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Analyses of topical policy issues

Socially conscious investment funds and home country institutions☆,☆☆

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ABSTRACT

We delve into performance and riskiness of socially conscious (SC) investment funds while considering the salient role of home country institutions as proxied by freedom indicators – namely, economic freedom with its five underlying component areas – in addition to the personal and overall human freedom of countries/regions as related to the home base currency of those funds. From a global perspective and including nonlinear considerations, evidence shows that advances in economic freedom and its constituent areas, as well as differences in personal freedom, have a consistent sizeable positive impact on the performance of SC funds but also a slight positive effect on their riskiness, attested to by various robustness tests. We articulate the added financial benefits to be gained when both socially responsible features and freedom infrastructure are present, confirming that freedom indicators matter. There is subtle evidence that changes in legal structure and security of property rights, as well as sound money, show a statistically and economically significant positive effect on performance across various specifications. In accord with widespread support for the importance of private property and the rule of law, this study shows that without sound money, a functioning legal system, and entrenched property rights, the performance of SC funds is stalled.

☆ Raw data used in the analysis will be documented and made readily available to any researcher(s) once the paper is accepted and upon request from the contact author—a practice aligned with the data policy of many peer-reviewed journals.

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1. Introduction

Although the economics of sustainable investment and socially conscious markets have received considerable research attention recently, some important questions remain unanswered, notably those related to the performance and riskiness of the mutual fund industry. It is also necessary to tackle the role, if any, of the rudiments, overall business landscape, underlying economic structure, and institutional framework that allow many investments (including socially responsible ones) to perform and prosper (e.g., Barnett and Saloman (2006), Marano et al. (2016) and Estrin et al. (2016)). Our contribution is to reignite and open this debate by determining whether or not the institutional framework has a *sizeable and influential effect* on performance of those mutual funds—including funds that tend to preclude or diminish financial-gain aspects for the sake of consistent advocacy for the social principles and underlying objectives of these investments and portfolios.

The empirical examination in this study is built on theoretical work that advanced model factors for ranking asset-pricing models, such as presented by Fama and French (2018), as well as Barillas and Shanken (2016) and Gibbons et al. (1989). Examining the impact of a nation's level of freedom as an institutional prerequisite for socially conscious investments and portfolio development is crucial given that a majority of global Socially Conscious (SC) funds are constructed to serve and advocate for a social agenda; or they might be constructed around a set of principle-based criteria or employ various social screens to align their objectives and strategies (see, e.g., Statman (2000, 2004)).

Although the relationship between economic freedom and equity returns has been investigated in the literature, the aim of this study is to fill a gap by examining the *nature of the relationship* between *home country institutions* proxied by freedom indicators and *socially conscious investment* from a global perspective using a wide selection of SC funds (based on different currencies and originating in various countries) while considering several control variables. We also look at the differential impact of the subcomponents of economic freedom on mutual funds' performance and riskiness.

Our study contributes to the literature on many fronts, from an empirical perspective our study is well timed by examining the importance of *home country institutional framework* in relation to performance and riskiness of specific groups of mutual funds which recently have shown important demand and attractiveness. To our knowledge, there is no specific literature that has examined the linkage between dynamics of international mutual funds and the overall landscape and quality of institutions of home country. (see, e.g., Bogle (2016), Barillas and Shanken (2016), Fama and French (2018), Gottesman and Morey (2006) and Chevalier and Ellison (1999a)).

Our study is crucial and well timed and relevant to tackle the macro-policy factors and relevant rudiments that guide and enrich the investment landscape specifically for the SC funds. Thus, we seek to connect country overall macro/policy insights coupled with micro focus on a specific group of mutual fund industry (see for instance, Tag and Degirmen (2022)). Additionally, we explore whether economic/social freedom(s), as proxied by quality of institutions, are contributing factors to intensification of performance of the SC funds—as social investment vehicles, and whether improvement of those institutional proxies could mitigate overall riskiness of financial products.

Therefore, our empirical contribution/investigation connects two strands of literature. The first focuses on the performance of the mutual fund industry, as we examine the relevance of examining performance of socially conscious funds *within the overall institutional landscape of the home country of fund firms* and investment companies that develop and construct those SC funds. Thus, we emphasis and advance another explanation/benefit of those funds as linked to quality of institutions and overall country policy environment in which they operate (e.g., Fama and French (2018), Gottesman and Morey (2006) and Chevalier and Ellison (1999a), and many others). The second strand discusses the economic freedom and country institutions in relation to equity market literature (e.g., North (1991), Easton and Walker (1997), Acemoglu and Johnson (2005), Justesen (2008), Beazer and Blake (2018), Burnie (2021), Chieh-Tse Hou and Gao (2021), Gonzálvez-Gallego and Pérez-Cárceles (2021) and Pandey et al. (2023)).

Examining SC funds and the drivers behind their market performance presents some challenges for researchers, mainly due to the lack or limitation of diversification in the process of constructing those funds while satisfying the criteria of social screens and principle-based choice (e.g., Statman (2004)). Opponents of socially conscious funds argue that the application of non-financial considerations such as environmental, social, and governance (ESG) factors in the investment process could result in lower investment returns because the number of investment opportunities is reduced (see, e.g., Geczy et al. (2005)).[1] We use a global set of socially conscious funds and relevant control variables in addition to the pertinent indicators of economic freedom in each country. The indicators are carefully aligned with the base currency of the SC funds. For instance, if a SC fund is denominated or its base currency is the Euro, then we associate freedom metrics of the Eurozone with such a fund. Indirectly, the novel question that we explore is whether economic/social freedom(s) are contributing factors to intensification of performance of the SC funds – as social investment vehicles – regardless of the country of origin of those SC funds, and whether those freedom(s) could mitigate overall riskiness of financial products as well.

We show that SC funds' performance and their risk level are influenced by the social and economic institutional context created by the prominence of three out of five areas underlying the economic freedom index; and both performance and

[1] In this study, it is not our objective to engage the debate about whether SC funds should perform better or worse than traditional investment funds. Nor do we intend to examine the cost associated with establishing or initiating a socially conscious fund or the related and ongoing monitoring programs; those questions and investigations are not aligned with the scope of our study.

risk are positively associated with the degree of advancement of overall personal freedom of "base currency" countries. More importantly, we document that progress in personal freedom of individual countries is associated with a sizeable higher performance but slightly higher riskiness of the related socially conscious funds.

The rest of this paper is structured as follows: To show the basis of our exploratory research questions and contribution, the next section discusses relevant studies that examined the dynamics of socially conscious markets and the institutional framework of some countries, and the role of home country institutions in this process. The Section 3 presents the data-collection methods, outlines the variables we use, and puts forth the preliminary analysis, highlighting some of the characteristics of SC markets across countries. The Section 4 specifies in a parallel manner the methodology and offers empirical evidence by looking more closely at the role of freedom indicators in performance measures and level of riskiness of SC funds. Finally, the Section 5 presents the conclusion and implications.

2. Related studies and contribution

2.1. Home country institutions, economic growth, and markets

Within a three-dimensional framework, we note the linkage between quality institutions measured by economic freedom indicators and the nation's economic growth, which in turn affects market development. We examine various nations, including those where economic freedom is weaker, such as South Africa and Brazil. Country-specific risks caused by discriminatory taxes, limited rule of law, restrictions on funds flows, or simply fear of expropriation are always mentioned as factors that deter foreign institutional investors (e.g., Erb et al. (1996) and Billmeier and Massa (2009))—hence our focus on the effect of the quality of *home country institutions on the mutual fund industry*. We argue that a business landscape generated by robust institutions confers the *rudiments for a successful integration* of financial products in the global market, notably products that align with principle-based or ethical or social considerations (see, e.g., Bekaert and Harvey (2002)).

Using a broad measure of laws and institutions, we note that reductions in investment barriers may increase the price of domestic mutual funds, thereby enhancing their performance as the new demand from international investors bids up their prices.[2] Some researchers (Domowitz et al., 1997) have examined the impact of restrictions on foreign equity ownership on stock prices and find that restrictions shaped market segmentation in the domestic stock market because the stock prices of unrestricted shares were significantly higher.

Unlike the approach of Acemoglu et al. (2001), we suggest that the annual "Economic Freedom of the World" reports – which provide a comprehensive measure of economic institutions in a number of nations – enables us to explore all possible links among economic institutions, economic growth, and other relevant macro-variables (see also, North (1991)).[3] The cornerstones of economic institutions, dubbed "economic freedom" in the reports, are voluntary exchange, freedom to compete, and security of private property.[4,5]

2.2. Home country institutions and market performance channel

Doucouliagos and Ulubasoglu (2006) find via meta-analysis that "regardless of the sample of countries, the measure of economic freedom and the level of aggregation, there is a solid finding of a direct positive association between economic freedom and growth" (p. 19).[6] We conjecture that in addition to growth, good market performance is much more attainable with better-quality institutions in the country. Past studies have documented the link between economic institutions and economic performance; this connection is less sturdy for economic institutions and financial markets, notably the link between social and personal freedom and financial products of capital markets. Home country institutions (social and/or economic) have both direct and indirect impacts on stock market performance, and consequently on the

[2] We are aware that loosening of capital controls may also potentially result in capital flight, due to poor investment climate, and thus reduction in equity prices.

[3] Acemoglu et al. (2001) examine institutions as determinants of economic prosperity using differences in European mortality rates as a proxy for current institutions to assess the latter's impact on income per capita. The authors observed a strong effect of institutions. They argue that Europeans set up different types of institutions in different colonies, depending on the mortality rate they faced, and that these institutions persist to this day. In nations with high mortality rates, Europeans were hesitant to settle and were likely to set up poor institutions. The opposite is argued for colonies that had low mortality rates. "Economic Freedom of the World" reports and a sample of literature using a measure of economic freedom provided in these reports can be found at http://www.freetheworld.com/.

[4] The overall measure of economic freedom is based on 42 different pieces of data, which are grouped into five broad categories or areas: (1) size of government; (2) legal structure and security of property rights; (3) access to sound money; (4) freedom to trade internationally; and (5) regulation of credit, labor, and business. Many academic articles have used this measure of economic institutions; most of these studies focus on the relationship between economic institutions and economic prosperity and growth—see Fig. A.1 of Appendix A.

[5] One of the pioneer works that supports our argument is by Easton and Walker (1997), who found that changes in economic freedom have a significant impact on the steady-state level of income, even after taking into account the levels of technology, education of the workforce, and investment. Their results imply that economic freedom is *a separate determinant* of the level of income. Likewise, Dawson (1998) finds that economic freedom boosts economic growth directly by increasing the efficiency with which inputs are transformed into outputs, and indirectly by encouraging and attracting investment, which in turn has a positive impact on economic growth.

[6] The authors reiterate that exclusion of a measure of economic freedom in an economic-growth study would deliver biased results in the analysis.

overall performance of the mutual fund that incorporates those financial products. On the one hand, the direct impact originates from restrictions on capital flows and transaction costs, or so-called "legal barriers", as noted in Bekaert et al. (2003), which are part of a broader measure of institutions. On the other hand, the indirect effect suggests that good institutions both attract investment and make it more productive and efficient, as they improve the business environment by strengthening the rule of law and enforcement of contracts, as well as streamlining business via the elimination of unnecessary barriers or hurdles.[7] La Porta et al. (1997) examine the impact of legal rules and their enforcement on the development of capital markets. They report that nations with a poor legal environment have small capital markets, whereas in nations that protect investments from expropriation, people are *more willing to freely invest* their funds in those nations' financial sectors.

2.3. Socially conscious investment funds and performance

Socially conscious (SC) or ethical investments have been practiced for more than a century; however, over the last few years a surging number of SC mutual funds across many nations denominated in multiple currencies were developed and grew considerably in terms of total assets and continues to be among the most well discussed financial products. According to Hudson (2005) and Mackenzie and Lewis (1999), socially responsible investments are based on ethical criteria as defined by *the moral codes of investors*. These investments have increased in popularity since 1980, and their advocates argue that the inclusion of *social and environmental* considerations in the investment decision-making process improves investment returns. In light of advances in sustainable investment and green holdings, it is worth examining the underlying factors that sustain the performance of these SC funds. A global perspective will allow us to capture differences across nations and to elucidate how (if at all) the risk profile of this type of investment is also predisposed by those factors; thus, we investigate the role of *home country institutions*, as well as economic and personal freedom.[8]

The five areas of the economic freedom index are embedded in the Human Freedom Index while the other six areas of *personal freedom* are rule of law, security and safety, movement, religion, association, assembly, and civil society, expression and information, and relationships (see Fig. A.1 in Appendix A). Therefore, from a methodological perspective, the Personal Freedom Index encompasses important aspects that *go in line with principles and objectives* of SC funds, such as *rule of law, expression and information, and security safety* areas which are *all crucial elements* for selecting and building those type of socially conscious financial products.

