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**The Global Equity Premium Revisited:
What Human Rights Imply for Assets' Purchasing Power**

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Abstract: In this paper, we argue that past computations equity risk premium did not properly account for the financial implications of political collapse on property, civil and human rights. Accordingly, we argue past calculations overstated the equity risk premium. In their stead, we argue a conservative lower bound is to set the value of equity to zero when confronted with the total absence of human, civil and property rights which negate the purchasing power of financial investments. In doing so, provide a valid lower-bound estimate of the equity risk premium that is corrected for lack of such basic rights, demonstrating the important changes in this estimate over time.

Keywords: Rare (“black swan”) events; Equity premium; International political crises; Property, civil and human rights; World War II; World equity index

JEL Classifications: G12, G15

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1 Introduction

In this paper, we consider the implications of apocalyptic risk for capital markets. The risk is defined as an event which leads to collapse of political system and abrogation of property/civil/human rights. The apocalyptic risk is represented by events such as foreign military invasions, coups leading to dictatorships and a revolution which transitions from a market economy to total centralized control. In our study, we aim to re-estimate the equity risk premium in way that it will reflect the fact that property/civil/human rights are integral part of free market economy. The argument flows from the recognition investors purchase capital assets so as to be able to transform current value to future consumption: If there is an intervening event which abrogates that link, such should be recognized in our estimates of the global risk premium.

We use events during the Second World War to discern markets' incorporation of information regarding the probability of an Armageddon for each country. Choudhry (2010) studied the relationship between key World War II events and the Dow Jones Industrial Average. Studies such as his examine the link between historical events and performance of asset markets. It has been suggested the danger of national collapse should be evaluated in terms of cash flows and risk premiums. For our part, we assume these considerations are overwhelmed by the more basic issues concerning loss of human, civil and property rights. Similar to Willard, Guinnane and Rosen (1996), Frey and Kucher (2001) and Frey and Daniel Waldenström (2004), we use capital markets to determine importance of historical events and their impact on equity risk premium.

We believe the true computation of the equity risk premium should be informed by correctly inferring what it means to earn a return on investment capital (or any asset) in a free-market economy, and then use those assets to acquire future purchasing power. The work we seek to address is the oft-quoted work by Jorion and Goetzmann (JG, 1999) and Dimson, Marsh and Staunton (DMS, 2008 and 2011). Both previous papers have attempted to compute what DMS denote as the magnitude of the "equity risk premium historically." While we take pains to improve the quality of the data we use in contrast to JG, one issue we address in detail is what Jorion and

Goetzmann (1999) characterized as “temporary” and “permanent” market closures in the continents of Europe and Asia. In seeking to provide a conservatively-low estimate of the difference between the U. S. and other national markets, they impute “a 75 percent loss in the month the series permanently disappears” (page 974) to these market closures. We believe they are inappropriately conservative when they effectively *concatenate* returns over “temporary” closures to the resumption of trading when that subsequently occurred: “For some of these, such as Germany . . . , we are able to trace the fall in value, which we evenly spread over the time period of the interruption” (page 974).¹

Consider three examples of events whose consequences are thus “evenly spread over the period” of interruption:

1. The effective end of civil rights in Germany’s Weimar Republic with the Feb. 1933 issuance of the so-called “Reichstag Fire Decree” and the German parliament’s passage of the Enabling Act in March 1933.
2. The March 1938 “Anschluss” by which the Republic of Austria was incorporated into the “Third German Reich.”
3. The June 1940 signing of an armistice between the French Republic and Germany, which provisions included the surrender of all persons who had been granted political asylum as well as subsequent loss of civil and human right in France.²

We claim the computations of Jorion and Goetzmann (1999) were unduly generous in failing to recognize the above events abrogated not only all property rights within the affected entities, but also civil and indeed human rights. The nature of the prevailing regime, and the arbitrariness of the regime’s identification of individuals deprived of rights, render these events over-arching in terms of their impact on the respective countries’ *domestic* investors. In free market economies, the point of financial resources is the implication they bear on *purchasing power*: In the absence of basic human

¹ The works of DMS (2008, 2011), Barro (2005) and Barro and Ursúa (2008) are subject to the same criticism.

² In private communication, one economic historian has argued the loss of rights was incurred by only a portion of the resident French population.

and civil rights, there is simply no meaning to the ostensible “purchasing power” of financial (or real) assets.

The impact is less clear on international investors (in the absence of capital controls), so our evaluation is a lower bound on the expropriation of such international investors’ assets.³ In the event of the above WWII cases, *ex post* international investors domiciled in belligerent nations (i.e., the Western Allies including United Kingdom, Australia, New Zealand and the United States) were also expropriated as states of war were sequentially interposed (1939 and 1941) between such investors and their financial assets.⁴

Now consider the case of the two major successful Communist revolutions of the twentieth century, the 1917 Russian and the 1949 Chinese. Such events overturned the existing financial regimes and eliminated entirely the property rights of shareholders. In this case, there is no distinction in the losses of domestic and international investors. We do not believe it would be meaningful to attempt a “concatenation” of property rights between 1917 and 1995 or between 1949 and 1990.

As a consequence, we should not treat subsequent values in these European domiciles as governed by a free market, but rather assume a legitimate lower bound entails a total elimination of the value of the equity market. We believe the same is true in the advent of a successful Communist revolution, á la Russia in 1917 or China in 1949.⁵

³ In light of our analysis of the implications of the abrogation of civil and human rights, we believe this is the *correct* estimate to compute.

⁴ In addition to the nature of the regime imposed on conquered nations such as Poland and France in 1939 and 1940, Overy (1994) documents

“German leaders sought to coordinate the industrial resources of the conquered and dependent areas with the long-term economic interests of the Reich. ... The state sought to suppress purely economic motives and to substitute some rough notion of ‘racial political’ priority ...”

Separately, Smith (1989) documents the magnitude of “monetary gold stolen by Germany during World War II” as 320 tons.

⁵ The Shanghai stock market was closed with the arrival of Imperial Japanese forces Dec. 5, 1941. Subsequent to V-J Day, trading resumed temporarily in 1946 but terminated three years later. The city of Shanghai was occupied by Communist forces May 27, 1949. The present Shanghai Stock Exchange re-opened and began operation Dec. 19, 1990.

While it is our firm belief the above three cases are relatively easy to determine in terms of the impact on human rights and their implications, our analysis requires a more-subtle distinction between the above cases and, say, those of Pinochet's Chile or modern-day regimes in China, Russia and the Middle East: In these latter cases, while there remains some arbitrariness to the rule of law, it is reasonably clear to market participants their willingness to abstain from political activities contrary to the prevailing regime provides adequate cover to engage in commercial activities, including but not limited to stock-market transactions. In contrast, for our examples cited from the 1930s and 40s, as well as the original 1917 / 1949 Communist regimes in the Soviet Union and China, no amount of regime accommodation by certain individuals would assure them the right to commercial activities or basic human rights.

