón de Sortino.
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1. Introduction

Financial market participants use benchmark indices in several ways. They use them as a performance indicator of a country's stock or bond markets, as portfolio benchmarks or as a tool to diversify investments into broad sectors, specific countries or country groups. Exchanges and other financial companies build them to reflect the behavior of any given group of assets that represent an industry, exchange or asset class. They also work as a reference for several financial products, whose pricing depends on the way in which such indices behave. For instance, an investor looking for a *passive investing strategy* can replicate the performance of the Mexican stock market in several ways[1]. She can use existing Exchange Traded Funds (ETFs) that replicate several stock groupings[2] or use derivatives with the IPC index as underlying asset[3].

This research paper focuses on Mexico's stock market indices, particularly, the high, medium and small capitalization ones, and on its potential adoption in a passive investment strategy. The main question addressed in this manuscript is which of the three above-mentioned indices would perform better when they are compared with the performance of the IPC index; or if the benchmark index in Mexico (IPC) is the best option for a passive investing strategy. Furthermore, to address such research question, a new performance measure is proposed, derived from the *Sortino ratio*, which implies an improvement over the measures regularly employed on performance analysis in the sense of fulfilling several desired features.

In what follows, the paper focuses, in its second section, on the data analysis for this study. In the third section, there is a review of some of the most common performance measures in literature, where there is a discussion regarding some of their features in order to introduce the proposal of a new measurement. In the fourth section, some metrics and the proposal are empirically analyzed. Finally, the fifth section contains the conclusions and the discussion on further research derived from this paper.

2. Data Sample

Data employed to measure the performance of Mexican stock indices, in this instance, originates from SiBolsa, a database published by the Mexican stock exchange conglomerate BMV Group[4]. It includes the daily price observations from the period between 2013 and 2015, regarding the four stock indices considered in this analysis and displayed in Table 1.

The box plot shown in Figure 1 displays the basic descriptive statistics on the data for the period 2013-2015. On one hand, the IPC mid cap index shows the less desirable behavior from a passive investor's point of view, being the one that shows the larger dispersion and

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[1] For a review on optimal portfolio diversification, see Elton & Gruber (1977). Moreover, Elton & Gruber (2011) find that, for a given portfolio, the larger the proportion invested on the S&P 500 benchmark index, the higher the portfolio's alpha, setting a good argument for the use of benchmark indices in a passive investing strategy.

[2] In Mexico, there are 315 mutual funds on stocks listed on Morningstar [www.morningstar.com.mx, July 13 2016]. Meanwhile, BlackRock offers five ETFs related to stock market capitalization [https://www.blackrock.com/mx, July 13 2016].

[3] The IPC index is the main stock benchmark for Mexico. It is composed by 35 securities traded in the Mexican stock exchange (BMV). IPC stands for *Índice de Precios y Cotizaciones*.

[4] The dataset and Matlab code are available to academic users on request.

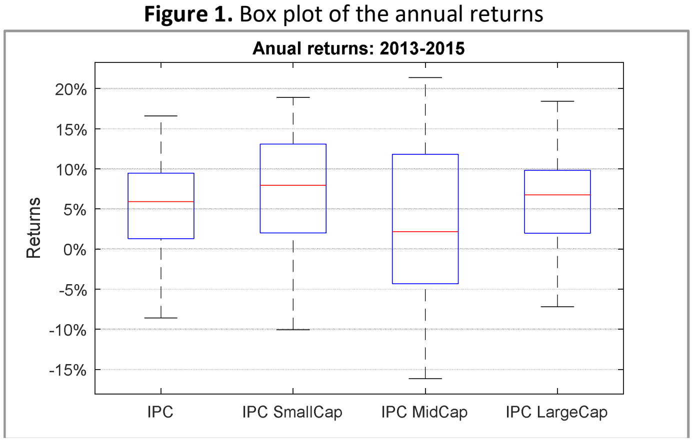
lowest average yield of the four. On the other hand, the IPC small cap index showed the higher average yield, albeit the second largest dispersion of the sample.

Table 1. Stock indices considered in the performance analysis

	Ticker	Number of Constituents (companies)	Comments [5]
IPC index	MEXBOL	35	It is the benchmark stock exchange index for Mexico. It includes the largest and more liquid stocks traded in the Mexican stock exchange. It uses a modified market cap weighting.
IPC large cap index	IPCLARGE	16	It measures the performance of the large market capitalization shares, those that represent the top 75% of the cumulative market capitalization within the IPC Composite index [IPCCOMP][6].
IPC mid cap index	IPCMID	28	It represents the middle market capitalization of the market, including the stocks that accumulate between 5% and 75% of the IPC Composite index.
IPC small cap index	IPCSMALL	28	It includes the lowest 5% of stocks of the accumulated capitalization of the IPC Composite index.

Source: Compiled by the authors using information taken from S&P Dow Jones Indices http://latam.spindices.com.

Figure 1. Box plot of the annual returns



By construction, the IPC index and the IPC large cap index share the same top seven constituents by index weight; so they behave in a similar way, showing the lowest volatility in the sample and similar returns. This likeness is also apparent when the annual yield correlation is taken into account (see Table 2), as correlation of both indices over the period of study reaches 0.88.

However, the story is different when the other two indices enter into the correlation analysis. There is a relatively high correlation between IPC mid cap and IPC small cap index (0.78); although when any of the two pairs with the IPC large cap or the IPC index correlation is small, or even negative between the IPC mid cap and the IPC large cap index. From a simple

[5] For a detailed methodology on the construction of the indices, see https://latam.spindices.com/index-finder.

[6] The IPC Composite index is a broad market measure different from the benchmark IPC index. It contains 73 companies while IPC index contains 35.

analysis, depicted in Figure 1 and Table 2, a reasonable conjecture arises: The IPC mid cap index could be out of the contest for the best index, albeit that should to be empirically proven in Section 4.

Table 2. Annual yield correlation matrix

	IPC index	IPC small cap index	IPC mid cap index	IPC large cap index
IPC index	1.00	0.20	0.16	0.88
IPC small cap index	0.20	1.00	0.78	0.18
IPC mid cap index	0.16	0.78	1.00	-0.35
IPC large cap index	0.88	0.18	-0.35	1.00

Source: Calculations by the authors with data from SiBolsa (BMV).

Figure 2. Histograms of annual returns

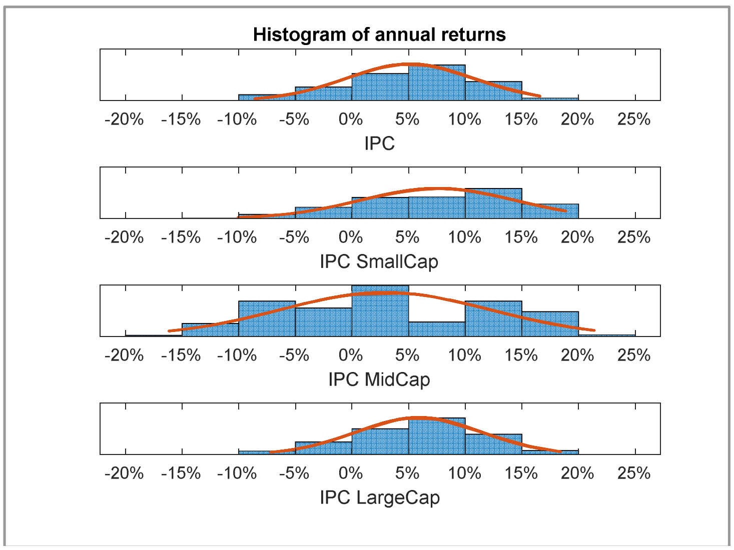


Figure 2 displays the histograms of annual returns. A heuristic analysis shows that daily returns on the IPC index distribute close to a normal function, while the IPC small cap index presents certain degree of negative skewness and the IPC mid cap index shows a degree of negative kurtosis. Notice that the four indices show a higher frequency of positive annual returns. Particularly, the distribution of the annual yield of the IPC small cap index presents a larger bias towards the right, which may be an indicator of better performance against other indices. In the subsequent sections, such claim is discussed and a conclusion about the best risk-performance ratio of the four indices will be reached.

3. Review of Performance Measurement Methodology

This section presents a review on the features regarding some of the most used performance methods, described by Bacon (2008), in order to introduce the main contribution of this research paper. This review of performance measures follows the framework provided by the concepts of *precision* and *stability*, developed by Hübner (2007), and *consistency*, taken from Grinold & Kahn (2000) and Villaverde (2010). According to Hübner (2007), *precision* relates to the certainty of the measure; so, there are periods in which certainty is higher than in others, while, *stability* means that the measure should not diverge from a factors model. Grinold &

Kahn (2000) discuss the idea that the concept of *consistency* is not enough; it is a necessary condition, but not a sufficient condition to demonstrate performance. A performance assessment should also consider that there must be enough independent investment decisions in a year. On the same line of reasoning, according to Villaverde (2010), *consistency* implies that a positive appraisal corresponds to a high percentage of positive performances, while a small percentage of positive performances would not offset a large number of negative performances.

The question of assessing investor's performance has been in the financial literature for long time, which is why there are several customary performance measures[7]. Most of them look for the best risk-reward relationship and are mainly differentiated by the way that they proxy each element of their calculations. For instance, a widely used performance indicator is the *Jensen's alpha*, which is a risk-adjusted measure of performance relative to the CAPM market line. In Jensen's alpha –Equation (1)– or the Capital Asset Pricing Model (CAPM) equation, the parameter α explains the excess return over the risk free rate $\left(r_i - r_f\right)$, adjusted by the risk parameter β.

$$r_i - r_f = \propto + \beta\left(r_m - r_f\right) + \varepsilon \qquad \textbf{(1)}$$

Whenever this equation yields a positive and statistically significant result for an investment strategy, this is because a better management compared to the market portfolio r_m.