The methodology of personal freedom index highlights that all aspects of the personal freedom index as relevant.[9] Furthermore, since the objective of our study is to examine socially conscious financial products it is necessary that aspects of *social institutions* must be included in our empirical study. Thus, we include this well-rounded personal freedom index by considering other human freedom indicators and subcomponents (see Fig. A.1 in Appendix A). The index is an effort to measure the extent to which the freedom from interference of individuals is respected in the host countries and jurisdictions observed—predominantly by government (Thompson, 1963). Vasquez et al. (2022) state that "*A security state may increase or appear to increase some aspects of safety, but it will curtail freedoms by empowering the state to violate rights. Thus, legal security and specific personal freedom are both necessary conditions for high levels of personal freedom*" (p.14). We fill the gap in the literature, by inclusion of the personal freedom index to measure the degree to which people are free to enjoy major civil liberties, empowered to exercise other freedoms, buy and sell, and make investment decisions which are all social requisites to improve the demand side and development of any financial products. Individuals (investors) typically attribute value to a higher degree of personal freedom (Ruger and Sorens, 2009, p.2).

Some studies have shown positive impact of various measures of economic freedom on economic growth (See e.g., Gwartney et al. (2006)), while others have shown that good governance, political freedom, aggregate freedom are positive and significant to the process of economic growth and entrepreneurial activity (see, e.g., Lui (1996), Zhao et al. (2003), Nikolaev et al. (2013), Audretsch et al. (2006) and Samila and Orenson (2011)). Whereas Berggren and Gutmann (2020) find a positive and robust relationship between judicial independence and personal freedom, even though democracy is not robustly associated with this type of freedom. Berggren and Gutmann (2020) considered substantive rules to protect personal freedom as one of the three links of the institutional environment of a country (see also e.g., Sen (1999) and Franck (1997)). For many years, practitioners and academics have asked if the introduction of social and environmental considerations to the investment decision process may hurt investment performance.[10] Unlike past studies, we investigate

[7] We could also argue that a nation with few or no restrictions to capital flows but with high taxes, a high level of red tape, and lacking a robust rule of law (i.e., failing to enforce contracts or to protect private property) may still fail to attract investment, or it even could mean that existing investments face challenges to perform as intended.

[8] The use of the personal freedom index fills a gap in the financial literature while examining overall freedom including economic and other human freedoms, thus, we recognize that personal freedom as a social concept that emphasis the dignity of individuals/investors.

[9] In Appendix A, we added some additional information regarding major indicators and subcomponents of personal freedom index and economic freedom index. For instance, under the personal freedom, the first area is rule of law which is based on questions such as "*To what extent are laws transparently, independently, predictability, impartially, and equally enforced, and to what extent do the actions of government officials comply with the law*" (p. 383 of the Human Freedom Index: A global measurement of personal, civil, and economic freedom report prepared by Vasquez et al. (2022)).

[10] However, it is not the purpose of our study to participate in ideology-laden debates or comparative analyses of whether SC funds should perform better or worse than traditional investment funds. For instance, Statman and Klimek (2006) find that socially responsible investing indices outperformed the S&P500 index in the late 1990s during the technology bubble, and subsequently lagged the S&P500 in the early 2000s.

the relationship between SC funds and national institutional factors/omitted variables that affect financial performance according to a more broad-based general model, and we attempt to eliminate inherent biases found in previous studies that did not take into account freedom/institutional gauges.[11]

2.4. International mutual funds growth and freedom metrics

Understanding the linkage between the quality of institutions of a particular country – that denominates the base currency of a fund – and its mutual fund industry is essential to gauging the latter's growth, size, performance, and riskiness.[12] In fact, international mutual funds can outperform the index with active fund management because there are more inefficiencies in the international market to capitalize on.[13] However, as identified previously, the link between active management and superior fund performance is inconclusive (Bogle, 2016, 2005; Duan et al., 2009). There is no specific literature that details how international mutual funds are affected by economic freedom and related factors. However, there have been some studies on the effects of various regulatory, political, and economic factors affecting the mutual fund industry. For example, wealthier countries with a more educated population possess a significantly larger mutual fund industry. Relatedly, countries with low trading costs usually indicate an older fund industry, meaning that the industry is more capable of providing liquid investments and attracting investors.[14]

Thus, a combination of demand, supply, and legal factors contributes to the size of the mutual fund industry (Khorana et al., 2005). We deem that this new macro-channel of effect that contributes to and influences the fund industry in terms of performance and riskiness will be much more visible and understood if we are able to examine a group of funds from a global perspective. Here, we are concerned with the managers' fulfillment of their fiduciary obligations together with measurement of their performance; notably, those performances are not detached but are consequential for managers' careers. Multiple organizational and economic studies of labor markets have concluded that individuals are fundamentally concerned about their advancement prospects within a firm, with potential for termination, promotion, and rewards being of central importance (see Chevalier and Ellison (1999b, 1997)).

As our objective is to empirically include *only socially conscious funds*, we are consistent with, and encouraged by, the publication of numerous recent studies which attempt to examine financial issues within specific markets or groups of industries to gain insights that would not be possible if we combine a wide range of assets and ignore specific factors. Studies with industry specifics are able to capture additional intuitions, as we do in this study (see, e.g., Acharya et al. (2013), Hu and Xiong (2013), Jin and Jorion (2006), Singleton (2014), Solt and Swanson (1981) and Tufano (1998)).

3. Data and summary statistics

3.1. Data and sample construction

We take advantage of a context in which it is possible to measure performance of financial products and investments and to delineate a set of control variables while examining our research question(s). The mutual fund industry, which is composed of professionally managed collective investments that pool money from multiple investors, offers a rare opportunity to model internal and external performance comparisons on a risk-adjusted basis while taking into account our freedom metrics and other relevant variables. We collected all the financial data from the Morningstar database, which is one of the well-known databases that encompass many socially conscious funds with a global coverage (see, e.g., Matallín-Sáez et al. (2019)).

Based on correspondence with the research director of Morningstar, Statman (2000) states that Morningstar classifies "socially conscious" mutual funds as funds, which impose major socially conscious constraints on their investment practices; and limiting the exclusionary screening process, would not earn the socially conscious classification. Thus, use

[11] Notably, SC funds focus on firms to include in their portfolio that satisfy some or all of social expectations. Measures of corporate social responsibility can include, for example, the drive for competitive advantage in production technology to eliminate waste, efforts to gain higher sales and retain loyal customers, ability to attract and keep better employees, lower litigation costs, lower environmental costs, better risk and crisis management, and good relations with governments and communities, etc. (for a useful bibliography of academic studies that examine corporate social responsibility and performance, see Griffin and Mahon (1997)).

[12] We note that mutual fund managers play a relatively important role as financial intermediaries in capital markets of each nation. Thus, it is judicious to assume that mutual funds are representative institutional investors of a country. Furthermore, to benchmark, link, or study currency effects on international mutual fund was not new, since some past studies have used that same intuition (see e.g., Massa et al. (2016) and Chan et al. (2005), and many more); we are inspired to follow same approach by linking country/region of SC funds to its base currency—currency of a fund is based on the *country of incorporation*. In our empirical examination, we used base currency not only to identify and link SC funds to national institutional indicators but also to control for that currency variable(s) in our panel estimations.

[13] In relation to mutual fund performance, Amihud and Goyenko (2013) determine that a mutual fund's R^2 can act as a measurement of fund performance. A lower R^2 indicates more asset selectivity. Selectivity is the proportion of the fund's variance that is caused by idiosyncratic risk or multifactor tracking error variance, and it is calculated as one minus the R^2 of the fund.

[14] The willingness to adapt and adopt is greater when the country's consumers are more sophisticated (have a higher literacy rate and a higher average number of years of education), have greater wealth and experience with managing wealth (measured using GDP per capita), and have access to higher-quality information (greater newspaper circulation and internet penetration). Nations with stronger investor protections increase investor trust in the market, encouraging individuals to participate more.

of this database does not undermine the contribution of our study, because we consider the classification of Morningstar to be sufficiently robust and rigorous to allow this empirical investigation.[15]

Given data limitations and availability, we focus only on the collected samples, which consist of U.S. and non-U.S. funds (from 12 other base currencies/countries), totaling 764 funds (selected from approximately 4983 socially conscious funds). All relevant information that we use as control variables for all open funds comes from the Morningstar database; only funds with complete information over the time period of 15 years (2001 to 2015) are selected. We note that the majority of funds (62.70%) in our global sample are equity funds.[16] Of course, to finally select the sample, we give considerable attention to the availability of annual performance measures (Sharpe, Alpha, Treynor, Information Ratio (IR), Sortino) and the riskiness level of each fund (measured by beta), as well as the start date of the fund and stop dates such that we delete funds that were either managed after 2001 (start date) and those that no longer existed before the end of 2015. The purpose of the criterion is to make sure that only SC funds managed during the chosen time period (2001 to 2015) are selected.

In our study, we used the most widely recognized *risk-adjusted performance measures* by the industry. The Sharpe ratio was introduced by Sharpe (1966) a relative measure of a portfolio's reward-to-risk ratio, calculated as its average return in excess of the risk-free rate divided by the standard deviation of portfolio/fund returns.

The Treynor was developed by Treynor (1965) as a composite measure to evaluate the performance of mutual funds. It is a relative measure of a fund's performance calculated as its average return in excess of the risk-free rate divided by its beta coefficient. It is a measure that would apply to all investors regardless of their risk preferences.

The Alpha is a term used to describe a manager's abnormal rate of return, which is the difference between the return the portfolio/fund actually produced and the expected return given its risk level. It was introduced by Jensen (1968) based on the capital asset pricing model (CAPM), such as alpha is the excess return earned higher than risk premium over time that those implied by the CAPM model, that is best performer managers are those who produce actual returns for their fund(s) that exceed their expected returns.

The information ratio statistic is used to measure a portfolio's average return in excess of a comparison benchmark portfolio divided by the standard deviation of this excess return. The Information Ratio (IR), developed in 1973 by Treynor and Black (1973), is one of the most important performance measures in the investment management industry (Grinold, 1989, p. 31). It is a ratio for the excess return of a portfolio/fund relative to a specified (normally its relevant) benchmark divided by the volatility of the excess returns. The numerator of the statistic measure represents the manager's ability to use her talent and information to generate a fund return that differs from the pre-selected benchmark against which her performance is being measured, whereas the denominator of this statistic measures the amount of residual risk that the manager incurred in pursuit of those incremental returns.

The Sortino is also a relative measure of a portfolio's performance, calculated as its average return in excess of minimum acceptable return threshold, divided by its downside risk coefficient. Sortino measure is a risk-adjusted performance statistic that differs from the Sharpe ratio in two ways, (1) as it measures the portfolio/fund's average return in excess of a user-selected minimum acceptable return threshold (that is often a risk-free rate); (2) unlike the Sharpe ratio which measures performance by total risk by effectively penalizing the manager for returns that are both too low or too high, Sortino captures just the downside risk in the fund. It is calculated by dividing the excess return by downside risk. The downside risk is the volatility of returns produced by a fund that fall below some hurdle rate. One of the most populator ways to calculate downside risk is the semi-deviation which uses the portfolio' average return as the hurdle return (See also, Sortino and Price (1994) and Harlow (1991)).

The Beta of the portfolio is a standardized measure of systematic (market) risk based upon a fund's covariance with the market portfolio (see the seminal works of Sharpe (1964), Lintner (1965), and Mossin (1966)). The CAPM redefines risk in terms of a portfolio or a security's beta to capture the non-diversifiable portion of that portfolio or asset risk relative to the market as a whole.

To ensure that all 764 SC funds in our final sample are indeed correctly characterized as socially conscious, we *manually examined the investment objective and strategy* of each as per the fund company to see if they are aligned with the social, environmental, governance, and ethical principles they advocate or portray. To assess the impact of freedom metrics, the present examination uses five different fund-performance measures and the beta of each fund as dependent variables, in addition to a set of available control variables (such as asset allocation, board quality, load, and broad categories: equity, fixed income, commodities, and base currency dummy variables).

Our main variables of interest are economic freedom levels (i.e., economic institutions) and changes in economic freedom. We follow the IMF's 2015 report titled "World Economic Outlook: Building Institutions" in using the index included in the "Economic Freedom of the World: 2015 Annual Report" published by the Fraser Institute as the key measure of the quality of institutions. The "Economic Freedom of the World" report provides a measure of economic

[15] Due to space limitation, we could not report more details about the Morningstar methodology, but readers are advised to consult Morningstar resources (see http://www.morningstar.com/).

[16] These data covered a period ending in 2015, the latest available date at the time of collecting the data, with the beginning year selected to match the year when Freedom World started publishing the Economic Freedom data index on a yearly basis. The chosen time horizon of our sample will not bias our results, while allowing us to sufficiently control for any negative effect from the financial downturn and global financial crisis during the year 2007–2008.

institutions that is based on 42 different pieces of data grouped into five broad categories: (1) size of government; (2) legal structure and security of property rights; (3) access to sound money; (4) freedom to trade internationally; and (5) regulation of credit, labor, and business. Economic freedom scores range from zero to 10, where a higher score indicates a higher level of economic freedom—see Appendix A for further details regarding the economic freedom index and its five sub-areas, as well as indices of personal freedom and human freedom. There is one potential economic justification for using the five areas underlying the summary measure of economic freedom, as each of them *encompasses fundamental aspects* of economic freedom: protection of private property, voluntary exchange, and freedom to compete.[17]

3.2. Descriptive statistics

Table 1, panel A, highlights the summary statistics of *yearly* performance measures and risk levels of all selected SC funds during the sample period. We report the results of some sub-groups of funds segregated by their base currency and the results of *all* funds. We note that our 764 global SC funds cover 13 different base currencies (i.e., Australian Dollar, Brazilian Real, Canadian Dollar, Danish Krone, Euro, Yen, Norwegian Krone, Pound Sterling, Singapore Dollar, South African Rand, Swedish Krona, Swiss Franc, and the U.S. Dollar).

