Monograph

Five Financial Eras: How Financial Markets Transformed the World

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CFA Institute Research Foundation

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CONTENTS

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FOREWORD

History is the documented experience of humankind. It is our collective story, told through records that have been passed down through time and in the process interpreted and reinterpreted, assembled and reassembled, suppressed and championed, used to enlighten, and made to serve. Historians are challenged to assemble from these records a coherent narrative with internal logic and testable propositions about what happened in our collective past.

Bryan Taylor's *Five Financial Eras: How Financial Markets Transformed the World* focuses on a particular part of the story: the reconstructed history of global financial markets over the *longue durée*. This aspect of history is of great interest to investors, who are supposed to be concerned only with the future but who cannot study the future directly. So, they must learn from the past to understand what can happen in the future.

Financial history focuses on the role of finance in the human story. Like any technology, finance has evolved a set of practices, methods, and institutions through a series of inventions and discoveries. Some of these are as basic as a loan, and others are as complex as the Black–Scholes option pricing formula.

In the long trajectory of this development, the financial marketplace stands out as an extraordinarily impactful innovation. Because of the imperfect nature of the historical record, we will probably never fully reconstruct the history of financial exchanges. Nonetheless, fragmentary evidence from the Bronze Age in western Asia to the Roman Republic, to the financial districts in Silk Road cities, to medieval European money centers and fairs shows that these exchanges played a vital role in trade and economic growth.

With the development of formal bond markets in the thirteenth century and traded equity securities in the fourteenth century, some European cities began to keep quantitative records of securities transactions and payouts. Enough of these records survive to enable us to understand the risk and return of investments over the ensuing centuries—and, more importantly, what they mean for the human experience. From the investor's point of view, securities markets allowed consumption smoothing, precautionary savings, diversification, and smooth intergenerational wealth transfer. Free and transparent capital markets allowed investors to rely on price competition and price discovery. By the same token, the creation of securities markets transformed government finance, municipal finance, and ultimately corporate finance, reducing the fragility of nations and city-states and also funding large-scale, risky enterprise.

For example, nineteenth-century bond markets in London, Paris, Brussels, Vienna, and Berlin funded the creation of a global railroad system that grew from tiny wooden rail tracks in the Midlands of England at the beginning of the century to a vast iron network that, by the end of that same century, allowed for travel across the entirety of the Eurasian and North American continents at speed and in comfort. Finance transformed everyday life, from the management of the household to the functions of government and, ultimately, to the development of the corporation as a key engine of global growth.

Equity markets were equally important. They emerged as a means of broadly sharing both the benefits and risks of enterprise. From the first Roman share companies to modern exchange-traded funds, equity markets have promoted this essential social function.

In this volume, author Bryan Taylor organizes the history of financial markets into five thematic eras, subdivided into shorter periods that represent particular stages of financial development, aspects of investor behavior, or clusters of world events. The book draws upon the author's decade-long efforts to collect and make available market data from hundreds of markets over many centuries. This undertaking alone is a remarkable feat: Taylor has gathered data from many different arenas, from primary archives to authoritative secondary sources to government publications. What emerges is a record across time and geographies of the power of the public capital markets to transform society.

This book is particularly useful for investors seeking to understand how current trends compare with history. For instance, in only the past 40 years, investors have witnessed extraordinary events: breathtaking technological innovation; historic stock market crashes; a perplexing, decades-long decline in interest rates after a just-as-unexpected rise during the previous period; and the opening of vibrant financial markets in countries that were previously shut to investment for decades.

These events all seem unique to those unfamiliar with deep history, but they are not. Similar events have happened before, and history offers a potential guide to understanding their causes and effects. Financial history is a yardstick by which we can measure the trends and events of today and, more importantly, understand how they might affect lives and society more broadly.

The long-term statistical evidence Taylor brings to bear is particularly illuminating for modern investors. Since the quantitative revolution in finance that began with Markowitz and modern portfolio theory, data have become central to investment analysis—not only data covering a narrow set of time periods and markets but also data comprising the global marketplace and the experience of many different political, economic, and social regimes.

Financial history is both important and underappreciated. Most people can tell you that a stock market crash happened in 1929. Before that, even many seasoned investors might have drawn a blank when asked to state one piece of historical financial knowledge. Yet for centuries, even millennia, before the present, people in all corners of the Earth borrowed, lent, traded, saved, invested, speculated, and made or lost fortunes.

All investors will benefit from expanding their knowledge of financial markets and asset returns in earlier times. Taylor's *Five Financial Eras: How Financial Markets Transformed the World* provides this education using massive amounts of hard-to-find data. While presenting the data, the book weaves a story that reminds us how universal the financial impulse has been for as far back in history as we can gather information. Only by delving deeply into history can we have any hope of foreseeing the future.

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1. INTRODUCTION

Every era has a financial *zeitgeist*, a characteristic spirit that pervades society, politics, and the economy. These periods tend to run in cycles. Economic cycles have been proposed by Kitchin (3–5 years), Juglar (7–11 years), Kuznets (infrastructural investment cycle of 15–25 years), and Kondratiev (a wave of 45–60 years). This book extends the study of economic cycles by looking at financial cycles and their impact on the returns on stocks, bonds, and bills.

This volume aims to provide readers with a better understanding of the financial trends that have driven financial markets during the past millennium. I have broken up the past into five eras, which I have further divided into 20 periods to provide a better understanding of the factors that influence returns to financial instruments during different periods. Financial markets respond to the needs of investors, government regulation, technological change, and other factors. The markets change as each of these factors changes.

Stocks and bonds have been around for millennia. A "bond" exists in cuneiform from around 2030 BC, when someone from Sumer named Ur-Damu took out a loan against the value of a quantity of reeds, promising in a bond under seal to repay it. The bond includes an oath to King Shu-Sin of Sumer (who ruled from 2037 to 2029 BC) and the names of the witnesses (Mills 2025, p. 32). Bonds and shares also existed in Roman times (Smith 2004, pp. 10–12). Investors shared in the cost of erecting public buildings and other enterprises that required too much capital for a single individual to provide.

Financial markets began expanding in Europe more than 900 years ago. The first known trade fairs occurred in France in the 1120s, the first currency transfers happened in the 1150s, the first bonds were issued in Venice in the 1170s, shares in the *Société des Moulins du Bazacle* were traded in the 1250s, the first gold coins since antiquity were issued in Italy in 1252, and other financial innovations occurred during the twelfth and thirteenth centuries. All these innovations were responses to the demands of traders and investors, enabling individuals to use financial markets to increase their returns, hedge or insure against risks, fund wars and other government services, provide capital to large enterprises, and achieve other financial goals.

As the demand for commodities, currencies, stocks, and bonds grew over time, exchanges were established to provide an efficient means for trading commodities, currencies, and financial instruments. Government regulation and technological change have driven changes in financial markets, turning them into the efficient, global, instantaneous markets that exist today.

How financial markets evolved over the past nine centuries and what factors drove these changes are the subject of this book. The goal is to study the evolution of financial markets and uncover the patterns in finance that have developed over time. Economics, politics, and technology influence the behavior of financial markets, but how did markets differ from one era to the next? For instance, the economy behaved differently during the long peace between 1815 and 1914 and during the hot and cold wars between 1914 and 1981. Privatization of industries and decreases in inflation and interest rates after 1981 allowed markets to expand dramatically. What drove these changes?

Having a better understanding of the past enables investors to more clearly grasp what forces are driving current markets and what changes could lead to a new financial era or period in the future.

The Four Financial Revolutions

Four financial revolutions have occurred when a significant change arose in the role that stocks and bonds played in the economy. The first occurred in 1171, when Venice imposed forced loans on its citizens to fund its war with Byzantium. These loans were eventually converted into the *prestiti* bonds, which were bought and sold in Venice until the 1500s. These bonds laid the foundation for all future government debt that has been issued. For example, the British consolidated bond (consol), first issued in 1751, was the most traded bond in the world until World War I began in 1914.[1] Today, outstanding government debt worldwide is more than USD100 trillion.

The second revolution occurred in the late 1500s, when England created trading companies that were given monopolies in different parts of the world. The first was the Muscovy Company, chartered in 1555, which had a monopoly on trade between Russia and England. It still exists today as a charity working in Russia. The four East India companies were founded in England (1601), the Netherlands (1602), France (1604), and Denmark (1616). Each country created corporations that had monopoly trading rights in the Far East and were able to raise large amounts of capital to fund their operations. Rather than just investing in an individual trading expedition, individuals could invest capital in companies that carried out trade year after year. Despite the appeal of these trading monopolies, most investors preferred to put their money in government bonds rather than in stocks, and by 1790, the bond market in the United Kingdom was 10 times the size of the stock market.

The third revolution occurred after the Napoleonic Wars ended in 1815. In the 1790s, the canal bubble occurred in the Midlands in England, and the United States began chartering corporations to provide banking and other services to the new nation. Between 1815 and 1914, stock markets were founded in every major country, and thousands of new companies were brought into existence. In 1815, the British bond market was 10 times the size of the London stock market, but in 1914, the British stock market was 4 times the size of the British government bond market. Stock market capitalization grew from 1% of global GDP in 1815 to 30% in 1914. However, world wars, government regulation, and inflation constrained the growth in stock markets for the next 65 years. Stock market capitalization, which was 30% of global GDP in 1914, represented only 22% of global GDP in 1981.

It is probably no coincidence that Angus Maddison points to 1820 as the time when the world escaped the low rates of growth that had prevailed since 1 AD and began two centuries of unprecedented economic growth. Global GDP grew by only 0.32% per annum between 1500 and 1820. Between 1820 and 1870, GDP growth accelerated, rising to 0.94%. It then grew significantly faster, at 2.12%, between 1870 and 1913. Growth slowed to 1.82% during the period of the two World Wars between 1913 and 1950, but the world achieved significant growth of 4.90% between 1950 and 1973, the fastest growth in history. Since 1973, GDP growth has slowed to 2.9%, with significant drops in GDP growth in the developed world economies but an acceleration in growth in Asia outside of Japan (Maddison 2007, p. 380).

The stock market has been instrumental in funding the transformation of the global economy and driving growth during the past 200 years. As a share of global GDP, the stock market grew

[1] A consol, or consolidated annuity, is a bond that never matures but pays interest forever, unless the bond is "called" (repurchased by the issuer).

from 1.6% in 1820 to 15% in 1870 and 39% in 1913. It fell to 21% in 1950, rose to 34% in 1973, and in 2024 represented 115% of global GDP.

The fourth revolution occurred in the 1980s. The economic problems of the 1970s led Ronald Reagan, Margaret Thatcher, and other world leaders to emphasize global free trade and privatization in the economy, bringing about an explosion in the size of stock markets. Between 1981 and 1999, global stock market capitalization as a percentage of GDP rose from 22% to 109%. Stock markets continue to play an important role in the global economy, and today stock markets exist in more than 100 countries. We are currently living through the fourth financial revolution, which is funding changes in information technology, communications, and biotechnology that are transforming the world.

The Five Financial Eras

French historian Fernand Braudel introduced the concept of *la longue durée*, focusing on long-term socioeconomic trends in history rather than individual events. He applied his analysis to Europe between the 1400s and 1700s. Braudel focused on socioeconomic factors that drove history, not individuals. His approach can be applied to any aspect of history, including finance and other branches of economics, as well as noneconomic phenomena. In this book, rather than

The past nine-plus centuries can be broken down into five financial eras.

Five Financial Eras

Years	Era	Description	Center
1100–1600	Financial Renaissance	Commodities, currencies, and bonds traded	Venice, Antwerp
1600–1789	Mercantilism	Stocks and bonds traded in Europe	Amsterdam, London
1789–1914	Free Trade	Stocks and bonds traded globally	London, Paris
1914–1981	World Wars and Cold War	Regulation of stock and bond markets	New York City
1981–2026	Globalization	Electronic trading on global exchanges	New York City

These eras have, naturally, been identified with hindsight. The goal is to gain a better understanding of the factors that drove financial markets in the past to give us insight into what factors will affect financial markets in the future.

focusing on specific factors that affected markets, I focus on the broad changes that occurred in politics, the economy, and technology that determined returns in financial markets.

This analysis is descriptive, not predictive. Investors in 1600 or 1789 or 1914 did not know that a new era of equity investing was about to begin. Just as we in 2026 cannot predict the behavior of financial markets in the 2030s or 2040s, other than in the most general terms, investors in the past could not predict that the Napoleonic Wars, World War I, World War II, or any other event would occur and influence future investment behavior and returns. Nevertheless, we can explain the factors contributing to returns during each era and indicate how and why these eras differed from one another. A short summary of each era appears next.

The Financial Renaissance

During the Financial Renaissance (1100–1600), exchanges primarily traded commodities and currencies, not stocks and bonds. Italy and France were the center of financial markets during this era. Exchanges and financial instruments were introduced and developed to improve the performance of financial markets. Many of these developments first occurred during the twelfth century.

The first Ypres fair was held around 1127, and the first Champagne fair was held around 1180, bringing together merchants from across the continent to exchange goods (Cipolla 1972, pp. 284–85). Trade fairs also served as a venue for international exchange and financial settlement. The first known foreign exchange contract dates to 8 June 1156. Venice imposed forced loans on its richer inhabitants in 1171–1172 to help fund the Byzantine–Venetian War of 1171. Venice's defeat in this war was one of the greatest military blunders in the history of the city-state. Venice issued its first bonds in 1262 and maintained 5% payments on these debt securities until the War of Chioggia in the 1370s (Homer and Sylla 1996, pp. 89–98).

The first gold coins since Roman times, minted in Florence, appeared in 1252, and the first gold coins in Venice were issued in 1284. These cities had sufficient capital that they could mint their own coins, rather than rely on Arab gold. This development signaled the rise of Italy as an important financial center (Kindleberger 1984, p. 23).

All these financial innovations drove trade in Europe. Italy was the financial center of Europe between the 1200s and the 1500s. Although governments in Italy, Germany, France, the Netherlands, and Spain issued bonds, the trading of bonds was not organized on exchanges. Shares in the first joint-stock English company, the Muscovy Company, were issued in 1555 (Scott 1910).

The Black Death in 1346 significantly changed the European economy, making labor scarce. The combination of additional waves of the plague and the Hundred Years' War (1337–1453) significantly slowed growth. Europeans initiated the Age of Discovery, with the Portuguese pushing around the Cape of Good Hope and Christopher Columbus sailing to the Americas. The balance of financial power shifted from Italy to northwestern Europe.

Mercantilism

During the era of Mercantilism (1600–1789), nations tried to promote exports and limit imports to achieve a favorable balance of trade. Such actions were thought to be the key to prosperity

in the home country. Exchanges in Amsterdam, Copenhagen, London, and Paris began trading both stocks and bonds. During the Financial Renaissance, exchanges focused on commodities and currencies. With the advent of Mercantilism, stocks and bonds began to be traded on the exchanges as well. Governments issued bonds to cover the expenses of the wars they fought, and as a result, trading in bonds, especially in Great Britain, expanded dramatically during the 1700s. Shares of the Dutch Duo (the Dutch East India Company and the Dutch West India Company), the French *Compagnie des Indes Orientales*, the British East India Company, the Bank of England, and the South Sea Company, as well as a number of smaller companies, traded in Europe.

Although the market capitalization of stocks that traded in London grew from less than 1% of British GDP in 1700 to 22% in 1789, outstanding British government debt, which in 1789 primarily existed in the form of 3% consols, grew from 5% of GDP in 1689 to 158% in 1789. Shares in Dutch East India Company stock began trading in Amsterdam in 1602, and shares in the Dutch West India Company began trading in 1623. Shares started trading in coffee shops in London in the 1690s, and by 1720, trading in more than a dozen companies was occurring regularly in Amsterdam, London, and Paris. Because of the wars of the 1700s, the amount of outstanding government debt grew much more rapidly than the capitalization of stock markets. The French Revolution of 1789 signaled a break with the past.

Free Trade

A dramatic change in financial markets occurred in the 1790s. The Dutch Duo both went bankrupt, and all French corporations were forced to close during the French Revolution. The United States, France, the Netherlands, and Denmark all defaulted on and reorganized their government debts. During the Napoleonic wars, all countries except for Great Britain suspended interest payments.