As CAPM represents the behavior of an efficient market, in general, excess return is expected to be statistically equal to zero. Under these assumptions, any result different from zero can only exist by taking specific risk $\sqrt{var(\varepsilon)}$, as shown in Equation (2).

$$\begin{gathered} var\left(r_i - r_f\right) = \beta^2 var\left(r_m - r_f\right) + var(\varepsilon) \\ \sigma^2 = \beta^2 \sigma^2_{r_m - r_f} + \omega^2 \end{gathered} \qquad \textbf{(2)}$$

This formulation allows for the construction of the *appraisal* or the *information ratio* (IR), which is used for measuring portfolio performance with the relationship between abnormal results and residual risk. The larger the *appraisal* or IR, the better performance of the fund manager.

$$Appraisal = IR = \frac{\alpha}{\omega} \qquad \textbf{(3)}$$

This performance gauge is similar to Jensen's alpha, in the sense that it also calculates excess return relative to risk; however, the *information ratio* uses the tracking error as a volatility proxy and it may use a benchmark index as a reference for return instead of the risk free rate, invariably employed by Jensen's alpha.

Grinold and Kahn (2000) present an alternative way to compute the IR. They use the *information coefficient* (IC), which is the correlation with the benchmark, or alternatively the subtraction between the probability of success and the probability of failure minus one. To get Equation (4), the result above is multiplied by the square root of the *breadth*, defined as the total of operations in the year. When correlation is used to calculate the IC, the measure benefits those strategies or managers that obtain returns similar to the benchmark, affecting

[7] See Bacon (2011) for a survey in a wide variety of performance measures.

them in the case of getting higher returns than the benchmark. However, if the probability is used to the computation of the IC, the manager who is able to beat the benchmark a greater number of times benefits from the use of the performance measure.

$$IR = IC \times \sqrt{Breadth} \quad \textbf{(4)}$$

One useful characteristic of using the *Breadth* is that it allows the differentiation between skill and luck of the fund manager. High values of *Breadth* in the year cannot be attributable to luck; otherwise, luck cannot be ruled out[8].

Another approach to compute the IR is the one presented by Qian & Hua (2004), displayed on Equation (5). They identify that there is a higher risk than that specified by the IC and propose correcting the measure by dividing it by its standard deviation.

$$IR = \frac{IC}{\sigma_n} \quad \textbf{(5)}$$

However, this version of IC shows an important problem that the use of correlation does not fix. When the return is lower than the target, the correlation compares with the average return and not with the target. Likewise, in the measure of risk, the standard deviation must be used when returns are lower than the target.

Another example of a widely used performance indicator is provided by the *Sortino ratio* (Sortino & Van Der Meer, 1991), which uses the *bad risk* as a measure of volatility and a target return as a benchmark[9]. Sortino's outstanding contribution to performance measurement is precisely the concept of *downside risk* or *bad risk*, which is a measure that only takes into account the observations in which portfolio return is below the target to calculate the standard deviation. Such a formulation is depicted by Equations (6) and (7).

$$Sortino = \frac{r_i - r_{target}}{{}^{-}\sigma} \quad \textbf{(6)}$$

$${}^{-}\sigma = \sqrt{\frac{\sum_{t=1}^{n} min\left[\left(r_i - r_{target}, 0\right)\right]^2}{n}} \quad \textbf{(7)}$$

The proposal presented in this paper is to modify the *Sortino ratio* in order to get a better measure of the IR than the raw version of it; better in the sense that the new indicators fulfil desirable features as *precision*, *stability* and *consistency*, developed by Hübner (2007), Grinold & Kahn (2000) and Villaverde (2010), which are not present in the original Sortino ratio.

It is important to notice that this research relies on one crucial assumption: The investor would prefer a *consistent* path to reach a risk-reward target to a higher risk-reward profile with the risk of extreme separation from the benchmark during the investment period. That is, while investing in a passive index strategy, the investor may assign a greater value to a strategy that maintains a close track of the benchmark than a strategy in which can exist extreme decoupling spells (that lead to stop loss), disrupting the investment process.

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[8] It is outside of the scope of this research paper to determine the threshold in observations to differentiate between the manager's skill and luck.

[9] In the example provided in this research paper, the target is the return of the benchmark IPC index.

The proposal is to improve the method of calculation of the *Sortino ratio* using a measure of probability of outperforming the market (via *rolling window* regressions) instead of the raw average performance measure, and dividing this new measure over the downside risk. This new indicator is called the *rolling window Sortino ratio* and it is described in Equation (8), where P depicts the probability of outperforming the target.

$$Rolling\ window\ Sortino\ ratio = \frac{P[r_i > r_{target}]}{{}^{-}\sigma_n} \quad \textbf{(8)}$$

Furthermore, the maximum *downside risk* is taken into the new ratio as the *target downside risk* to create a new performance measure called *modified Sortino ratio*. This measure generates the probability of outperforming relative to the maximum *downside risk* for a period of time and it is described in Equation (9).

$$Modified\ Sortino\ ratio > 0\ \ if\ \begin{cases} P[r_i > r_{target}] \geq P_{target} \\ {}^{-}\sigma_n \leq {}^{-}\sigma_{target} \end{cases} \quad \textbf{(9)}$$

With the proposed modifications, the new indicators will be *precise*, *stable* and *consistent*. In addition, they allow the investor to distinguish between skill and luck, because the probabilities calculated with the rolling windows give results that are more robust.

4. Performance Analysis

In this section, the discussion of the main results of the performance analysis takes place. For calculation purposes, consider an initial investment of $100. Figure 3 displays the path of the prices regarding the four indices studied in the research paper. Notice that, as expected given the skewness in yields distribution, the IPC small cap reaches the highest return at the end of the period of study. However, as previously discussed, investment performance not only means returns; the volatility or another proxy to risk needs consideration.

The first approximation to this measure is the Jensen's alpha; albeit, if used raw, such a performance measure may not be *consistent* in the sense of Grinold & Kahn (2000) and Villaverde (2010). Therefore, to keep *consistency* and be useful for measure return relative to risk, Jensen's alpha needs an adjustment.

To introduce *consistency* into the performance measure, a technique is proposed. Such a technique involves the calculation of a *rolling window* regression analysis and the use of those results to generate a probability of an excess return. For instance, to calculate a modified Jensen's alpha, we use the 382 original yearly return observations in the sample and, with each sequence of 32 of them, an OLS regression is employed to estimate the excess return[10].

Figure 4 displays the coefficient of determination for the regressions. Recall that the closer to one, the better the goodness-of-fit. In the three indices, r^2 was not close to one. However, the best fit is depicted by the IPC large cap index; that is, the excess return is explained by a modified alpha in a higher degree than the others.

[10] The equation to estimate is the CAPM, $y \equiv r_i - r_f = \alpha + \beta(r_m - r_f) + \varepsilon$. Therefore, the performance measure is relative to the market benchmark, in this case, the IPC index offered the market line r_m. See regression results in Appendix I.

Figure 3. Mexican stock indices prices (2013=100)

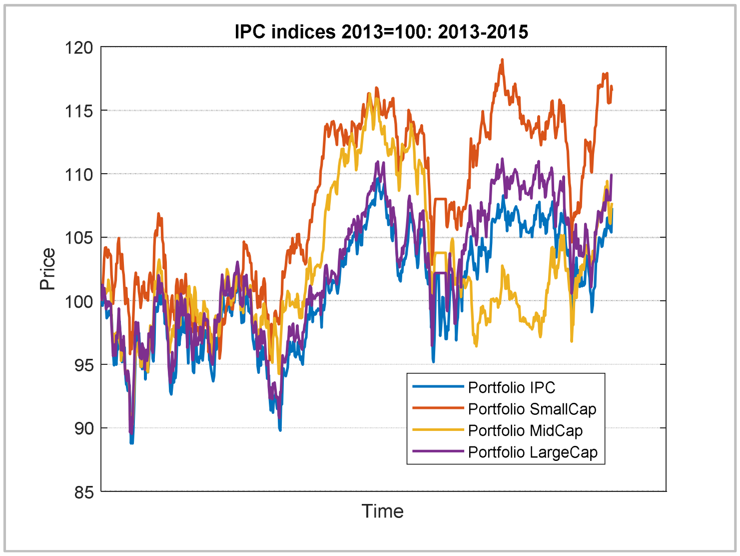


Figure 4. Histograms for r^2

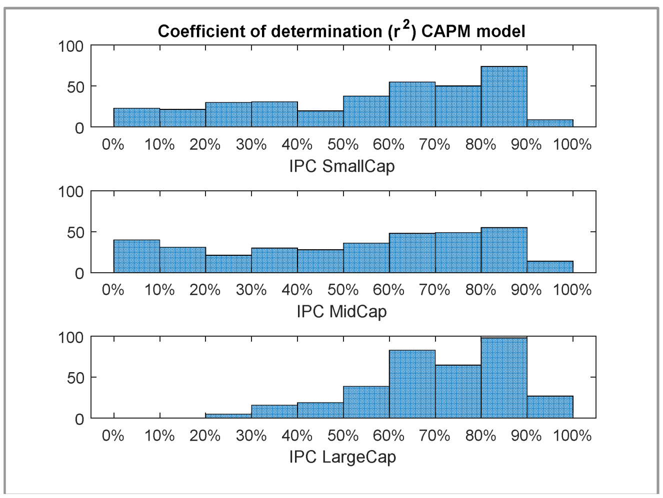
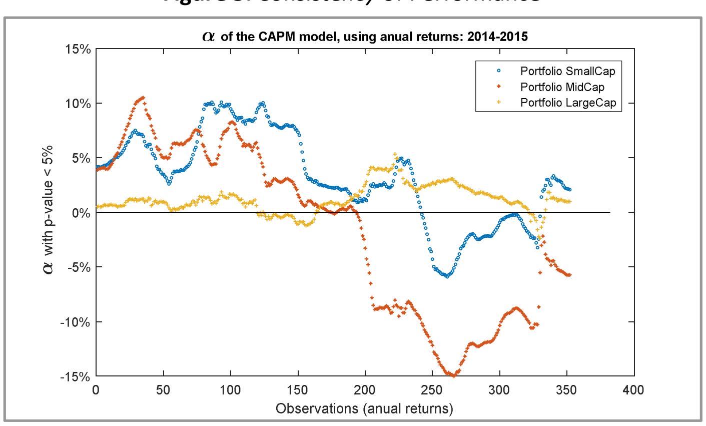


Figure 5 displays a graphical interpretation of *consistency*. In the three indices, performance is *consistent*. In general, positive and negative performances agglomerate and the transition from positive to negative is parsimonious.