The mean and median of performance measures are positive for all SC funds except the U.S. dollar information ratio. The mean (median) for all SC funds combined shows Sharpe ratios equaling 0.45 (0.55) with low standard deviation (1.29) versus those of Alphas, equaling 0.99 (1.0) with the lowest standard deviation (0.17).[18]

Panel B of Table 1 shows the summary statistics of the change of indicators across all countries/regions; we note that the mean is negative for all indicators except in the areas of regulation and sound money over the stated period. The result documents that all relevant countries and regions have witnessed negative but small changes of their freedom indicators. Of course, we note that the dispersion is visibly higher for both Size of Government (area 1) and Regulation (area 5), supporting the expectation of higher dispersion among selected regions and countries in our study regarding these metrics. Furthermore, a group of SC funds denominated in the Euro currency represents the largest group (315 out of 764 SC funds), so we display the movement of the main economic freedom indices in Appendix B (Figs. B.1 to B.3) together with the corresponding five areas to proxy the economic as well as personal and human freedom of Eurozone countries (France, Germany, Italy, the Netherlands, and Spain). We deem those five countries as good proxies for the Eurozone region, as they are among the top five countries in terms of GDP and represent approximately 83% of total GDP and 81.1% of the total population of all Eurozone countries combined.

4. Empirical results

4.1. Linear effects of freedom gauges

In this section, we test whether changes in economic freedom affect the SC funds' performance by following the intuition and application of multifactor explanations (see Chen et al. (1986) and Dybvig and Ross (1985)). To test this relationship, we run the following regressions. We aim to test our hypotheses by alternately regressing performance measures or the risk level on the *proposed freedom indicators (FM),* while taking into account a number of control variables, as in the following full model (A):

$$Y_{it} = Const. + \delta \times FM_{it} + \varphi GFC_{it} + \sum_{l=1}^{m} \theta^{l} X_{i,l} + \xi_i \qquad (A)$$

where Y_i denotes the dependent variable, which represents either performance measures (i.e., alphas; Sharpe, Treynor, IR, or Sortino) or the risk level (i.e., beta) used for fund i at year t; and GFC_{it} is a dummy variable that captures the Global Financial Crisis of 2007–2008 in the estimation to gauge its effect on the performance and risk level of SC funds. The GFC should be understood as an easy way to split the sample pre-versus post-GFC, and the dummy variable equals one for the period from 2008 until 2015, or zero otherwise. Alternatively, to the GFC variable, we control for the year fixed effects as well. In addition, we include a set of m control variables X_i such as the global broad category of the fund, board quality grade, and true no-load dummy during the time period of the study, etc.[19] Also included are m control variables

[17] The first area, Size of Government, gauges the extent to which governments rely on private choice rather than government to allocate resources (see, Gwartney et al. (2006)). Protection of private property is captured by the second area, Legal Structure and Security of Property Rights, which measures not only the degree to which private property is protected but also the other key components of a legal system necessary for the protection of private property, such as rule of law, independent judiciary, and an impartial court system (Gwartney et al., 2008). The third area, Access to Sound Money, is important both for protection of private property and voluntary exchange, since lack of sound money limits the gains from trade, and inflation (for instance) reduces the value of property held in monetary instruments. The fourth area, Freedom to Trade, measures the degree to which individuals and businesses are allowed to trade internationally. Lastly, freedom to compete and engage in markets is measured by the fifth area (Regulation of Labor, Credit, and Business).

[18] Both difference of means and variances are statistically significant; results of ANOVA analysis that addresses the statistical significance are not reported but are available from the corresponding author.

[19] We could have included additional demographic variables such as age, gender, tenure, and professional experience of fund managers as variables in our analysis, but age and gender (including fund style) were not always reported over the sample period in our databases.

Table 1
Summary statistics of selected SC fund metrics for the full sample and sub-samples as guided by the fund base currency. (Annual data from 2001 to 2015).

Panel A: Descriptive statistics of selected SC fund metrics for the full sample and a sub-sample out of 13 fund groups as guided by the fund base currency.

Base currency		Fund risk level	Fund performance metrics				
		Beta	Alpha	IR	Treynor	Sharpe	Sortino
Euro	Mean	1.003	0.091	0.209	2.986	**0.327**	1.479
	Standard Dev. (SD)	0.139	4.453	1.957	19.340	1.233	9.987
	Median	1.00	0.12	0.05	4.94	0.42	0.64
	Minimum	0.15	−38.86	−11.63	−87.64	−2.63	−2.23
	Maximum	2.44	24.03	26.04	149.31	4.71	568.81
Norwegian Krone	Mean	1.032	1.091	0.306	6.452	**0.458**	1.724
	Standard Dev. (SD)	0.147	5.918	1.505	29.034	1.304	3.444
	Median	1.00	0.32	0.33	9.66	0.55	0.96
	Minimum	0.33	−17.95	−4.99	−88.62	−2.15	−1.97
	Maximum	1.72	42.07	5.14	114.45	3.26	18.84
Pound Sterling	Mean	0.989	0.483	0.240	4.352	**0.524**	1.865
	Standard Dev. (SD)	0.152	6.394	1.503	26.669	1.461	3.733
	Median	0.99	0.68	0.14	7.42	0.53	0.89
	Minimum	0.52	−42.76	−4.63	−118.24	−3.04	−2.34
	Maximum	2.00	27.95	6.04	74.82	4.44	26.35
Swedish Krona	Mean	0.997	0.622	0.268	6.621	**0.417**	1.580
	Standard Dev. (SD)	0.129	5.102	1.380	36.185	1.283	3.533
	Median	1.00	0.40	0.17	8.13	0.56	0.89
	Minimum	0.07	−25.82	−4.28	−104.54	−2.98	−2.39
	Maximum	1.50	54.11	11.14	536.23	5.02	31.66
US Dollar	Mean	0.982	0.305	0.001	4.351	**0.621**	2.018
	Standard Dev. (SD)	0.222	4.996	1.388	25.152	1.300	4.829
	Median	0.97	0.27	−0.02	5.62	0.68	1.13
	Minimum	0.0039	−31.47	−6.40	−991.94	−3.71	−2.63
	Maximum	2.56	33.83	5.80	79.74	3.83	123.06
All funds	Mean	0.995	0.291	0.169	4.107	**0.450**	1.698
	Standard Dev. (SD)	0.17	5.03	1.71	24.47	1.29	7.24
	Median	1.00	0.23	0.06	5.68	0.55	0.88
	Minimum	0.00391	−42.76	−11.63	−991.94	−3.71	−2.63
	Maximum	2.56	54.11	26.04	536.23	5.02	568.81

Panel B: Summary statistics of *change* of freedom indicators across all relevant countries including Euro-zone region.

Variables Statistics	Economic Freedom (EF)	Area 1 (Size of Government)	Area 2 (Legal System & Property Rights)	Area 3 (Sound Money)	Area 4 (Freedom to Trade Internationally)	Area 5 (Regulation)	Human Freedom (HF)	Personal Freedom (PF)
Mean	−0.0012	−0.0009	−0.0039	0.0003	−0.0044	0.0034	0.0002	−0.0002
Standard Dev. (SD)	0.0104	0.0298	0.0116	0.0186	0.0176	0.0237	0.0065	0.0051
Median	0.0000	0.0006	−0.0033	0.0012	−0.0032	0.0064	0.0010	0.0000
Minimum	−0.0546	−0.0840	−0.0676	−0.2716	−0.1287	−0.0939	−0.0361	−0.0416
Maximum	0.0517	0.1219	0.0386	0.1346	0.0691	0.0984	0.0402	0.0736

Notes: To save space, the correlation coefficients between all relevant variables based on the full sample are not reported but are available from the author upon request. Since the data are only available from 2008 to 2015, the sample size – used for both freedom (human freedom and personal freedom) indicators – is reduced from 11,460 to 5348.

used in the global sample that were directly collected from the Morningstar database, as well as 12 dummy variables to control for various base currencies associated with our SC funds versus the U.S. dollar. For statistical analysis purposes, some variables were converted to numbers, such as board quality grade (A to D) being converted to relevant scores of 10 to 4 (see e.g., Chevalier and Ellison (1999b) and Gottesman and Morey (2006)).[20] The majority of control variables were

[20] Board grades are awarded based on whether the fund board has served shareholders' interests well, as determined by a comprehensive analysis by Morningstar's analysts. Boards that lead the industry with respect to serving shareholders well earn A's. Those that exceed the industry standard but do not incorporate all-best practices earn B's. Fund boards with standard governance earn C's, while those trailing the industry norms earn D's or F's.

included in the estimation using their corresponding values, while other control variables such as flexible asset allocation, true No-Load, and global broad category of the funds are all used as dummy variables.

In the estimation of Eq. (A), freedom indicators (FM) are proxied in multiple ways: using the change of Economic Freedom (EF), the Economic Freedom Five Areas (areas 1 to 5), Personal Freedom (PF), or the overall Human Freedom (HF) measure. Thus, we advance the econometric section and perform a series of empirical tests on the impact of FM on the performance and riskiness of selected SC funds. This process assists in the hypotheses' operationalization.[21]

Table 2 shows the result of regression in Eq. (A) as we try to explain the performance of the mutual funds by *sequential regression*. Table 2 shows that results across all possible fund performance measures (dependent variables) are directly responding to our main research question. There is clear support for our research question in the case of the Sharpe ratio and Treynor ratio such that SC funds in countries with higher economic freedom have a 6.54% higher Sharpe ratio than the others, and in terms of the Treynor ratio there is a 130.94% additional performance for those SC funds.[22] Even after controlling for the year fixed effect, the result pinpoints that higher economic freedom indicators are positively associated with higher performance.

In terms of overall risk of the SC funds, results show that the change in economic freedom has a *positive statistically significant effect* on their beta, such that a 1% improvement in economic freedom at the country level – associated with the base currency of the SC funds – contributes on average to an additional 0.36 (or 0.76) to the overall riskiness of those SC funds. Thus, we can see that economic freedom has an impact on the riskiness and performance of SC funds, but that impact is contingent upon the performance measures used. For instance, we note that other performance measures such as alpha (i.e., the excess return of an investment relative to the return of a benchmark index in line with the Capital Asset Pricing Model), information ratio (i.e., the average return in excess of that of a comparison or benchmark portfolio divided by the standard deviation of this excess return), and Sortino (i.e., variation of the Sharpe ratio that differentiates detrimental volatility from total overall volatility by using the asset's standard deviation of negative portfolio returns – downside deviation – instead of the total standard deviation of portfolio returns) are not statistically influenced by the change of economic freedom.[23] From another perspective, we find that during the post-global financial crisis (GFC) there was a sizeable negative effect reflecting a noticeable depressive effect on all selected performance measures except alpha of SC funds. In sum, there is higher SC fund performance; the estimated coefficient of the Economic Freedom (EF) measure is statistically and economically significant in direct response to our research question.

In the next section, we examine the effect of the EF Five Area ratings, as each one of the subcomponents conveys a different aspect of economic freedom of a country. Then we examine the performance/riskiness and area components of the economic freedom index.[24]

We first examine areas 1 to 3 together, then we repeat the estimation with all five areas for each risk and performance measure. Area 1 measures the Size of Government, and here we see that *lower levels of government spending and taxation*, relatively low level of government investment as a share of gross investment, and relatively few state-owned enterprises translate into higher ratings in this area (Table 3).[25]

21 We are alternately using three proxies to capture the effect of freedom indicators on various performance measures in our study; we are following this process for robustness of empirical results, as we want to see which among the selected proxies has the highest impact on the performance measures.

22 It is noted that the Sharpe ratio is the average return earned in excess of the risk-free rate per unit of volatility or total risk. Volatility is a measure of the price fluctuations of an asset or portfolio, whereas the Treynor ratio measures the reward-to-risk by taking into account a performance metric for determining how much excess return was generated for each unit of risk (systematic or market risk) taken on by a portfolio. Risk in the Treynor ratio refers to systematic risk as measured by a portfolio's beta. Beta measures the tendency of a portfolio's return to change in response to changes in return for the overall market.

23 Information ratio measures the ability of a portfolio manager to use her talent and information to generate a portfolio return that differs from that of the benchmark.