There are essentially two approaches to the issue of quantifying WWII-related military collapse. On the one hand, the argument is made that most investors did not face expropriation risk; while some did, it is unlikely the whole population of investors was adversely affected in the same way; and that authoritarian regimes permitted the transfer of wealth from one group to another, perhaps leaving total wealth basically unchanged. On the other hand, we argue that expropriation of some investor groups was both arbitrary and complete, and that curtailment of human, civil and property rights to a portion of a country's domestic population could and was arbitrarily expanded to other segments of society as well as to international investors.

It is for this reason we argue JG's 25% residual-value assumption is an upward-biased estimate of equity value. In its stead, we compute the equity risk premium under our zero-residual-value assumption. We are by no means the sole to make this zero-residual-value assumption: At least with respect to Russian capital markets, Berkman, Jacobsen and Lee (2011) write explicitly, "[I]nvestors in Russian stocks and bonds during the Revolution of 1917 lost all their money." The determination of the appropriate residual value for a market which has collapsed remains a topic of disagreement. JG have determined a value of 25%. We feel a residual-value of zero is a natural lower-bound for a market in which human, civil and basic property rights have been abrogated.

With the success of Western-style free-markets over competing economic and political systems in 1945 and 1991, time-aggregation has diminished the impact of pre-1945 diminution of property, civil and human rights in the world's major markets. But such was not the case in the first half

of the 20th century, so we provide a moving-window time-series estimate of (lower bound of) the equity risk premium, as well as its implication for total-value as of 2014. Accordingly, we provide a lower-bound estimate of the equity Sharpe Ratio, demonstrating the important changes in this estimate over time.

The study by Berkman, Jacobsen and Lee (2011) has addressed the issue of political (military) risk. Although the authors concede they “lack long data series for Russian stock markets,” they claim “several months with missing observations for some European countries around the start of World War II, and some monthly returns are missing for the German stock market at the end of World War II.” In seemingly minimizing the lack of data and attributing it to “missing observations,” we contend their paper, also, has failed to recognize some crises are of an existential threat to their domestic domiciles.

As have other authors, the exceptional role of the United States in the computation of a global equity risk premium is also recognized here. The United States has been subject to existential risk of a global nuclear apocalypse since Soviet detonation of a nuclear device in Aug. 1949, and that risk was expanded with the Oct. 1964 first nuclear test in the People’s Republic of China. Due to its unique geographical location, including the relative friendliness of its northern and southern neighbors, the United States has not since 1814 been at serious risk of an invasion of its continental territory.⁶ On the domestic side, there were periods of labor unrest in the United States, a 1919 – 1921 “First Red Scare” when the Socialist Party of America garnered nearly a million votes in the 1912 and 1920 Presidential elections. That said, the Great Depression was addressed through existing Constitutional structures, and the Socialist Party dissolved itself in 1972 to form the Social Democrats, USA. As a consequence of this external security and internal stability, as well as the size of its capital market, we separate out the impact of U. S. capital markets as we compute a global equity risk premium.

It is appropriate at this time to lay out the specific assumptions under which our analysis proceeds: First, computing an equity risk premium should take correct cognizance of the purchasing-power implication of earning a return on an asset in a free-market economy. Moreover, in the absence

⁶ Even if its resolution had been different, we assume the American Civil War did not threaten the viability of the northern states.

of clear substantiation of ownership rights, “concatenating” returns over “temporary” closures to the resumption of trading when that subsequently occurred is inappropriate. We believe the same is true in the advent of a successful Communist revolution, á la Russia in 1917 or China in 1949. Finally, there is a distinction between non-democratic regimes which tolerate free markets so long as individuals abstain from political activities contrary to the prevailing regime. In contrast, for the examples we cite from the 1930s and 40s, as well as the original 1917 / 1949 Communist regimes in the Soviet Union and China, no amount of regime accommodation by certain individuals would assure them the right to commercial activities or basic human rights.

As a result, there is a special role to examining European stock markets in the 1930s. While analogous analyses should have been conducted in Russia in 1917 and China in 1949, we do not have access to stock and bond markets in those countries for those periods.

The paper is now structured as follows. Section 2 presents an overview of the data sources we assembled in support of this research. Section 3 presents the calculation of the global equity risk premium using our modified methodology. While it has no bearing on U. S. equity risk-premium estimates, we correct numerical errors in reported values and present our calculation of that premium as well. Section 4 concludes.

2 Data

In order to shed light on the research questions on which we focus, we obtained data from the Global Financial Data (GFD) database, which provides historical financial data on international stock indices. For most of the countries under consideration, U. S. dollar-denominated benchmarks are available from the early 1920s. Since total-return indices were only available on an annual frequency, in our study we use monthly capital return indices starting in January 1921. These indices are built using a uniform methodology. The GFD database pays special attention to the quality of its time series, and therefore employs a double-blind proprietary research process that involves only primary sources. The database takes primary source information from government archives, exchanges, central banks and periodicals of record. Each dataset’s history may come from varying sources, and sometimes includes more than one primary source. The GFD database uses a third party to build the dataset with the same source material to confirm that its findings are

accurate. Such an approach provides multiple points of comparison, and any discrepancies are researched individually to ensure accuracy.

Table 1 presents those countries which have had continuous equity markets, as we define them, over the period covered by the GFD data we utilize. Continuity of such markets is a confluence of good fortune with respect to economic development, geographical location and governance.