Out of these problems came a rebirth of financial markets. In the 1790s, dozens of canals were incorporated in England, leading to a bubble in canal shares. Most trading in canal shares occurred in the Midlands, not in London. In the 1790s, the number of companies that traded in Great Britain, the United States, and other countries increased dramatically. Before 1790, there was rarely activity in more than a dozen stocks in London. Beginning in 1805, however, the number of stocks being traded on the London Stock Exchange exploded, reaching 100 in 1814, 200 in 1824, and 300 in 1832.

Dozens of companies were established in the United States. Alexander Hamilton reorganized the United States' finances, the Bank of the United States stock began trading in 1792, and the Buttonwood Agreement was signed in New York City in 1792, providing rules for brokers to trade stocks. The Dublin Stock Exchange was founded in 1799, the Paris stock exchange reopened on 10 May 1795, and the Banque de France was established in 1801 (Michie 2006, pp. 50–56).

After the end of the Napoleonic Wars in 1815, the era of Free Trade began, and the hundred years of almost unbroken peace between 1815 and 1914 enabled Europe to industrialize. Angus Maddison places the beginning of modern economic growth in 1820. During the 1840s, railroads were built in every major European country, and soon the telegraph, oceanic cables, the Suez Canal, and railroads established rapid communications throughout the world. There were relatively few wars between 1815 and 1914, and stock market capitalization grew relative to both government debt and GDP. While British government debt shrank from 182% of GDP

in 1815 to 29% in 1914, British stock market capitalization grew from 17% to 122% of GDP. By 1914, every developed country in Europe had exchanges that traded stocks and bonds, and the gold standard, resulting in fixed exchange rates, enabled financial assets to be freely traded across borders.

World Wars and Cold War

World War I, the Great Depression, and World War II led to direct government regulation of the economy to a degree that would not have been considered before 1914. Returns on both stocks and bonds declined between 1914 and 1949 as economic uncertainty, inflation, a larger role for government, and increases in government debt impacted returns. Stock market capitalization as a share of GDP shrank around the world. France's market capitalization as a share of GDP fell from 58% in 1914 to 7% in 1981, and that of the United Kingdom decreased from 122% to 38%. Global stock markets closed at the beginning of World War I and were heavily regulated during World War II. Global stock market capitalization as a share of global GDP fell from 47% in 1929 to 24% in 1949. Low returns in the 1930s, regulated stock markets, and memories of losses during the Great Depression discouraged investors from participating in equity markets between 1929 and 1949.

Markets experienced a remarkable recovery between 1949 and 1973 as economies and stock markets in the developed world recovered from World War II. Between 1949 and 1973, the world enjoyed the highest rates of GDP growth in history, and many stock markets provided double-digit returns. Rising interest rates led to lower bond prices, reducing the return on government bonds and producing the highest equity–bond risk premium in history. Central banks allowed inflation to increase in the 1970s, causing interest rates and bond yields to rise and imposing losses on fixed-income investors. By 1981, neither stocks nor bonds had provided investors with sufficient returns for some time. As a result, during the 1970s, many investors lost faith in both stocks and bonds.

Globalization

Beginning in 1981, the era of Globalization began, which allowed stock and bond markets to grow in almost every country in the world. US Federal Reserve chairman Paul Volcker raised interest rates to defeat inflation. The process began in 1979, when the United Kingdom and other nations removed capital controls on foreign currency. European governments privatized industries that had been previously nationalized, and as a result, the market capitalization of French stocks as a share of GDP rose from 7% in 1981 to 106% in 1999. China, Russia, and Eastern Europe reintroduced stock exchanges to trade shares in privatized companies. Emerging markets were established, and those countries opened local stock exchanges to promote growth. By 2000, there were stock exchanges in more than 100 countries.

The internet and improvements in telecommunications enabled information to travel around the world instantaneously. Returns on both stocks and bonds during the 1980s and 1990s were among the highest in history. By the 2020s, stock and bond markets were increasingly integrated. During the COVID-19 pandemic in 2020, global stock markets moved in lockstep with each other, first sharply moving down and then moving up. Although some degree of deglobalization appears to be taking place during the 2020s, financial markets remain highly integrated worldwide.

The Equity Risk Premium

The principal goal of this study is to analyze how the realized equity risk premium (ERP) has changed over time. The phrase "equity risk premium" is used in the literature to mean two very different things: (1) the realized ERP, or the difference between the returns an investor would have received in equities as compared with bonds or bills over some past time period, and (2) the expected ERP, or the difference between equity and bond or bill returns that an investor expects (based on information available at the time) over some future time period. In this book, contrary to much of the literature, when I refer to simply "the ERP," I mean "the *realized* ERP."

The equity risk premium, both realized and expected, is one of the most important concepts in finance. Ibbotson and Sinquefield (1976) were the first to measure the realized ERP in a systematic way. A few years later, Robert J. Shiller studied the equity risk premium (Shiller 1982), and Rajnish Mehra and Edward C. Prescott wrote an article titled "The Equity Premium: A Puzzle" that summarized the issues involved with analyzing and measuring the ERP (Mehra and Prescott 1985). The ERP measures the difference in returns between a risky asset, such as a stock, and a risk-free asset, such as a government treasury bill. In the short run, there is little chance that the government will default on short-term bills. The puzzle to which Mehra and Prescott referred is their observation that the realized ERP had been much larger than was predicted by certain macroeconomic models that gave accurate predictions elsewhere in the economy.

Analysts want to know the expected ERP—that is, how much investors, on average, demand or expect to receive as a return for taking on the additional risk of putting their money in equities rather than in bonds or cash. Unfortunately, there is no way to know what the expected ERP is. It differs between investors and varies over time. One way of obtaining information about the expected ERP is to look at the realized ERP. Although these two measures are not necessarily equal, logic suggests there has to be a connection. This analysis involves collecting historical data to compare the rates of return on risky investments, such as stocks, and the return on bonds or cash.

If we can determine the return on equities, what risk-free instrument should we compare equities with? Two choices are provided: long-term government bonds (using a 10-year benchmark bond) and short-term government bills (usually with a one-month maturity). Of the two, government bills have lower risk because the government is unlikely to default on one-month treasury bills before they mature. Treasury bills suffer from reinvestment risk, however. When the bill matures and the investor buys another treasury bill, the yield may—and probably will—differ from the previous one-month bill.

To avoid this risk, investors can lock in their rate of return over a longer period by purchasing a treasury bond. By choosing government bonds and equities, analysts are comparing the returns with two long-term instruments. Although investors no longer have to worry about reinvestment risk with government bonds (reinvestment risk applying only to the coupons paid during the life of the bond, not the principal), they do have to worry about fluctuations in the price of bonds over time and default risk. The government might neither pay the interest that is due on the bond nor redeem the principal that is owed on the bond when it matures.

Although default risk is very low for many countries' government bonds today, defaults can occur. As recently as 2015, Greece defaulted on its debt. Investors in Greece could hold, for example, US government bonds that are free of default risk, rather than Greek government bonds, but then they would face exchange rate risk when the value of the euro fluctuated against the US dollar.

One of the problems with government bonds is that the price of the bond and the yield on the bond fluctuate over time. The yield on the bond is the average of anticipated future yields for government bills plus a "horizon" or interest rate risk premium. Various factors, such as inflation and default risk, cause these variables to change over time. The yield and the price of the bond are inversely related, so higher anticipated future interest rates lead to higher bond yields and a lower bond price. If the investor sells the bond before it matures, the investor may suffer a capital gain or a capital loss.

Because there is no way of accurately measuring the expected ERP, I will use historical data on the realized ERP as a necessarily imperfect proxy. Because there are two quite different instruments that investors might consider risk free, I will provide a measurement for both the equity-minus-bond ERP and the equity-minus-bill ERP. During conditions of stable markets, the two will be similar, but during periods of market uncertainty and instability, such as during wars or hyperinflationary periods, they can vary dramatically.

The real returns (returns after subtracting inflation) on stocks, bonds, and bills during each of the most recent four eras are provided in **Exhibit 1**.[2] The average annual real return on stocks has risen over time. Stock returns have been above the long-term average during the current era (Globalization) and may, in the future, revert to the historical mean returns of around 5% in real terms. The real return on bonds was negative during the era of World Wars and Cold War between 1914 and 1981. The real return on bills was negative in that era and has been low during the era of Globalization. Global inflation has been higher since World War I than before World War I.

Differences in the eras can also be observed by comparing the market capitalization of equities with the size of government debt. During periods of war, the government redirects financial resources to funding the war while limiting the resources that can be invested in the private sector. The eras of Mercantilism (Seven Years' War, American Revolution) and World Wars and Cold War (World War I, World War II, Korean War, Vietnam War) were mostly periods

Exhibit 1. Real Annual Returns on Global Stocks, Bonds, and Bills; the Equity Risk Premium; and Inflation, 1700–2025 (returns in British pounds up to 1789 and US dollars since 1789)

Period	Era	Real Annual Total Return (%)			Bond ERP (%)	Bill ERP (%)	Inflation (%)
		Stocks	Bonds	Bills			
1700–1789	Mercantilism	4.92	4.33	3.74	0.56	1.18	0.01
1789–1914	Free Trade	5.31	3.47	3.04	1.94	2.27	0.62
1914–1981	World Wars, Cold War	5.19	–1.15	–0.06	6.48	5.25	3.39
1981–2025	Globalization	7.62	3.58	0.84	3.9	6.6	2.92

[2] All data in the exhibits are from Finaeon, Inc.

Exhibit 2. Market Capitalization as a Percentage of Government Debt

Year	France	United Kingdom	United States
1700	—	50.7	—
1789	—	9.3	41.9
1914	74.3	415.9	1,786.2
1981	44.9	83.2	129.5
2025	115.9	130.2	188.3

that favored investment in government bonds and restricted investment in the stock market. In contrast, the Free Trade and Globalization eras were periods of relative peace, leading to growth in stock markets relative to GDP.

Exhibit 2 compares equity market capitalization with the level of government debt for three countries at different points in time. The United Kingdom is the only country for which data are available between 1700 and 1789, and during that period, equity market capitalization shrank from 51% of government debt to 9% as a result of the growth of debt. The absolute size of the UK equity market grew immensely during that period. During the Free Trade era, between 1789 and 1914, market capitalization expanded dramatically compared with government debt, increasing from 9% in the United Kingdom to 416%. During the wars that followed between 1914 and 1981, equity market capitalization shrank relative to government debt, decreasing in all three countries. After 1981, however, equity market capitalization grew relative to government debt. Wars clearly induce governments to reallocate financial resources away from the private sector and into the public sector.

The 20 Financial Periods

In my analysis, financial periods affecting the realized ERP are shorter than the eras of *la longue durée*. The *zeitgeist* usually lasts a generation, around 20–25 years, before new events drive the financial economy in a different direction. Equity returns differ significantly from one period to the next, as do bond returns, the equity risk premium, inflation, and other financial factors. The start and end dates for a period can be determined by politics, the economy, war, inflation, interest rates, or other variables.

This book focuses on financial markets. There are significant dates when political or economic events occurred that changed the course of financial history and set the tone for returns that would occur during the next generation. I define the historical periods as the time between these dates. Before the 1600s, there was almost no organized trading of stocks and bonds. Exchanges were set up to buy and sell commodities or to transfer money between ports in Europe, but little trading of financial assets occurred. Although bonds were bought and sold in Venice, Italy, and in Spain during medieval times and the Renaissance, no organized markets for stocks or bonds existed.

Nevertheless, there were important turning points in financial history before the 1600s. In the twelfth century, for example, foreign exchange contracts were introduced, Venice first raised money to fight its wars, and fairs were introduced in France to increase trade. In 1252, gold was minted in Italy for the first time since the Roman Empire fell in 476. In 1346, the Black Death struck and transformed the medieval economy. The Portuguese sailed around Africa in 1488, and in 1492, Columbus sailed to the Americas. The discovery of silver and gold in central Europe and the Americas initiated the Great Inflation, which spread through Europe between the 1520s and the 1620s. Before the 1600s, we can only provide broad outlines of financial periods.

Financial markets reacted to the economic climate of the times. Periods of technological change, free trade, few government restrictions, and a stable economic environment all increase the profitability of corporations and returns to shareholders. Periods of high inflation harm fixed-income investors, whereas periods of low inflation or disinflation benefit them.

Both the rates of return on stocks and bonds and the equity risk premium are influenced by external factors. When a change occurs in the overall economic environment, the rates of return on stocks and bonds change. The ERP is not a fixed value but changes constantly, primarily in response to changes in the return on stocks rather than on bonds. Even if the expected ERP were fixed (which it is not), the realized ERP would vary because of ordinary fluctuations in asset values. There is no point in trying to find "the" ERP because it fluctuates dramatically over time. It is more important to try to predict the returns and volatilities associated with stocks, bonds, bills, real estate, and other financial assets at different points in time.

Other analysts have looked at only 50, 100, or 150 years of data on financial markets. In this book, I have collected nearly a millennium of data to see how financial markets and returns have changed over time. What I found is that the state of the economy and the government's role in the economy, comprising fiscal and monetary policy, greatly influenced the rates of return to financial assets in the past. Events in various periods throughout the eras studied led to dramatically different rates of return to both stocks and bonds. It was not only the state of the economy but also the role of government in the economy that influenced returns.

Reasonable people could argue about when different financial periods began or ended, but I tried to base these periods on exogenous factors that determined returns throughout the world. My analysis is global and not limited to one country. The goal has been both to minimize the number of periods to avoid confusion and to make them as precise as possible. Since the 1600s, most of these periods have lasted a generation, around 20–25 years.

Over time, significant changes in the political, economic, and financial environments have created new driving forces for the economy. For example, before the 1840s, no telegraph, transatlantic cable, transcontinental railroads, or telephones existed. The transmission of information on which financial markets depended was slower, and global markets were less integrated. Nevertheless, carrier pigeons, semaphores, and other means were used before the mid-1800s to speed up transmission of information. New technologies eventually made the transmission of information instantaneous. Today, it takes just seconds to transmit information around the world. In the 1700s, it took days or weeks.

I have broken up financial history into the periods shown in **Exhibit 3**.

Within a given period of approximately 20 years, there are, of course, multiple bull and bear markets, as well as financial crises. Returns may be fairly similar in different countries during a

Exhibit 3. Financial Periods, 1100–2026

Years	Financial Period	Years	Financial Period
1100–1346	Medieval Economy	1848–1873	Nation Building
1346–1492	Renaissance Economy	1873–1896	Gilded Age
1492–1600	Great Inflation	1896–1914	Gold Standard
1600–1648	Thirty Years' War	1914–1929	World War I and the Roaring Twenties
1648–1689	Anglo–Dutch Wars	1929–1949	Depression and World War II
1689–1720	First Stock Bubble	1949–1968	Bretton Woods
1720–1763	Mercantilist Economy	1968–1981	OPEC and Stagflation
1763–1789	American Revolution	1981–1999	Privatization
1789–1815	Napoleonic Wars	1999–2019	Financial Repression
1815–1848	Railroad Revolution	2019–2026	Technology Wars

period, such as the Gold Standard (1896–1914), or dramatically different—for example, during World War I and the subsequent recovery (1914–1929, hereafter simply "World War I"). During Financial Repression, equity returns were very low between 2000 and 2009, when stocks suffered two bear markets (each with declines of more than 49%), but much higher between 2010 and 2019, when no bear markets occurred in the United States (2019 still involved financial repression because interest rates were kept near zero).

We may have begun a new financial period, starting in 2019, of higher interest rates, more international confrontation, more emphasis on domestic production and industrial policy, less focus on unrestricted international trade, and even greater emphasis on information technology and biotechnology as a source of growth. Artificial intelligence, widely perceived as potentially the next transformative technology, is being likened to the introduction of the internet in the 1990s. I call the period beginning in 2019 "Technology Wars" because of the emphasis of the United States, Israel, China, Russia, and other countries on using new technologies as a source of international competition, but we will be unable to define this period more precisely for another two decades. Nevertheless, it seems unlikely that global financial integration will revert to the low levels that existed before 1981.

Of course, we cannot predict the future and I could be wrong. Nonetheless, the 2020s seem sufficiently different from the 2010s to justify the beginning of a new financial period.

Returns on Stocks and Bonds

Returns on stocks and bonds differ from one period to the next. High returns in one period have been found to be followed by low returns in the next period, and vice versa. Before World War I, stock and bond returns were correlated. Both stocks and bonds experienced either high or low

returns during any given period because investors focused on yield and stocks provided limited capital gains.