24 Although in this section we examine the different areas of economic freedom separately, we are aware that they may not be able to stand by themselves. Different components and areas of economic freedom are interlinked such that when one component or area is weak or missing, the effectiveness of other areas is reduced. The authors of the "Economic Freedom of the World" report refer to different areas of economic freedom as different parts of the car (engine, tires, etc.). Even though you can view each part separately, it takes all of them to get the car going (Gwartney et al., 2008). Similarly, nations can have freedom to trade goods, services, and financial instruments, but the benefits would be very limited if the nation does not have the rule of law. That is, unless the court system works properly and contracts are enforced, freedom to trade is not going to produce optimal benefits. In addition, if a nation has a robust rule of law but a very high level of taxation, no freedom to trade, and a high level of red tape, then the benefits from the rule of law would be limited. The goal of this section is to discover which aspects of economic freedom matter the most, even if we cannot view them as entirely separate. This will further determine which areas of economic freedom should be tackled first in order to improve the performance of the mutual fund industry.

25 In line with Fig. A.1 of Appendix A, it is important to note that the size of government area does not only capture government consumption, spending/investment, but also the revenue side (tax rate, payroll tax rates), and state ownership of assets. It is widely recognized that there is a unique relationship between size of government and economic growth. Thus, government revenue is endogenous and reverse causality may matter for some countries as those nations that are economically successful may have the ability to expand (increase the size) their governments by providing more social services. However, the area 2 overall rating is based on a multitude of indicators. For instance, government consumption depicts general government consumption spending as a percentage of total consumption such that countries with a larger proportions of government expenditures received lower ratings, *in addition* a higher rating of government investment or subsidies as share of GDP will generate a lower rating for countries with larger transfer sectors and subsidies. Higher government investment is calculated as a share of total investment. Whereas countries with higher marginal tax rates that take effect at lower income thresholds received lower ratings. The last indicator is state ownership of assets that measures the degree to which the state controls capital in major sectors, but it does not measure the extent of government revenue and expenditure as a share of output as it is usual for nations which *expansive* fiscal policies to exercise little direct control over the economy.

Table 2
Regressions of fund performance and risk metrics on economic freedom growth of relevant countries or region. The dependent variables denote the performance measures (Alpha to Sortino) and Beta, which measures risk level of the fund at year *t covering* the full period. Sample size $n = 11{,}460$.

Dependent variables ⇒ Independent Variables ⇓	**Beta**	**Alpha**	**Information Ratio (IR)**	**Treynor**	**Sharpe**	**Sortino**	**Beta**	**Alpha**	**Information Ratio (IR)**	**Treynor**	**Sharpe**	**Sortino**
Const.	0.9816*** [.007]	-0.26 [.48]	1.742*** [.237]	3.022*** [.93]	0.505*** [.073]	1.665*** [.223]	1.00*** [.005]	-0.28** [.14]	1.82*** [.23]	-7.62*** [.82]	-0.68*** [.06]	-1.15*** [.14]
Economic Freedom (EF)	0.3605*** [.169]	2.079 [4.64]	-0.999 [.232]	130.94*** [25.36]	6.538*** [1.207]	3.847 [3.16]	0.76*** [.212]	-1.09 [6.88]	-2.28 [2.17]	11.74 [21.7]	2.31** [1.06]	-3.94 [6.94]
Flexible Asset Allocation (dummy)	0.11 [.138]	0.47 [2.56]	-0.043 [.341]	2.503 [5.22]	-0.017 [.364]	0.154 [1.12]	0.10 [.13]	0.26 [2.58]	-0.187 [.34]	1.96 [2.29]	0.09 [.21]	0.34 [.69]
Board Quality Grade	-0.007*** [.0008]	0.095*** [.023]	0.0303*** [.008]	0.138 [.129]	0.012 [.008]	0.033 [.03]	-0.008*** [.0007]	0.079*** [.021]	0.014* [.007]	0.10* [.06]	0.03*** [.004]	0.06** [.03]
True No-Load (dummy)	0.0004 [.004]	0.225** [.113]	0.008 [.038]	-0.26 [.541]	0.023 [.03]	0.068 [.091]	-0.002 [.003]	0.348*** [.096]	0.035 [.03]	0.59 [.36]	0.10*** [.016]	0.2* [.11]
Global Broad Category: GBC-Equity	0.0056 [.003]	0.174 [.108]	-1.776*** [.232]	3.8*** [.673]	0.278*** [.062]	0.656*** [.21]	-0.006** [.002]	0.19** [.08]	-1.83*** [.23]	4.34*** [.78]	0.38*** [.055]	0.82*** [.15]
GBC-Fixed Income	-0.02*** [.004]	0.212** [.085]	-1.709*** [.236]	2.25*** [.61]	0.274*** [.066]	0.72*** [.176]	-0.026*** [.004]	0.21*** [.06]	-1.76*** [.23]	2.65*** [.81]	0.35*** [.06]	0.86*** [.18]
GBC-Convertibles	-0.0007 [.016]	-0.414 [.443]	-2.04*** [.306]	1.63 [2.85]	0.232 [.23]	0.571 [.568]	-0.006 [.016]	-0.46 [.41]	-2.1*** [.30]	1.61 [1.49]	0.26** [.12]	0.63* [.34]
GBC-Tax preferred	0.22*** [.016]	-0.712*** [.204]	-1.776*** [.283]	0.98 [.913]	0.214 [.142]	0.875 [.588]	0.208*** [.02]	-0.83*** [.16]	-1.95*** [.28]	1.16 [1.86]	0.43** [.17]	1.23* [.63]
GBC-Allocation	0.036*** [.004]	0.19 [.123]	-1.69*** [.235]	1.49** [.66]	0.172*** [.066]	0.394** [.155]	0.026*** [.005]	0.23** [.11]	-1.73*** [.23]	1.92** [.76]	0.24*** [.056]	0.52*** [.14]
GFC	-0.0045*** [.003]	0.296*** [.096]	-0.048 [.031]	-3.03*** [.468]	-0.302*** [.024]	-0.686*** [.129]						
Year fixed effect	No	No	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes
12 Base Currency Dummies vs. U.S. Dollar dummy	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	No	No	No
R-Square Adjusted	**0.0344**	**0.0084**	**0.051**	**0.0097**	**0.027**	**0.002**	**0.029**	**0.005**	**0.053**	**0.484**	**0.57**	**0.098**

Notes: Robust standard errors are provided in brackets below the estimated coefficients, after correcting for heteroscedasticity following the method of White (1980), as in MacKinnon (1985). As recommended by Greene (2000), *for all relevant results* we use the pooled OLS estimation with standard errors that *are adjusted* for cross-section heteroskedasticity and cross-section correlation (i.e., panel corrected standard errors). *, **, and *** indicate the significant difference from zero at the 10%, 5%, and 1% levels, respectively. Additionally, we re-estimated all the regressions by taking into account the Global Financial Crisis (GFC) of 2007–2008 dummy variable to capture if there was any shift in the dependent variables. Those results are not reported but they do not qualitatively differ from the above ones. The GFC should be understood as an easy way to split the sample and cover the period from 2007 until 2015; thus, this variable does not only capture 2007–2008. When we control for year fixed effect, we dropped the GFC variable to avoid getting spurious results.

We note that in terms of riskiness of SC funds, improvement and/or a high rating in area 1 means that fund firms *face less competition from government* and are better positioned to compete globally, due to factors such as lower tax rates. The results show that changes in area 1 are positive but statistically insignificant, which means that improvement in area 1 is not associated with a lower riskiness level of SC funds, though Sound Money (area 3) has an opposite and higher effect on the riskiness of selected funds. In fact, it is not surprising that sound money emerges as one of the areas with a strong impact on the riskiness of SC funds, as this factor tells us if the money of the country is prone to sudden appreciation or perhaps a longer-term depreciation in purchasing power. Institutions that lead to low (and stable) rates of inflation and fewer regulations that limit the ability to use alternative currencies should increase the riskiness of SC funds, yet based on the results of Table 3, we notice that area 3 has a sizeable positive impact on the performance of SC funds across two performance measures. Given the nature of SC funds, which are developed to align with *important social and environmental principles*, we find that improvement in the Size of Government – such as a reduction in government spending and consumption – has a positive effect on the performance of SC funds; one can conjecture that perhaps SC funds enjoy better performance, given their social focus, once government spending/consumption on various programs contracts and the Size of Government factor recovers. Yet, we note that other areas such as Legal System and Property Rights are all positively supportive and statistically significant to the overall performance for Information Ratio, Sharpe, Sortino, and Treynor.

Positive changes in Regulation (area 5), which measures regulation of credit, labor, and business, may lower transaction costs and thus make socially responsible firms more competitive. This, in turn, should translate into positive performance of SC funds. However, the coefficients on the changes in area 5 indicate significant positive effects for SC funds' riskiness but statistically significant negative effects on their Treynor, Sharpe, and Sortino ratios (Table 3, columns 5 to 7). We notice from a global perspective that higher improvement in area 5 implies that its score is high in this portion of the index;

Table 3
Regressions of fund performance and risk metrics on growth of freedom areas in relevant countries or regions. The dependent variables denote the performance measures (Alpha to Sortino) and Beta, which measures risk level of the fund at year *t covering* the full period. Sample size $n = 11{,}460$.

Dependent variables ⇒ Independent Variables ⇓	**Beta**	**Alpha**	**Information Ratio (IR)**	**Treynor**	**Sharpe**	**Sortino**
Const.	1.00*** [.006]	-0.51*** [.16]	1.71*** [.24]	-8.11*** [.90]	-0.73*** [.06]	-1.35*** [.19]
Area 1 (Size of Government)	0.004 [.07]	-0.77 [2.33]	-0.62 [.74]	28.78*** [7.51]	2.36*** [.38]	8.63*** [2.78]
Area 2 (Legal System & Property Rights)	0.43** [.20]	4.56 [5.92]	3.23** [1.66]	84.26*** [22.57]	3.88*** [.91]	15.27*** [4.53]
Area 3 (Sound Money)	0.27*** [.075]	-2.45 [2.72]	-1.16 [.83]	-9.64 [6.8]	1.38*** [.42]	5.37*** [1.85]
Area 4 (Freedom to Trade Internationally)	-0.06 [.12]	-7.97** [3.39]	-6.05*** [1.27]	-18.28 [11.7]	-5.49*** [.74]	-15.9** [7.27]
Area 5 (Regulation)	0.22** [.005]	6.80* [3.62]	1.86* [.96]	-29.55** [14.56]	-2.90*** [.53]	-7.63** [3.06]
Flexible Asset Allocation (dummy)	0.10 [.13]	0.28 [2.57]	-0.17 [.34]	2.26 [2.2]	0.11 [.19]	0.39 [.67]
Board Quality Grade	-0.008*** [.0007]	0.08*** [.021]	0.016** [.007]	0.14** [.06]	0.029*** [.004]	0.065** [.03]
True No-Load (dummy)	-0.002 [.003]	0.35*** [.096]	0.037 [.03]	0.63* [35]	0.10*** [.016]	0.20* [.11]
Global Broad Category: GBC-Equity	-0.005** [.002]	0.20** [.08]	-1.82***[.23]	4.45*** [.78]	0.39*** [.054]	0.85*** [.14]
GBC-Fixed Income	-0.02*** [.004]	0.22*** [.06]	-1.75*** [.24]	2.75*** [.80]	0.36*** [.06]	0.88*** [.19]
GBC-Convertibles	-0.006 [.015]	-0.45 [.41]	-2.09*** [.30]	1.72 [1.46]	0.27** [.12]	0.66** [.33]
GBC-Tax preferred	0.21*** [.016]	-0.80*** [.16]	-1.94*** [.28]	1.56 [1.87]	0.44*** [.17]	1.31** [.63]
GBC-Allocation	0.026*** [.005]	0.24** [.10]	-1.73*** [.23]	2.02*** [.76]	0.25*** [.056]	0.54*** [.14]
GFC						
Year fixed effect	Yes	Yes	Yes	Yes	Yes	Yes
12 Base Currency Dummies vs. U.S. Dollar dummy	No	No	No	No	No	No
R-Square Adjusted	**0.030**	**0.006**	**0.055**	**0.485**	**0.576**	**0.10**

countries must allow markets to determine prices and refrain from regulatory activities that retard entry into business and increase the cost of producing products. They also must refrain from "playing favorites", that is, from using their power to extract financial payments and reward some businesses at the expense of others. Yet, contrary to expectation, we find that improvement in area-5 is associated with SC funds achieving less in terms of performance—even though the total contribution of all five areas is positive for Sharpe and Treynor.

Table 4
Regressions of fund performance and risk metrics on *personal freedom* growth of relevant countries or region. The dependent variables denote the performance measures (Alpha to Sortino) and Beta, which measures risk level of the fund at year *t covering* the full period. Sample size $n = 5349$.