Table 1: Performance of Equity Markets with Continuity of Rights

Country	Begin Date	End Date	Mean	Median	Std. Dev.
Argentina(ARG)	31/01/1939	31/12/1996	20.05	0.00	61.49
Australia (AUS)	31/01/1921	31/12/1996	6.67	4.96	17.65
Brazil(BRA)	30/06/1925	31/12/1996	-19.99	-32.44	31.57
Canada (CAN)	31/01/1921	31/12/1996	6.37	8.54	17.17
Chile (CHL)	31/12/1921	31/12/1996	12.91	0.02	39.09
Columbia (COL)	31/01/1927	31/12/1996	0.23	-3.40	21.84
Spain (ESP)	31/01/1921	31/12/1996	3.74	3.24	18.96
Finland (FIN)	31/01/1921	31/12/1996	7.01	3.22	21.26
Greece (GRE)	31/12/1952	31/12/1996	9.72	-4.89	27.69
India (IND)	31/01/1921	31/12/1996	3.38	0.60	18.90
Ireland (IRL)	31/01/1934	31/12/1996	6.58	4.70	16.44
Israel (ISR)	31/01/1949	31/12/1996	6.73	4.74	26.64
Mexico (MEX)	31/01/1930	31/12/1996	8.85	1.81	30.07
New Zealand (NZ)	31/12/1926	31/12/1996	5.10	6.78	18.20
Pakistan (PAK)	31/07/1960	31/12/1996	3.90	1.71	21.04
Peru (PER)	31/12/1926	31/12/1996	8.76	0.00	44.03
Philippines (PHL)	31/12/1952	31/12/1996	2.30	-5.13	32.53
Portugal (POR)	30/06/1931	31/12/1996	8.01	-0.73	30.05
South Africa (ZAF)	31/01/1921	31/12/1996	6.67	5.46	19.47
Switzerland (SUI)	31/01/1921	31/12/1996	7.91	8.28	16.56
Sweden (SWE)	31/01/1921	31/12/1996	8.06	8.65	17.78
United Kingdom (UK)	31/01/1921	31/12/1996	6.56	8.79	19.15
Uruguay (URY)	31/01/1925	31/12/1996	1.20	-4.07	56.11
United States (USA)	31/01/1921	31/12/1996	7.99	11.01	19.26
Venezuela (VEN)	31/12/1929	31/12/1996	7.64	3.02	25.48

s

The table presents annual nominal returns denominated in U.S. dollars for 25 countries. In those countries human and property rights were preserved during examined period. The sample period varies across country and it is defined by column 2 and 3. The last three columns reports mean, median and annual volatility. The returns reported in the table are consistent with approach of Jorion and Goetzmann (1999).

3 The Global Equity Risk Premium

3.1 Importance of the Global Equity Risk Premium

Lying as it does close to the heart of finance, the computation of the equity risk premium is central to the profession. Its existence, rationale and magnitude have all been explored. Thus, Boldrin, Christiano and Fisher (2001) explored the possible effect of habit persistence in individuals' preferences. Chien, Cole and Lustig (2012) have attributed the volatility of the market price of risk to intermittent portfolio rebalancing. Schulz (2016) shows “evidence for an unconditionally flat term structure of equity risk premia.”

In part, the discussion addresses the rationality or irrationality of the equity risk premium and its magnitude. Cecchetti, Lam and Mark (2000) believe “the representative agent’s subjective beliefs about endowment growth are distorted Whereas Siegel and Thaler (1997) conclude “it is difficult to explain the equity premium without incorporating some kind of irrationality,” DeLong and Magin (2009) “conclude that it is highly likely that the equity premium return is not just part of our past, but of our present and future as well. It is reasonable to anticipate the equity return premium to continue — albeit at a somewhat lower level than the historical pattern” In turn, Malkiel (2003) reiterated his view, “I suspect that the end result will not be an abandonment of the belief . . . that the stock market is remarkably efficient in its utilization of information.”

The monograph by Mehra (2008) providing detail surveys on estimation and application of equity risk premiums:

1. Its impact is pervasive in *corporate finance* as it is an input in the determination of risk-adjusted returns critical for valuation purposes
2. It serves a central role in asset pricing, as it is the benchmark against which risky debt and equity returns are computed

Consequently, Jorion and Goetzmann (1999) sought to address the computation of the global equity risk premium by considering some 75 years of returns to equity assets throughout the world.

As laid out in our initial assumptions, we believe the computation of such returns cannot ignore the *environment* in which they are calculated: Since asset returns represent claims to purchasing

power, if access to purchasing power is impeded or eliminated, the nominal returns become meaningless. By providing a lower bound to residual purchasing power, we seek to address this defect in the JG computations.

3.2 The Value of Financial Assets Amid Property, Civil and Human Rights

It is perhaps self-evident one requires property rights in order to secure the benefits of financial and real assets: It is only through such rights societies provide all of their members with guarantees they can convert their investments into the purchasing power which provides the utility individuals are maximizing.⁷ We assume civil and human rights are necessary but not sufficient conditions for the existence of property rights.

To begin, we note the literature is replete with authors who have *correlated* economic development and property rights.

1. Mauro (1995) addresses this relationship: “Low security of property rights over physical capital, profits, and patents may reduce incentives and opportunities to invest, innovate, and obtain foreign technology.”
2. Knack and Keefer (1995) note “[I]nstitutions that protect property rights are crucial to economic growth and to investment.” Further, Keefer and Knack (1997) write, “Deficiencies in the institutional environment may reduce investment and the ability of countries to absorb technological advances from abroad. Without these advances, countries may grow more slowly.”
3. De Soto (2000) argues transitional and developing economies have limited success with capitalism due to lack of formal property rights for the poor.
4. According to its web site, the Cato Institute is “a public policy research organization ... dedicated to the principles of individual liberty, limited government, free markets and peace.”

⁷ With the Lutheran Pastor Martin Niemöller’s famous quote firmly in mind, the adjective “all” is designed to eliminate selective or sequential arbitrary deprivation of rights.

In its position on “Property Rights, The Key to Economic Development,” it states, “Historical economic development can only be explained by private property, the rule of law, and other key institutions.”

5. In economics, the Coase Theorem addresses the importance of well-defined property rights (though possibly not their initial distribution) to an efficient allocation of capital to investment. This has led to the conclusion a clear delineation of property rights is an essential ingredient to market transactions.
6. Pinto, Weymouth and Gourevich (2010) uncover a surprising result, that “left-leaning governments are more likely to be associated with higher stock market capitalization than their counterparts to the right and center of the political spectrum.” They explain this seemingly paradoxical result by noting “These results are consistent with recent theories emphasizing an emergent coalition of workers and owners against managers in favor of greater transparency and shareholder protection.”
7. Dowell-Jones and Kinley (2011) consider the impact of finance on human rights, exploring how the Great Recession’s derivatives aspect has adversely impacted employment. Our paper considers the (reverse) impact of human rights on finance: In the absence of such rights, finance is meaningless.

Moreover, our position is a strong one: As a lower-bound to an asset whereby restricted property rights — and, explicitly, human and civil rights — preclude from its owner the right to legal, free and unfettered access, we posit a value of zero. Thus:

1. Barro (2006), Berkman, Jacobsen and Lee (2010) and Barro and Ursúa (2008) address the impact of geopolitical crises and offer a potential explanation — the severity of potential but unobserved disasters or disaster probabilities — for the magnitude of the equity risk premium.
2. In a book review, Kuzner (2012) writes of
“negative freedoms, or ‘freedoms from,’ say, the seizure of property, arbitrary violence, and so on. Here freedom assumes the form of protection, a set of borders or frontiers that surround and safeguard the individual.”
3. Johnson, McMillan and Woodruff (2002) write explicitly, “Property rights are fundamental: entrepreneurs will not invest if they expect to be unable to keep the fruits of their investment.”