This situation changed after World War I, as central banks and governments intervened more directly in financial markets to control interest rates, government expenditures, and taxes and to influence the behavior of the economy. The interest rate cycle lengthened, while the stock market cycle grew shorter. Consequently, after World War I, stock and bond market cycles moved contrary to one another. This dynamic produced an extremely high realized ERP after World War II and after 2019 but an extremely low realized ERP between 1999 and 2019.

A stylized set of predicted returns based on these observations is summarized in **Exhibit 4**, which shows the alternating pattern of high and low returns on stocks and bonds.

Exhibit 4. Predicted Returns Based on Financial Period Characteristics

Years	Financial Period	Stocks	Bonds	ERP
1600–1648	Thirty Years' War	High		
1648–1689	Anglo–Dutch Wars	Low		
1689–1720	First Stock Bubble	High	High	Low
1720–1763	Mercantilist Economy	Low	Low	Low
1763–1789	American Revolution	High	High	Low
1789–1815	Napoleonic Wars	Low	Low	Low
1815–1848	Railroad Revolution	High	High	Low
1848–1873	Nation Building	Low	Low	High
1873–1896	Gilded Age	High	High	Low
1896–1914	Gold Standard	Low	Low	Low
1914–1929	World War I and the Roaring Twenties	High	Low	High
1929–1949	Depression and World War II	Low	High	Low
1949–1968	Bretton Woods	High	Low	Very High
1968–1981	OPEC and Stagflation	Low	Low	Low
1981–1999	Privatization	High	High	High
1999–2019	Financial Repression	Low	High	Low
2019–2026	Technology Wars	High	Low	High

Exhibit 5 provides real returns for stocks in the Netherlands between 1602 and 1689 in Dutch guilders, for the United Kingdom between 1689 and 1914 in British pounds, and for the United States since 1914 in US dollars. The table shows that for the most part, equity returns follow the hypothetical predictions of Exhibit 4, where lower returns in one period are followed by higher returns in the next. The only exception to this rule is the high returns on stocks during the period of Nation Building, which Exhibit 4 did not predict. Some of the contrasts are greater than others, but the patterns, for the most part, are consistent with the model. High returns to stocks during one period led to lower returns in the next as long-term returns reverted to the mean.

Exhibit 5. Returns by Financial Period After Inflation

Years	Financial Period	Country	Stocks (%)	Bonds (%)	Bills (%)	Bond ERP (%)	Bill ERP (%)
1602–1648	Thirty Years' War	Netherlands	10.94				
1648–1689	Anglo-Dutch Wars	Netherlands	4.52				
1689–1720	First Stock Bubble	UK	11.48	11.07	4.87	–0.17	5.72
1720–1763	Mercantilist Economy	UK	1.82	2.11	3.61	–0.28	–1.54
1763–1789	American Revolution	UK	5.22	3.03	3.10	2.13	–0.19
1789–1815	Napoleonic Wars	UK	3.16	1.34	2.53	1.81	0.21
1815–1848	Railroad Revolution	UK	6.73	6.62	5.22	0.10	0.66
1848–1873	Nation Building	UK	4.38	2.71	1.65	1.62	1.61
1873–1896	Gilded Age	UK	6.90	5.23	3.34	1.58	2.89
1896–1914	Gold Standard	UK	4.20	–0.78	0.92	5.03	3.37
1914–1929	World War I and the Roaring Twenties	US	5.91	–2.61	0.51	8.75	6.13
1929–1949	Depression and World War II	US	2.06	0.13	–1.05	1.93	3.14
1949–1968	Bretton Woods	US	11.72	–0.80	0.65	12.63	10.69
1968–1981	OPEC and Stagflation	US	0.10	–1.92	–0.22	2.05	0.73
1981–1999	Privatization	US	12.71	7.6	2.95	4.74	9.47
1999–2019	Financial Repression	US	2.84	2.78	–0.48	0.06	3.33
2019–2025	Technology Wars	US	8.99	–5.17	–1.03	14.93	9.11

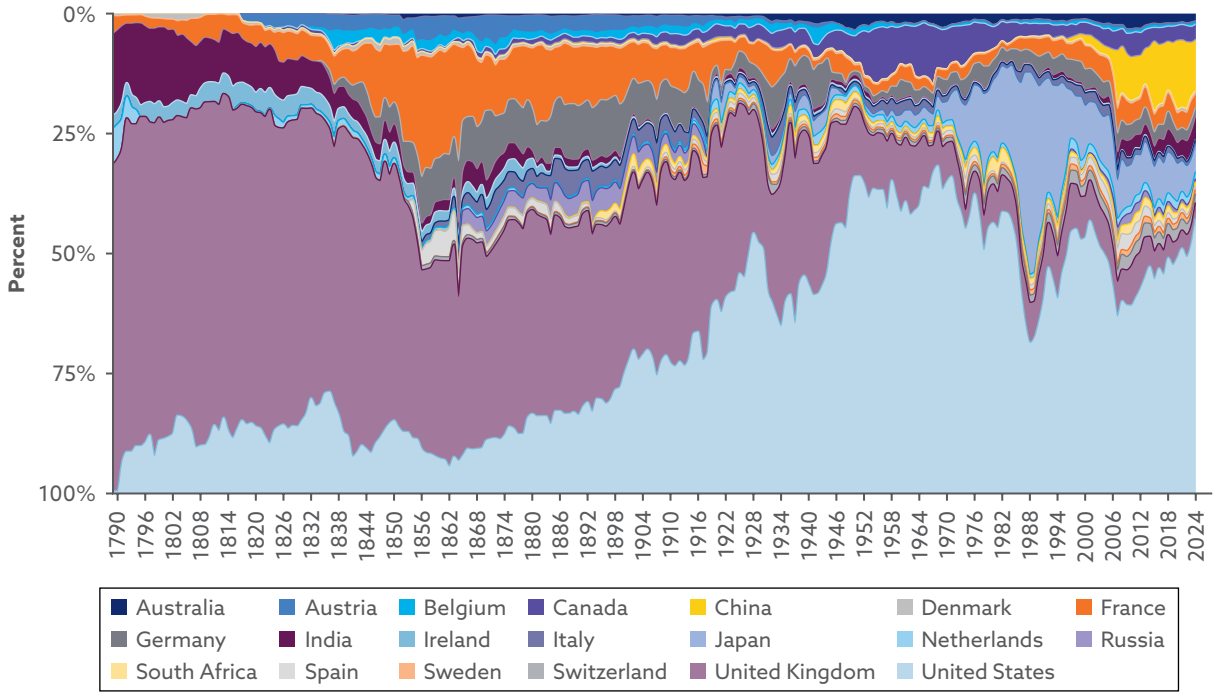
Note: Years for some financial periods differ slightly in this exhibit because of data availability.

Historical patterns would predict a higher return on stocks and lower returns on bonds between 2019 and 2040 than between 1999 and 2019. Given the increase in bond yields during 2021 and 2022 and the subsequent decline in bond prices, low returns on bonds during the current period would be expected because of higher interest rates. This dynamic yields a forecast for a much higher ERP between 2019 and 2040 than the ERP between 1999 and 2019.

Historical data show that there is a 30-year cycle in stocks. Stocks provided high returns in the 1920s, 1950s, 1980s/1990s, and 2010s. The 30-year cycle in stocks produced low returns in the 1910s, 1940s, 1970s, and 2000s. This cycle would predict low returns in the 2030s. The cycle is irregular, however, and does not match calendar decades perfectly. For instance, the lowest stock returns were in the 1930s, not the 1940s, and the 1990s were nearly as rewarding as the 1980s.

Changes in the stock market capitalization of major countries as a share of global stock market capitalization are illustrated in **Exhibit 6**. The UK stock market (depicted in mauve) was the largest in the world during the 1800s but gradually reduced its relative share during the 1900s. The United States (light blue) dominated global stock markets in the twentieth century. After World War II, the United States represented more than 70% of global stock market capitalization. France (orange) and Germany (gray) were the largest markets in the 1800s after the US and UK markets. Japan's (blue) growth until 1989 and its decline thereafter are also evident.

Exhibit 6. Share of Global Market Capitalization by Jurisdiction (percent), 1789–2024



The "TWIG" Theory of Returns on Stocks, Bonds, and Bills

Returns in the five eras and 20 periods of financial history differed because of

- trade,
- war,
- inflation, and
- government.

The presence of any or all of those factors significantly affected returns on stocks, bonds, and bills. I refer to this as the "TWIG" theory of financial markets: Break (that is, change) any part of the TWIG (trade, war, inflation, government), and market returns can decline.

When there is free trade between countries, no war, low inflation, and little government intervention in the economy, financial markets provide higher returns to investors. When there are limitations on free trade in the form of tariffs, import substitution, or autarky; war; inflation; and government control over the economy, financial markets provide lower returns to investors. A brief explanation shows why each of these has a negative impact on returns.

Free trade generates economic growth. Autarky refers to trying to produce goods without pursuing international trade. Barriers to trade, including both tariffs and nontariff barriers, may help companies within their own domestic market but limit their ability to sell their goods and services in other countries. Exchange rates can also be manipulated to limit trade between countries. Trade restrictions were used between 1914 and 1981 to limit free trade, causing a reduction in returns on stocks. The most successful economies, such as the Anglosphere countries (the United Kingdom, the United States, Canada, Australia, and New Zealand) and East Asian countries, are ones that promoted trade. Countries that relied on tariffs and import substitution, such as South American countries, suffered from those policies.

War directs economic activity away from the production of consumer goods. War creates massive destruction that reduces the supply of resources to the market. Governments often take over production during war and redirect industries toward the war effort. Consumer goods become short in supply, and the government limits the profitability of corporations. Countries directly involved in a war suffer, while countries that supply matériel to belligerent countries but are not involved in the war may benefit. Countries often default on government bonds during a war and inflate the economy because they find it difficult to pay for the war. After the war, there is dislocation in the economy and recovery may be slow. Once the war and its subsequent dislocations are resolved, the economy can recover quickly as it returns to normal, but during the war, returns on stocks, bonds, and bills falter.

Inflation is one of the worst enemies of bonds and bills. If you purchased a bond in a low-inflation environment expecting to receive a 3% return for the next 10 years but then inflation goes up to 10%–100% or hyperinflation occurs, your returns will be quickly reduced. Stocks can provide protection against inflation but mainly in relative terms. The ERP increases during inflationary periods, more because of the low return to bonds and bills than an increase in the return to stocks. After adjusting for inflation, some countries have seen real losses of more than 90% to investors as inflation accelerated and shares failed to keep up. After the inflation

stopped, shares recovered to their real values, but the destruction of value in bonds and bills remained. Fixed-income investors had no way of recovering their losses.

Asset bubbles drive up prices as large amounts of money and credit chase assets that are limited in supply. The bubble can affect shares, real estate, or any other financial assets. People begin buying financial assets because they are certain they can sell them in the future at a profit. This process can continue for several years before reality leads to a crash in the market. Prices often return to the level that existed before the bubble began as investors flee crashing assets, which can maintain a low value for years after. People avoid investing in shares, real estate, or any other asset whose value was artificially bid up, fearing they will get burned again.

Socialism refers to government ownership and control of industry, which can come in the form of government regulation of an industry, government nationalization of an industry, government restrictions on operating in an industry, or any other restriction on the market. The mere threat of socialist intervention in the market can hold back returns for decades out of fear that either the government may pay too low of a price for the assets it nationalizes or it may seize assets without compensation.

The TWIG factors also favor innovation, investment, and growth in capital markets. Such important innovations as canals in the 1790s, railroads in the 1840s, the telegraph and undersea cables in the 1850s, petroleum in the 1860s, electricity plants in the 1880s, automobiles in the 1900s, radios in the 1920s, airplanes in the 1930s, mainframes in the 1950s, personal computers in the 1980s, the internet in the 1990s, and AI in the 2020s all needed the right economic and political conditions to grow. Although other factors influence long-term returns, the TWIG factors are the four main factors that best explain differences in market returns over time and between countries. Therefore, I will examine each TWIG factor in the following chapters on the five financial eras. I will describe the key aspects of each era and each period, defining each in terms of war, trade, the role of government, stock market returns, capitalization, bear markets, financial crises, interest rates, the role of central banks, commodity prices, inflation, and exchange rates. A summary is provided for each of these categories during each period, followed by a description of the primary factors that influenced financial markets during each period.

2. THE FINANCIAL RENAISSANCE

Beginning around 1100, Europe underwent fundamental intellectual and institutional changes that transformed European society. Europeans recognized that they could uncover the forces of nature through rational investigation and experiment. The first European university was created in Bologna in 1080. By 1500, there were 70 centers of secular learning in western Europe. Gutenberg printed his first book in Mainz in 1455, and by 1500, there were 220 printing presses in operation in western Europe, which produced 8 million books between 1455 and 1500. The cost of book production fell dramatically, and Venice became the center of book production. By the middle of the sixteenth century, Venice had produced around 20,000 titles (Maddison 2007, pp. 77–78). In 1543, Copernicus published his heliocentric theory, which transformed man's perception of the universe. Galileo used his own refractor telescope to observe the moon, Venus, and the satellites of Jupiter, enriching Copernicus's theories.

Financial markets experienced their own renaissance between 1100 and 1600. Europe began using financial instruments that had existed before medieval times in Asia, and new financial instruments were created that would continue to be used for centuries to come. International fairs promoted trade, exchanges were established to trade commodities and provide foreign exchange in other countries, markets for stocks and bonds were created, and Europeans traveled to America and began trading with Asia. Despite prohibitions against usury, financiers found ways around these restrictions by creating differences in the values of currencies. By the end of the Financial Renaissance, Europeans had established the financial instruments, institutions, and markets that would be needed to provide centuries of growth for their economies.

The Financial Renaissance is divided into three periods. During the Medieval Economy, there was both rapid economic growth and rapid innovation. Foreign currency contracts, bonds, international fairs, and double-entry bookkeeping were all introduced to promote growth and change. The period from 1100 to 1346 was one of relatively rapid growth and change. Financial markets were established, and new financial instruments were introduced, enabling the European economy to initiate growth. The period from 1346 to 1492 was a time of readjustment, as the plague swept through Europe and the Hundred Years' War limited the growth of the economy. The period of 1492 to 1600 provided a return to growth, as Europeans explored the world and silver flowed into the economy, leading to the highest levels of inflation in Europe until the twentieth century.

1100–1346: The Medieval Economy

Wars:	Crusades (1095–1291), Mongol conquests (1206–1324)
Trade:	Trade fairs began in France in 1127, Hanse trade in northern Europe, Mongol Peace encouraged trade with Asia
Government Intervention:	Very little except during Crusades and wars
Government Debt:	Increased to fund Crusades and wars, *prestiti* introduced in venice
New Corporations:	*Société des Moulins du Bazacle* shares traded in 1250s; Bardi, Peruzzi and Alberti families in Italy in 1300s

New Industries:	Heavy plow, stirrups, gunpowder, mechanical clock, astrolabe, trebuchet, fulling mill, compass
Financial Crises:	Italy (1294), Peruzzi and Bardi collapse (1345)
Sovereign Defaults:	England (1294, 1345)
Bond Yields:	Fell from 12% in the 1100s to 5% in the 1300s in Venice and the Netherlands
Commodity Prices:	Famine in 1315–1317, price spikes during other famines
Inflation:	Gradual inflation between 1100 and 1346
Exchange Rates:	Foreign currency transactions began in 1156 and grew thereafter

Europe went through a period of relatively rapid growth between 1100 and 1300, at least relative to the centuries before 1000. The economic expansion of medieval Europe laid the foundations for future growth by bringing gold back into the European economy, issuing government bonds as a means of enforced taxation, and establishing large multinational companies that operated from Italy to England. Trade fairs occurred in Ypres as early as 1127, and fairs were established in Champagne in 1180, bringing together merchants from across the continent. By the 1200s, fairs in Provins, Troyes, Lagny, and Bur-sur-Aube allowed merchants to trade cloth, spices, and other goods virtually year round (Cipolla 1972, pp. 284–85).