Dependent variables ⇒ Independent Variables ⇓	Beta	Alpha	Information Ratio (IR)	Treynor	Sharpe	Sortino	Beta	Alpha	Information Ratio (IR)	Treynor	Sharpe	Sortino
Const.	0.962*** [.007]	−0.51*** [.19]	−0.13 [.237]	0.99 [.89]	0.311*** [.081]	1.17*** [.27]	1.00*** [.006]	−0.62*** [.14]	0.036 [.26]	−16.38*** [.67]	−1.28*** [.052]	−2.31*** [.14]
Personal Freedom (PF)	0.301 [.37]	−4.26 [11.51]	−2.60 [4.18]	80.84* [47.37]	16.64*** [2.69]	61.08*** [13.33]	0.32 [.46]	−35.22 [12.95]	−16.98 [4.79]	77.55* [44.2]	19.24*** [2.98]	71.09*** [13.62]
Flexible asset allocation (dummy)	−0.18*** [.04]	0.97 [.61]	−0.15 [.31]	4.75 [4.47]	0.17 [.36]	0.053 [.96]	−0.19*** [.038]	0.73 [.59]	−0.28 [.27]	6.72*** [1.00]	0.58*** [.15]	1.04*** [.23]
Board quality grade	−0.006*** [.0012]	0.13*** [.03]	0.03** [.01]	0.10 [.11]	0.009 [.009]	0.03 [.05]	−0.008*** [.001]	0.09*** [.03]	0.01 [.04]	0.33*** [.07]	0.057*** [.006]	0.14*** [.05]
True No-Load (dummy)	0.014*** [.004]	0.21 [.13]	0.10** [.05]	0.34 [.50]	0.036 [.033]	0.21 [.14]	0.005 [.004]	0.19* [.11]	0.11*** [.04]	2.11*** [.29]	0.21*** [.022]	0.51** [.23]
Global broad category: GBC-Equity	0.021*** [.004]	0.49*** [.13]	0.07 [.25]	12.8*** [.73]	0.78*** [.69]	1.68*** [.35]	0.002 [.002]	0.49*** [.09]	−0.014 [.26]	15.15*** [.62]	1.08*** [.05]	2.26*** [.20]
GBC-fixed income	−0.038*** [.005]	0.089 [.11]	−0.30 [.26]	4.51*** [.69]	0.59*** [.07]	1.89*** [.26]	−0.04*** [.006]	0.03 [.08]	−0.38 [.27]	6.23*** [.69]	0.82*** [.06]	2.31*** [.29]
GBC-Convertibles	0.011 [.024]	−0.86 [.76]	−0.42 [.38]	6.72* [3.72]	0.54* [.29]	0.89* [.51]	0.006 [.023]	−0.92 [.70]	−0.51 [.39]	7.23*** [1.31]	0.63*** [.12]	1.12*** [.27]
GBC-Tax preferred	0.21*** [.03]	−0.83*** [.27]	−0.23 [.34]	2.43** [.96]	0.85*** [.19]	3.21*** [1.06]	0.17*** [.03]	−1.13*** [.24]	−0.46 [.35]	6.46*** [2.11]	1.51*** [.26]	4.65*** [1.18]
GBC-Allocation	0.026*** [.005]	0.96*** [.17]	0.30 [.25]	6.70*** [.75]	0.54*** [.07]	0.77*** [.13]	0.01** [.005]	0.92*** [.15]	0.21 [.27]	8.18*** [.64]	0.73*** [.051]	1.13*** [.14]
Year fixed effect	No	No	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes
12 base currency dummies vs. U.S. dollar dummy	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	No	No	No
R-Square adjusted	**0.0639**	**0.0146**	**0.0263**	**0.0904**	**0.1451**	**0.0082**	**0.048**	**0.013**	**0.028**	**0.616**	**0.526**	**0.047**

Table 5
Regressions of fund performance and risk metrics on *human freedom* growth of relevant countries or region. The dependent variables denote the performance measures (Alpha to Sortino), and Beta, which measures risk level of the fund at year *t covering* the full period. Sample size $n = 5349$.

Dependent variables ⇒ Independent variables ⇓	Beta	Alpha	Information Ratio (IR)	Treynor	Sharpe	Sortino	Beta	Alpha	Information Ratio (IR)	Treynor	Sharpe	Sortino
Const.	0.962*** [.007]	−0.52*** [.199]	0.145 [.257]	1.42 [.88]	0.35*** [.07]	1.313*** [.26]	1.00*** [.005]	−0.44*** [.13]	0.12 [.26]	−16.73*** [.64]	−1.38*** [.051]	−2.66*** [.16]
Human Freedom (HF)	0.942*** [.354]	13.090 [9.01]	5.629* [3.36]	−747.65*** [37.99]	−36.26*** [2.278]	−74.75*** [10.32]	1.86*** [.42]	−5.09 [12.56]	−8.31* [4.72]	172.7*** [33.74]	6.69*** [2.02]	40.16*** [15.65]
Flexible asset allocation (dummy)	−0.17*** [.038]	0.97 [.63]	−0.15 [.30]	4.75 [3.55]	0.174 [.36]	0.053 [.95]	−0.19*** [.036]	0.66 [.58]	−0.31 [.3]	6.85*** [1.12]	0.62*** [.15]	1.17*** [.30]
Board quality grade	−0.0065*** [.0012]	0.13*** [0.03]	0.028** [.011]	0.10 [.10]	0.009 [.01]	0.03 [.05]	−0.008*** [.001]	0.083*** [03]	0.006 [.01]	0.34*** [.07]	0.06*** [.006]	0.16*** [.05]
True No-Load (dummy)	0.014*** [.004]	0.21 [.13]	0.103** [.049]	0.34 [.47]	0.036 [.03]	0.21 [.147]	0.006 [.004]	0.16 [.11]	0.10** [.04]	2.16*** [.29]	0.23*** [.02]	0.55** [.23]
Global broad category: GBC-Equity	0.021*** [.004]	0.49*** [.13]	0.07 [.25]	12.79*** [.75]	0.78*** [.067]	1.68*** [.35]	0.003 [.002]	0.46*** [.09]	−0.03 [.27]	15.21*** [.62]	1.10*** [.05]	2.32*** [.20]
GBC-fixed income	−0.038*** [.005]	0.08 [.11]	−0.308 [.26]	4.51*** [.72]	0.59*** [.07]	1.89*** [.26]	−0.05*** [.006]	−0.0004 [.08]	−0.39 [.27]	6.27*** [.69]	0.64*** [.12]	2.36*** [.3]
GBC-Convertibles	0.011 [.025]	−0.86 [.75]	−0.42 [.38]	6.72** [3.14]	0.54** [.25]	0.89** [.45]	0.006 [.023]	−0.94 [.70]	−0.51 [.39]	7.21*** [1.32]	0.64*** [.12]	1.14*** [.28]
GBC-Tax preferred	0.207*** [.027]	−0.83*** [.26]	−0.23 [.34]	2.43* [1.29]	0.85*** [.21]	3.21*** [1.11]	0.17*** [.03]	−1.23*** [.23]	−0.51 [.35]	6.63*** [2.06]	1.56*** [.26]	4.84*** [1.18]
GBC-Allocation	0.026*** [.0056]	0.96*** [.17]	0.30 [.25]	6.70*** [.75]	0.54*** [.07]	0.77*** [.128]	0.013** [.005]	0.89*** [.14]	0.19 [.27]	8.20*** [.65]	0.74*** [.15]	1.17*** [.14]
Year fixed effect	No	No	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes
12 base currency dummies vs. U.S. dollar dummy	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	No	No	No
R-Square adjusted	**0.0656**	**0.0149**	**0.0267**	**0.1723**	**0.1852**	**0.0097**	**0.052**	**0.012**	**0.027**	**0.618**	**0.521**	**0.046**

Tables 4 and 5 show the results when we are using other freedom proxies (sample size is smaller than previous results as annual data cover the years 2008 to 2015); precisely in Table 4, SC funds in countries where Personal Freedom (PF) is showing greater progress have a tendency to add 16.64% (or 19.24%) in Sharpe ratio or 61.08% (or 71.09%) in Sortino ratio. Thus, *personal freedom (and its underlying indicators*—see Fig. A.1) emerges as having a stronger positive effect or an association with a higher performance of those SC funds. In contrast to Table 4, we notice that the results of Table 5 show that progress made in the broad-based human freedom index of a country is associated with negative performance and higher riskiness (beta) of SC funds, which is bypassed considering the fixed year effect. However, the results of Table 5

(columns 8 to 13) reveal an opposite sign such that a higher human freedom index is linked with a higher performance of Sharpe, Treynor, and Sortino performance measures. Thus, for managers of those funds or investors who are considering SC funds, the results grant and show that even after conditioning for those specific "worst" or "best" year(s), the overall human freedom index bears a sizeable impact on the development and success of those SC funds with better and higher explanatory power.

Given the aforementioned results, for robustness checks, we subsequently ran a battery of sensitivity tests to examine the validity of our core evidence and to verify that our predictions were maintained. For instance, our analysis might be plagued by an unwarranted linear assumption of the relationship between the freedom indicators and SC funds' characteristics in terms of performance and riskiness. In addition, results of Figs. B.4 to B.6 (see Appendix B) point to the possibility of a nonlinear relationship between squared Sharpe ratios and three freedom indicators; thus, a robustness check is crucial, and is examined in the next section. This result again implies that there are likely to be additional factors – hence, the need to use principal components regression – that contribute to the overall performance/riskiness of the selected funds.

4.2. Robustness framework and assessment

4.2.1. Squared sharpe ratio

This analysis is in line with Fama and French (2018), who propose squared Sharpe ratios to *select factors related* to the covariance matrix of returns, in general. They developed the squared Sharpe ratio for model factors as a metric for ranking asset-pricing models—in line with Barillas and Shanken (2016). However, Fama and French (2018) argued that the competing models should be judged based on the maximum squared Sharpe ratio. Fama and French (2018) define a_i as the vector of intercepts from regressions of $\prod_i$ on f_i and $\sum_i$ as the residual covariance matrix, thus the maximum squared Sharpe ratio for the intercepts is $Sh^2\ (ai) = a_i' \sum_i^{-1} a_i$ and the winner among competing models is the one that produces the smallest $Sh^2(a_i)$.

The GRS statistic of Gibbons et al. (1989) provides a test of whether multiple factors add to a base model's explanation of expected returns. Fama and French (2018) state that the goal is to minimize $Sh^2(a)$ – ignoring measurement error – and the best model is the one whose factors have the highest $Sh^2(f)$. Thus, as we search for the underlying host country FM factors that have substantial influence on the performance of SC funds, we suggest that a robustness check could assume that the achieved (actual) Sharpe ratio of each fund we have depends on a set of 'useful' factors pertinent to each SC fund that derives it; then we simply compute the squared Sharpe ratio, Sh^2, of each fund as the metric to judge freedom indicators and test if they do, indeed, increase or reduce the Squared factor. Therefore, we attempt to deconstruct the squared Sharpe ratio and show contributions of FM factors to Sh^2. Figs. B.4 to B.6 in the Appendix depict the non-linear relationship between freedom indicators and the estimated squared Sharpe ratio of all selected funds, such that the smaller the change of FM indicators in either direction, the higher the squared Sharpe ratio, supported by the visible concentration of a majority of points in the middle of the figures.

Table 6 shows that the growth of the selected freedom indicators has a significant contribution to the squared Sharpe ratio. If we want to consider the maximum squared Sharpe ratio of the fund, then we note that personal freedom has a positive and statistically significant higher effect on it than the other FM indicators even after controlling for fixed year effect. In addition, when we consider the three and then the five economic freedom areas, we note that explanatory power improves, and area 2 (Legal System and Property Rights) has a significant positive effect on the squared Sharpe ratio, while the other four areas except Sound Money exhibit a statistically significant negative impact on it.

It is noticeable from a global perspective that SC funds – even though they seriously take into account major social, ethical and/or environmental considerations – do indeed benefit from the improvement of some freedom aspects notably the social institutions as proxied by the personal freedom index, but they also take advantage of the weakening of some other facets of economic freedom.

4.2.2. Principal components regression

In this sub-section, we attempt to incorporate another dimension to our analysis: the fact that perhaps the three freedom indicators may have some *inherent commonality* that we could not capture by examining each one individually. In addition, when it comes to the five areas underlying the overall economic freedom index, we conjecture that *cross-dimensionality* of areas can reveal further insight and provide additional intuition to our analysis. We assume that all FM indicators are candidates to explain the performance measures (i.e., Sharpe ratio—selected since, on average, it has been shown to be subject to the highest and most consistent influence from FM indicators given its strong explanatory power) and riskiness (i.e., beta). Results of the first stage we identify three freedom indicators (EF, PF, and HF) and then we extract principal components from those variables. Through analysis of the eigenvectors, the number of eigenvectors will be chosen so that cumulative variance explained by the principal components is at least 90%. In the second stage, we use the five economic freedom areas, and then we extract principal components that represent the covariance matrix in the same fashion. We retain only the first components that account for close to 90% of the cumulative eigenvalues of the total volatility in the covariance matrix—we acknowledge that the number of retained principal components is somewhat arbitrary, but we are in line with Connor and Korajczyk (1988) and many other studies. Estimation for principal components analysis to reduce the dimensionality of the data set. A set of principal components is generated, and a subset

Table 6
Regressions of squared Sharpe ratio (Sh2) on growth of *each of the possible freedom metrics* of relevant countries or region. Full sample size n = 11,460 or sub-sample size n = 5349.