4. Harold Demsetz (1967), writing in “Toward a Theory of Property Rights”:

“When a transaction is concluded in the marketplace, two bundles of property rights are exchanged. . . . Economists usually take the bundle of property rights as a *datum* [emphasis added] . . .”

Our perspective is similar, though not identical, and, we argue, *consistent*: We assert that in the absence of civil and human rights, a valid lower-bound to property rights is zero.

5. Boubakri, El Ghouli and Saffar (2014) provide a quantitative estimate of the existence/absence of human rights:

“We examine the influence of political rights on the implied cost of equity capital using a sample of firms from 44 countries. We find that firms’ equity financing costs are lower when political rights are stronger.”

6. Writing in the narrower context of real estate, Yong Tu and Helen X. H. Bao (2009):

”“ ”Political instability may weaken investors’ belief in property rights, putting the investors in fear that part of their investment may be wasted due to poor protection.”

We consequently take issue with the assertion, in Frey and Waldenström (2004), that “A nation may disappear but the related financial assets may survive.” Rather, we believe the implication of our definition of property, civil and human rights is this: In its absence, due to the inability to consume freely from one’s wealth, the residual value of the equity (and bond) claims is zero, not 25% as assumed by Jorion and Goetzmann (1999). The remainder of this section is devoted to detailing the empirical implications of that assumption.

Consider Tables 2 and 3 below. Table 2 details the specific circumstances which abolished civil and property rights in different countries during the 20th century.

Table 2: Description of Events Leading to Restrictions of Civil and Property Rights in Twenty Century

Country	Break Date (with 0)	Event Date	Restart	Description of Event
Austria	Apr-38	12/03/1938	Oct-46	Austria was annexed into the Germany.
Belgium	Jun-40	10/05/1940	Jun-45	Invasion of Belgium by German forces.
Czechoslovakia	Oct-38	30/09/1938	1993 ^a	Nazi Germanys annexation of Czechoslovakias areas along the country's borders.
Denmark	Apr-40	9/04/1940	Jun-45	Invasion of Denmark by Germany.
Egypt	Feb-52	25/01/1952	N/A	Nasser Revolution to Sadat Succession
France	Jun-40	22/06/1940	Sep-44	German victory in the Battle of France led to French capitulation.
Germany	Apr-33	23/03/1933	Mar-57	The Enabling Act and Reichstag Fire Decree- most civil liberties were abolished.
Hungary	Dec-40	20/11/1940	1990 ^a	Hungary joined German-Italian-Japanese pact.
Italy	Sep-43	8/09/1943	May-45 ^b	Italy left the Axis and joined Allies. As a consequence, Italy was occupied by German forces.
Japan	Jul-44	N/A	Jul-46	GFD database covers the Japanese market until July 1944.
Netherlands	May-40	15/05/1940	May-45	Invasion of Netherlands by Germany
Norway	Apr-40	9/04/1940	Jun-45	Invasion of Norway by German forces
Poland	Sep-39	1/09/1939	1991 ^a	Germany invaded Poland and started World War II.

The table describes 13 events from history of 38 countries, when the Human, Civil and Property rights were significantly limited or abolished. We assume that lack of key rights and liberties are equivalent with collapse of free economy and capital market. In second column, the dates of such events are reported; as default is assumed that stock market on those days is equal to 0. The next columns report exact date of event, date of restart of stock market and brief description of event. ^a In early 90's stock markets were reopened in Poland, Hungary and Czech Republic. However in first years of operation they were not representative to the whole economy due to their tiny size. Thus, in line with the work of Jorion and Goetzmann (1999), those markets were not included in the analysis before year 2000. ^b In the case of Italy 1943, the motivation for our assumption is the loss of national sovereignty and its attendant implications for property, civil and human rights.

Based on the events reported in Table 2, Table 3 conducts the calculation of equity returns using our assumption regarding countries with discontinuous equity markets due to loss of property and/or human rights. In so doing, we explicitly distinguish between the empirical results of JG approach, and our own, designated BR, approach.⁸

The construction of Table 3 required a judgment call as to which countries to include, and exclude, from this table. We deemed those countries which succumbed internally or externally to autocratic rule during World War II to be incontrovertible, and hence included in the table. The sole additional country is then-named Kingdom of Egypt, whose price series ends in 1952 with the Revolution of the Free Officers Movement. In Table 3, we specifically considered military *coup d'etats*, primarily in Latin America but also in post-WWII Europe, Africa and Asia. By examining each, we determined these internal *coups* were materially different from the external loss of sovereignty during World War II, and also different from a regime change that abolished capital markets. We deemed the 1952 change in Egypt to be a change of regime akin to the Nov. 1917 Bolshevik Revolution in Russia.

Accordingly, we made the judgment calls that these military *coup d'etats* did *not* constitute events causing an end to their respective national capital markets. That in turn implies our estimate of the equity risk premium is conservative, since inclusion of any additional countries would tend to *lower* the risk-premium estimate further.

⁸ In Appendix A, we include our detailed presentation of two tables:

1. Table A1 contains the Composition of World Index for Countries with Continuity of Human and Property Rights throughout the period, and identifies for each country its period of exclusion and return (if any).
2. Table A2 contrasts by presenting the Composition of World Index for Jorion and Goetzmann (1999) Approach.

Table 3: Performance of Equity Markets with Discontinuity of Human and Property Rights

Country	JG Approach				BR Approach			
	Period	Mean	Median	Std. Dev.	Period	Mean	Median	Std. Dev.
Austria (AUT)	01/1922-12/1996	7.48	3.60	28.76	01/1922-04/1938 10/1946-12/1996	0.04 7.90	-1.93 1.60	49.36 25.27
Belgium (BEL)	01/1921-12/1996	5.01	2.72	19.78	01/1921-06/1940 06/1945-12/1996	-6.03 5.99	-16.44 5.20	36.02 15.21
Denmark (DNK)	01/1921-12/1996	4.93	1.91	14.49	01/1921-04/1940 06/1945-12/1996	-4.97 6.49	-0.29 3.21	27.83 14.26
France (FRA)	01/1921-12/1996	6.97	8.02	24.96	01/1921-06/1940 09/1944-12/1996	-5.02 6.63	-8.83 10.27	33.96 23.08
Germany (GER)	01/1921-12/1996	-4.63	2.28	47.35	01/1921-04/1933 03/1957-12/1996	-80.00 10.54	-24.18 8.61	105.91 17.81
Italy (ITA)	01/1921-12/1996	8.18	2.02	31.29	01/1921-09/1943 05/1945-12/1996	5.69 6.76	-0.16 3.01	32.25 29.82
Japan (JPN)	01/1921-12/1996	7.87	7.24	28.11	01/1921-07/1944 07/1946-12/1996	-4.55 14.41	-0.77 17.99	26.68 30.31
Netherlands (NED)	01/1921-12/1996	6.59	6.07	20.01	01/1921-05/1940 05/1946-12/1996	-5.70 9.19	0.38 10.56	29.09 16.57
Norway (NOR)	01/1921-12/1996	5.52	1.43	17.06	01/1921-04/1940 06/1945-12/1996	-1.38 5.71	2.91 0.00	27.41 18.20
Czech Republic (CZE)	01/1921-10/1938	3.08	2.10	29.83	01/1921-10/1938	1.67	2.10	33.75
Egypt (EGY)	12/1948-08/1962	-11.79	-8.70	26.40	12/1948-02/1952	-60.20	-12.80	71.80
Hungary (HUN)	12/1924-10/1948	2.25	-7.05	53.06	12/1924-12/1940	-3.55	-6.32	37.40
Poland (POL)	01/1921-9/1939	5.57	-8.62	97.49	01/1921-9/1939	-6.57	-9.16	74.56