Figure 5. *Consistency* of Performance



Once the measure is *consistent*, albeit the goodness-of-fit is somewhat low, to address the research question, a new measure of performance is proposed. Such a new measure consists in taking into account the classical definition of probability in order to establish the best performer as the strategy or index with the highest probability of defeating the market during the analyzed period.

In this instance, starting from the outcome of the 352 regressions in a rolling window basis with each index, a measure of probability of outperforming the benchmark is calculated. Results are shown in Table 3.

Table 3. Probability of beating the benchmark with a rolling window Jensen's alpha

	IPC small cap	IPC mid cap	IPC large cap
Number of significant observations with positive α (*p-value* < 5%)	255	170	297
Number of observations	352	352	352
Probability of positive α	**72%**	**48%**	**84%**

Source: Compiled by the authors with data from SiBolsa (BMV).

The IPC large cap index outperformed the benchmark 84% of the time, as measured by the rolling window Jensen's alpha. It was closely followed by the IPC small cap index with a probability of 72% to outperform the benchmark. Meanwhile, the IPC mid cap index is far behind, with a probability of 48% of outperforming the benchmark, almost that of a coin toss event. Therefore, under in a passive investment strategy for the Mexican stock markets, the two candidates for the best strategy are the IPC small cap and the IPC large cap index. Both of them are *consistently* outperforming the benchmark IPC index; that is, not only they outperform the benchmark on accumulated returns for the full period of time, but also they outperform it most of the time or, more precisely, in most of the rolling windows.

The issue that will be the ultimate reason for deciding between the two indices as the best way to follow a passive investing strategy for Mexican stock market, is the risk taken to perform. Is this excess return over the benchmark worth the additional risk?

A way to answer this question is by using the standard deviation as a proxy of risk. However, as discussed in Section 3, this may induce a mistake; that is, identifying as risk any excess returns over the target. In this case, the measure of *downside risk* offers a better approach to determine the additional risk. A performance measure that uses downside risk is the *Sortino ratio.*

Table 4 displays, in its first section, the results for the raw *Sortino ratio*, which are similar to those obtained in Jensen's alpha estimation. The IPC small cap and the IPC large cap index offer better performance. On one hand, for the IPC small cap index, results indicate that for every unit of risk, measured by the *downside risk,* there are 1.8 points of excess returns over the IPC index. On the other hand, the IPC large cap index outperforms the benchmark IPC index for 1.1 points for each point of *downside risk*. The IPC mid cap index underperforms the benchmark IPC index.

Therefore, under the raw *Sortino index*, the IPC small cap and the IPC large cap index perform better than the benchmark IPC index. Thus, it seems that a solution to the research question is at hand: The small cap index reaches a higher risk-reward profile, making it so far the best strategy for a passive investment strategy.

Table 4. Performance analysis with Sortino ratio

	IPC small cap	IPC mid cap	IPC large cap
Average excess return over IPC index (target)	2.4%	-2.2%	0.8%
Downside Risk (b)	1.3%	5.1%	0.7%
Raw Sortino ratio	1.8	-0.4	1.1
Number of significant observations with positive excess return over IPC Index (target)	287	183	281
Number of observations	382	382	382
Probability of outperforming the IPC index (a)	75%	48%	74%
***Rolling window Sortino ratio* a / b**	56.4	9.4	101.7
Maximum deviation from target (absolute value) (c)	6.4%	16.9%	4.5%
Modified Sortino ratio **(a / c)**	11.7	2.8	16.3

Source: Compiled by the authors with data from SiBolsa (BMV).

However, there are a couple of caveats. First, there is a problem of *consistency* with returns. The same discussion as the *Jensen's alpha* can be applied to the raw *Sortino ratio*; so, using the rolling windows regressions could produce a more consistent measure (see positive alpha probability in Table 3). When this technique is introduced, the new performance indicator, the *rolling window Sortino ratio*, indicates that the best index for the strategy is the IPC large cap index. Second, there is a problem of *consistency* with risk. A lower *downside risk* means that a certain portfolio is less risky on average, which does not mean a smoother ride all the way. Even with a low *downside risk,* there may be events of extreme volatility that may trigger a stop loss when certain index separates from the benchmark index, making the risk measurement *inconsistent,* as the risk exposure may deviate from the market in a way that distort the decision making. To adjust *downside risk* for *consistency*, instead of the *rolling window* estimation employed throughout the paper to calculate excess returns, the proposal includes the calculation and contrast of an extreme risk scenario to discriminate among alternatives. Particularly, the proposal employs the maximum deviation from target to calculate the *modified Sortino ratio*. In sum, when the consistency is introduced to both, excess returns and risk indicators, as Table 4 shows, the best risk-reward relationship is provided by the IPC large cap index, which reaches a *modified Sortino ratio* of 16.1, the highest of the sample, which yields a different result from the *raw Sortino ratio*.

5. Conclusions

In a passive-index-investment strategy, the selection of the index is crucial for performance. In this research paper, a new way to measure index performance is proposed to help fund managers to pick the best indices, which is ever more important under the current ETF investing ubiquity. In the example provided in this paper, the results for the performance analysis of the IPC large cap, the IPC mid cap and the IPC small cap index vs. the benchmark IPC index, are conclusive. When the *rolling window* or the *modified Sortino ratio* were employed to define the best passive investing strategy, the best index changed from the one that would be picked under the *raw Sortino ratio*. For the first two instances, the best index is the IPC large cap; while in the raw version, the best investment strategy is the IPC small cap index. The difference is that, in the first case, the employed measures were *precise*, *stable* and *consistent* and, in the second, they were not.

In this instance, some fund manager using the *raw Sortino ratio* to decide its best way to index a passive investing strategy may face *inconsistent* or *unstable* results that could in turn produce undesired outcomes, even if in the long-run he expects a higher return. Extreme spells of volatility may deter their clients to follow the strategy for enough time to receive its benefits. On the other hand, by using the *rolling window* or the *modified Sortino ratio* for such investment decision, the fund manager reduces the possibility of occurrence of such deviations and still gets the better performance, considering the risk-reward profile, which relates with the probability for a positive alpha. Such results enhance the importance of using an adjusted measure as the ones that we propose, as they comply with Hübner's *precision* and *stability* (Hübner, 2007) and Grinold & Kahn's and Villaverde's *consistency* (Grinold & Kahn, 2000; Villaverde, 2010).

An important question that remains for future research is of an empirical nature: Do current investors prefer consistency in their indexed portfolios? Alternatively, do they just care about the raw traditional measures and are they ready to face a large separation from the benchmark? Where is the line of the passive-indexed investor?

Another matter to address in the future is to test the proposal developed in this paper with other portfolios built using Fama & French (1992) and Carhart (1997) factor models to test for the stability of the measurement.

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Appendix I. Results for Rolling Window CAPM Estimation

Regression (Rolling Window)	Alpha small cap	(1-p value) small cap	r^2 small cap	Alpha mid cap	(1-p value) mid cap	r^2 mid cap	Alpha large cap	(1-p value) large cap	r^2 large cap
1	0.0415	1.0000	0.8045	0.0389	1.0000	0.7852	0.0052	1.0000	0.8654
2	0.0418	1.0000	0.8450	0.0397	1.0000	0.8040	0.0055	1.0000	0.8682
3	0.0413	1.0000	0.8586	0.0403	1.0000	0.8180	0.0053	1.0000	0.8654
4	0.0417	1.0000	0.8667	0.0405	1.0000	0.8429	0.0053	1.0000	0.8713
5	0.0422	1.0000	0.8697	0.0406	1.0000	0.8584	0.0059	1.0000	0.8720
6	0.0431	1.0000	0.8754	0.0410	1.0000	0.8704	0.0070	1.0000	0.8595
7	0.0431	1.0000	0.8517	0.0398	1.0000	0.8632	0.0065	1.0000	0.8689
8	0.0437	1.0000	0.8634	0.0396	1.0000	0.8770	0.0064	1.0000	0.8865
9	0.0445	1.0000	0.8504	0.0400	1.0000	0.8822	0.0063	1.0000	0.8916
10	0.0459	1.0000	0.8390	0.0415	1.0000	0.8864	0.0066	1.0000	0.8714
11	0.0469	1.0000	0.8247	0.0435	1.0000	0.8901	0.0072	1.0000	0.8536
12	0.0474	1.0000	0.8097	0.0449	1.0000	0.8771	0.0064	1.0000	0.8312
13	0.0487	1.0000	0.7935	0.0482	1.0000	0.8521	0.0064	1.0000	0.8139
14	0.0501	1.0000	0.7593	0.0513	1.0000	0.8005	0.0064	1.0000	0.8023
15	0.0507	1.0000	0.7448	0.0530	1.0000	0.7775	0.0060	1.0000	0.7984
16	0.0504	1.0000	0.7425	0.0545	1.0000	0.7687	0.0049	1.0000	0.7959
17	0.0523	1.0000	0.7334	0.0591	1.0000	0.7539	0.0057	1.0000	0.7914
18	0.0533	1.0000	0.7244	0.0620	1.0000	0.7414	0.0060	1.0000	0.7845
19	0.0545	1.0000	0.7195	0.0646	1.0000	0.7363	0.0055	1.0000	0.7854
20	0.0566	1.0000	0.7314	0.0680	1.0000	0.7618	0.0065	1.0000	0.7862
21	0.0583	1.0000	0.7100	0.0710	1.0000	0.7601	0.0063	1.0000	0.7739
22	0.0613	1.0000	0.7136	0.0756	1.0000	0.7675	0.0090	1.0000	0.7699
23	0.0639	1.0000	0.6531	0.0787	1.0000	0.7347	0.0108	1.0000	0.7386
24	0.0649	1.0000	0.5883	0.0812	1.0000	0.6869	0.0109	1.0000	0.6965
25	0.0686	1.0000	0.4934	0.0860	1.0000	0.6376	0.0125	1.0000	0.6545
26	0.0697	0.9999	0.4344	0.0887	1.0000	0.5914	0.0117	1.0000	0.6348
27	0.0726	0.9998	0.3831	0.0925	1.0000	0.5732	0.0119	1.0000	0.6223
28	0.0737	0.9995	0.3472	0.0951	1.0000	0.5612	0.0109	1.0000	0.6258
29	0.0751	0.9985	0.2963	0.0992	1.0000	0.6124	0.0125	1.0000	0.6041
30	0.0731	0.9988	0.3062	0.1013	1.0000	0.5910	0.0109	1.0000	0.6115
31	0.0717	0.9989	0.3113	0.1015	1.0000	0.5693	0.0110	1.0000	0.6086
32	0.0719	0.9987	0.3027	0.1028	1.0000	0.5743	0.0113	1.0000	0.6059
33	0.0713	0.9988	0.3070	0.1035	1.0000	0.5692	0.0118	1.0000	0.5904