Dependent variables ⇒ Independent Variables ⇓	**Squared Sharpe**	**Squared Sharpe**	**Squared Sharpe**	**Squared Sharpe**	**Squared Sharpe**	**Squared Sharpe**	**Squared Sharpe**	**Squared Sharpe**	**Squared Sharpe**	**Squared Sharpe**
Const.	2.12*** [.124]	2.404*** [.124]	2.30*** [.123]	2.17*** [.17]	2.25*** [.176]	0.362*** [.11]	0.035 [.11]	-0.18 [.11]	-0.19 [.16]	-0.37** [.16]
Economic Freedom (EF)	-37.99*** [1.969]					-31.03*** [2.66]				
Personal Freedom (PF)				31.54*** [5.14]					32.42*** [6.00]	
Human Freedom (HF)					-71.25*** [4.95]					-26.84*** [4.88]
Area 1 (Size of Government)		-15.84*** [.82]	-14.22*** [.893]				-2.12** [.91]	-3.68*** [.91]		
Area 2 (Legal System & Property Rights)		9.83*** [1.93]	13.40*** [1.93]				25.07*** [2.16]	20.93*** [2.05]		
Area 3 (Sound Money)		1.97** [.98]	-0.82 [.92]				2.89*** [.74]	9.57*** [.77]		
Area 4 (Freedom to Trade Internationally)			-14.74*** [1.59]					-38.57*** [2.05]		
Area 5 (Regulation)			-6.38*** [.933]					-0.31 [1.31]		
Flexible Asset Allocation (dummy)	0.316 [.819]	0.32 [.81]	0.31 [.79]	0.022 [1.11]	0.022 [1.07]	0.42 [.56]	0.56 [.56]	0.51 [.50]	0.79 [.62]	0.86 [.62]
Board Quality Grade	0.039* [.02]	0.04** [.02]	0.039** [.02]	0.04 [.037]	0.042 [.04]	0.05*** [.014]	0.06*** [.014]	0.06*** [.013]	0.13*** [.03]	0.14*** [.03]
True No-Load (dummy)	0.013 [.054]	0.013 [.054]	0.013 [.054]	0.14 [.084]	0.14* [.082]	0.12*** [.04]	0.15*** [.04]	0.14*** [.04]	0.47*** [.06]	0.487*** [.06]
Global Broad Category: GBC-Equity	0.04 [.103]	0.04 [.09]	0.041 [.10]	0.06 [.13]	0.06 [.14]	0.23** [.11]	0.29*** [.11]	0.26** [.10]	0.59*** [.15]	0.61*** [.15]
GBC-Fixed Income	-0.042 [.11]	-0.042 [.10]	-0.042 [.11]	0.42*** [.14]	0.42*** [.15]	0.09 [.12]	0.14 [.12]	0.13 [.11]	0.80*** [.18]	0.84*** [.18]
GBC-Convertibles	0.021 [.30]	0.021 [.3]	0.02 [.30]	0.23 [.24]	0.23 [.26]	0.06 [.21]	0.09 [.21]	0.09 [.20]	0.38 [.26]	0.41 [.26]
GBC-Tax preferred	-0.43 [.30]	-0.43 [.31]	-0.43 [.31]	0.52 [.48]	0.52 [.52]	-0.16 [.34]	0.02 [.33]	-0.05 [.34]	1.71*** [.57]	1.81*** [.57]
GBC-Allocation	-0.24** [.11]	-0.24** [.10]	-0.24** [.10]	-0.22* [.129]	-0.22 [.14]	-0.13 [.11]	-0.09 [.11]	-0.10 [.10]	0.09 [.16]	0.11 [.16]
GFC	-0.34*** [.045]	-0.62*** [.045]	-0.48*** [.048]							
Sample size	11460	11460	11460	5340	5340	11460	11460	11460	5340	5340
Year fixed effect	No	No	No	No	No	Yes	Yes	Yes	Yes	Yes
12 Base Currency Dummies vs. U.S. Dollar dummy	Yes	Yes	Yes	Yes	Yes	No	No	No	No	No
R-Square Adjusted	**0.0433**	**0.053**	**0.0672**	**0.074**	**0.1039**	**0.279**	**0.281**	**0.319**	**0.31**	**0.306**

is selected to include as regressions in an OLS regression (PCR method). Of course, the estimators are transformed back from components to obtain estimators for the coefficients of the original model (A).

Evidence reveals that for Sharpe, as the dependent variable, overall personal freedom exerts a statistically significant positive effect on the Sharpe ratio of SC funds, while economic freedom has the opposite sign. Human freedom did show a weaker but positive impact on Sharpe ratio using the PCR method.[26] Furthermore, even overall economic freedom has shown a statistically significant negative (positive) effect on SC funds' performance (riskiness). Some of its underlying areas matter more than others—for instance, Sound Money and Legal System and Property are positive contributors whereas

26 Due to space limitations, these results are not reported but are available from the corresponding author upon request.

Size of Government and Freedom to Trade are negative contributors to SC funds' performance. Contrary to the funds' performance, after considering crucial control variables, we find that riskiness of the SC funds is increased the freer the economic landscape (human freedom is weakly significant) of the country associated with the base currency of SC funds. Most importantly, area 3 (Sound Money) and area 5 (Regulation) are associated with higher riskiness, but other areas of economic freedom (e.g., areas 1 and 4) are associated with lower riskiness of SC funds. It is crucial within an economic nexus to understand that nations may not witness progress in all five areas; thus, we document that the status of some of those areas could be desirable for these groups of funds, while improvement of other areas/aspects could be detrimental to their performance or riskiness.

4.2.3. Nonlinearity outlook and methods

Next, we examine the nonlinearity possibility as we control for the influence of other variables including year fixed effect, and we rule out the option that suggested freedom indicators (FM) may have a weak effect or stronger effect given the nonlinearity consideration. Thus, we test to see if the relationship of the suggested FM is time- and/or size-contingent and loses its intensity at a certain point. Panel A of Table 7 shows the results of our OLS regression with the addition of a polynomial nonlinearity component of the freedom indicators using both the indicator and its square. We document that personal freedom (PF) and its square are both statistically significant; and in fact, there is a significant positive effect of squared PF, suggesting that the turning point of the relationship is at a smaller but negative variation of the PF indicator. Personal freedom (human freedom) has the same influence on SC funds' performance, and we conclude that coefficients of the term and its square are significant and differ in size and (not in) sign to suggest that only at extremely high (low) change of PF (HF) do we start to witness as nonlinear positive *combined* impact on the performance of these global SC funds.

Additionally, riskiness of SC funds under the nonlinearity consideration did not reveal any stable effect of the term and its square of personal freedom and human freedom, except in the case of HF when we notice that a 1% annual change in terms of HF is associated with a 1.83 higher riskiness of SC funds. Surprisingly, and in contrast to previous results, we notice that area 1 (Size of Government) no longer has a statistical effect, but its square (quadratic relationship) does. This serves to showcase that the improvement in the area is beneficial to the overall performance of SC funds only at *a higher degree of progress* in terms of Size of Government; meanwhile Sound Money (area 3) maintains the same influence of both terms on riskiness of SC funds. In sum, the relationship between some EF areas (areas 4 and 5) and the Sharpe ratio is inverted-U-shaped, while the other areas have the opposite shape.

For additional robustness of our results, Table 7, panel B, reports the result of nonlinear models using a numerical optimization algorithm, nonlinear least squares method, employing freedom indicators and only a subset of mentioned control variables that are shown to have a consistent and higher level of significance in the linear least squares method. The model has been re-estimated with different starting values to verify that the *global maximum* has been achieved; the maximum likelihood estimator is the value of coefficient that maximizes the concentrated log-likelihood function. Regarding performance of SC funds, we obtain supporting evidence that all three freedom indicators except human freedom (HF) have a statistically significant positive effect, whereas riskiness of those funds is positively but slightly influenced by the economic freedom and human freedom variations of relevant country or region. Yet again, areas 1 and 5 have negative effects but the other areas show a higher but positive impact on the performance of SC funds. With this decomposition of the underlying five areas of economic freedom, we discern that riskiness of the SC funds is greatly impacted and increased, in the order of 0.32, by the areas of Sound Money, and Legal System and Property Rights.

5. Conclusion, implications, and future directions

In this study, we pinpoint the relevance of freedom indicators in performance and riskiness of financial products. We used the socially conscious mutual fund industry because it represents an excellent laboratory for testing our main research question and dissects the contributory role of economic/social freedom(s) on SC funds performance, but we believe the results can be extended to cover other industries, notably organizations adjacent to the mutual fund industry such as other financial institutions (e.g., banks and insurance companies), since managers in those types of firms are usually motivated and/or required to maintain high performance vis-à-vis a measurable benchmark or index.

We deem that estimated positive impacts and an influential/contributory role of aspects of economic freedom and personal freedom on performance and riskiness should not constrain the attractiveness of some socially conscious funds versus others, and thus applicability and scope of the study should not curtail the emphasis on the role of country/region freedom indicators in the overall performance of the financial industry and similar organizations.

Broadly speaking, we find that changes in the overall level of economic freedom have a direct positive and statistically significant impact on the performance of SC funds. We also note that the coefficients of economic freedom and/or personal freedom do not change much, either in magnitude or significance, when we add several control variables including year fixed effect, even after undertaking various robustness examinations. When we separate the economic freedom index into its five areas, we find that some aspects of economic freedom, measured by area, matter for SC funds' performance and riskiness. However, changes in area 2 (Legal System and Property Rights) and area 3 (Sound Money) consistently show a statistically significant effect across many model specifications.

In conclusion, the findings in this study point to policy and practical implications. From an academic perspective, this study contributes to the areas of international ESG investing – by evaluating the ESG risks and opportunities surrounding

Table 7
Examining non-linearity effect of freedom indicators on fund performance and risk level while controlling for year fixed effect. The dependent variables denote the performance measure (Sharpe) or Beta, which measures risk level of the fund at year t covering the full period or sub-sample period. Full sample size $n = 11{,}460$ or sub-sample size $n = 5349$.

Panel A: Polynomial nonlinearity component is captured by using relevant variable(s) and its square, which suggests the relationship loses its effectiveness or intensity at a certain point.

Dependent variables ⇒ Independent Variables ⇓	**Sharpe**	**Beta**	**Sharpe**	**Sharpe**	**Beta**	**Beta**	**Sharpe**	**Beta**	**Sharpe**	**Beta**
Const.	-0.68*** [0.06]	1.00*** [.006]	-0.73*** [.06]	-0.75*** [.06]	0.99*** [.006]	0.99*** [.006]	-1.26*** [.05]	1.00*** [.006]	-1.38*** [.05]	1.00*** [.005]
Economic Freedom (EF)	-2.28* [1.42]	0.61** [.27]								
Squared EF (EF2)	1.39 [40.06]	-6.18 [8.04]								
Personal Freedom (PF)							21.99*** [2.41]	0.057 [.46]		
Squared PF (PF2)							-353.2*** [56.68]	34.14*** [12.88]		
Human Freedom (HF)									9.11*** [2.44]	1.83*** [.47]
Squared HF (HF2)									255.72* [138.5]	-2.80 [21.43]
Area 1 (Size of Government)			3.15*** [.39]	2.92*** [.38]	-0.013 [.07]	-0.002 [.07]				
Squared Area 1—(Area1)^2			25.83*** [6.97]	4.05 [7.81]	1.79 [1.14]	1.95 [1.23]				
Area 2 (Legal System & Property Rights)			1.12 [1.0]	2.80*** [1.06]	0.48** [.21]	0.38* [.16]				
Squared Area 2—(Area2)^2			-274.4*** [52.79]	-255.6*** [52.9]	7.71 [10.25]	9.19 [10.25]				
Area 3 (Sound Money)			-0.81 [.77]	-0.81 [.77]	0.66*** [.16]	0.65*** [.16]				
Squared Area 3—(Area3)^2			-2.84 [3.45]	15.63*** [4.09]	1.95*** [.65]	1.70** [.70]				
Area 4 (Freedom to Trade Internationally)				-9.70*** [.98]		0.03 [.15]				
Squared Area 4—(Area4)^2				-140.51*** [23.46]		3.27 [2.99]				
Area 5 (Regulation)				-2.91*** [.54]		0.28*** [.11]				
Squared Area 5—(Area5)^2				-24.9*** [8.17]		-2.35 [1.61]				
Flexible Asset Allocation (dummy)	0.1 [.21]	0.10 [.13]		0.10 [.20]	0.10 [.14]	0.10 [.13]	0.58*** [.15]	-0.19*** [.04]	0.613*** [.15]	-0.19*** [.036]
Board Quality Grade	0.03*** [.004]	-0.008*** [.0007]		0.03*** [.004]	-0.008*** [.0007]	-0.008*** [.0007]	0.05*** [.006]	-0.008*** [.001]	0.06*** [.006]	-0.008*** [.001]
True No-Load (dummy)	0.10*** [.017]	-0.002 [.003]		0.11*** [.016]	-0.003 [.003]	-0.03 [.003]	0.22*** [.02]	0.006 [.039]	0.22*** [.02]	0.006 [.39]
Global Broad Category: GBC-Equity	0.38*** [.05]	-0.005** [002]		0.39*** [.05]	-0.006*** [0.003]	-0.00** [.002]	1.08*** [.05]	0.002 [.002]	1.09*** [.05]	0.003 [.002]
GBC-Fixed Income	0.35*** [.06]	-0.02*** [.004]		0.36*** [.06]	-0.03*** [.004]	-0.025*** [.004]	0.82*** [.06]	-0.05*** [.006]	0.82*** [.06]	-0.05*** [.006]
GBC-Convertibles	0.27** [.12]	-0.006 [.015]		0.26** [.11]	-0.005 [.16]	0.65*** [.16]	0.63*** [.12]	0.007 [.024]	0.64*** [.12]	0.006 [.02]
GBC-Tax preferred	0.43** [.17]	0.209*** [.016]		0.44*** [.17]	0.21*** [.16]	0.03 [.15]	1.51*** [.26]	0.17*** [.03]	1.55*** [.26]	0.17*** [.027]
GBC-Allocation	0.24*** [.05]	0.26*** [.005]		0.25*** [.05]	0.026*** [.005]	0.28 [.107]	0.73*** [.05]	0.013** [.005]	0.74*** [.05]	0.013** [.005]
GFC										
Sample size	11460	11460	11460	11460	11460	11460	5340	5340	5340	5340
Year fixed effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
12 Base Currency Dummies vs. U.S. Dollar dummy	No	No	No	No	No	No	No	No	No	No
R-Square Adjusted	**0.57**	**0.029**	**0.573**	**0.586**	**0.031**	**0.031**	**0.527**	**0.049**	**0.521**	**0.052**