The table presents U.S. dollars annual nominal returns denominated in percentage points for 13 countries. In those countries human and/or property rights were violated during examined period. The table is divided into two panels. The first one report markets with temporary violation of key rights. The second panel reports markets permanently closed (see Jorion and Goetzmann (1999)). The table reports two approaches to breaks in trading activity. So called JG approach applies linear interpolation for missing months. The BR approach estimates performance of equity market only if human and/or property rights are fully respected.

The results of Table 3 are particularly instructive as its BR results present the very disparate results obtained when taking cognizance of human and civil rights. In contrast, the JG results average over these, ignore their impact, and allow for the post-World War II global recovery and end-of-period 1990's peace dividend to improve the overall time-series performance of world equity markets.

3.3 Construction of Global Equity Indices: Approaches

Jorion and Goetzmann (1999) constructed a value-weighted global equity index using data on international stock markets' performance sourced from Morgan Stanley Capital International Perspectives (MSCIP) for developed markets and from International Finance Corporation (IFC) for emerging markets. Due to the lack of reliable data on market capitalization for all examined markets for the period 1921 – 1996, the authors assigned weights based on gross domestic product (GDP). The data on GDPs were obtained from Mitchell (1992, 1993, 1995) and converted to U. S. dollars using annual averages. The Jorion and Goetzmann study shows that the GDP weights are roughly of the same order of magnitude as the market-value weights implied by capitalization.

The beginning of each decade of the 20th century is marked by rebalancing of portfolios, where weights are determined by the changed distribution of world GDP. Jorion and Goetzmann argue that a value-weighted scheme is appropriate for measurement of investor returns when survival is an issue.

From the perspective of our study, it is very important to discuss how the Jorion and Goetzmann study dealt with trading interruptions. They considered two kinds of interruptions: A temporary one, where the stock market eventually reopens before the end of 1996, and a permanent one, with no information about the continuity of prices across the interruption. In the case of a temporary break in trading, the return between the last data point before the break and the first data point after resuming trading is evenly spread out over the time period of the interruption. In the case of countries such as Czechoslovakia, Egypt, Greece, Hungary, Poland and Romania, Jorion and Goetzmann assumed that a market fell by 75% in the month following a permanent interruption. They argued that arbitrary selection of a 75% imputed drop was justified by the fact that markets before their death are characterized by low weight.

In our paper, we refer to Jorion and Goetzmann’s method of constructing a global equity portfolio as the JG approach. In Table A2, we present the composition of a global index portfolio using the JG approach. In the early 1920s, the portfolio consists of 20 countries; during World War II, there are 31 countries in the portfolio. The last rebalancing in the 1990s leads to a global portfolio of 34 countries.

Our study suggests an alternative approach to constructing a world index portfolio that takes into account the fact that without human, civil and property rights there is no free market. We construct a value-weighted global equity index using the same data applied in the JG method. The country indices and GDPs denominated in U.S. dollars were sourced from GFDatabse. Similar to Jorion and Goetzmann’s (1999) study, we assigned weights based on GDP. In the case of non-violation of human, civil and property rights on a country level, ordinary rebalancing takes place at the beginning of each decade. Any such violation leads to at least one extraordinary rebalancing of the world portfolio — the value of the affected stock market is assumed to be 0 (investors lose all capital invested in a particular market), and the country is excluded from the world portfolio up until basic rights of all residents are restored. At that time, a second rebalancing take place, and the country again becomes part of the value-weighted world portfolio.

Table 2 presents thirteen country-level events when human, civil and property rights were significantly limited or abolished. In all except three cases, markets were added back to the world portfolio by the mid-1990s. In our paper, we refer to our described method of world index construction as the BR approach. In comparison with the JG approach, it has 24 rebalancings versus 8 for the JG approach, in the period 1921 – 1996. Table A1 presents the country composition of the BR value-weighted equity portfolio with respect to human, civil and property rights. The first row reveals the length of time without ordinary and extraordinary rebalancing. In the early 1920s, the BR portfolio consists of 20 countries; during World War II, the number of countries in the portfolio ranges from 22 to 25. The number was determined by GFDatabse data availability and German or Soviet occupations. On average, the world equity portfolio is subject to change every eight months during World War II. The years 1940 and 1944 are characterized by a particularly high number of changes to the portfolio. In the case of the JG approach, as little as 3% of the world equity market was affected by permanent interruption. In the BR approach, as much as 23.1% of the world equity market was affected by violations of basic rights in the early and mid-1940s. Not surprisingly, there

are significant differences in the performance of both proxies for a global equity index.

3.4 The Global Equity Risk Premium — Contrasting JG and BR Estimates

With these results in place, Figure 1 presents a *time-series of* global non-U. S. and global-with U. S. estimates of the *monthly* equity Sharpe Ratio using JG and our own BR estimates.⁹ In our estimates, we set our lower-bound residual value of an equity market to zero in accordance with Table 2. Of the two largest economies to which this applies, the German is set to zero in March 1933, with the enactment of the Enabling Act; the French is set to zero at the conclusion of the June 1940 Armistice.

Our analysis of failed markets recognizes these events occurred to some fairly substantial markets — Germany and France. To demonstrate the effect of *time* in our estimates, we compute the estimate of the Sharpe Ratio at distinct points, using data available up to that date. Thus, we begin our estimates in 1931 using the past ten years, and then expand that window until 1996, the date of the JG results. We present these results with and without the inclusion of the U. S. stock-market in the results. In order to test for equality of Sharpe ratios, we apply the methodology suggested by Ledoit and Wolf (2008). Those authors applied a bootstrap testing method appropriate to time-series tests, and which is robust against tails heavier than the Normal distribution. Table 4 presents results of test for equality of Sharpe ratios.