Regression (Rolling Window)	Alpha small cap	(1-p value) small cap	r^2 small cap	Alpha mid cap	(1-p value) mid cap	r^2 mid cap	Alpha large cap	(1-p value) large cap	r^2 large cap
34	0.0712	0.9986	0.3016	0.1045	1.0000	0.4764	0.0123	1.0000	0.5959
35	0.0695	0.9985	0.2971	0.1050	0.9995	0.3434	0.0123	1.0000	0.5711
36	0.0647	0.9993	0.3326	0.0996	0.9992	0.3250	0.0097	1.0000	0.5812
37	0.0611	1.0000	0.4482	0.0937	0.9998	0.3820	0.0107	1.0000	0.6390
38	0.0602	0.9998	0.3864	0.0897	0.9997	0.3667	0.0107	1.0000	0.6103
39	0.0621	0.9994	0.3379	0.0883	0.9992	0.3272	0.0131	1.0000	0.5776
40	0.0620	0.9944	0.2362	0.0859	0.9967	0.2606	0.0124	1.0000	0.5088
41	0.0576	0.9954	0.2458	0.0791	0.9980	0.2855	0.0062	1.0000	0.5740
42	0.0536	0.9992	0.3271	0.0750	0.9995	0.3486	0.0072	1.0000	0.6260
43	0.0521	0.9996	0.3576	0.0723	0.9998	0.3808	0.0095	1.0000	0.6439
44	0.0493	0.9998	0.3817	0.0681	0.9999	0.4092	0.0110	1.0000	0.6364
45	0.0421	1.0000	0.4914	0.0599	1.0000	0.4887	0.0090	1.0000	0.6429
46	0.0396	1.0000	0.5466	0.0574	1.0000	0.5223	0.0084	1.0000	0.6513
47	0.0392	1.0000	0.5615	0.0574	1.0000	0.5277	0.0098	1.0000	0.6607
48	0.0368	1.0000	0.6172	0.0528	1.0000	0.5981	0.0100	1.0000	0.6455
49	0.0350	1.0000	0.6711	0.0504	1.0000	0.6351	0.0094	1.0000	0.6539
50	0.0349	1.0000	0.6807	0.0500	1.0000	0.6553	0.0095	1.0000	0.6472
51	0.0332	1.0000	0.6236	0.0501	1.0000	0.6630	0.0091	1.0000	0.6548
52	0.0317	1.0000	0.6470	0.0506	1.0000	0.6700	0.0086	1.0000	0.6892
53	0.0286	1.0000	0.6937	0.0493	1.0000	0.7173	0.0069	1.0000	0.7228
54	0.0261	1.0000	0.7336	0.0502	1.0000	0.7339	0.0040	1.0000	0.7527
55	0.0280	1.0000	0.7606	0.0535	1.0000	0.7435	0.0025	1.0000	0.8131
56	0.0316	1.0000	0.7599	0.0590	1.0000	0.6957	0.0012	1.0000	0.8655
57	0.0358	1.0000	0.7281	0.0626	1.0000	0.6764	0.0029	1.0000	0.8750
58	0.0374	1.0000	0.7196	0.0633	1.0000	0.6996	0.0035	1.0000	0.8818
59	0.0372	1.0000	0.7373	0.0628	1.0000	0.7400	0.0024	1.0000	0.8863
60	0.0377	1.0000	0.7660	0.0635	1.0000	0.7584	0.0029	1.0000	0.9104
61	0.0374	1.0000	0.7879	0.0624	1.0000	0.7988	0.0031	1.0000	0.9182
62	0.0377	1.0000	0.8008	0.0621	1.0000	0.8147	0.0034	1.0000	0.9233
63	0.0390	1.0000	0.7810	0.0632	1.0000	0.7793	0.0053	1.0000	0.8976
64	0.0383	1.0000	0.7845	0.0621	1.0000	0.7782	0.0043	1.0000	0.8952
65	0.0386	1.0000	0.7831	0.0623	1.0000	0.7792	0.0041	1.0000	0.8949
66	0.0399	1.0000	0.7814	0.0635	1.0000	0.7878	0.0058	1.0000	0.8964
67	0.0412	1.0000	0.7824	0.0651	1.0000	0.7901	0.0072	1.0000	0.9007
68	0.0421	1.0000	0.7724	0.0660	1.0000	0.7810	0.0065	1.0000	0.8991
69	0.0437	1.0000	0.7635	0.0666	1.0000	0.7530	0.0065	1.0000	0.8904
70	0.0454	1.0000	0.7532	0.0677	1.0000	0.7427	0.0066	1.0000	0.8856
71	0.0489	1.0000	0.7435	0.0699	1.0000	0.7373	0.0086	1.0000	0.8844
72	0.0528	1.0000	0.7222	0.0727	1.0000	0.7128	0.0106	1.0000	0.8744
73	0.0570	1.0000	0.6735	0.0749	1.0000	0.6742	0.0097	1.0000	0.8634
74	0.0596	1.0000	0.6391	0.0755	1.0000	0.6221	0.0067	1.0000	0.8458
75	0.0645	1.0000	0.6151	0.0751	1.0000	0.6104	0.0095	1.0000	0.8354

Regression (Rolling Window)	Alpha small cap	(1-p value) small cap	r^2 small cap	Alpha mid cap	(1-p value) mid cap	r^2 mid cap	Alpha large cap	(1-p value) large cap	r^2 large cap
76	0.0718	1.0000	0.5713	0.0749	1.0000	0.5825	0.0116	1.0000	0.8185
77	0.0782	1.0000	0.4938	0.0737	1.0000	0.5625	0.0142	1.0000	0.7866
78	0.0831	0.9999	0.4320	0.0703	1.0000	0.4827	0.0137	1.0000	0.7047
79	0.0863	0.9998	0.3856	0.0622	1.0000	0.5447	0.0105	1.0000	0.7143
80	0.0945	0.9984	0.2946	0.0604	1.0000	0.5713	0.0143	1.0000	0.6994
81	0.0987	0.9939	0.2315	0.0557	1.0000	0.6047	0.0133	1.0000	0.6991
82	0.0982	0.9950	0.2419	0.0519	1.0000	0.6356	0.0130	1.0000	0.7003
83	0.0995	0.9920	0.2186	0.0495	1.0000	0.6645	0.0140	1.0000	0.6930
84	0.0994	0.9921	0.2191	0.0474	1.0000	0.6914	0.0132	1.0000	0.6953
85	0.0992	0.9937	0.2306	0.0446	1.0000	0.6860	0.0109	1.0000	0.6906
86	0.1008	0.9899	0.2070	0.0432	1.0000	0.6980	0.0078	1.0000	0.6951
87	0.0988	0.9955	0.2461	0.0439	1.0000	0.7045	0.0088	1.0000	0.7033
88	0.0947	0.9991	0.3199	0.0444	1.0000	0.6997	0.0096	1.0000	0.6964
89	0.0911	0.9998	0.3830	0.0443	1.0000	0.6937	0.0082	1.0000	0.6958
90	0.0919	0.9997	0.3675	0.0492	1.0000	0.6602	0.0108	1.0000	0.6983
91	0.0934	0.9988	0.3073	0.0524	1.0000	0.5917	0.0118	1.0000	0.6554
92	0.0977	0.9866	0.1929	0.0601	0.9999	0.4335	0.0155	1.0000	0.5876
93	0.0000	0.9078	0.0947	0.0675	0.9977	0.2780	0.0186	1.0000	0.4708
94	0.0976	0.9514	0.1275	0.0711	0.9799	0.1726	0.0154	1.0000	0.4495
95	0.0968	0.9679	0.1488	0.0736	0.9547	0.1311	0.0142	1.0000	0.4547
96	0.0972	0.9709	0.1538	0.0000	0.9432	0.1195	0.0136	1.0000	0.4516
97	0.0988	0.9542	0.1305	0.0000	0.9396	0.1163	0.0131	1.0000	0.4744
98	0.0977	0.9705	0.1532	0.0000	0.8792	0.0809	0.0135	1.0000	0.4428
99	0.0989	0.9540	0.1303	0.0000	0.6772	0.0337	0.0166	0.9998	0.3866
100	0.0947	0.9894	0.2047	0.0000	0.6152	0.0261	0.0164	0.9996	0.3582
101	0.0925	0.9961	0.2532	0.0000	0.5735	0.0219	0.0161	0.9996	0.3585
102	0.0904	0.9986	0.2994	0.0000	0.6214	0.0268	0.0167	0.9996	0.3528
103	0.0877	0.9994	0.3370	0.0000	0.7043	0.0376	0.0155	0.9996	0.3581
104	0.0868	0.9999	0.3973	0.0000	0.8939	0.0875	0.0151	0.9998	0.3957
105	0.0844	1.0000	0.4908	0.0723	0.9622	0.1404	0.0138	1.0000	0.4515
106	0.0864	1.0000	0.5045	0.0698	0.9839	0.1839	0.0120	1.0000	0.4932
107	0.0866	1.0000	0.5342	0.0676	0.9936	0.2295	0.0110	1.0000	0.5276
108	0.0868	1.0000	0.5466	0.0662	0.9966	0.2604	0.0120	1.0000	0.5490
109	0.0829	1.0000	0.6597	0.0607	0.9998	0.3795	0.0080	1.0000	0.6538
110	0.0836	1.0000	0.6454	0.0630	0.9995	0.3444	0.0090	1.0000	0.6105
111	0.0810	1.0000	0.6750	0.0605	0.9996	0.3509	0.0049	1.0000	0.6463
112	0.0842	1.0000	0.6358	0.0616	0.9996	0.3611	0.0083	1.0000	0.6104
113	0.0844	1.0000	0.6321	0.0619	0.9997	0.3696	0.0083	1.0000	0.6110
114	0.0849	1.0000	0.6203	0.0618	0.9998	0.3766	0.0093	1.0000	0.6167
115	0.0841	1.0000	0.6215	0.0597	0.9999	0.4017	0.0097	1.0000	0.5930
116	0.0834	1.0000	0.6423	0.0566	1.0000	0.5324	0.0082	1.0000	0.6396
117	0.0845	1.0000	0.5898	0.0599	1.0000	0.5580	0.0106	1.0000	0.6539