The first known foreign exchange contract dates from 8 June 1156, when two brothers, having received 115 Genoese pounds in a contract concluded before a Genoese notary, promised to reimburse 460 bezants one month after their arrival in Constantinople or in any other city where the emperor held court. A similar contract from 1157 existed (Einzig 1962, p. 66). One of the largest users of bills of exchange in the Middle Ages was the papacy, which used them to transfer money to Rome. Because the bills converted one currency into another, the users were able to circumvent strict rules against lending money by disguising interest in the exchange rate.

The system of using bills of exchange to transfer money across Europe remained virtually unchanged between the twelfth century and the French Revolution. The volume of foreign exchange transactions increased, the sophistication of transactions improved, the transferability of bills became more widespread, and the number of money centers increased, especially as the role of fairs decreased and forward rates came into more prominence. The basic techniques, however, remained the same. Transactions in coins continued to play a prominent role, although most rates were quoted in banco money, which did not depreciate when coins were debased and declined in value. Usances (the period of time allowed for the payment of a bill of exchange) were long, and interest rates were hidden while rates continued to be quoted in imaginary currencies (Spufford 1986).

Shares in the *Société des Moulins du Bazacle*, a water mill in Toulouse, France, can be traced back to 1250 (Le Bris, Goetzmann, and Pouget 2018). Its shares were traded in the open market in Toulouse. Thus, some of the building blocks for exchanges that traded stocks and bonds were laid. Gold coins were first minted in Florence in 1252 and in Venice in 1284. These cities

had sufficient capital that they could mint their own coins, rather than rely on Arab gold, and this development signaled the rise of Italy as an important financial center.

The Mongols provided peace in Asia, the Crusades came to an end, and Marco Polo traveled to China. Trade grew in the Mediterranean and in continental Europe. The economy revived in France, Germany, and the Flemish countries. Double-entry bookkeeping, a key element of modern finance, began to be used in Italy during the 1300s.

Because of the risk of default, interest rates for governments were in double digits in most countries. Venice imposed forced loans on its richer inhabitants in 1171–1172 and issued its first bonds in 1262. Venice did not miss any interest payments between 1262 and 1379, and the bonds became popular investment vehicles throughout Italy. Ghent, in present-day Belgium, issued bonds between 1275 and 1290 but failed to keep up interest payments, rendering the bonds almost worthless by the 1330s. Florence consolidated its debt in the 1340s. Data on bond yields are available from Italy beginning in 1285, Germany beginning in 1326, France beginning in 1387, the Netherlands beginning in 1400, and Spain beginning in 1504. Italy was the financial center of Europe from the 1200s until the 1500s (Homer and Sylla 1996, pp. 89–103; Michie 2006, pp. 17–21; Schmelzing 2020).

The period between 1200 and 1346 was one of accelerated growth after the gradual recovery of the eleventh and twelfth centuries. The mines of Kutna Hora, Czechia, discovered in 1298, increased the supply of silver to the rest of Europe. By the end of the 1200s, Europe was experiencing a period of rapid economic growth. Three multinational companies were partnerships that carried out business across Europe. These companies were not publicly listed, because there were no stock exchanges, but they engaged in trade in Italy, France, Spain, and England in multiple industries. The Bardi, Peruzzi, and Alberti families collected money for the Pope, transferred wool from England to Italy, introduced double-entry bookkeeping, operated factories, lent money to kings, helped fund wars, and carried out similar corporate tasks. If stock exchanges had existed, Venetian bonds and shares in those companies would have been listed on them, but there was neither sufficient capital for trading in bonds and shares nor enough volume to justify establishing exchanges.

International operations were carried out in gold, and local transactions occurred in silver. From 1250 to 1310, the price of gold rose relative to silver, benefiting international companies' profits. From 1310 until 1340, however, the price of silver rose relative to gold, English kings defaulted on their debts, and the price of wheat rose. The Bardi, Peruzzi, and Alberti families met their demise before the Black Death struck in 1346. Within 30 months of 1345, all three companies went bankrupt.

Bruges became an important center of international trade in the 1300s after interest in the Champagne fairs declined. The Italian trading fleets, English wool manufacturers, and members of the Hanse were attracted to Bruges as a central trading location for northern Europe (Cipolla 1972, pp. 310–26).

The famine of 1315–1317, the start of the Hundred Years' War in 1337, the declining price of gold relative to silver, the default of Edward III of England to the Peruzzi and Bardi families in 1345, and similar events put a brake on the rapid growth of the late 1200s and early 1300s. Even before the bubonic plague struck Europe in 1346, the European economy was already beginning to slow down.

1346–1492: The Renaissance Economy

Wars:	Hundred Years' War (1337–1453), War of Chioggia (1378–1381), Wars of the Roses (1455–1487), Ottoman–Venetian Wars (1420–1479)
Trade:	Increased trade in Europe, Hanse in Baltic, Portuguese in Africa
Government Intervention:	Very little except during war
Government Debt:	Increased for Hundred Years' War, Ottoman–Venetian Wars
New Industries:	Iron and steel, eyeglasses, printing, windmills, spinning wheel
Financial Crises:	Venice (1381, 1440–1470), Great Bullion Famine
Sovereign Defaults:	Venice (1381), England (1442)
Bond Yields:	Venetian bonds at 5%, yields over 10% in other countries
Banks Founded:	Medici Bank (1397), Banco di San Giorgio (1408)
Commodity Prices:	Price spikes during famines, higher prices after 1350
Inflation:	1350–1380 and 1381–1410, deflation during other decades
Exchange Rates:	Currencies debased, silver generally scarce

The rapid growth of the 1200s and early 1300s was followed by a period of slower growth between 1346 and 1492. International trade declined; periodic famines and pestilences reduced the population, creating demographic changes; and both the Hundred Years' War and local civil wars limited trade and economic growth. Although Europe between 1200 and 1346 experienced an era of relatively rapid expansion and growth, Europe outside of Italy between 1346 and 1492 was a world of demographic decline and economic adjustment.

The Black Death struck in 1346, killed about one-third of the population of Europe by 1352, and shifted economic power to the workers who survived. Subsequent plagues in 1363–1366 and 1393–1399 further reduced the population. The Hundred Years' War devastated Europe between 1337 and 1453, and the Wars of the Roses took place in England between 1455 and 1485. Other events influenced financial markets as well, including the War of Chioggia, which involved Venice and Genoa between 1378 and 1381 and caused Venice to default on interest payments on the *prestiti* for the first time in history. Plagues reduced the willingness of people to take risks. The amount of capital available per capita increased, and both wages and the standard of living rose for survivors of the plagues.

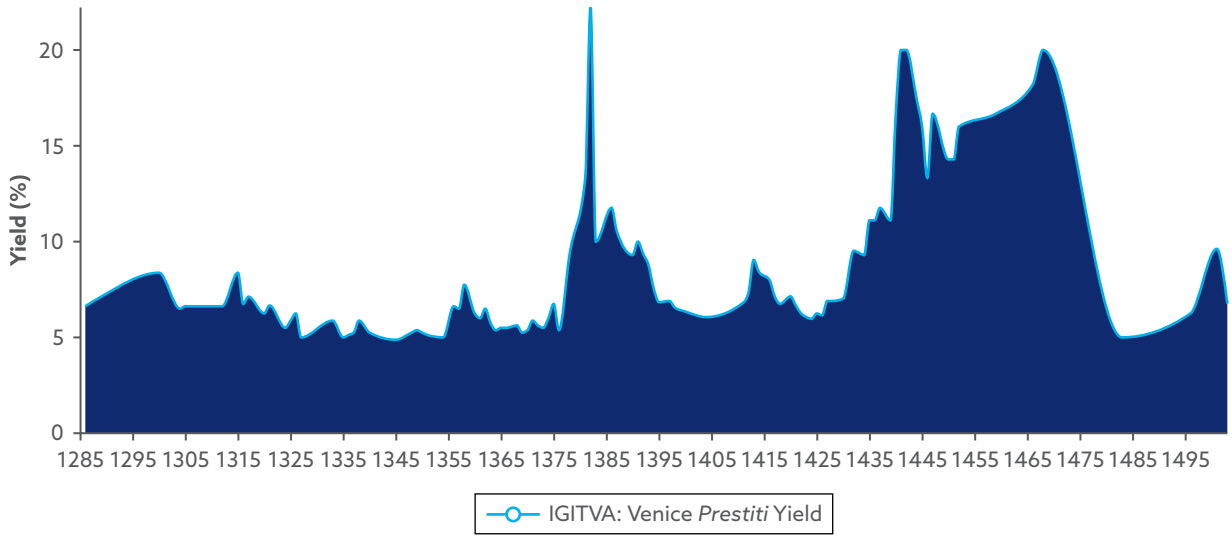
Technological improvements laid the foundation of the modern economy. Making iron using blast furnaces improved the quality of iron and steel. Glass became cheaper to make and was used to produce eyeglasses, which improved vision and increased productivity. Mechanical clocks were introduced, which relied on coiled springs, escapements, verges, and foliots to provide an accurate measurement of time. Gunpowder was used in war for cannons and eventually handheld weapons. Finally, the Gutenberg Bible was first printed in 1455, and by 1500, an estimated 20 million books had been printed. Europeans applied the knowledge of the ancients and the Chinese to produce modern innovations that enabled the economy to grow.

Although interest rates were generally in the single digits in Italy, they were 10% or higher in the rest of Europe. Forced loans still dominated in France and England. The forced loans were sometimes converted into permanent annuities, referred to as rentes. Bruges provided the primary exchange for commodities until the mid-1400s.

The Medici Bank was founded in Florence in 1397 and did not fail until 1494. Between 1430 and 1480, the Medici Bank was the greatest financial organization in Europe, with branches throughout Europe, the Levant, and North Africa. The Banco di San Giorgio was founded in Genoa in 1408 and survived until it was closed by Napoleon in 1805 (Weatherford 1997, pp. 80–92). Wars occurred between Venice, Milan, and the Ottoman in the 1420s. In 1453, Constantinople fell to the Turks, and this event was followed by war between Venice and the Turks between 1464 and 1479. The wars impacted the return on state-issued bonds. As **Exhibit 7** shows, under optimal conditions, Venetian bonds yielded around 5%, but when the market believed Venice might default, as it did in 1381 during the War of Chioggia, bond prices declined and investors received no interest payments. The bonds continued to trade in Venice until 1502 and acted as a good barometer of the Italian economy.

The European economy went through alternating patterns of inflation and deflation between the onset of the Black Death and the European discovery of America. The periods from 1350 to 1380 and from 1411 to 1430 were marked by inflation, as the population declined and the demand for money increased relative to its supply. Rulers increased the money supply by debasing the currency. The periods from 1381 to 1410 and from 1432 to 1500 were marked by deflation: The money supply shrank, and prices fell. The so-called monetary famine, or shortage of money, of the late fifteenth century encouraged Europeans to look for silver and gold. The Portuguese traveled around Africa to reach India, thus avoiding relying on the land route through Asia. Columbus sailed west to reach China but ended up in America instead. New mines were discovered in central Europe and later in the Americas, which contributed to the inflation of the 1500s.

Exhibit 7. Yield on Venetian *Prestiti* Bonds (percent), 1285–1502



By 1492, the foundation of the modern financial economy was laid. The financial instruments and institutions had been created that would enable stock and bond markets to exist, banks to hold and transfer money, and exchanges to buy and sell commodities, currencies, stocks, and bonds. The next step was to further develop these institutions.

1492–1600: The Great Inflation

Wars:	Italian Wars (1494–1559), French Wars of Religion (1562–1598) Eighty Years' War (1568–1648), Anglo–Spanish War (1585–1604)
Trade:	Shifted from Italy to northern Europe, trade with Americas and Asia began
Government Intervention:	Very little except during war
Government Debt:	Increased to fund wars, explore Asia and Americas
New Exchanges:	Belgium (1531), France (1540), Germany (1558), England (1571)
New Industries:	Pistols, pocket watches, knitting machines, microscopes, maps, globes
Financial Crises:	Spain (1522, 1557, 1575, 1596), France (1558), Netherlands (1558)
Sovereign Defaults:	England (1594); France, Spain, and the Netherlands (1557–1560); Antwerp (1576), Portugal (1560)
Bond Yields:	Fell from 12% to 5% in the Netherlands
Banks Founded:	Banco Rialto (1587)
Commodity Prices:	Rose from 1550 to 1600 as silver flooded in from Americas
Inflation:	Prices increased from 1550 to 1600 as commodity prices rose
Exchange Rates:	Currencies debased, silver flowed in, exchange rates fluctuated

During the 1500s, the center of finance in Europe shifted from Italy to Belgium and the Netherlands, both of which acted as intermediaries for trade between the Baltic region and the Mediterranean. England, France, Spain, and Portugal struggled for economic and military supremacy in Europe during the 1500s. The fall of Constantinople in 1453 reduced the role of Italy in international trade and drove Europeans to seek new trade routes around Africa, to the Americas, and to the Baltic region. Francis I of France fought wars with Charles V, who was the Holy Roman Emperor in the first half of the 1500s, and Henry VIII and Elizabeth I of England fought against Philip II and the Spanish Armada in the second half of the sixteenth century.

These wars had to be funded. Rulers drained bankers in both Italy and the Netherlands, as well as the Fuggers in Germany, to fund their wars. Spain became Europe's largest debtor, with most loans in the 10%–15% interest range because of Spain's inability to pay off its loans. This situation also led to the depreciation of currency in most countries to help fund the wars. Bills of exchange began to dominate trading in Antwerp, but in 1570, Antwerp defaulted on its debts,

and in 1576, the Spanish army sacked Antwerp. Amsterdam soon became the financial center of Europe and remained so through the 1600s. As during all periods of war, investors and financial markets suffered from the cost of governments' unwillingness to fund their wars through taxation and instead were forced to borrow money or debase the currency.

The rate of discount from the Bank of Saint George in Genoa was low throughout most of the 1500s, averaging around 3%–5% during most years and even falling below 2% in 1585. The flood of silver that flowed into Italy from the Americas drove down interest rates. Cities with good credit ratings, such as Nuremberg and Amsterdam, could obtain loans and deposits at low interest rates, while countries whose princes defaulted, such as France and England, had to pay double-digit interest on their loans.

After 1492, securities trading began to emerge in northern Europe. Bruges and Antwerp vied for the financial leadership of Europe in the early 1500s. By the 1520s, Antwerp had established itself as the principal financial center of Europe, overseeing trade between the Baltic region and the Mediterranean. Residents of Antwerp had made the request to form a common body for trading in 1485. The "Oude Bourse" and the "New Bourse" were established in 1515 and 1531, respectively. By that time, Antwerp had replaced Bruges as the primary trading center for commodities, although Amsterdam was soon to replace Antwerp (Michie 2006, pp. 21–23). England, France, Portugal, and Spain all went to bankers in Antwerp to raise money for their governments. The English defeated the Spanish Armada in 1588, significantly reducing Spain's role in Europe's politics and economy (Michie 2006, pp. 21–25).

Columbus sailed to America in 1492, and Spain began issuing bonds (*juros*) in 1520, although a financial crisis occurred in Spain in 1522, causing the *juros* to decline in price. French government securities (*rentes*) were first issued in 1522. Bankers and financiers loaned money to sovereigns in the 1500s, only to be met with defaults by the governments. Between 1557 and 1560, there was a triple sovereign default of France, Spain, and the States General of the Netherlands. Spain defaulted again in 1575, 1596, and 1607. In 1597, France forcibly reduced the interest rate that it paid on its debt from 8% to 4%. Each default weakened the bankers and forced them to charge higher interest rates to cover expected losses when the sovereign defaulted again. During the revolt of the Netherlands, Spanish troops sacked Antwerp in 1576 and besieged it in 1584–1585. Consequently, banking moved to Amsterdam, which became the new financial center of the Netherlands in the 1580s. The Dutch national debt was placed on a permanent basis in 1596 (Homer and Sylla 1996, pp. 106–21).