⁹ As was indeed the case for the JG study, the Sharpe Ratio we compute also ignores the riskfree rate and is computed as the ratio of Average Monthly Return to Std. Dev. of Monthly Returns.

Table 4: Analysis of Sharpe Ratios — Tests of Robustness

Index/Period	1933-1939	1933-1943	1933-1945	1933-1955	1933-1996
Global index	0.2912	0.0928*	0.0644*	0.0702*	0.4044
Global index ex-U.S.	0.1514	0.0970*	0.0430**	0.0304**	0.6768

The table presents p -values for two-sided test of equal Sharpe ratio. The *monthly* equity Sharpe ratios are calculated for the global index with and without U. S. market, respectively. The indices were computed using JG and our own BR approach. The applied bootstrap testing method was suggested by Ledoit and Wolf (2008). In case of each test the estimated block size was carried out using method proposed by the paper.

Figure 1: The figures display monthly Sharpe ratios calculated for World index constructed with (upper figure) and without U.S. stock market (lower figure). Each figure presents estimations for index constructed in line of Jorion and Goetzmann (1999) (JG approach) and BR approach. The BR approach for construction World index takes into account the impact of violation of human and property rights on wealth creation. For given point the Sharpe ratio is calculated from monthly returns for period between January 1921 and corresponding date. Sharpe ratio is the ratio of monthly mean to monthly volatility.

There are several results which highlight the differences between our results and those of JG:

1. Taking the point estimates at face value, we note the importance of our results to the rest-of-the-world analysis (see lower part of Figure 1): Given the lasting negative results of the Great Depression, under our BR results, the estimated Sharpe Ratio did not become positive until 1960, whereas the JG results first became positive as early as 1939.
2. The importance of the U. S. equity market to the world estimate of the equity risk premium is considerable. When the U. S. is included in the global equity portfolio, the BR Sharpe Ratio becomes positive as early as 1932, and is $0.16/0.14 - 1 = 14.3\%$ higher than the rest-of-the-world.
3. Over the twentieth century, the Sharpe reward to risk ratio for U. S. equities is $1 - 0.12/0.14 = 14.3\%$ lower than the rest-of-the-world. For JG paper it is $1 - 0.1433/0.1740 = 17.6\%$ lower than the rest-of-the-world.
4. Time diversification has compressed the JG and BR estimates, as equity markets reflected the generally-positive final outcomes to twentieth-century crises.
5. The tests on equal Sharpe ratios reveal (see Table 4) that Sharpe ratios for BR and JG approach are statistically different in period during and after World War II. However, in period 1933-1996 despite of the fact that the BR approach produce lower Sharpe ratio it is not statistically different than one estimated using the JG method.

Finally, Table 5 conducts a comprehensive comparison of Sharpe-Ratio estimates across several dimensions: It contrasts the JG paper’s *U. S.-specific* results with those obtained using GFD data, the JG paper’s *results* with our implementation of the JG *approach* (which we assert is a correct implementation of the analysis using GFD data) and the JG approach with our own BR approach. The table implements these analyses for the U. S. index, the Global Index, and the Rest-of-the-World index, proceeding to compute arithmetic average returns, annualized volatilities, monthly Sharpe Ratios, geometric return and end-of-period wealth. The results report all of the above for both the JG period 1921 – 1996 *as well as* an updated calculation to 1921 – 2014.

Table 5: Performance of World Equity Index in periods 1921-1996 and 1921-2014

Index	Method/Source	Arithmetic Return		Annual Volatility		Monthly Sharpe Ratio		Geometric Return		Ending Wealth	
		1921-1996	1921-2014	1921-1996	1921-2014	1921-1996	1921-2014	1921-1996	1921-2014	1921-1996	1921-2014
U.S index	JG paper	8.04%	N/A	16.19%	N/A	0.143	N/A	6.95%	N/A	\$171.2	N/A
	GFD	7.99%	7.74%	19.26%	18.68%	0.120	0.120	6.31%	6.16%	\$104.41	\$263.92
Global index	JG paper	7.76%	N/A	12.14%	N/A	0.185	N/A	7.25%	N/A	\$211.2	N/A
	BR approach	6.98%	7.17%	12.57%	13.89%	0.160	0.149	6.36%	6.37%	\$107.79	\$315.07
	JG approach	7.44%	7.54%	12.38%	13.75%	0.173	0.158	6.87%	6.79%	\$155.38	\$454.21
	JG paper	7.28%	N/A	12.08%	N/A	0.174	N/A	6.75%	N/A	\$146.2	N/A
Non-U.S index	BR approach	5.79%	5.69%	11.88%	13.24%	0.141	0.124	5.20%	4.91%	\$46.85	\$87.26
	JG approach	6.84%	6.55%	12.09%	13.39%	0.163	0.141	6.28%	5.79%	\$101.71	\$189.41

The table presents risk-return profile of indices. Each row corresponds to the different definition of index. Table reports nominal returns in U.S. dollars per annum. Arithmetic return is obtained from monthly returns multiplied by twelve. Volatility is equal to monthly standard deviation of returns multiplied by square root of twelve. Sharpe ratio is the ratio of monthly mean to monthly volatility. Ending wealth reports the final value of \$1 invested on January 1921 at the end of the sample. Some numbers are taken directly from study by Jorion and Goetzmann (1999).

Table 6: Global Equity Risk Premium Relative to U.S. T-Bills for period 1900-2014

Index	Source/Approach	Period	Mean	Std. Dev.	Sharpe Ratio	Ending Wealth
U.S. Index	DMS 2011 paper	1900-2010	7.20%	19.80%	0.364	\$21,766
	GFD database	1900-2014	7.41%	19.61%	0.378	\$31,862
	3-month T-bills	1900-2014	3.83%	2.86%		\$72.16
Global index	DMS 2011 paper	1900-2010	5.90%	17.10%	N/A	N/A
	DMS approach	1900-2014	6.68%	17.29%	0.387	\$24,064
	BR approach	1900-2014	6.26%	16.79%	0.373	\$15,864
Global index	DMS 2011 paper	1900-2010	5.90%	19.90%	N/A	N/A
ex-U.S.	DMS approach	1900-2014	5.66%	20.59%	0.275	\$4,613
	BR approach	1900-2014	4.57%	19.08%	0.239	\$1,754

The table presents estimation of equity risk premium for global index. The global index consist of following countries: Australia, Germany, Finland, France, Italy, Japan, Sweden, United Kingdom and United States. As proxy of risk free rate we use 90 days time-money rates on New York Stock Exchange Loans until 1920 and 3 month U.S. T-bills after 1920. Each row corresponds to the different definition of index. Table reports total returns in U.S. dollars per annum. Following the study by Dimson, Marsh, and Staunton (2011), the historical equity risk premium is measured by taking the geometric difference between the equity return and the risk-free return: $(1 + \text{Equity rate of return}) / (1 + \text{Risk} - \text{free return}) - 1$. Arithmetic mean and standard deviation of equity premium is calculated for each period. Sharpe ratio is the ratio of mean to standard deviation of annual equity risk premium. Ending wealth reports the final value of \$1 invested in the beginning 1900 at the end of the sample. Some numbers are taken directly from study by Dimson, Marsh, and Staunton (2011), to compare DMS and BR approach. The table reports two approaches to breaks in trading activity. The so-called DMS approach used in work Dimson, Marsh, and Staunton (2011). The BR approach estimates performance of equity market only if human and/or property rights are fully respected.