Regression (Rolling Window)	Alpha small cap	(1-p value) small cap	r^2 small cap	Alpha mid cap	(1-p value) mid cap	r^2 mid cap	Alpha large cap	(1-p value) large cap	r^2 large cap
118	0.0858	1.0000	0.5403	0.0628	1.0000	0.4798	0.0113	1.0000	0.5841
119	0.0916	1.0000	0.4720	0.0638	1.0000	0.4525	0.0062	1.0000	0.5837
120	0.0946	1.0000	0.5213	0.0589	1.0000	0.5152	-0.0008	1.0000	0.6263
121	0.0962	1.0000	0.5850	0.0532	1.0000	0.6387	-0.0030	1.0000	0.7137
122	0.0992	1.0000	0.6213	0.0504	1.0000	0.7125	-0.0004	1.0000	0.7467
123	0.0989	1.0000	0.6609	0.0450	1.0000	0.7848	-0.0028	1.0000	0.7845
124	0.1004	1.0000	0.7538	0.0417	1.0000	0.8188	0.0001	1.0000	0.8022
125	0.0975	1.0000	0.7529	0.0346	1.0000	0.8451	-0.0011	1.0000	0.8223
126	0.0932	1.0000	0.7523	0.0277	1.0000	0.8542	-0.0035	1.0000	0.8401
127	0.0881	1.0000	0.7804	0.0241	1.0000	0.8775	-0.0064	1.0000	0.8649
128	0.0874	1.0000	0.8242	0.0266	1.0000	0.8911	-0.0035	1.0000	0.8736
129	0.0826	1.0000	0.8275	0.0245	1.0000	0.9070	-0.0058	1.0000	0.8892
130	0.0798	1.0000	0.8573	0.0258	1.0000	0.9178	-0.0057	1.0000	0.9085
131	0.0800	1.0000	0.8739	0.0286	1.0000	0.9123	-0.0036	1.0000	0.9051
132	0.0809	1.0000	0.8756	0.0305	1.0000	0.9074	-0.0021	1.0000	0.8952
133	0.0806	1.0000	0.8760	0.0306	1.0000	0.9081	-0.0017	1.0000	0.8932
134	0.0794	1.0000	0.8746	0.0296	1.0000	0.9125	-0.0027	1.0000	0.8995
135	0.0786	1.0000	0.8679	0.0288	1.0000	0.9055	-0.0035	1.0000	0.8903
136	0.0777	1.0000	0.8594	0.0282	1.0000	0.9004	-0.0040	1.0000	0.8847
137	0.0773	1.0000	0.8574	0.0276	1.0000	0.8933	-0.0046	1.0000	0.8766
138	0.0771	1.0000	0.8585	0.0277	1.0000	0.8853	-0.0047	1.0000	0.8674
139	0.0781	1.0000	0.8640	0.0288	1.0000	0.8665	-0.0038	1.0000	0.8462
140	0.0790	1.0000	0.8619	0.0295	1.0000	0.8471	-0.0033	1.0000	0.8197
141	0.0800	1.0000	0.8696	0.0307	1.0000	0.8421	-0.0023	1.0000	0.7995
142	0.0801	1.0000	0.8696	0.0309	1.0000	0.8397	-0.0019	1.0000	0.7943
143	0.0792	1.0000	0.8654	0.0302	1.0000	0.8372	-0.0027	1.0000	0.7945
144	0.0789	1.0000	0.8521	0.0292	1.0000	0.8230	-0.0029	1.0000	0.7723
145	0.0788	1.0000	0.8420	0.0284	1.0000	0.8003	-0.0033	1.0000	0.7256
146	0.0793	1.0000	0.8318	0.0282	1.0000	0.7494	-0.0035	1.0000	0.6586
147	0.0781	1.0000	0.7845	0.0255	1.0000	0.7135	-0.0056	1.0000	0.6057
148	0.0763	1.0000	0.7403	0.0229	1.0000	0.6567	-0.0086	1.0000	0.5324
149	0.0754	1.0000	0.6692	0.0208	1.0000	0.5629	-0.0102	0.9999	0.4324
150	0.0733	1.0000	0.5958	0.0161	1.0000	0.4502	-0.0110	0.9996	0.3559
151	0.0707	1.0000	0.5202	0.0138	0.9998	0.3767	-0.0086	0.9995	0.3483
152	0.0628	0.9999	0.4156	0.0102	0.9994	0.3382	-0.0085	0.9996	0.3515
153	0.0553	0.9995	0.3463	0.0082	0.9992	0.3271	-0.0092	0.9994	0.3416
154	0.0474	0.9957	0.2484	0.0066	0.9985	0.2972	-0.0085	0.9995	0.3430
155	0.0398	0.9859	0.1905	0.0058	0.9981	0.2858	-0.0113	0.9986	0.3022
156	0.0352	0.9523	0.1285	0.0068	0.9982	0.2886	-0.0120	0.9972	0.2682
157	0.0000	0.8991	0.0901	0.0098	0.9997	0.3682	-0.0113	0.9975	0.2735
158	0.0000	0.8788	0.0808	0.0103	0.9999	0.4195	-0.0112	0.9984	0.2957
159	0.0000	0.9299	0.1087	0.0104	0.9999	0.3987	-0.0104	0.9979	0.2814

Regression (Rolling Window)	Alpha small cap	(1-p value) small cap	r^2 small cap	Alpha mid cap	(1-p value) mid cap	r^2 mid cap	Alpha large cap	(1-p value) large cap	r^2 large cap
160	0.0000	0.9051	0.0932	0.0100	1.0000	0.4521	-0.0092	0.9992	0.3280
161	0.0000	0.8102	0.0585	0.0082	0.9998	0.3930	-0.0088	0.9985	0.2970
162	0.0000	0.7807	0.0516	0.0068	0.9989	0.3120	-0.0063	0.9988	0.3089
163	0.0000	0.9405	0.1171	0.0076	0.9999	0.3958	-0.0011	0.9999	0.4141
164	0.0285	0.9818	0.1776	0.0068	1.0000	0.4432	0.0016	1.0000	0.5312
165	0.0257	0.9727	0.1570	0.0047	0.9997	0.3641	0.0009	1.0000	0.5607
166	0.0253	0.9794	0.1713	0.0050	0.9998	0.3850	0.0040	1.0000	0.6098
167	0.0256	0.9931	0.2258	0.0055	0.9999	0.4331	0.0064	1.0000	0.6691
168	0.0246	0.9963	0.2564	0.0041	0.9997	0.3633	0.0063	1.0000	0.7009
169	0.0244	0.9980	0.2838	0.0037	0.9993	0.3315	0.0074	1.0000	0.7132
170	0.0247	0.9995	0.3461	0.0031	0.9966	0.2596	0.0080	1.0000	0.7259
171	0.0240	0.9999	0.4098	0.0019	0.9507	0.1267	0.0078	1.0000	0.7441
172	0.0233	1.0000	0.4795	0.0000	0.8464	0.0689	0.0080	1.0000	0.7662
173	0.0228	1.0000	0.5455	0.0000	0.7560	0.0465	0.0087	1.0000	0.7792
174	0.0228	1.0000	0.6488	0.0000	0.8717	0.0779	0.0093	1.0000	0.8000
175	0.0226	1.0000	0.7201	0.0000	0.9301	0.1089	0.0094	1.0000	0.8244
176	0.0226	1.0000	0.7776	-0.0005	0.9521	0.1283	0.0089	1.0000	0.8595
177	0.0220	1.0000	0.8396	-0.0016	0.9875	0.1966	0.0074	1.0000	0.8906
178	0.0229	1.0000	0.8240	0.0000	0.9375	0.1146	0.0083	1.0000	0.8953
179	0.0227	1.0000	0.8225	0.0000	0.6462	0.0297	0.0082	1.0000	0.8997
180	0.0223	1.0000	0.8271	0.0000	0.2817	0.0046	0.0082	1.0000	0.8934
181	0.0215	1.0000	0.8315	0.0000	0.7788	0.0511	0.0073	1.0000	0.8964
182	0.0206	1.0000	0.8351	0.0000	0.9207	0.1024	0.0058	1.0000	0.9093
183	0.0210	1.0000	0.8426	0.0036	0.9812	0.1761	0.0064	1.0000	0.9060
184	0.0211	1.0000	0.8418	0.0032	0.9839	0.1837	0.0067	1.0000	0.9045
185	0.0214	1.0000	0.8379	0.0024	0.9808	0.1748	0.0071	1.0000	0.9018
186	0.0214	1.0000	0.8337	0.0024	0.9840	0.1841	0.0091	1.0000	0.8905
187	0.0193	1.0000	0.8399	0.0036	0.9923	0.2207	0.0090	1.0000	0.8875
188	0.0176	1.0000	0.8431	0.0051	0.9968	0.2633	0.0109	1.0000	0.8837
189	0.0167	1.0000	0.8445	0.0055	0.9938	0.2311	0.0144	1.0000	0.8885
190	0.0113	1.0000	0.8674	0.0051	0.9505	0.1266	0.0117	1.0000	0.8706
191	0.0114	1.0000	0.8595	0.0000	0.7412	0.0437	0.0133	1.0000	0.8683
192	0.0110	1.0000	0.8520	0.0000	0.5937	0.0239	0.0160	1.0000	0.8365
193	0.0108	1.0000	0.8400	0.0000	0.5688	0.0215	0.0161	1.0000	0.8254
194	0.0091	1.0000	0.8327	0.0000	0.4537	0.0127	0.0146	1.0000	0.8155
195	0.0093	1.0000	0.8202	0.0000	0.3175	0.0059	0.0151	1.0000	0.7997
196	0.0128	1.0000	0.8187	0.0000	0.1322	0.0010	0.0195	1.0000	0.8136
197	0.0106	1.0000	0.8090	0.0000	0.3303	0.0064	0.0188	1.0000	0.7945
198	0.0100	1.0000	0.7987	0.0000	0.6718	0.0330	0.0194	1.0000	0.7782
199	0.0123	1.0000	0.7849	0.0000	0.7456	0.0445	0.0236	1.0000	0.7807
200	0.0120	1.0000	0.7520	0.0000	0.8906	0.0860	0.0258	1.0000	0.7471
201	0.0108	1.0000	0.7275	-0.0427	0.9679	0.1488	0.0282	1.0000	0.7210