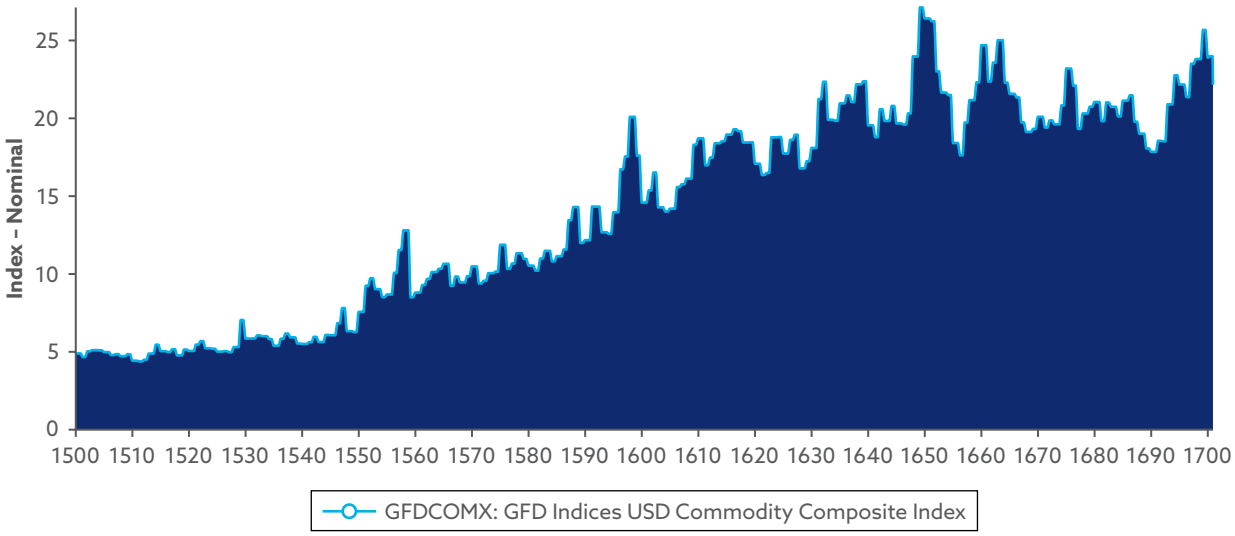
The Spaniards began mining silver in Potosí and in Zacatecas in Mexico in the 1540s, which contributed to the Great Inflation between 1510 and 1650. Prices increased faster between 1510 and 1650 than they would again until the 1900s. The Great Tudor Debasement occurred in England between 1544 and 1551 under Henry VIII and Edward VI. Although exchanges were primarily founded to quote exchange rates and trade commodities, rather than trade in stocks and bonds, they were founded in Cologne in 1553, Hamburg in 1558, Paris in 1563, London in 1571, Seville in 1583, Frankfurt-am-Main in 1585, Nuremberg and Lübeck in 1605, and Königsberg and Leipzig in 1635. Securities were sold at a discount to their redemption value, creating loans on securities (Michie 2006, p. 23).

The Banco di Rialto and the Banco del Giro were founded in Venice in 1587 and 1619, respectively. The first major joint-stock company was the Company of Merchant Adventurers to New Lands, also known as the Muscovy Company, established in England in 1555. The company had

a monopoly on trade between Russia and England and was the precursor to the English East India Company, established in 1601, and the Dutch East India Company, established in 1602 (Scott 1910).

Exhibit 8 illustrates the course of commodity prices during the 1500s and 1600s. Prices began to rise during the second quarter of the sixteenth century and continued to rise until around 1650, when the Thirty Years' War came to an end and inflationary pressures subsided.

Exhibit 8. GFD Commodity Index, 1500–1700



3. MERCANTILISM

The era from 1600 to 1789 saw rapid growth in financial markets. Investors in Amsterdam, London, and Paris began trading shares in international monopolies established by national governments. The issuance of shares by the English East India Company in 1601 and the Vereenigde Oost-Indische Compagnie, or Dutch East India Company (VOC), in 1602 began a new period in financial markets. The Amsterdam Exchange began trading shares in the VOC in 1602 and traded them regularly until the bankruptcy of the VOC in 1794. Governments pursued the policy of mercantilism, which encouraged governments to restrict imports, increase stocks of gold, and protect domestic industries. The goal was to increase the nation's supply of gold and silver with exports rather than deplete it through imports.

Governments in England, the Netherlands, France, and Denmark promoted their national monopolies and fought wars with each other to control trade. Government debt increased during the 1600s, leading to bubbles in 1719–1720 in England and France when those countries used debt–equity swaps to try to eliminate their debts. Government debt continued to increase during the 1700s, and in the case of both England and France, government debt was as great as each country's GDP by the end of the eighteenth century. Although England was able to fund its consolidated debts, France's antiquated system of taxation prevented it from maintaining its debt, leading to higher taxes, the French Revolution, and the Napoleonic Wars.

During the 1600s, the VOC was the largest corporation in the world. Some people say it was the largest corporation in history. During the 1700s, the number of British companies increased, and shares were actively traded in the coffee houses in London. Britain represented the majority of the market capitalization of stocks during the 1700s with the British East India Company, the Bank of England, and the South Sea Company, along with the British consols, receiving the focus of attention by shareholders.

The era between 1600 and 1789 is marked by government attempts to control trade and promote growth, through both the regulation of trade and the promotion of national monopolies. The Netherlands, England, France, and Denmark established national monopolies to trade with the Indies between 1601 and 1616. However, the Thirty Years' War (1618–1648), the English Civil War (1642–1651), and ongoing inflation limited growth. Between 1648 and 1688, the English and the Dutch fought three wars to determine which country would dominate the European economy. Jean-Baptiste Colbert, the French first minister of state, promoted the French monarchy and state. In 1655, Louis XIV said, "L'État c'est moi," meaning that the French monarchy was absolute.

The world changed significantly in 1689 when the Glorious Revolution replaced the absolute monarchy in England with a constitutional monarchy. This action led to English financial markets developing rapidly in the first half of the eighteenth century, with the first known stock market bubbles taking place in England and France. After 1720, financial markets remained subdued until 1789, when the French Revolution began. Government debt grew steadily during the 1700s, however, rising from 5% of English GDP in 1692 to 158% in 1789. During the same period, the market cap of shares in England grew from 1% of GDP to 15% of GDP. France's government debt was about equal to the nation's GDP in 1789. The 1700s was a century when the growth of government debt was more important than the growth of equities.

1600–1648: The Thirty Years' War

Wars:	Thirty Years' War (1618–1648), English Civil War (1642–1651)
Trade:	Increasing trade except when interrupted by war
Government Intervention:	Very little except during war
Government Debt:	Increased to fund wars
Stock Market Returns:	Netherlands, 13.60% per year
New Exchanges:	Netherlands (1602)
New Industries:	Trading companies—British (1601), Dutch (1602), French (1604), and Danish (1616) East India companies, Dutch West India Co. (1628)
Stock Market Capitalization:	Increased as East India and West India companies expanded
Bear Markets:	Netherlands: 1607, 1614–1617, 1622–1625
Financial Crises:	Germany: 1622; Netherlands: 1637
Sovereign Defaults:	France: 1604, 1624, 1648; Spain: 1607, 1627, 1647
Bond Yields:	Around 5%–8% in the Netherlands
Banks Founded:	Amsterdamsche Wisselbank (1609), Bank of Hamburg (1619), Banco del Giro (1619), Nürnberger Banco Publico
Commodity Prices:	Rose from 1600 to 1640s
Inflation:	Prices increased from 1600 to 1640s
Exchange Rates:	Stable; minor volatility in late 1640s

Financial markets developed rapidly during the 1600s. Before 1600, loans to princes were largely directed by bankers from Italy, Antwerp, Amsterdam, or the Fuggers in Germany. In the 1600s, especially in the Netherlands, nations began to issue debt securities that were held by domestic citizens. The issuance of shares by the English East India Company in 1601, the VOC in 1602, the French East India Company in 1604, and the Danish East India Company in 1616 began a new period in financial markets.

The Amsterdam stock exchange was founded in 1602, and exchange rates between the Dutch guilder and the British pound are quoted beginning in 1590. The Company of Adventurers of London Trading to the Ports of Africa, also known as the Guinea Company, was founded in 1607 and received letters patent from King James I in 1618. The Bank of Amsterdam (Amsterdamsche Wisselbank) was established in 1609, followed by the Banco del Giro and Bank of Hamburg in 1619, the Nürnberger Banco Publico in 1621, the Dutch West India Company in 1621, the Riksens Staenders Bank in 1668, the Hudson's Bay Company in 1670, and the Bank of England in 1694. Bourses were established in Lübeck in 1605, Königsberg in 1613, Bremen in 1614, Frankfurt am Main in 1615, and Leipzig in 1635, primarily to trade commodities and currencies, not stocks

and bonds. The financial floodgates had opened throughout the continent, and Europe would never be the same.

The Thirty Years' War lasted from 1618 until 1648 and was one of the bloodiest wars in history. It is estimated that between 4 million and 8 million people died directly or indirectly from that war (Parker 1997, p. 189). The English Civil War took place between 1642 and 1651. More than 4% of the English population, or about 200,000 people, died in the war. The eventual outcome of the Thirty-Years' War was the Peace of Westphalia, signed in 1648, which reorganized the borders in Europe. It also recognized the independence of the Netherlands from Spain, for which the Netherlands had been fighting for 80 years.

The Peace of Westphalia shifted the European balance of power and moved the financial center of Europe from Italy to the Netherlands. For the most part, peace prevailed in continental Europe (but not the British Isles) between 1648 and 1789, when the French Revolution led to the Napoleonic Wars and another continent-wide conflagration. Those 150 years of relative peace, however, allowed financial markets to establish themselves and develop.

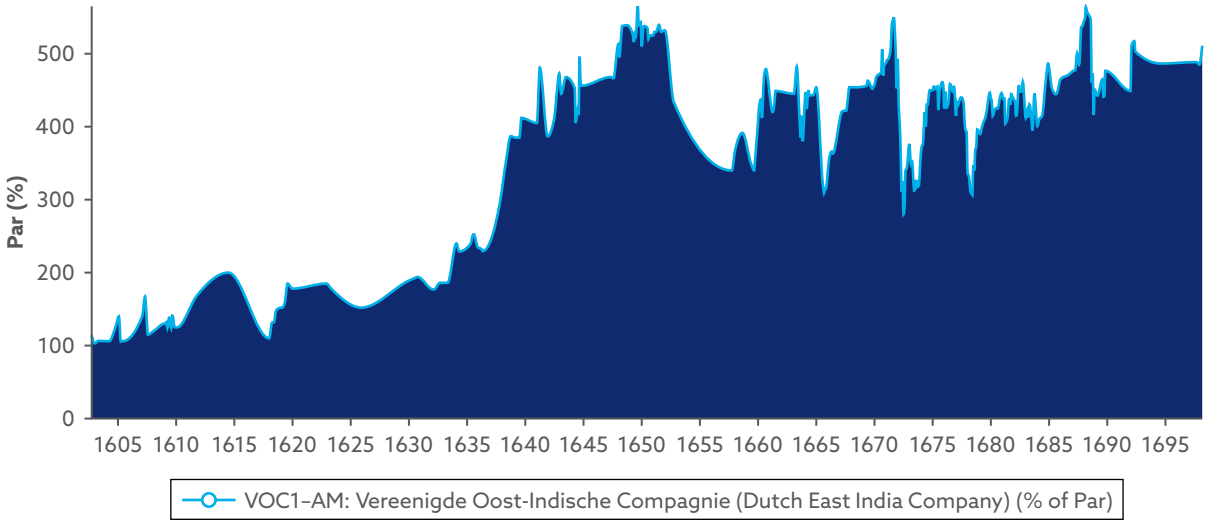
In 1602, VOC stock was issued and started trading on the Amsterdam Stock Exchange. Trading volume in VOC stock rose rapidly from 100,000 guilders a year between 1603 and 1607 to 400,000 between 1608 and 1612. The value of bonds issued by Dutch public authorities rose from 2.1 million guilders between 1600 and 1619 to 7.8 million between 1672 and 1677. Although a number of corporations were established in England in the 1500s and 1600s, the number of shares issued by each company was low and there was very little trading in their shares (Michie 2006, p. 25–31). There is a record of trades in Dutch VOC stock throughout the 1600s (Michie 2006), and changes in the economic and political environment are reflected in the price fluctuations of the stock.

All the major modern tools of trading stocks, including short selling, futures trading, and bear raids, were quickly introduced in Amsterdam. In 1608, Isaac le Maire led a bear raid against VOC stock in an attempt to manipulate the price of the shares (van Dillen, Poitras, and Majithia 2006). In 1688, Joseph Penso de la Vega wrote a book, *Confusion de Confusiones*, that detailed trading in East India Company stock on the Amsterdam exchange. Corporations were soon established in other countries as well. Det Danske Ostindiske Kompagni (Danish East India Company) was founded in Copenhagen in 1616, and the Vestindisk Kompagni (West India Company) was established in 1671.

The Spanish state bankruptcy of 1607 wiped out many of the Genoese bankers and contributed to shifting the financial center of Europe to Amsterdam. Previous Spanish defaults had occurred in 1557, 1560, 1575, and 1596. When the Thirty Years' War broke out in 1618, a monetary crisis, known as the *Kipper-und-Wipperzeit* (clipped-coin time) hit Germany. Small coins became scarce, and princes debased the currency, creating one of the worst episodes of inflation in Europe since the Roman inflation of the third century. In some German cities, prices increased tenfold between 1618 and 1622. The crisis peaked in February 1622, when the debasement and inflation were finally halted (Kindleberger 1991).

The Spanish state bankruptcy in 1627 caused further damage to the Genoese bankers and the Fuggers. The Dutch tulip mania occurred between November 1636 and February 1637, though it had little impact on financial markets. After the Peace of Westphalia ended the Thirty Years' War in 1648, the bankruptcy of the French state eliminated Italian bankers' influence over the European economy.

Exhibit 9. Dutch East India Company Stock Price in Dutch Guilders (percent of par value), 1601–1698



Other than data on VOC stock, exchange rates between different cities, and commodity prices, few data exist to facilitate analysis of financial markets in the first half of the seventeenth century. The VOC enabled the Netherlands to bring back spices and other commodities from the Far East. During its time, the VOC was the largest corporation in the world, with around 50,000 employees, a private army of 10,000 soldiers, and more than 4,500 ships between 1600 and 1799. The history of the price of VOC stock in the 1600s is illustrated in **Exhibit 9**, which shows that most of the stock price appreciation occurred during the 1630s and 1640s. The price fluctuated during the rest of the century as the company was buffeted by economic crises.

1648–1689: The Anglo–Dutch Wars

Wars:	First Anglo–Dutch War (1652–1654), Second Anglo–Dutch War (1665–1668), Third Anglo–Dutch War (1672–1678)
Trade:	Increasing trade except when interrupted by war
Government Intervention:	Very little except during war
Government Debt:	Increased to fund wars
Stock Market Returns:	Netherlands: 3.59%
New Stock Markets:	India (1685)
Stock Market Capitalization:	Declined as VOC took on debt
Bear Markets:	Netherlands: 1648–1659, 1663–1665, 1671–1672, 1674–1678, 1688

Financial Crises:	Netherlands: 1652, 1665, 1672 (known as *Rampjaar*)
Sovereign Defaults:	France (1661), Prussia (1683), Spain (1652, 1662, 1666)
Bond Yields:	Around 4% in the Netherlands
Central Banks Founded:	Stockholms Banco (Sweden, 1657), Sveriges Riksbank (1668)
Commodity Prices:	Spikes during famines, but otherwise stable
Inflation:	Little overall change in the price level
Exchange Rates:	Remained stable

The Peace of Westphalia brought an end to the Thirty Years' War in 1648 and brought independence to the Netherlands after 80 years of war. At the end of the Thirty Years' War, France defaulted on its debts, leading to the ruin of the Italian bankers. Spain defaulted again in 1652. With the Netherlands now the primary economic power in northern Europe, it was challenged by the English. Although the Anglo–Dutch Wars were not nearly as large or as expensive as the Thirty Years' War, new wars erupted between England and the Netherlands in the decades that followed the Peace of Westphalia. The wars became a battle for economic supremacy in northwestern Europe.

The First Anglo–Dutch War immediately followed the English Civil War and took place between 1652 and 1654. The English attacked Dutch ships, disrupting Dutch shipping. The Second Anglo–Dutch War took place between 1665 and 1668. The Third Anglo–Dutch War occurred between 1672 and 1674, part of the Franco–Dutch War of 1672 to 1678. England allied with France to fight the Dutch. When France and England invaded the Netherlands in 1672, it led to a severe market decline in VOC stock. In Dutch history, 1672 is referred to as the *Rampjaar* (Disaster Year). The Dutch strategically flooded their country rather than allow the French to achieve victory. The impact of these wars on VOC stock can be seen in Exhibit 9. VOC stock lost almost half its value in a matter of months in 1672, falling from NLG550 to NLG290, although the stock eventually bounced back.