Table 5 gives rise to several conclusions. JG significantly underestimate the *volatility* of the U. S. stock market: As is well-known, said volatility exceeds 19% — consistent with Ibbotson-Sinquefeld results — but they have it at just over 16%. This is a proportional error of magnitude $19.26/16.19 - 1 = 19\%$ and affects subsequent estimates of the monthly Sharpe Ratio. Their is at 0.143, whereas our is at 0.120 for period 1921-1996 and 1921-2014 period.

JG relatively-generous assumption (of a 25% residual value in the event of a market collapse) overestimates the end-of-period wealth for \$1 invested in Jan. 1921: Their value is \$171.2 whereas ours is \$104.41. For period 1921-2014, such investment return \$263.92.

Computing the Sharpe Ratio for the global index over the JG period 1921 – 1996, their *paper* reports a value of 0.1845. Our replication of their paper yields 0.1734, whereas our methodology gives rise to 0.16. Their full overstatement is thus $0.185/0.16 - 1 = 15.63\%$. This has particularly-dramatic implications at the end-of-wealth levels: Their paper reports \$211.2, our implementation of their paper is \$155.38, and our approach gives \$107.79. The full overstatement here is $211.2/107.79 - 1 = 95.9\%$.

The contrast of the BR approach with JG approach for periods 1921 – 1996 and 1921 – 2014 leads to an overstatement $155.38/107.79 - 1 = 44\%$ and $454.21/315.07 - 1 = 44\%$, respectively. In the period 1996 – 2014 there is no difference between the two approaches, as none of the examined markets experiences limitation of property, civil and human rights.

These issues are compounded when one addresses the rest-of-the-world index. Their Sharpe-Ratio overstatement is on the order of $0.174/0.14 - 1 = 24.29\%$ and the wealth-ratio excess is $146.2/46.85 - 1 = 212\%$.

In addition to the contrast with JG, we also compare our results with Dimson, Marsh and Staunton (DMS, 2008 and 2011). In so doing, our sample consists of the total return indices for Australia (since 1900), France (1900), Finland (1929), Germany (1900), Italy (1929), Japan (1920), Sweden (1929), United Kingdom (1900) and United States (1900). Whereas the DMS study covers 19 countries over the period 1900 – 2010, the countries from our sample represent 87% of world capitalization in 1900. Our sample is limited to the countries whose returns are included in the GFD database over the sufficiently-long period of time.

In observing the results for Table 6, we can conclude the adjustment for critical events does give rise to a quantitatively and qualitatively distinct outcome. With respect to U. S. data, the GFD database we utilize results in a Sharpe Ratio of 0.378, which is slightly *higher* than the 0.364 reported by DMS. In contrast, for the Global index ex-U. S., our results report Sharpe Ratios lower by 13% from their DMS counterparts

Thus, the consequences of our analysis, and their quantitative and qualitative distinction from those of JG and DMS, result from taking full cognizance of the events which occurred to stock markets and their investors primarily in Europe in the late '30's.

3.5 Implications of the Lower-bound Estimate for the Equity Risk Premium for Portfolio Optimization

We now turn to addressing the implication our lower-bound estimate of the equity risk premium holds for portfolio optimization. Specifically, this section addresses the issue of how the portfolio's optimal equity weight changes as the equity risk premium is adjusted downwards.

In accordance with financial theory and the CFA Institute's recommendation, we address this by positing the representative investor has a mean-variance utility function $U = E(r_p) - 0.5A\sigma_p^2$, where the first-order condition implies the optimal equity weight y^* is given by

$$y^* = \frac{E(r_p) - r_f}{A\sigma_p^2}.$$

According to the results reported in Table 5, the Global Index's mean equity risk premium declines from 7.25% to 6.36%. As a broad range of studies places the degree of risk aversion for the representative investor in the range of 2.0 to 4.0 [see Friend and Blume (1974); Grossman and Shiller (1981)], when the risk-aversion parameter value for A is set to 3, the optimal equity weight declines from 89.8% to 67.3%.¹⁰ In contrast to the rather-high value of 89.8%, this latter weight of

¹⁰ The effect of the $7.25 - 6.36 = 89$ b.p. decline in equity risk premium has given rise to the substantial $89.8 - 67.3 = 22.5\%$ change in the optimal equity weight. However, it is well-known optimal investment weights are quite sensitive to relatively small changes in means. See the papers of Best and Grauer (1991), Black and Litterman (1992), Green and Hollifield (1992) and DeMiguel, Garlappi and Uppal (2009).

67.3% would appear a more reasonable optimal weight for equities.

4 Conclusions

The one and only rationale for investing in capital markets is the transformation of current wealth into future consumption: Investors prize such assets not for their ability to smoothen their consumption patterns over time, while making the individual selection of risky assets in which they invest. Consumption of goods and services does not occur in a *vacuum*, in that it requires knowledge of and sensitivity to the prevailing structures which give rise to orderly functioning of markets. Thus, when a revolutionary (Communist) regime occurs, one which “suspends” the functioning of capital markets, we believe it makes little sense to smoothen the ownership of capital assets until such time as the regime is transformed back to one which enables capital markets to function once again.

The establishment of Communist rule in such countries as Russia, China and Cuba was only one example of the “suspension” of markets. The other example was the abrogation of property, civil and human rights during the Second World War. While such abrogation was not necessarily immediately accompanied by suspension of capital markets, for some segments of society the negation of such rights eliminated their access to capital (and real) markets; the arbitrary nature of this imposition implied it could, and frequently was, extended to other segments of society and subsequently to international investors.

In this light, we feel it is inappropriate to assume a 75% loss of wealth, or to attempt to concatenate the “suspension” of market access until circumstances permitted its renewal. When it comes to the calculation of the equity Sharpe Ratio, we believe this to be a bias in the analysis of Jorion and Goetzmann (1999): We attempt to correct this by assuming the the loss of property, civil and human rights imply zero residual value. In turn, this results in our lower-bound estimate for the equity risk premium over our sample period.