Regression (Rolling Window)	Alpha small cap	(1-p value) small cap	r^2 small cap	Alpha mid cap	(1-p value) mid cap	r^2 mid cap	Alpha large cap	(1-p value) large cap	r^2 large cap
202	0.0157	1.0000	0.7026	-0.0477	0.9823	0.1791	0.0349	1.0000	0.6810
203	0.0195	1.0000	0.6459	-0.0555	0.9924	0.2212	0.0381	1.0000	0.6270
204	0.0249	1.0000	0.5924	-0.0650	0.9984	0.2934	0.0411	1.0000	0.5791
205	0.0236	1.0000	0.5674	-0.0782	1.0000	0.4385	0.0406	1.0000	0.5574
206	0.0261	1.0000	0.5584	-0.0850	1.0000	0.5527	0.0412	1.0000	0.5497
207	0.0235	1.0000	0.5655	-0.0889	1.0000	0.6274	0.0395	1.0000	0.5550
208	0.0243	1.0000	0.5656	-0.0882	1.0000	0.6509	0.0388	1.0000	0.5713
209	0.0238	1.0000	0.5916	-0.0883	1.0000	0.6804	0.0401	1.0000	0.5614
210	0.0249	1.0000	0.6176	-0.0880	1.0000	0.6802	0.0403	1.0000	0.5576
211	0.0251	1.0000	0.6048	-0.0869	1.0000	0.6399	0.0399	1.0000	0.5632
212	0.0247	1.0000	0.6184	-0.0873	1.0000	0.6474	0.0395	1.0000	0.5673
213	0.0254	1.0000	0.6640	-0.0876	1.0000	0.6385	0.0393	1.0000	0.5637
214	0.0269	1.0000	0.6647	-0.0877	1.0000	0.6446	0.0390	1.0000	0.5815
215	0.0254	1.0000	0.6838	-0.0862	1.0000	0.6262	0.0399	1.0000	0.5774
216	0.0236	1.0000	0.6960	-0.0856	1.0000	0.5860	0.0398	1.0000	0.5735
217	0.0229	1.0000	0.7112	-0.0871	1.0000	0.6012	0.0375	1.0000	0.6233
218	0.0227	1.0000	0.7103	-0.0891	1.0000	0.6006	0.0385	1.0000	0.6184
219	0.0233	1.0000	0.6902	-0.0920	1.0000	0.6228	0.0400	1.0000	0.5939
220	0.0246	1.0000	0.6696	-0.0914	1.0000	0.6080	0.0405	1.0000	0.5351
221	0.0286	1.0000	0.6617	-0.0863	1.0000	0.6100	0.0436	1.0000	0.5793
222	0.0350	1.0000	0.5123	-0.0802	1.0000	0.4738	0.0533	1.0000	0.4434
223	0.0414	0.9995	0.3439	-0.0847	0.9999	0.4178	0.0494	0.9998	0.3834
224	0.0469	0.9970	0.2660	-0.0861	0.9999	0.4093	0.0495	0.9992	0.3262
225	0.0479	0.9965	0.2584	-0.0950	1.0000	0.4992	0.0385	0.9999	0.4072
226	0.0491	0.9985	0.2989	-0.0873	1.0000	0.5058	0.0384	1.0000	0.4879
227	0.0496	0.9986	0.3023	-0.0874	1.0000	0.5160	0.0389	1.0000	0.4977
228	0.0464	0.9992	0.3285	-0.0918	1.0000	0.5318	0.0309	1.0000	0.5301
229	0.0436	0.9999	0.3962	-0.0918	1.0000	0.5757	0.0265	1.0000	0.6053
230	0.0453	1.0000	0.4404	-0.0880	1.0000	0.5917	0.0271	1.0000	0.6419
231	0.0467	1.0000	0.4902	-0.0833	1.0000	0.5808	0.0288	1.0000	0.6474
232	0.0476	1.0000	0.5136	-0.0815	1.0000	0.5896	0.0273	1.0000	0.6506
233	0.0444	1.0000	0.5089	-0.0826	1.0000	0.5996	0.0249	1.0000	0.6893
234	0.0402	1.0000	0.5306	-0.0842	1.0000	0.6225	0.0247	1.0000	0.6981
235	0.0357	1.0000	0.5291	-0.0865	1.0000	0.6324	0.0234	1.0000	0.7149
236	0.0295	1.0000	0.5373	-0.0888	1.0000	0.6476	0.0219	1.0000	0.7249
237	0.0256	1.0000	0.5674	-0.0898	1.0000	0.6693	0.0217	1.0000	0.7390
238	0.0190	1.0000	0.5875	-0.0929	1.0000	0.6887	0.0191	1.0000	0.7533
239	0.0146	1.0000	0.6344	-0.0935	1.0000	0.7158	0.0209	1.0000	0.7620
240	0.0093	1.0000	0.6544	-0.0953	1.0000	0.7340	0.0213	1.0000	0.7937
241	0.0048	1.0000	0.6577	-0.0974	1.0000	0.7497	0.0219	1.0000	0.7984
242	-0.0017	1.0000	0.6776	-0.1016	1.0000	0.8167	0.0241	1.0000	0.7668
243	-0.0050	1.0000	0.6128	-0.1039	1.0000	0.7929	0.0240	1.0000	0.7609

Regression (Rolling Window)	Alpha small cap	(1-p value) small cap	r^2 small cap	Alpha mid cap	(1-p value) mid cap	r^2 mid cap	Alpha large cap	(1-p value) large cap	r^2 large cap
244	-0.0104	1.0000	0.5903	-0.1076	1.0000	0.8148	0.0233	1.0000	0.7574
245	-0.0144	1.0000	0.5964	-0.1096	1.0000	0.8243	0.0240	1.0000	0.7600
246	-0.0199	1.0000	0.5960	-0.1118	1.0000	0.8172	0.0247	1.0000	0.7651
247	-0.0251	1.0000	0.5865	-0.1137	1.0000	0.7976	0.0254	1.0000	0.7629
248	-0.0336	1.0000	0.6275	-0.1184	1.0000	0.8060	0.0246	1.0000	0.7449
249	-0.0359	1.0000	0.6411	-0.1186	1.0000	0.8014	0.0261	1.0000	0.7326
250	-0.0429	1.0000	0.6832	-0.1216	1.0000	0.8011	0.0272	1.0000	0.7011
251	-0.0495	1.0000	0.7198	-0.1278	1.0000	0.8260	0.0267	1.0000	0.7059
252	-0.0523	1.0000	0.7127	-0.1299	1.0000	0.8147	0.0259	1.0000	0.7015
253	-0.0516	1.0000	0.7097	-0.1309	1.0000	0.8146	0.0279	1.0000	0.6861
254	-0.0533	1.0000	0.6841	-0.1337	1.0000	0.7859	0.0288	1.0000	0.6456
255	-0.0541	1.0000	0.6546	-0.1370	1.0000	0.7709	0.0283	1.0000	0.6470
256	-0.0553	1.0000	0.6431	-0.1395	1.0000	0.7526	0.0275	1.0000	0.6608
257	-0.0567	1.0000	0.6756	-0.1412	1.0000	0.7794	0.0285	1.0000	0.6556
258	-0.0568	1.0000	0.6576	-0.1426	1.0000	0.7589	0.0293	1.0000	0.6290
259	-0.0568	1.0000	0.6217	-0.1450	1.0000	0.7320	0.0286	1.0000	0.6547
260	-0.0580	1.0000	0.6343	-0.1467	1.0000	0.7058	0.0288	1.0000	0.6542
261	-0.0589	1.0000	0.6862	-0.1480	1.0000	0.7146	0.0294	1.0000	0.6257
262	-0.0572	1.0000	0.6761	-0.1466	1.0000	0.6497	0.0300	1.0000	0.6100
263	-0.0564	1.0000	0.6294	-0.1479	1.0000	0.5966	0.0302	1.0000	0.5730
264	-0.0555	1.0000	0.5807	-0.1487	1.0000	0.5388	0.0305	1.0000	0.5363
265	-0.0536	1.0000	0.5365	-0.1490	1.0000	0.5016	0.0307	1.0000	0.4962
266	-0.0508	1.0000	0.4781	-0.1498	1.0000	0.4705	0.0292	1.0000	0.4713
267	-0.0475	0.9999	0.4377	-0.1485	1.0000	0.4566	0.0272	1.0000	0.5214
268	-0.0433	0.9999	0.4225	-0.1462	1.0000	0.4546	0.0276	1.0000	0.5342
269	-0.0414	0.9999	0.3961	-0.1463	1.0000	0.4498	0.0252	1.0000	0.5983
270	-0.0380	0.9998	0.3798	-0.1446	1.0000	0.4753	0.0235	1.0000	0.6498
271	-0.0331	0.9958	0.2495	-0.1392	0.9999	0.3992	0.0247	1.0000	0.6509
272	-0.0313	0.9868	0.1939	-0.1369	0.9996	0.3511	0.0243	1.0000	0.6594
273	-0.0304	0.9736	0.1588	-0.1353	0.9991	0.3191	0.0237	1.0000	0.6723
274	0.0000	0.6814	0.0343	-0.1317	0.9829	0.1807	0.0228	1.0000	0.6707
275	0.0000	0.2799	0.0045	0.0000	0.7771	0.0508	0.0222	1.0000	0.6903
276	0.0000	0.8383	0.0664	0.0000	0.1636	0.0015	0.0219	1.0000	0.6880
277	-0.0217	0.9595	0.1369	0.0000	0.5665	0.0213	0.0213	1.0000	0.6917
278	-0.0204	0.9811	0.1757	0.0000	0.8326	0.0647	0.0208	1.0000	0.7455
279	-0.0199	0.9875	0.1965	0.0000	0.8529	0.0711	0.0194	1.0000	0.7255
280	-0.0196	0.9947	0.2382	0.0000	0.9250	0.1052	0.0197	1.0000	0.7557
281	-0.0209	0.9772	0.1663	0.0000	0.8945	0.0878	0.0178	1.0000	0.7750
282	0.0000	0.7801	0.0514	0.0000	0.8357	0.0656	0.0166	1.0000	0.8358
283	0.0000	0.3576	0.0075	0.0000	0.8304	0.0640	0.0177	1.0000	0.8495
284	0.0000	0.1947	0.0021	0.0000	0.8830	0.0826	0.0179	1.0000	0.8614
285	0.0000	0.0767	0.0003	0.0000	0.9320	0.1103	0.0178	1.0000	0.8693