Charles II defaulted on England's debts in 1672, raising England's interest rate to 12%, while the Dutch, who did not default, had to pay only 4%. Exchanges were established in Königsberg in 1619, Leipzig in 1678, Bremen in 1682, and Berlin in 1685. These exchanges existed mainly for trading commodities, coins, and currencies. The Stockholms Banco was founded in 1656. It collapsed in 1668 and was purchased by the newly established Swedish Riksbank.

The only company for which we have regular data on share values in the 1600s is the VOC. Transactions for the VOC rose from around 57 per annum in the 1660s to 136 in the 1670s and 525 in the 1680s. The price of shares in the Dutch West India Company peaked in 1629 and then declined in price until the company declared bankruptcy in 1674 during the Third Anglo–Dutch War. There is also occasional, inconsistent data on English stock prices. Most of the data in England are for the British East India Company. Although there is very little history of the price of bonds in the 1600s, the yield on bonds generally declined during the seventeenth century (Michie 2006, p. 28–31).

Between 1648 and 1689, financial markets were primarily a Dutch experiment, but when William of Orange replaced James II as king of England in 1689, introducing the "Glorious Revolution," he brought with him knowledge of Dutch finance. In the 1690s, English finance exploded. Shares in more than a dozen companies were traded in the coffee houses in London, and share trading grew dramatically for the next 30 years.

1689–1720: The First Stock Bubble

Wars:	Nine Years' War (1689–1697), War of the Spanish Succession (1701–1714)
Trade:	Trade grew though interrupted by war
Government Intervention:	High during the War of the Spanish Succession
Government Debt:	Increased to fund War of the Spanish Succession; England and France tried to eliminate their debts in 1720
Stock Market Returns:	Netherlands: 1.71%; England: 10.67%
New Markets:	None
New Industries:	Paper (White Paper Makers, 1690), Textiles (English Linen Co., 1692), Banks (Bank of England, 1694), Insurance (London Assurance, Royal Exchange Assurance, 1719), Mining (English Copper Co., 1719)
Stock Market Capitalization:	Rose from 1694, exploded during bubbles in 1719 and 1720
Bear Markets:	Fall of James II (1688), Nine Years' War (1700), Death of Charles II (1704)
Financial Crises:	Mississippi Co. in France (1719), South Sea Co. in England (1720)
Bond Returns:	United Kingdom: 9.85%
Bond Yields:	Fell in England from 8.9% in 1700 to 1.2% in 1720
Central Banks Founded:	Bank of England (1694)
Commodity Prices:	Peaks in 1699 and 1711, but overall stable
Inflation:	Overall stable, spikes in 1699 and 1711
Exchange Rates:	Stable, except around 1694 and during the South Sea crisis (1719–1720)
Sovereign Defaults:	France (1700, 1713, 1720)

England was transformed by the Glorious Revolution in 1689, when William of Orange became king, removing James II from power. The Dutch brought their financial skills to London, and trading in shares of English corporations grew dramatically. The Glorious Revolution brought an enduring parliamentary democracy to England as well as peace between England and the Netherlands.

In 1689, there were 15 major joint-stock companies in London with a total of almost GBP1 million in capital. Only three of these companies had more than GBP100,000 in capital: the East India Company (GBP740,000), the Africa Company (GBP111,000) and the Hudson's Bay Company (GBP110,00). By 1695, there were more than 150 companies with more than GBP4 million in capital. The Bank of England alone raised GBP1.2 million in capital in 1694. The Bank of Scotland was established in 1695. East India Company stock began trading daily in 1692, and the Bank of England was founded in 1694.

It was not until the 1690s that data on the prices of stocks and bonds were published in newspapers and became regularly available. Trading occurred in coffee shops, and the *Course of the Exchange*, dedicated to publishing the price of foreign currencies, coins, commodities, stocks, and annuities, was published twice a week beginning in 1698 using prices from Jonathan's Coffee House. The publication kept track of daily stock trades. Stockbrokers whose sole job was to trade shares appeared. A law passed in 1697 tried to restrict the number of stockbrokers in London to 100, but it failed. Britain tied the pound sterling to gold in 1717, when Sir Isaac Newton accidentally undervalued silver, bringing gold into England and pushing silver out. Shares of the British East India Company, the Bank of England, and the South Sea Company traded not only in London but also in Amsterdam and Paris. Information was transmitted among London, Paris, and Amsterdam, and stock markets quickly became international (Neal 1990).

The Nine Years' War, fought from 1689 to 1697 between France and the rest of Europe, formed the Grand Alliance against France. England benefited from the war, but the failure to resolve all the issues in the Peace of Ryswick in 1697 led to the War of the Spanish Succession a few years later. The Great Northern War was fought between Russia and Sweden between 1701 and 1720 and marked the rise of Russia as a major European power.

Bear markets occurred in 1688 because of the Revolution of 1688, during which James II was replaced by William of Orange; in 1700 because of the Nine Years' War; and in 1704 after the death of Charles II. A recovery occurred in the 1710s after the War of the Spanish Succession ended. Britain suffered a financial crisis and recoinage between 1692 and 1696. In 1693, the British government created permanent transferable debt that could be traded, and in 1717, British debt was converted from a floating to a permanent basis. British government debt grew from less than GBP1 million in 1688 to more than GBP50 million by 1720. This debt amounted to about 60% of British GDP, and the government wanted a way to unload the debt (Michie 1999, pp. 15–28). France was in a similar condition, with high government debt stemming from the War of the Spanish Succession, and both countries encouraged their citizens to trade their debt for shares in the *Compagnie des Indes Orientales* in Paris and the South Sea Company in London as a way of reducing the cost of the debt England and France had accumulated.

The result was the Mississippi Bubble and the South Sea Bubble of 1719 and 1720. John Law's bank opened in 1716, and the *Compagnie des Indes Orientales* took over other French trading companies to help Law's system succeed. Both France and England suffered the first known share market bubbles in history. Share prices for the *Compagnie des Indes Orientales* may have gone from 300 livres in 1718 to 10,000 livres in Paris in 1719 (as illustrated in **Exhibit 10**), and South Sea shares climbed from GBP100 to GBP1,000 in 1720, but the share prices eventually collapsed. Dozens of companies were incorporated in 1720, such as the London Assurance Company and the Royal Exchange Assurance Company, both of which lasted until the 1960s.

The Million Dollar Bank on Tickets of the Million Adventure became a mutual fund that invested in British government funds. The yield on Million Bank shares is illustrated in **Exhibit 11**. During 1720, the Bubble Act was passed; it both restricted the incorporation of new companies and redirected capital toward the South Sea Company. Because of these restrictions, this act put a damper on the founding of new corporations in England for the rest of the century.

Exhibit 10. *Compagnie des Indes Orientales et de la Chine* Stock Price in Livres, 1718–1721

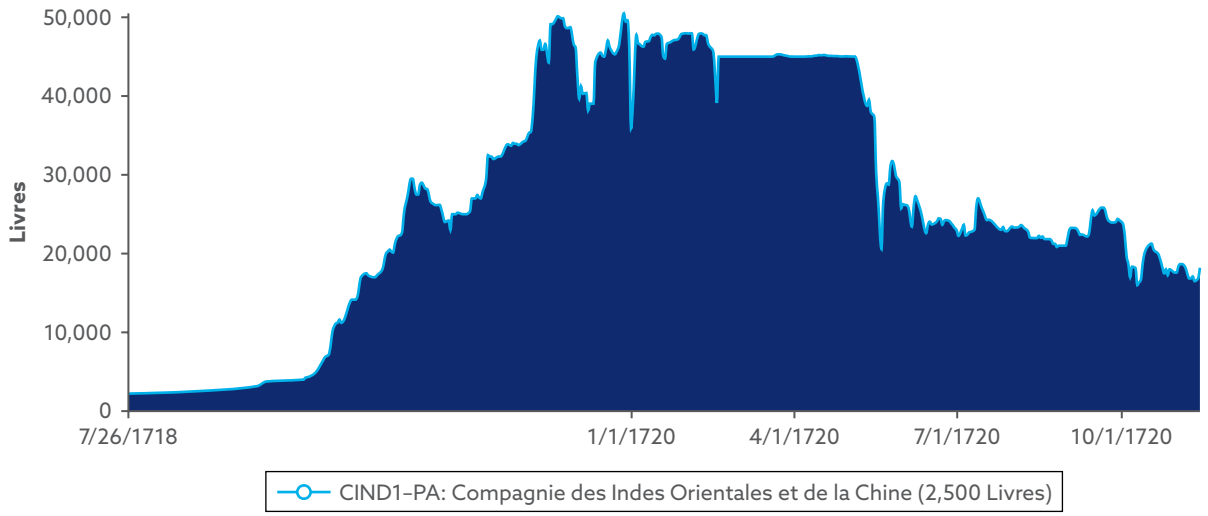
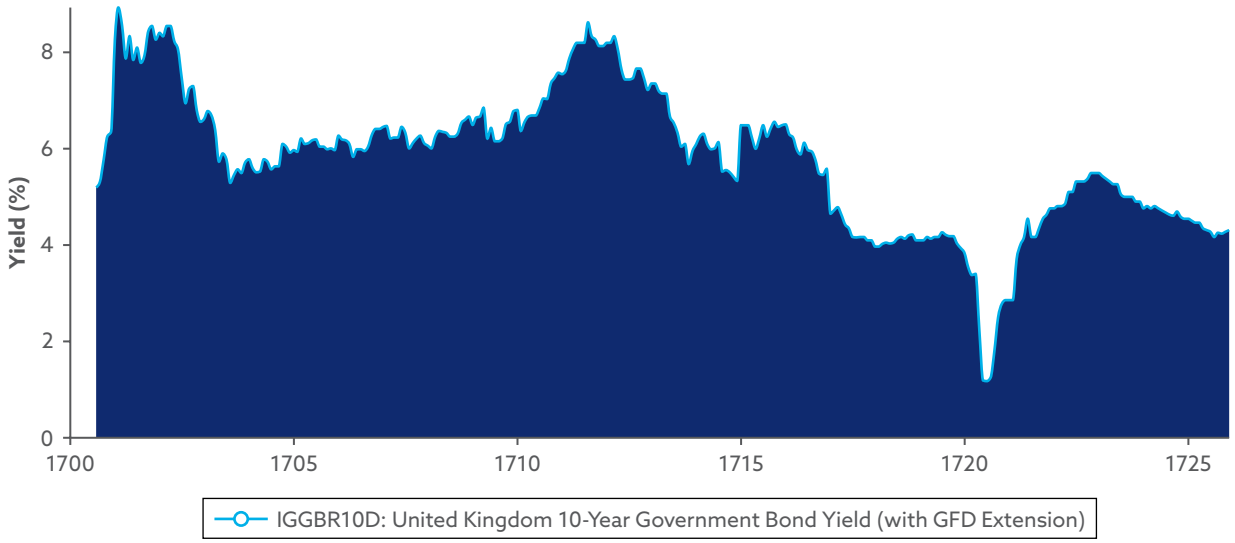


Exhibit 11. Yield on Million Bank Shares in Percent, 1700–1725



When the bubble of 1719–1720 hit London, Paris, and Amsterdam, stock trading exploded and data on individual stocks became regularly available. The first stock market bubbles occurred, drawing in thousands of people, including Sir Isaac Newton, who lost a fortune. Most people had never bought stocks or bonds before, and most of them avoided stocks after the crash. More than a dozen companies were trading daily in the coffee shops in London in 1720, with prices regularly published in the *Course of the Exchange* (Balen 2004; Carswell 1993; Buchan 2020).

After the collapse of *Compagnie des Indes Orientales* shares, order returned to the stock market when the Paris stock exchange was founded on Rue Vivienne on 27 September 1724. London, Paris, and Amsterdam provided an integrated market, with capital flowing among the three cities to arbitrage price differences and exchange rates fluctuating to reflect the cash flows. After the bubbles of 1719–1720 and the losses that investors incurred, interest in stocks remained low for the rest of the century. Interest in government bonds grew, however: British government debt increased to more than GBP400 million by the end of the century as Britain funded its wars with debt paying 3%–4%. France also funded its growing debts, but its system of issuing and paying its debts was more antiquated, making it difficult for France to fund its debts.

1720–1763: The Mercantilist Economy

Wars:	War of the Austrian Succession (1740–1748), Seven Years' War (1756–1763)
Trade:	Increased
Government Intervention:	No major wars until 1756, so relatively light
Government Debt:	Increased very little until the Seven Years' War
Stock Market Returns:	United Kingdom: 2.94%; Netherlands: 1.18%
New Stock Markets:	Spain: 1746; Denmark: 1759
New Industries:	Sugar (St. Kongensgade Sukkerfabrik, 1763)
Stock Market Capitalization:	Decreased after the 1720 bubble
Bear Markets:	Stocks declined between 1720 and 1762
Financial Crises:	None
Bond Returns:	United Kingdom: 3.05%; France: 5.55%
Bond Yields:	France: 3%–10.5%; United Kingdom: 2.8%–5.5%
Central Banks Founded:	Kurantbanken (Denmark, 1736)
Commodity Prices:	Rising prices from 1745 to 1761
Inflation:	Slight deflation
Exchange Rates:	Stable

There was little change in investment opportunities between 1720 and 1763. The year 1720 marked the height of the South Sea Bubble, when the price of South Sea stock peaked at GBP1,000 after rising tenfold and the Mississippi Company rose thirtyfold. From there, it was downhill for the next four decades. Stock markets in England, France, and the Netherlands all hit new lows at the beginning of 1762. There were no major bull markets for four decades as most investors chose safe government bonds over risky equities. Shares in French *Compagnie des Indes Orientales* and Dutch VOC shares gradually declined between 1721 and 1763. The VOC found it more difficult to make profits in the 1700s. It chose to issue more debt rather than new shares, eventually creating a debt load that would force it into bankruptcy.

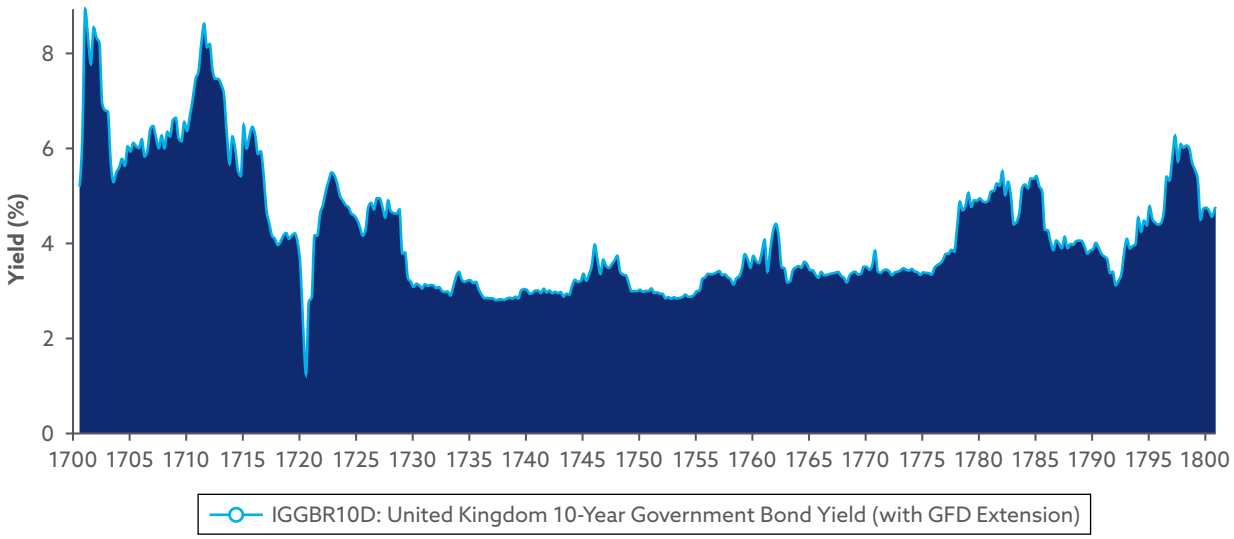
The British issued long-term government debt in 1729 that was consolidated into 3.5% "stock" (bonds) in 1752 and reduced to 3% in 1757. British government debt rose from GBP53.9 million in 1720 to GBP134.2 million in 1763, while the stock market's capitalization fell during the same period. Stock markets recovered from the lows of 1762 once the Seven Years' War ended and peace prevailed. The Seven Years' War provided a benchmark for the transition to the new period of conflict between England and France, which would last for the next 60 years.