(*continued on next page*)

equities and ETFs – and global risk management while addressing the relevance of both social and economical institutional framework in the search for socially responsible and growth-first climate-investing portfolios across nations. Practitioners and policymakers can benefit from this research since it provides additional information and guidance on the underlying institutional factors and freedom indicators that support the *prosperity and growth* of this group of financial products. For investment firms, economic freedom and/or aspects of economic freedom, or personal freedom, should be included as an additional instrument – and a macro insight – along with the optimal combination of risky assets. For assisting the analyst and portfolio manager, the intuitive character of the method makes it versatile and easy to use by investment firms as a supplementary decision tool.

We articulate the added financial benefits to be had when socially responsible features and freedom infrastructure are present, confirming that freedom indicators matter. A noticeable limitation of our study is that we did not test possible internal channels that govern and direct investment strategies and decisions (e.g., including those stringent tests over

Table 7 (*continued*).

Panel B: Nonlinear model specification using nonlinear least squares method by regressing dependent variables (fund performance and risk level) on most significant variables plus relevant freedom indicators.

Dependent variables ⇒ Independent Variables ⇓	**Sharpe**	**Beta**	**Sharpe**	**Beta**	**Sharpe**	**Beta**	**Sharpe**	**Beta**
Const.	0.61*** [.02]	1.00*** [.002]	0.69*** [.02]	1.00*** [.002]	0.55*** [.015]	0.99*** [.002]	0.55*** [.015]	0.99*** [.002]
Economic Freedom (EF)	5.35*** [1.15]	0.38** [.15]						
Personal Freedom (PF)					29.28*** [2.9]	0.26 [.38]		
Human Freedom (HF)							-35.27*** [2.21]	0.92*** [.29]
Area 1 (Size of Government)			-2.43*** [.43]	-0.12** [.06]				
Area 2 (Legal System & Property Rights)			10.67*** [1.04]	0.32** [.14]				
Area 3 (Sound Money)			5.61*** [.66]	0.32*** [.08]				
Area 4 (Freedom to Trade Internationally)			3.74*** [.70]	0.081 [.09]				
Area 5 (Regulation)			-1.61*** [.55]	0.12 [.07]				
Board Quality Grade	0.035*** [.007]	-0.009*** [.001]	0.04*** [.007]	-0.009*** [.001]	0.07*** [.01]	-0.007*** [.001]	0.084*** [.01]	-0.007*** [.001]
GFC	-0.30*** [.024]	-0.004 [.003]	-0.37*** [.026]	-0.008** [.003]				
Sample size	11460	11460	11460	11460	5340	5340	5340	5340

how sustainable a company or government is to satisfy ESG criteria) within the mutual fund industry, and how the overall quality of institutions interacts (if at all) and is taken into consideration internally as well. This study opens the door for future studies to address the role of macro-channel and political environment of a country, as it provides the institutional framework in which the mutual fund industry develops, grows, and constructs various financial products. Thus, it will be beneficial to address the role of freedom indicators or resilient economic freedom aspects in the construction of various thematic portfolios for which environmental, social, and governance factors have been integrated into the investment process.

Data availability

Parts of the data are commercially available from sources identified in the text, and the remainder of the data (i.e., freedom indicators) is available from public sources.

Appendix A

Economic Freedom and Components Areas, plus Human Freedom and Personal Freedom

The index measures the degree of economic freedom present in five major areas: [1] Size of Government; [2] Legal System and Security of Property Rights; [3] Sound Money; [4] Freedom to Trade Internationally; [5] Regulation. Comprehensive data are only available with a two-year lag, therefore the index itself has a two-year lag. Each component and sub-component is placed on a scale from 0 to 10 which reflects the distribution of the underlying data. When sub-components are present, their ratings are averaged to derive the component rating. The component ratings within each area are then averaged to derive ratings for each of the five areas. In turn, the five area ratings are averaged to derive the summary rating for each country. The five components of area 1 (Size of Government) indicate the extent to which countries rely on the political process to allocate resources and goods and services. When government spending increases relative to spending by individuals, households, and businesses, government decision-making is substituted for private choice and economic freedom is reduced.

Area 2 focuses on the key ingredients of a legal system consistent with economic freedom which are rule of law, security of property rights, an independent and unbiased judiciary, and impartial and effective enforcement of the law.

Area 3 captures the importance of individuals having access to sound money.

The components in area 4 are designed to measure a wide variety of restraints that affect international exchange: tariffs, quotas, hidden administrative restraints, and controls on exchange rates and the movement of capital.

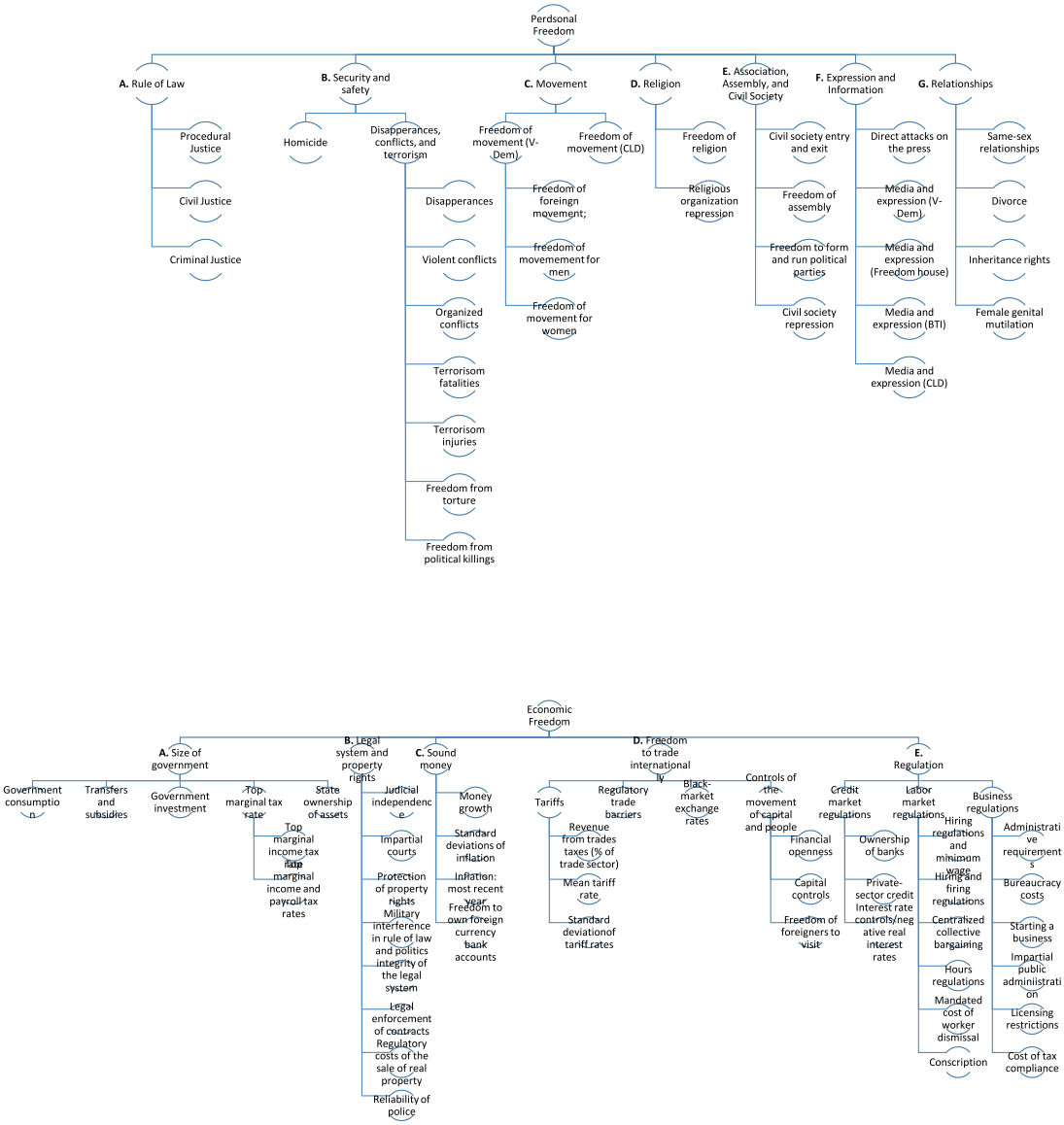

Fig. A.1. Personal Freedom/Economic Freedom Indicators and their associated sub-components. *Note*: V-Dem = Varieties of Democracy; CLD = Civil Liberty Dataset; BTI = Berteismann Stiftung's Transformation Index.
Source: Compiled and organized by authors from Cato Institute and the Fraser Institute, the Human Freedom Index published by Vasquez et al. (2022).

When regulations restrict entry into markets and interfere with the freedom to engage in voluntary exchange, they reduce economic freedom. Area 5 of the index focuses on regulatory restraints that limit the freedom of exchange in credit, labor, and product markets.

The Human Freedom Index (HFI) presents a broad measure of human freedom, understood as the absence of coercive constraint. This index uses 82 distinct indicators of personal and economic freedom in the following areas: Rule of law; Security and safety; Movement; Religion; Association, assembly, and civil society; Expression and information; Identity and Relationships; Size of government; Legal system and property rights; Sound money; Freedom to trade internationally; and Regulation. The latest global compilation of statistics is "The Human Freedom Index" published by the CATO Institute, Fraser Institute, and the Friedrich Naumann Foundation for Freedom.

The Human Freedom Index presents the state of human freedom in the world based on a broad measure that encompasses personal, civil, and economic freedom. Human freedom is a social concept that recognizes the dignity of individuals and is defined here as negative liberty or the absence of coercive constraint. Additionally, the index is a

resource that provides a more objective way to observe relationships between freedom and other social and economic phenomena, as well as the ways in which the various dimensions of freedom interact with one another.

The Human Freedom Index merges the Economic Freedom Index and a Personal Freedom Index. The first is an older construction by the Fraser Institute. The Personal Freedom Index (PFI) has the first seven dimensions of the Human Freedom Index listed above. The scores are on a scale from 0 to 10, or the range from no freedom to full freedom; one can read a score of 5.0 as "half-free". For further details regarding the methodology of each index, readers are advised to find details at the official websites of the Cato Institute and/or Fraser Institute.