Regression (Rolling Window)	Alpha small cap	(1-p value) small cap	r^2 small cap	Alpha mid cap	(1-p value) mid cap	r^2 mid cap	Alpha large cap	(1-p value) large cap	r^2 large cap
286	0.0000	0.3590	0.0076	-0.1215	0.9734	0.1584	0.0183	1.0000	0.8514
287	0.0000	0.3407	0.0068	-0.1206	0.9746	0.1608	0.0183	1.0000	0.8496
288	0.0000	0.3112	0.0056	-0.1198	0.9755	0.1625	0.0175	1.0000	0.8463
289	0.0000	0.2784	0.0044	-0.1192	0.9841	0.1844	0.0170	1.0000	0.8414
290	0.0000	0.1189	0.0008	-0.1190	0.9886	0.2012	0.0167	1.0000	0.8325
291	0.0000	0.0993	0.0005	-0.1186	0.9897	0.2060	0.0166	1.0000	0.8177
292	0.0000	0.3064	0.0054	-0.1185	0.9931	0.2258	0.0160	1.0000	0.7988
293	0.0000	0.3936	0.0093	-0.1186	0.9914	0.2151	0.0152	1.0000	0.6819
294	0.0000	0.2742	0.0043	-0.1181	0.9660	0.1459	0.0143	1.0000	0.6774
295	0.0000	0.9143	0.0984	0.0000	0.7918	0.0540	0.0140	1.0000	0.6779
296	-0.0180	0.9932	0.2263	0.0000	0.3817	0.0087	0.0137	1.0000	0.6898
297	-0.0161	0.9997	0.3660	0.0000	0.1857	0.0019	0.0137	1.0000	0.6943
298	-0.0141	1.0000	0.4850	0.0000	0.6844	0.0347	0.0135	1.0000	0.7078
299	-0.0121	1.0000	0.5740	0.0000	0.9473	0.1234	0.0127	1.0000	0.7349
300	-0.0092	1.0000	0.6938	-0.1035	0.9991	0.3206	0.0135	1.0000	0.7666
301	-0.0072	1.0000	0.7575	-0.1002	1.0000	0.5124	0.0145	1.0000	0.8122
302	-0.0063	1.0000	0.8237	-0.0978	1.0000	0.6563	0.0137	1.0000	0.8677
303	-0.0061	1.0000	0.8550	-0.0961	1.0000	0.7556	0.0119	1.0000	0.8756
304	-0.0046	1.0000	0.8873	-0.0940	1.0000	0.8226	0.0115	1.0000	0.8815
305	-0.0041	1.0000	0.8978	-0.0931	1.0000	0.8378	0.0102	1.0000	0.8688
306	-0.0039	1.0000	0.8962	-0.0925	1.0000	0.8425	0.0094	1.0000	0.8709
307	-0.0032	1.0000	0.8985	-0.0922	1.0000	0.8217	0.0086	1.0000	0.8680
308	-0.0027	1.0000	0.8925	-0.0916	1.0000	0.8218	0.0082	1.0000	0.8608
309	-0.0026	1.0000	0.8916	-0.0908	1.0000	0.8199	0.0076	1.0000	0.8588
310	-0.0018	1.0000	0.8918	-0.0885	1.0000	0.8400	0.0087	1.0000	0.8649
311	-0.0026	1.0000	0.8948	-0.0885	1.0000	0.8387	0.0084	1.0000	0.8640
312	-0.0018	1.0000	0.8993	-0.0874	1.0000	0.8406	0.0095	1.0000	0.8759
313	-0.0024	1.0000	0.8983	-0.0879	1.0000	0.8187	0.0099	1.0000	0.8834
314	-0.0040	1.0000	0.8918	-0.0887	1.0000	0.7963	0.0094	1.0000	0.8899
315	-0.0058	1.0000	0.8735	-0.0897	1.0000	0.7535	0.0086	1.0000	0.8938
316	-0.0071	1.0000	0.8539	-0.0906	1.0000	0.7168	0.0082	1.0000	0.8938
317	-0.0106	1.0000	0.8360	-0.0925	1.0000	0.6796	0.0059	1.0000	0.9032
318	-0.0133	1.0000	0.7900	-0.0942	1.0000	0.5974	0.0048	1.0000	0.8947
319	-0.0147	1.0000	0.7169	-0.0954	1.0000	0.5166	0.0049	1.0000	0.8842
320	-0.0169	1.0000	0.6665	-0.0976	1.0000	0.4389	0.0041	1.0000	0.8696
321	-0.0178	1.0000	0.6114	-0.0991	0.9997	0.3708	0.0025	1.0000	0.8535
322	-0.0198	1.0000	0.5449	-0.1012	0.9984	0.2962	-0.0009	1.0000	0.8352
323	-0.0230	1.0000	0.4554	-0.1056	0.9887	0.2015	-0.0082	1.0000	0.8130
324	-0.0218	0.9997	0.3619	-0.1058	0.9583	0.1354	-0.0020	1.0000	0.7902
325	-0.0239	0.9980	0.2848	0.0000	0.9193	0.1015	-0.0022	1.0000	0.7600
326	-0.0235	0.9963	0.2555	0.0000	0.9077	0.0946	-0.0051	1.0000	0.6972
327	-0.0278	0.9891	0.2034	0.0000	0.8625	0.0745	-0.0077	1.0000	0.6601

Regression (Rolling Window)	Alpha small cap	(1-p value) small cap	r^2 small cap	Alpha mid cap	(1-p value) mid cap	r^2 mid cap	Alpha large cap	(1-p value) large cap	r^2 large cap
328	-0.0323	0.9705	0.1532	0.0000	0.7999	0.0560	-0.0160	1.0000	0.6106
329	-0.0244	0.9671	0.1475	0.0000	0.8864	0.0840	-0.0221	1.0000	0.4861
330	-0.0036	0.9907	0.2111	-0.0551	0.9828	0.1804	-0.0238	0.9999	0.4251
331	0.0141	0.9982	0.2898	-0.0302	0.9985	0.2965	-0.0137	1.0000	0.4741
332	0.0195	0.9998	0.3830	-0.0218	0.9999	0.4127	-0.0090	1.0000	0.5817
333	0.0210	0.9999	0.4251	-0.0273	1.0000	0.4472	-0.0050	1.0000	0.6251
334	0.0246	1.0000	0.4607	-0.0385	0.9999	0.4227	0.0024	1.0000	0.6874
335	0.0300	1.0000	0.5250	-0.0422	1.0000	0.4661	0.0116	1.0000	0.7598
336	0.0298	1.0000	0.5994	-0.0430	1.0000	0.5439	0.0183	1.0000	0.8691
337	0.0268	1.0000	0.6956	-0.0443	1.0000	0.6529	0.0181	1.0000	0.9037
338	0.0249	1.0000	0.7625	-0.0483	1.0000	0.6960	0.0128	1.0000	0.9121
339	0.0316	1.0000	0.8447	-0.0446	1.0000	0.7969	0.0130	1.0000	0.9289
340	0.0333	1.0000	0.8804	-0.0444	1.0000	0.8466	0.0136	1.0000	0.9396
341	0.0314	1.0000	0.8969	-0.0477	1.0000	0.8606	0.0123	1.0000	0.9449
342	0.0302	1.0000	0.9321	-0.0494	1.0000	0.9014	0.0125	1.0000	0.9555
343	0.0290	1.0000	0.9413	-0.0522	1.0000	0.8992	0.0103	1.0000	0.9493
344	0.0293	1.0000	0.9478	-0.0525	1.0000	0.9066	0.0112	1.0000	0.9495
345	0.0284	1.0000	0.9494	-0.0538	1.0000	0.9125	0.0117	1.0000	0.9507
346	0.0276	1.0000	0.9483	-0.0538	1.0000	0.9158	0.0116	1.0000	0.9516
347	0.0250	1.0000	0.9308	-0.0546	1.0000	0.9170	0.0105	1.0000	0.9479
348	0.0231	1.0000	0.9119	-0.0557	1.0000	0.9118	0.0102	1.0000	0.9465
349	0.0220	1.0000	0.9001	-0.0567	1.0000	0.8923	0.0101	1.0000	0.9450
350	0.0215	1.0000	0.9005	-0.0574	1.0000	0.8762	0.0097	1.0000	0.9420
351	0.0214	1.0000	0.8969	-0.0572	1.0000	0.8705	0.0100	1.0000	0.9395
352	0.0209	1.0000	0.8886	-0.0573	1.0000	0.8630	0.0100	1.0000	0.9379