There were few major wars between 1720 and 1763, the main ones being the War of the Austrian Succession and the Seven Years' War. Both wars led to bear markets and an increase in bond yields. The financial maneuverings of John Law and the South Sea Company had wiped out much of the debt of both France and England. Most people lost interest in trading stocks after the losses from the bursting of the share bubbles in Paris and London. Consequently, there were few IPOs and stock market capitalization declined slightly between 1720 and 1763 (Michie 1999, pp. 20–32).

England introduced the 3% bond in 1729 and consolidated its debts in 1752, creating the "consol," or perpetuity (a bond without a maturity date), which lasted for the next 260 years and was the most traded bond in the world until World War I. France issued similar bonds in 1746 that continued to trade until the French Revolution. Government bonds became the primary instrument traded on the Paris stock exchange and in the London coffee houses. **Exhibit 12** illustrates the course of bond yields during the 1700s in England. It shows the decline in bond yields when the 3% bond was introduced in 1729, as well as increases in bond yields during the War of the Austrian Succession (1740–1748), the Seven Years' War (1756–1763), the American Revolution (1775–1783), and the French Revolutionary and Napoleonic Wars (1793–1815).

The *Course of the Exchange* and *Lloyd's List* published stock and bond prices on a regular basis during the 1700s. *Every Man His Own Broker* was first published by Thomas Mortimer in 1761 to advise individuals on trading stocks at Jonathan's Coffee House. Because of the lack of interest in shares, there were few new companies, and the stock market displayed little action either up or down. Bonds outperformed stocks as bond prices rose and bond yields declined. There were no financial crises, although bear markets occurred as a result of the two wars that England, France, and other European powers engaged in. Commodity prices rose slightly between the 1740s and 1760s because of the ongoing wars.

Exhibit 12. British Government Bond Yields in Percent, 1700–1800



Although few companies were founded in England between 1720 and 1763, stock trading grew in both Denmark and Spain. The Reales Minas de Guadalcanal was founded in 1727, and the Real Compania Guipuzcoana de Caracas was established in 1729. Five more companies were founded in Spain in the 1740s and four more companies in the 1750s. Unfortunately, the number of shares was limited, and there was insufficient trading to keep track of changes in the prices of these companies. Similarly, the Soassurancekompagniet was established in Copenhagen in 1726, the Asiatisk Compagnie in 1732, and the Kurantbank in 1736. Data on Danish shares is only available beginning in 1759 (Stancke 1971).

1763–1789: The American Revolution

Wars:	American Revolutionary War (1775–1783)
Trade:	Increasing trade except when interrupted by war
Government Intervention:	Very little except during the American Revolution
Government Debt:	Increased to fund wars
Stock Market Returns:	World: 5.67%; United Kingdom: 5.23%
New Stock Markets:	Portugal (1769), Austria (1771), United States (1781), Ireland (1783)
New Industries:	Canals (Trent and Mersey Canal, 1766)
Stock Market Capitalization:	Increased slightly
Bear Markets:	American Revolution (1768–1784)

Financial Crises:	Seven Years' War (1763), England and Netherlands (1772)
Sovereign Defaults:	France (1770, 1788)
Bond Returns:	United Kingdom: 3.57%
Bond Yields:	Stable (France, 5%–11%; United Kingdom, 3.2%–3.8%)
Central Banks Founded:	Banco Nacional de San Carlos (Spain, 1782)
Commodity Prices:	Rose from 1762 until 1786, declined to 1789
Inflation:	Moderate inflation; high in United States during the Revolutionary War
Exchange Rates:	Erratic because of wars and inflation

There was little change in the investment opportunities for investors between 1763 and 1789. The primary war during those years was the American Revolutionary War (1775–1783). British government debt grew as a result of the Seven Years' War and the American Revolution. The capitalization of the stock market shrank relative to debt, and investors bought bonds and shares for income, not for capital gains. The UK stock market suffered a bear market during the American Revolution between 1777 and 1778, with a decline in both stock and bond prices. British share prices fell by more than 40% between 1768 and 1778. Inflation in the United States made the US dollar "not worth a Continental." At the end of the war, it took 1,000 Continental paper dollars to get one silver dollar. A financial crisis occurred in June 1772, when Alexander Fordyce lost GBP300,000 shorting British East India Company stock unsuccessfully. This crisis led to the failure of eight banks in London and eventually 20 banks in Europe. The crisis spread to Scotland and then to the Netherlands (Sheridan 1960).

The small number of companies that existed in the United Kingdom grew between 1763 and 1789. The Trent and Mersey Canal and the Worcestershire Canal were both established in 1766. The approval of more canals led to the first share bubble since 1720. These shares were not traded in London but in the towns where the canals were built. The Irish Grand Canal was incorporated in 1772, and work on the Irish Royal Canal began in 1790. The Bank of North America was founded in 1781, and the Banco de San Carlos, which eventually became the Banco de España, was founded in 1782. Although there was little change in the trading of stocks and bonds in London between 1763 and 1789, the foundation for the dramatic growth in stocks and bonds during the 1800s was laid. Interest in canal shares would explode in the 1790s.

The impact of the American Revolution on the British stock market is clearly evident in **Exhibit 13**. Stock prices fell during 1777 and 1778 as the rebellion began. Prices showed little overall change between 1778 and 1782 while the war was fought and recovered only after the Treaty of Paris was signed in 1783. The British stock market almost doubled in price between 1783 and 1792, when the French Revolutionary Wars began.

Exhibit 14 compares returns on stocks, bonds, and bills in Great Britain during the 1700s. Because of the bubble of 1719–1720, returns on stocks and bonds were high between 1700 and 1720. Returns were much lower between 1720 and 1763 as markets retreated from

Exhibit 13. British Stock Price Index in British Pounds, 1775–1783

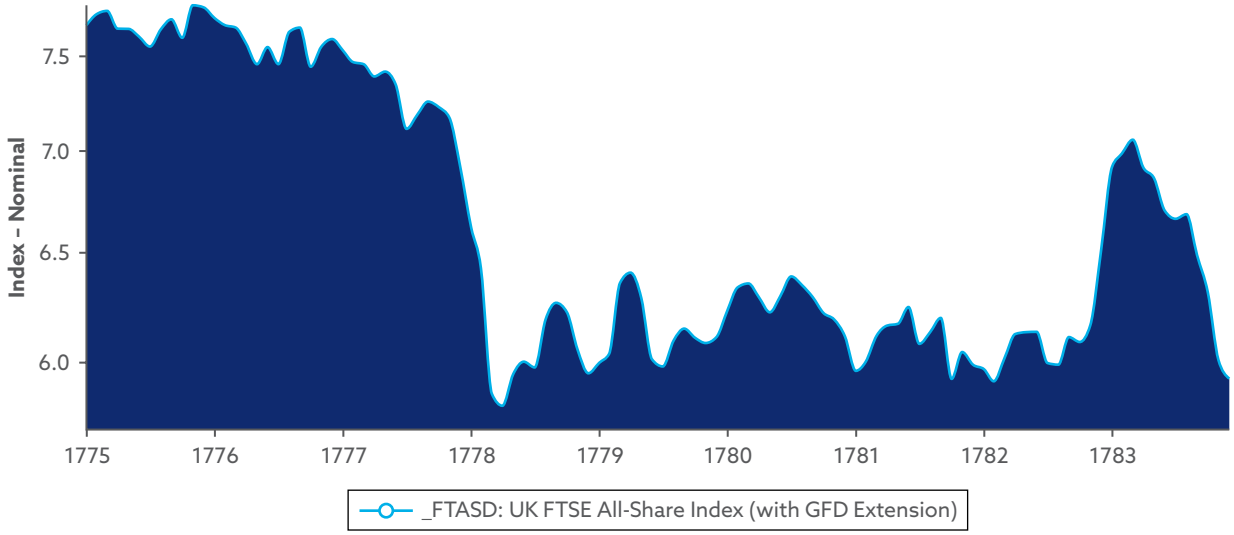


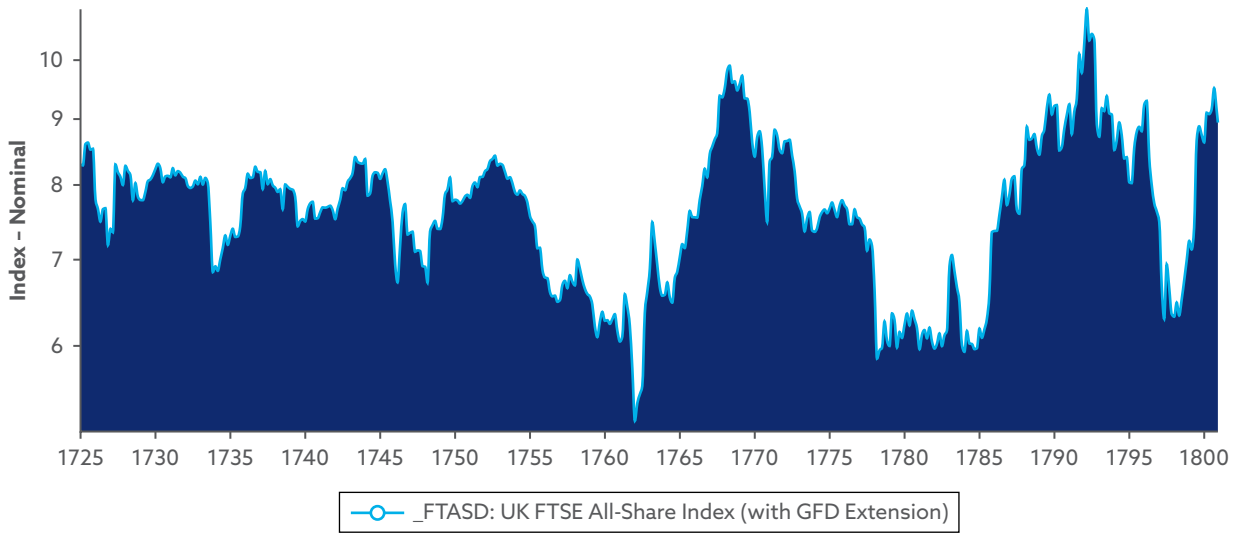
Exhibit 14. Annual Returns on Stocks, Bonds, and Bills in Great Britain in Real British Pounds, 1700–1789 (all data in percent)

Period	Stocks	Bonds	Bills	Bond ERP	Mkt. Cap/GDP	Inflation	Real GDP
1700–1720	10.67	10.15	6.06	0.46	33.8	–0.28	0.95
1720–1763	3.13	2.99	3.61	0.15	20.5	0.07	0.51
1763–1789	5.82	3.4	3.33	2.34	14.8	0.59	1.07

the bubble. In both time periods, there was little difference between the returns of stocks and bonds. Both were traded for their yield, not their capital gains. During the period between 1763 and 1789, stocks outperformed bonds as bond prices declined and yields rose. The ratio of market cap to GDP declined during the 1700s, although the level of government debt increased.

The behavior of stock prices in Great Britian in the 1700s is further illustrated in **Exhibit 15**. Stocks lost value during the Seven Years' War (1756–1763) but rallied once peace returned. Stocks again declined during the American Revolutionary War (1775–1783) but rallied once peace returned. A third bear market occurred during the French Revolution and the wars between France and the Allies that followed. The relatively small amount of net price change during this long period does not mean stock investors fared poorly. English stocks paid a dividend yield of between 4% and 6% during the 1700s, and as stated earlier, shares were bought mostly for their yields, not their capital gains.

Exhibit 15. British Stock Market Prices, 1725–1800



The American Revolution increased government debt in the United States, Britain, and France. The United States defaulted on its debts at both the federal and state levels, and American debt was reorganized by Alexander Hamilton in 1792. By 1789 in both England and France, government debt was as great or greater than each country's GDP. Despite the greater debt burden, England was able to fund its debts because its financial markets were more efficiently organized. British and Dutch investors continued to buy British debt because there was little fear of British default. France's antiquated system of taxation, however, prevented it from funding its debt, leading to higher taxes, which the French were unable to bear. The result was the French Revolution and the Napoleonic Wars, which engulfed Europe during the next 25 years.

4. FREE TRADE

While the era of Mercantilism from 1600 to 1789 was one of restricting free trade and favoring protected domestic industries over imports, the nineteenth century began a new era. Britain encouraged more free trade and global markets, and economies grew as a result. The period between 1689 and 1815 was a period of increasing government debt, which left little capital for investment in individual companies, but the period from 1815 to 1914 was a period of peace during which government debt declined and investment in the stock market grew dramatically in every country in the world. In 1789, there were only a handful of companies whose shares traded publicly, but by 1914, thousands of companies were listed on dozens of stock exchanges around the world.

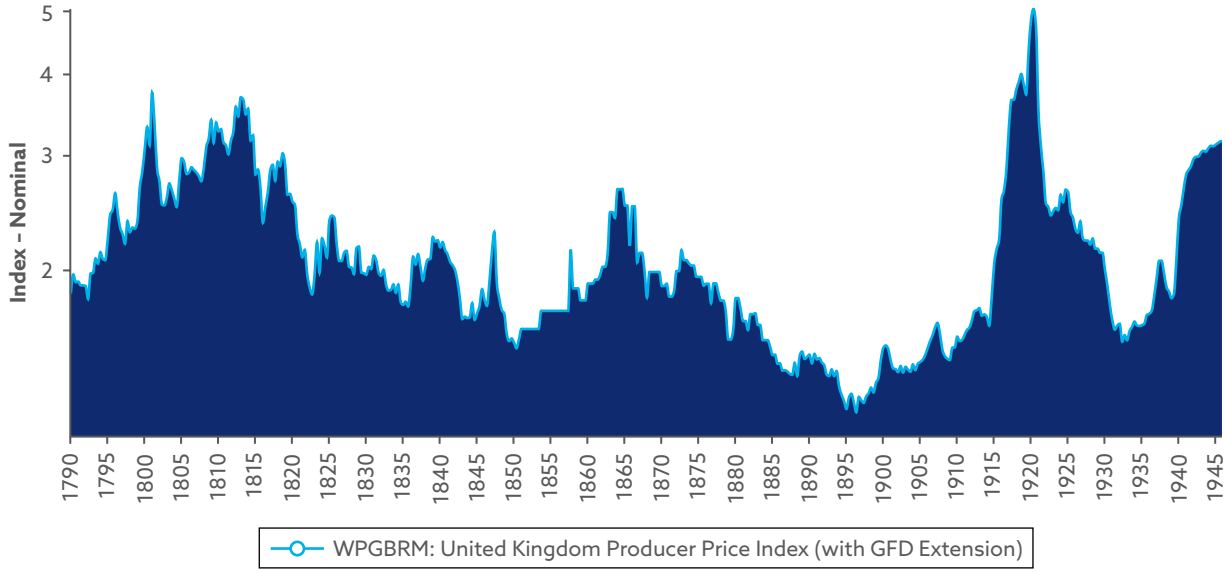
Adam Smith's *The Wealth of Nations* was published in 1776, attacking mercantilism and promoting the benefits of free markets and free trade. Between 1789 and 1914, dozens of new industries were born, and their benefits quickly spread throughout the world. Canals and turnpikes, railroads, utilities, iron and steel, chemicals, the telegraph, telephone, cinema, bicycles, sewing machines, automobiles, and dozens of other industries came into existence, completely transforming the global economy.

The era started out with the French Revolutionary Wars, which became the Napoleonic Wars. Napoleon imposed the Continental System on Europe, favoring France in trade and cutting off Britain's trade with the continent to try to force it into submission. Napoleon established new legal systems throughout Europe, and after the Napoleonic Wars, the Treaty of Paris in 1815 reestablished the boundaries of Europe. There were no continent-wide wars in Europe between 1815 and 1914, a hundred years of peace that redirected capital away from government bonds and into corporate stocks and bonds. Thousands of different issues—bonds and shares—were traded daily, and global stock market capitalization increased from less than 1% of global GDP in 1789 to more than 33% of global GDP in 1914.