While time-averaging and a relatively-benign second-half of the twentieth century have ameliorated some of the effects of this error, its effect persists: Qualitatively correcting for this assumption as well as computational errors gave rise to lower global Sharpe Ratios — 0.516 rather than 0.641. When focused on the non-U. S. portion of the global portfolio, it reduced the Sharpe Ratio even

more, from 0.603 to 0.43. It is crucial to correct this error. For one, this has implication for the representative investor's optimal equity weight. For another, property, civil and human rights are fundamental to the purchasing-power component of free markets. Moreover, the Sharpe Ratio plays a critical role in finance, in determining a key input to investments and capital-budgeting decisions.

A Detailed Composition of World Indices for Empirical Analysis

Table A1: Composition of World Index for Countries with Continuity of Human and Property Rights

Period /Month	2023																									
	1/21-1/30	1/30-4/33	4/33-4/38	4/38-10/38	10/38-9/39	9/39-1/40	01/40-5/40	5/40-6/40	6/40-12/40	12/40-9/43	9/43-7/44	7/44-8/44	8/44-4/45	4/45-6/45	6/45-7/46	7/46-10/46	10/46-1/50	1/50-3/50	3/50-3/57	3/57-1/60	1/60-1/70	1/70-1/80	1/80-1/90	1/90-12/96		
ARG	x	x	x	x	x	x	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	x	x	✓	✓	✓	✓	
AUS	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
AUT	x	✓	✓	✓	x	x	x	x	x	x	x	x	x	x	x	x	✓	✓	✓	✓	✓	✓	✓	✓		
BEL	✓	✓	✓	✓	✓	✓	✓	x	x	x	x	x	x	x	x	✓	✓	✓	✓	✓	✓	✓	✓	✓		
BRA	x	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
CAN	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
CHL	x	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
COL	x	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
CZE	✓	✓	✓	✓	✓	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		
DNK	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
EGY	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		
ESP	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
FIN	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
FRA	✓	✓	✓	✓	✓	✓	✓	✓	x	x	x	x	x	x	x	x	x	x	x	✓	✓	✓	✓	✓		
GER	✓	✓	✓	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	✓	✓	✓	✓	✓		
GRE	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	✓	✓	✓	✓		
HUN	✓	✓	✓	✓	✓	✓	✓	✓	✓	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		
IND	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
IRL	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	✓	✓	✓	✓	✓		
ISR	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	✓	✓	✓	✓	✓		
ITA	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	x	x	x	x	x	x	x	x	x	✓	✓	✓	✓	✓		
JPN	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	x	x	x	x	x	x	x	x	✓	✓	✓	✓	✓		
MEX	x	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
NED	✓	✓	✓	✓	✓	✓	✓	x	x	x	x	x	x	x	x	✓	✓	✓	✓	✓	✓	✓	✓	✓		
NOR	✓	✓	✓	✓	✓	✓	✓	x	x	x	x	x	x	x	x	✓	✓	✓	✓	✓	✓	✓	✓	✓		
NZ	x	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
PAK	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	✓	✓	✓	x	x	x	✓	✓	✓		
PER	x	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
PHL	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	✓	✓	✓	✓		
POL	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	x	x	x	x	x	x	x	x	x	x	x	x	x	x		
POR	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	✓	✓	✓	✓	✓		
ZAF	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
SUI	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
SWE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
UK	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
URY	x	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
USA	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
VEN	x	x	x	x	x	x	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		

The table display composition of World index constructed for market/periods with continuity of human and property rights. The weights are set by GDP weights at the beginning of each decade. Each row indicate countries included in World index (by ✓) and countries excluded from World index (by X). The above approach to construction World index assumes that in case of countries experience discontinuity of human and property rights, the value of index is zero.

Table A2: Composition of World Index for Jorion and Goetzmann (1999) Approach

Period	1/21-1/30	1/30-1/40	1/40-1/50	1/50-1/60	1/60-1/70	1/70-1/80	1/80-1/90	1/90-12/96
ARG	X	X	✓	✓	X	✓	✓	✓
AUS	✓	✓	✓	✓	✓	✓	✓	✓
AUT	X	✓	✓	✓	✓	✓	✓	✓
BEL	✓	✓	✓	✓	✓	✓	✓	✓
BRA	X	✓	✓	✓	✓	✓	✓	✓
CAN	✓	✓	✓	✓	✓	✓	✓	✓
CHL	X	✓	✓	✓	✓	✓	✓	✓
COL	X	✓	✓	✓	✓	✓	✓	✓
CZE	✓	✓	X	X	X	X	X	X
DNK	✓	✓	✓	✓	✓	✓	✓	✓
EGY	X	X	X	✓	✓	X	X	X
ESP	✓	✓	✓	✓	✓	✓	✓	✓
FIN	✓	✓	✓	✓	✓	✓	✓	✓
FRA	✓	✓	✓	✓	✓	✓	✓	✓
GER	✓	✓	✓	✓	✓	✓	✓	✓
GRE	X	X	X	✓	✓	✓	✓	✓
HUN	X	✓	X	X	X	X	X	X
IND	✓	✓	✓	✓	✓	✓	✓	✓
IRL	X	X	✓	✓	✓	✓	✓	✓
ISR	X	X	X	✓	✓	✓	✓	✓
ITA	✓	✓	✓	✓	✓	✓	✓	✓
JPN	✓	✓	✓	✓	✓	✓	✓	✓
MEX	X	✓	✓	✓	✓	✓	✓	✓
NED	✓	✓	✓	✓	✓	✓	✓	✓
NOR	✓	✓	✓	✓	✓	✓	✓	✓
NZ	X	✓	✓	✓	✓	✓	✓	✓
PAK	X	X	X	X	✓	✓	✓	✓
PER	X	✓	✓	✓	✓	✓	✓	✓
PHI	X	X	X	✓	✓	✓	✓	✓
POL	✓	✓	X	X	X	X	X	X
POR	X	X	✓	✓	✓	✓	✓	✓
SUI	✓	✓	✓	✓	✓	✓	✓	✓
SWE	✓	✓	✓	✓	✓	✓	✓	✓
UK	✓	✓	✓	✓	✓	✓	✓	✓
URY	X	✓	✓	✓	✓	✓	✓	✓
USA	✓	✓	✓	✓	✓	✓	✓	✓
VEN	X	✓	✓	✓	✓	✓	✓	✓
ZAF	✓	✓	✓	✓	✓	✓	✓	✓

The table display composition of World index constructed using Jorion and Goetzmann (1999) method. In order to minimize rebalancing, Jorion and Goetzmann (1999) adopted a portfolio value weighted approach. The weights are set by GDP weights at the beginning of each decade. Each row indicate countries included in World index (by ✓) and countries excluded from World index (by X). The approach assumes that in case of countries such as Czechoslovakia, Egypt, Hungary, and Poland there a 75% was loss in the month

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