Appendix 2. Matlab code

```
clear all
close all
clc
[Data] = xlsread('Data_investigacion.xlsx','Data');
obs = size(Data,1);
%% Figura 1
figure;
indices = {'IPC' 'IPC SmallCap' 'IPC MidCap' 'IPC LargeCap'};
boxplot(Data(:,1:4)*100,indices);
ax = gca;
ax.YAxis.TickLabelFormat = '%g%%';
ax.YGrid = 'on';
title('Anual returns: 2013-2015');
ylabel('Returns');
%% Figura 2
figure;
%
subplot(4,1,1);
edges =[-20:5:25];
histogram(Data(:,1)*100,edges,'Normalization','pdf');
title('CategorÌas de rendimientos anuales');
```

```
ax = gca;
ax.XAxis.TickLabelFormat = '%g%%';
ax.YTick = [];
xlabel('IPC');
hold on
y = Data(:,1)*100;
[mu,sigma] = normfit(y);
norm = normpdf(y,mu,sigma);
plot(y,norm,'LineWidth',1.5)
hold off
%
subplot(4,1,2);
histogram(Data(:,2)*100,edges,'Normalization','pdf');
ax = gca;
ax.XAxis.TickLabelFormat = '%g%%';
ax.YTick = [];
xlabel('IPC SmallCap');
hold on;
y = Data(:,2)*100;
[mu,sigma] = normfit(y);
norm = normpdf(y,mu,sigma);
plot(y,norm,'LineWidth',1.5)
hold off;
%
subplot(4,1,3);
histogram(Data(:,3)*100,edges,'Normalization','pdf');
ax = gca;
ax.XAxis.TickLabelFormat = '%g%%';
ax.YTick = [];
xlabel('IPC MidCap');
hold on;
y = Data(:,3)*100;
[mu,sigma] = normfit(y);
norm = normpdf(y,mu,sigma);
plot(y,norm,'LineWidth',1.5)
hold off;
%
subplot(4,1,4);
histogram(Data(:,4)*100,edges,'Normalization','pdf');
ax = gca;
ax.XAxis.TickLabelFormat = '%g%%';
ax.YTick = [];
xlabel('IPC LargeCap');
hold on;
y = Data(:,4)*100;
[mu,sigma] = normfit(y);
norm = normpdf(y,mu,sigma);
plot(y,norm,'LineWidth',1.5)
hold off;
%% Figura 3
figure;
[Data2] = xlsread('Data_investigacion.xlsx','Data2');
plot(Data2,'LineWidth',1.5);
title('Portfolios 100 base: 2013-2015');
xlabel('Time');
ylabel('Price');
legend('Portfolio IPC', 'Portfolio SmallCap','Portfolio MidCap',...
    'Portfolio LargeCap');
ax = gca;
ax.YGrid = 'on';
ax.XTick = [];
ax.XTickLabel=[];
%% Tabla 1
correlacion = partialcorr(Data(:,1:4));
Titulos={'IPC','SmallCap','MidCap','LargeCap'};
Tabla_1=array2table(correlacion,'VariableNames',Titulos,'RowNames',Tit
ulos)

%% Figura 4
```

```
for j=1:3

   Pvalue{j} = [];
   r_2{j} = [];
   Alpha{j} = [];

   for k = 1:obs-30
       prima_m = [Data(k:k+30,1)] - [Data(k:k+30,5)];
       y =[Data(k:k+30,j+1)] - [Data(k:k+30,5)];
       x = [ones(31,1) prima_m];
       [b,bint,r,rint,stats] = regress(y,x);
       Alpha{j}= [Alpha{j}; b(1,1)];
       Pvalue{j}= [Pvalue{j}; 1-stats(1,3)];
       r_2{j}= [r_2{j}; stats(1,1)];

   end

end
figure;
subplot(3,1,1);
edges =[0:10:100];
histogram(r_2{1}*100,edges);
title('Coefficient of determination (r^{2}) CAPM model');
ax = gca;
ax.XAxis.TickLabelFormat = '%g%%';
xlabel('IPC SmallCap');
subplot(3,1,2);
histogram(r_2{2}*100,edges);
ax = gca;
ax.XAxis.TickLabelFormat = '%g%%';
xlabel('IPC MidCap');
subplot(3,1,3);
histogram(r_2{3}*100,edges);
ax = gca;
ax.XAxis.TickLabelFormat = '%g%%';
xlabel('IPC LargeCap');
hold off;
%% Figura 5
figure
%subplot(2,1,1);
plot(Alpha{1}*100,'o','MarkerSize',2);
title('\bf \fontsize{16}{\alpha} \fontsize{10}of the CAPM model, using
anual returns: 2014-2015');
hold on
plot(Alpha{2}*100,'*','MarkerSize',2);
plot(Alpha{3}*100,'+','MarkerSize',2);
plot(ones(382,1).*0,'k-');
xlabel('\rmObservations (anual returns)');
ylabel('\bf \fontsize{16}{\alpha} \fontsize{11}\rmwith p-value < 5%');
legend('Portfolio SmallCap', 'Portfolio MidCap','Portfolio LargeCap');
ax = gca;
ax.YAxis.TickLabelFormat = '%g%%';
hold off;

%% Tabla 2 (solo datos)
for  j=1:3
    for k = 1:size(Pvalue{j},1)
       if Pvalue{j}(k,1)<0.95
            Alpha{j}(k,1)= 0;

       end
    end
end

for  j=1:3
    Cuenta{j}=[];
    for k = 1:size(Alpha{j},1)
       if Alpha{j}(k,1)>0
```

```
            Cuenta{j}(k,1)= 1;

        end
    end
end
CC = [];
for j=1:3

    CC=[CC sum(Cuenta{j})];
end


Observaciones_con_alpha_positiva=CC;

Total_Observaciones=[size(Alpha{1},1),size(Alpha{1},1),size(Alpha{1},1
)];

Porcentaje_Alpha=CC./Total_Observaciones;
Tabla=[Observaciones_con_alpha_positiva;Total_Observaciones;Porcentaje
_Alpha];
Titulos={'SmallCap','MidCap','LargeCap'};
Row={'Observaciones_con_alpha_positiva';'Total_Observaciones';'Porcent
aje_Alpha'};

Tabla_2=array2table(Tabla,'VariableNames',Titulos,'Rownames',Row)

%% Tabla 3

Primas(:,1)=Data(:,2)-Data(:,1);
Primas(:,2)=Data(:,3)-Data(:,1);
Primas(:,3)=Data(:,4)-Data(:,1);
Primas_promedio=mean(Primas);
FF=size(Primas,1);
for i=1:FF
    for ii=1:3
        DownSide(i,ii)=min(Primas(i,ii),0);
    end

end
Downside_risk=std(DownSide);
Sortino=Primas_promedio./Downside_risk;

Cuenta=[];
for  j=1:3

    for k = 1:size(DownSide,1)
       if DownSide(k,j)==0
            Cuenta(k,j)=1;

       end
    end
end
Observaciones_con_prima_positiva= sum(Cuenta);
Total_Observaciones=[size(DownSide,1),size(DownSide,1),size(DownSide,1
)];
Porcentaje_acierto=
Observaciones_con_prima_positiva./Total_Observaciones;
a_entre_b = Porcentaje_acierto./Downside_risk;
Maxima_desviacion_sobre_IPC=min(DownSide);
a_entre_c=abs(Porcentaje_acierto./Maxima_desviacion_sobre_IPC);

Tabla=[Primas_promedio;Downside_risk;Sortino;Observaciones_con_prima_p
ositiva;...

Total_Observaciones;Porcentaje_acierto;a_entre_b;Maxima_desviacion_sob
re_IPC;...
    a_entre_c];
```

```
Row={'Primas_promedio';'Downside_risk';'Sortino';'Observaciones_con_pr
ima_positiva';...

'Total_Observaciones';'Porcentaje_acierto';'a_entre_b';'Maxima_desviac
ion_sobre_IPC';...
    'a_entre_c'};
Tabla_3=array2table(Tabla,'VariableNames',Titulos,'Rownames',Row)




[Data2] = xlsread('Data_investigacion.xlsx','Data2');
Titulos={'IPC','SmallCap','MidCap','LargeCap'};
Maximo_DrawDown =
array2table(maxdrawdown(Data2),'VariableNames',Titulos)

%% Tabla anexos
Titulos={'Alpha_SmallCap','Pvalue_SmallCap','R_squared_SmallCap',...
    'Alpha_MidCap','Pvalue_MidCap','R_squared_MidCap',...
    'Alpha_LargeCap','Pvalue_LargeCap','R_squared_LargeCap'};

Tabla_a = [Alpha{1},Pvalue{1},r_2{1},Alpha{2},Pvalue{2},r_2{2},...
    Alpha{3},Pvalue{3},r_2{3}];
Tabla_anexo=array2table(Tabla_a,'VariableNames',Titulos);
clearvars -except Tabla_anexo Tabla_1 Tabla_2 Tabla_3 Maximo_DrawDown;
```