Appendix B

Figs. B.1 to B.3 **shows the movement of the main and sub-area indexes of economic freedom of Eurozone countries chosen to represent the Euro-region**

Figs. B.4 to B.6**: Movement of freedom indicators versus Squared Sharpe ratios (Sh2) of selected SC funds**

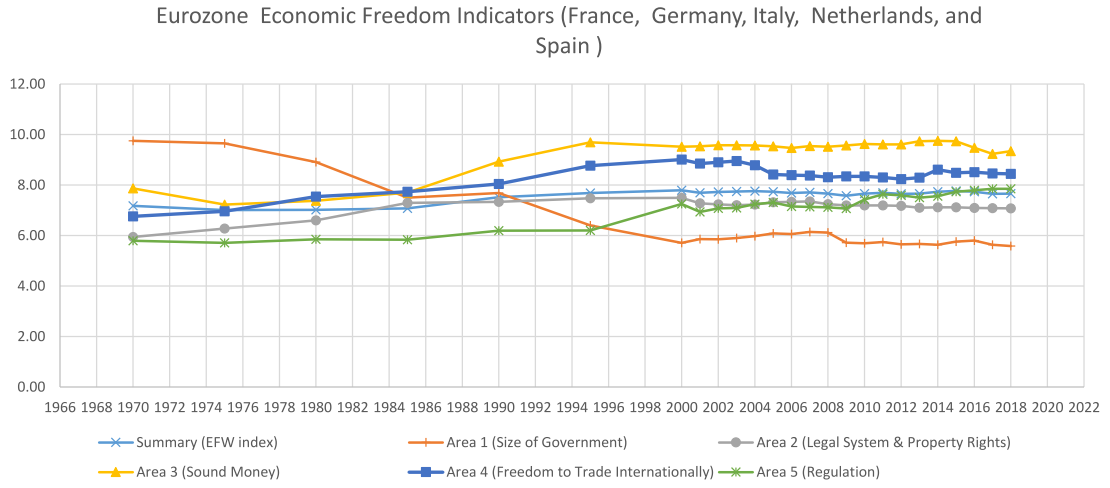

Fig. B.1. Eurozone Economic Freedom Indicators (France, Germany, Italy, Netherlands, and Spain)

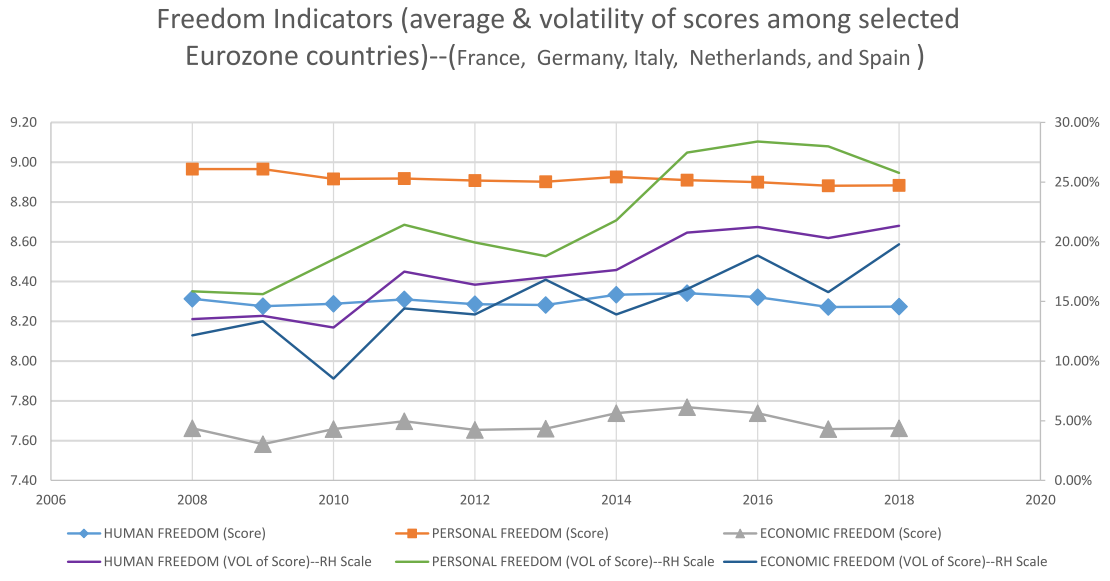

Fig. B.2. Freedom Indicators (average & volatility of scores among selected Eurozone countries)–(France, Germany, Italy, Netherlands, and Spain)

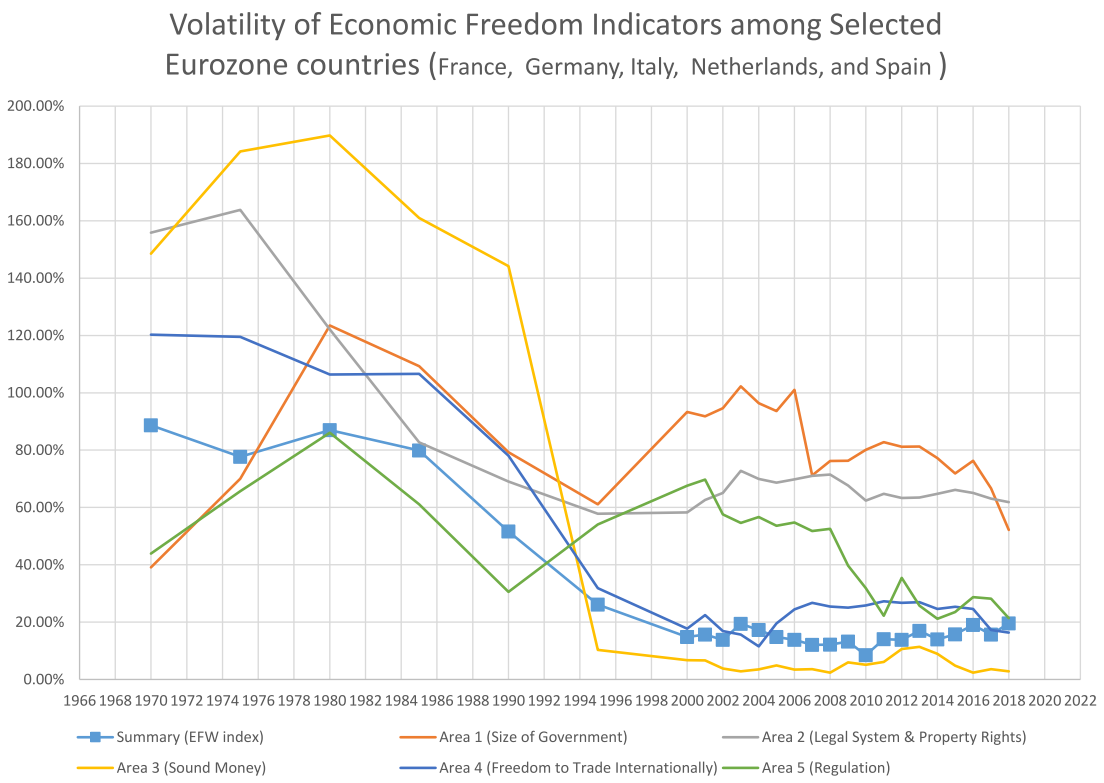

Fig. B.3. Volatility of Economic Freedom Indicators among Selected Eurozone countries (France, Germany, Italy, Netherlands, and Spain)

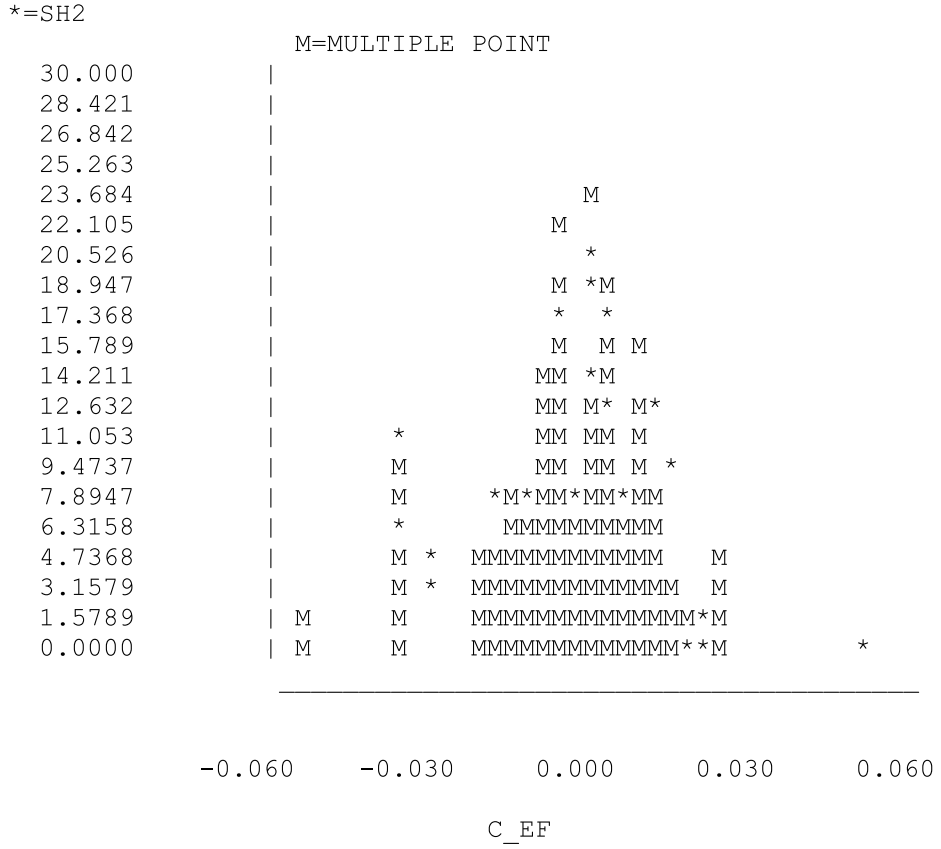

Fig. B.4. Change of Economic Freedom (C_EF).

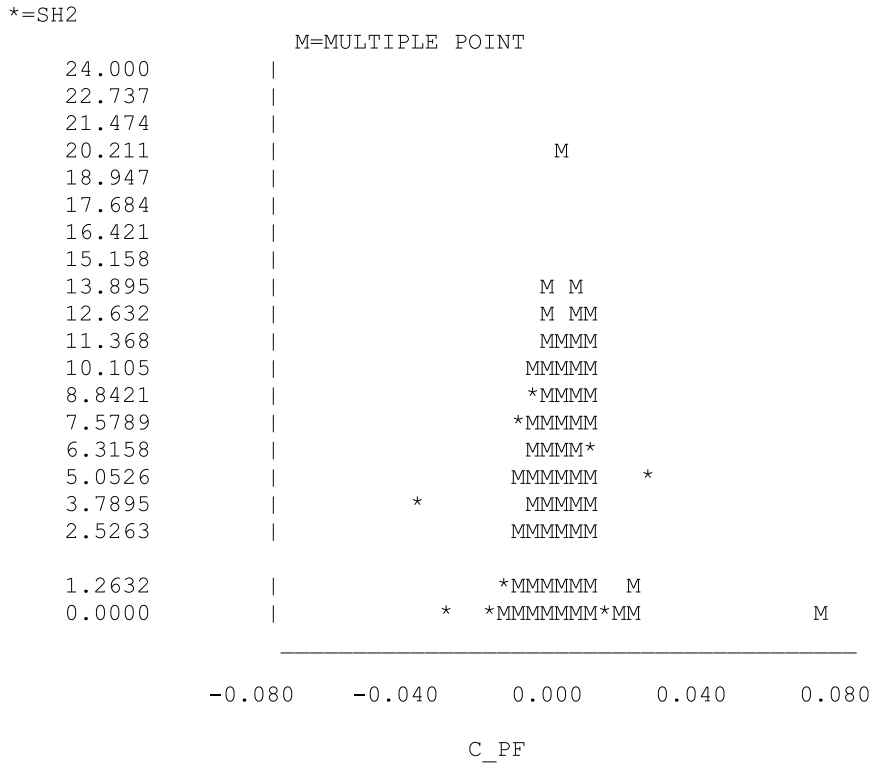

Fig. B.5. Change of Personal Freedom (C_PF)

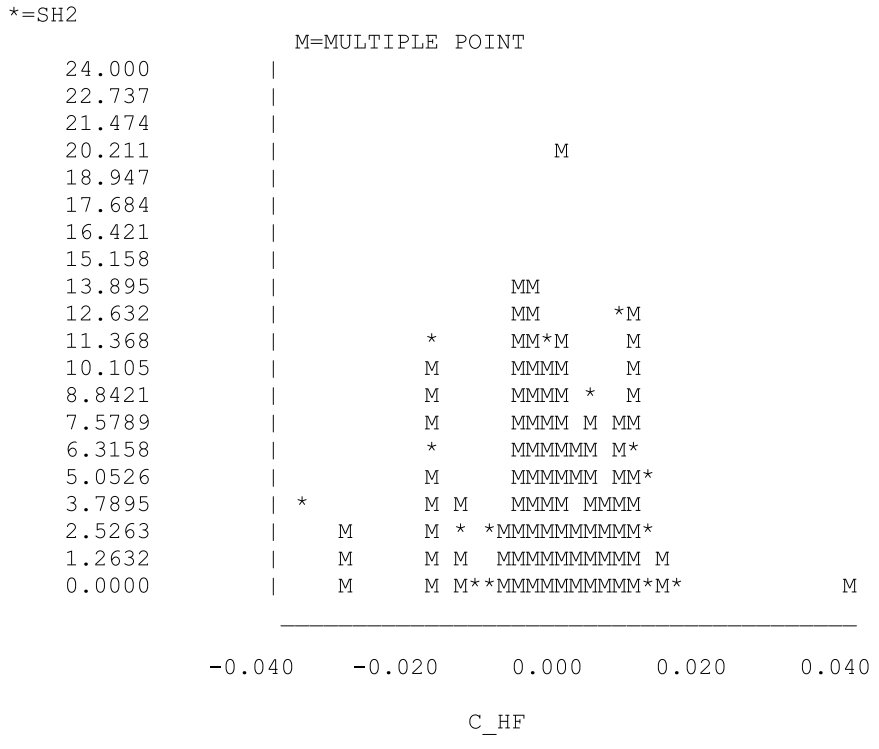

Fig. B.6. Change of Personal Freedom (C_PF).

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