Exhibit 16 shows the influence of rising and falling commodity prices in the periods during free trade. Britain faced rising prices during the Napoleonic Wars between 1790 and 1813. Prices declined until 1849, when gold was discovered in California; it was also discovered in Australia in 1851. This discovery, combined with the American Civil War, led to rising prices until 1864. Britain faced a second period of deflation between 1864 and 1896. Inflation was mild between 1896 and the beginning of World War I in 1914. Prices rose dramatically until 1920. Prices dropped when the postwar recession hit and continued to decline until 1932, when another inflationary trend began that lasted for the rest of the century. In 1945, the British wholesale price index was still below the level it had reached in 1800. The pattern of rising and falling prices influenced the yields on bonds and bills during those 150 years.

The discovery of large silver deposits in the Comstock Lode in Nevada increased the supply of silver and reduced its price, pushing the world onto the gold standard, which Britain had joined in 1717. This development integrated the world with a system of fixed exchange rates (each currency defined as a specific quantity of gold) that enabled government bonds to be traded on every exchange in Europe, with payment offered in a multitude of currencies. US and Russian corporate bonds and British consols were sometimes used to arbitrage foreign currency differences.

Exhibit 16. British Wholesale Price Index, 1790–1945



The French Revolution led to the Napoleonic Wars, which together engulfed Europe between 1793 and 1815. The Treaty of Vienna in 1815 brought peace to Europe, and between 1825 and 1845, Europe built railroads, which provided immense growth to the economy by rapidly increasing the speed of transportation. The combination of the collapse of the Railroad Bubble in 1845 and the Revolutions of 1848 sent stock markets to the lowest levels they would reach for the rest of the century.

Dozens of new industries were founded during the 1800s. Wars in Germany (1864–1870) and Italy (1859–1870) brought those countries together as unified nations, and the unity of the United States was cemented by the American Civil War (1861–1865). In other countries, building railroads contributed to the nation building that occurred during the middle of the century. These events led to a period of financial integration through the gold standard between 1873 and 1914, a development that helped stock exchanges and bond markets to be established in every major country in the world. Europe benefited from a century of free trade after 1815.

Exhibits 17 and **18** show the shares of 12 sectors of the stock markets in the United Kingdom and the United States, respectively, between 1789 and 1914. Although the data for the two countries differ, the trends are similar. The 1800s saw a relative decline in finance and the rise and fall of railroads (shown as "transports"). Between 1789 and 1914, finance shrank from more than 90% of total market capitalization to less than 30% in the United Kingdom and to less than 20% in the United States. Transports rose from 1% to 31% in the United Kingdom, with a similar rise in the United States.

Between 1789 and 1873, the decline in finance was offset by the rise of the railroads. In 1789, before canals and railroads became the focus of economic development, transport stocks

Exhibit 17. Sector Allocations in the United Kingdom, 1789–1914 (all data in percent)

Year	1789	1815	1848	1873	1896	1914
Communications				2.00	1.97	1.74
Consumer Discretionary		0.06		0.92	3.70	7.31
Consumer Staples		0.13		0.49	4.46	8.29
Energy				0.43	0.44	5.37
Finance	92.68	62.80	33.53	30.80	28.61	29.72
Health Care					0.02	0.09
Industrials	4.92	2.02	1.13	1.43	1.60	3.12
Information Technology				0.27	0.15	0.38
Materials	0.08	0.40	0.04	4.04	4.19	8.47
Real Estate				0.19	0.37	0.37
Transports	1.40	32.49	61.72	53.43	46.07	31.41
Utilities and Telecommunications	0.92	2.11	3.56	6.00	8.40	3.73

represented about 1% of market cap. They rose to more than 60% in the United Kingdom by 1848 because of the railway boom of the 1830s and 1840s. It was not until after the American Civil War that railroads represented more than 60% of market cap in the United States. While railroads connected the cities of Europe, railroads enabled both the United States and Canada to assume their modern form by connecting the two coasts together. By the beginning of World War I, transport stocks had declined to around 30% of the stock market in both the United States and the United Kingdom as the market diversified into other industries. Materials grew in both countries, along with consumer goods and energy in the United Kingdom and energy, utilities, and telecommunications in the United States.

The national market capitalizations in the world became more diversified between 1789 and 1914. In 1789, Great Britain, Ireland, and India (the British East India Company) represented 87% of global market capitalization, the Netherlands about 8%, France about 4%, and the United States and Denmark each about 1%. The VOC went bankrupt in 1794, and the French closed all the country's corporations during the French Revolution. Gradually, countries across Europe began trading shares on domestic markets, in France (1801), the Netherlands (1814), Austria (1817), Belgium (1832), Germany (1834), Switzerland (1851), Italy (1856), and Sweden (1870). Elsewhere, shares traded domestically in markets such as Bombay (now Mumbai; 1840s), Hong Kong (now Hong Kong SAR; 1865), Shanghai (1869), Singapore (1872), and Tokyo (1878). Countries that had shares listed in London, such as

Exhibit 18. Sector Allocations in the United States, 1789–1914 (all data in percent)

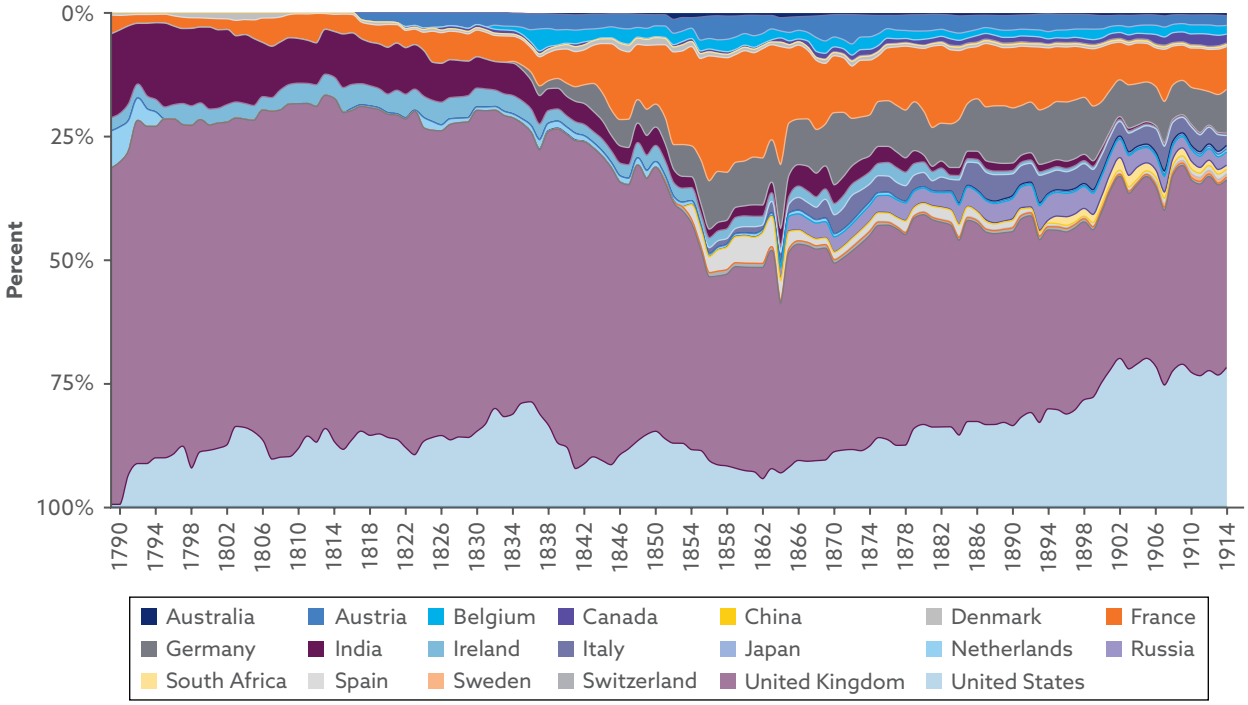
Year	1789	1815	1848	1873	1896	1914
Communications					0.40	0.92
Consumer Discretionary			13.33	5.71	4.55	5.66
Consumer Staples				0.03	3.38	5.00
Energy				1.31	5.61	11.69
Finance	100.00	93.05	45.09	16.26	22.56	17.14
Health Care						0.22
Industrials			0.71	0.85	4.05	6.25
Information Technology						0.05
Materials			0.30	1.49	5.54	11.72
Real Estate			0.45	2.44	1.69	0.60
Transports		6.47	36.03	66.82	38.97	29.55
Utilities and Telecommunications		0.47	4.09	5.09	13.27	11.20

Canada (1822), Australia (1825), and South Africa (1835), began trading shares domestically as well.

By 1850, the United Kingdom and Ireland represented 57% of global market cap, the United States 15%, India 12%, and the rest of the world about 15%. Diversification continued during the nineteenth century, and by 1914, the United Kingdom represented about 38% of global market cap, the US 28%, Germany and France each about 8%, and the remaining 20% scattered among the rest of the world. This trend is illustrated in **Exhibit 19**, which shows changes in the distribution of global market cap between 1789 and 1914.

Between 1815 and 1914, Europe was transformed from a continent riven by war to an integrated financial market, where capital moved freely between countries and new industries and corporations were born on a regular basis. But this situation was about to change. No one in 1913 could have imagined that the gold standard and integrated global financial markets could be destroyed in a matter of weeks, which happened when World War I began. The world quickly moved from global integration to deglobalization and government regulation that would come to dominate economies for the subsequent 65 years.

Exhibit 19. Distribution of Global Market Capitalization (percent), 1789–1914



1789–1815: The Napoleonic Wars

Wars:	French Revolutionary and Napoleonic Wars (1792–1815), War of 1812 (1812–1816)
Trade:	Trade interrupted by war, blockades
Government Intervention:	Very heavy because of war
Government Debt:	Increased to fund wars
Stock Market Returns:	World: 3.55%; United Kingdom: 3.61%; United States: 3.23%
New Stock Markets:	Italy (1808)
New Sectors:	Turnpikes (Philadelphia and Lancaster, 1792), Waterworks (London Bridge Water Works, 1793), Bridges (Trois Vieux Ponts sur Seine, 1805), Docks (East and West India Dock Co., 1806), Breweries (Golden Lane Brewery, 1807), Publishing (London Literary Institution, 1807), Retail (Auction Mart, 1809), Theater (Drury Lane Theatre, 1813), Gold (Minas Gerais, 1814)

Stock Market Capitalization:	Corporations closed in Netherlands and France; growth in United Kingdom, United States
Bear Markets:	French Revolution (1792–1797), Napoleonic Wars (1809–1812), Waterloo (1815)
Financial Crises:	United Kingdom (1793 [Canal Mania], 1810, 1815–1816), France (1797), Germany (1799), Denmark (1813)
Sovereign Defaults:	United States (1790), Austria (1796, 1802, 1805, 1811), France (1797, 1812), Germany (1807, 1812–1814), Spain (1809), Sweden (1812), Denmark (1813), Netherlands (1814)
Bond Returns:	World: 3.42%; United Kingdom: 1.86%; United States: 3.36%
Bond Yields:	France: 4.9%–66.7%; United Kingdom: 3.1%–6.3%; United States: 4.5%–24.6%
Central Banks Founded:	Danske and Norske Specie Bank (1791), Banque de France (1800), Finlands Bank (1811), Nederlandsche Bank (1814)
Commodity Prices:	Prices rose until 1797, stable until 1808, rose dramatically until 1814
Inflation:	High because of war; inflation in Denmark and Austria
Exchange Rates:	Erratic because of wars and inflation

On 14 July 1789, the Bastille was stormed and the French Revolution began. The wars that followed, first between French Revolutionary Forces and the rest of Europe and later between Napoleonic France and the rest of Europe, engulfed the continent for the next 26 years, causing a dramatic reorganization of Europe and of financial markets.

Between 1792 and 1815, the French Revolutionary and Napoleonic Wars dominated financial markets. The French Revolution led to the dissolution of French and Dutch corporations and default on the government debts of every country that participated in the Napoleonic Wars except for the United Kingdom. Dutch and French debt was reorganized. Interest payments on Swedish, Russian, and Spanish debt were suspended, although they later resumed. Britain suspended its link to gold in 1797, only to restore it in 1821.

Napoleon redrew the boundaries of Europe, brought an end to the Holy Roman Empire in Germany, and exerted control over Italy. Napoleon ended the inflation caused by the issuance in 1790–1796 of assignats (fiat money) during the French Revolution and brought stability to the French economy. Napoleon restored the gold standard, created the Banque de France, and reintroduced stock exchanges in Paris. Inflation occurred in Denmark and Austria (1804–1815) when their governments issued paper money to pay for their participation in the Napoleonic Wars. This led to the near bankruptcy of the state in both countries. After the war, national banks were established in Austria, Denmark, the Netherlands, and Norway to provide stability and promote growth.

The First Bank of the United States was founded in 1792 with USD10 million in capital, USD2 million of which was provided by the US government. Overnight, it became the

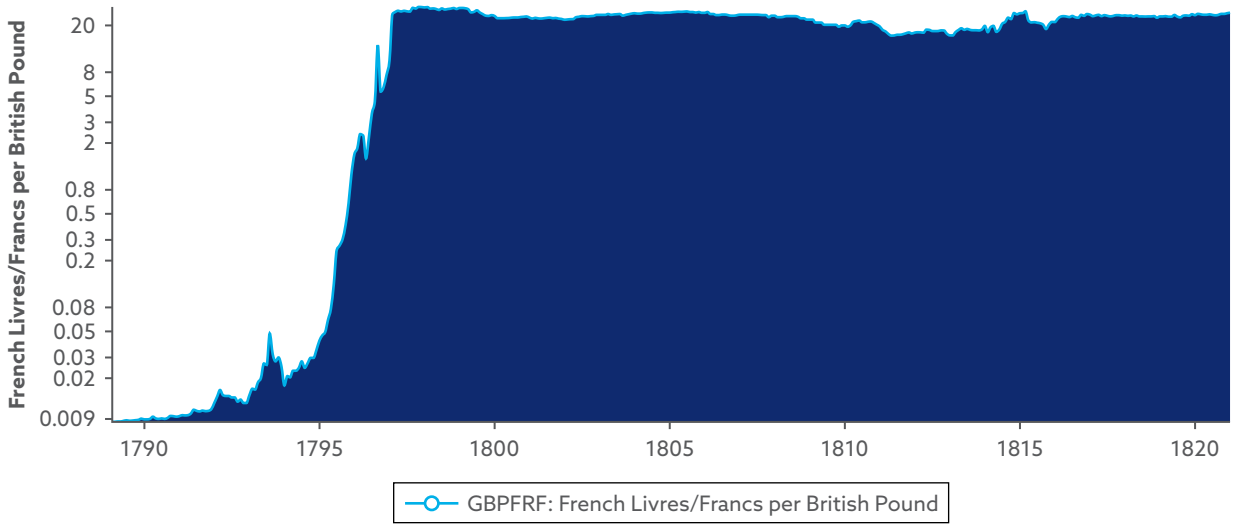
second largest corporation in the world, after the Bank of England. This was part of the reorganization of US finances that Alexander Hamilton introduced (Wright 2008). Continental Congress and state debts were reorganized and reissued, replacing the debts that previous American governments had defaulted on. The United States fought to a stalemate in the War of 1812, but this did not impede the growth of the United States. Finance companies (banks and insurance companies) were the primary corporations that existed in the United States. Because banks and insurance companies did not operate across state lines, most banks were small and local.

Canal Mania struck England in the 1790s, when Parliament approved 44 canals to be built in the Midlands between 1791 and 1794. The price of many canal stocks doubled and quadrupled in the early 1790s before the bubble burst in November 1792 and the price of most canal stocks returned to par (GBP100). Canal Mania existed mainly in the Midlands of England, where the capital was raised, not in London. Investors in London put their money in British government debt. A second Canal Mania occurred between 1813 and 1819, as money flowed into canal stocks after the Napoleonic Wars concluded (De Solis 1969).

A financial crisis occurred in France in 1797, when assignats collapsed in value. This crisis is illustrated in **Exhibit 20**, which compares the value of the British pound against the livre/franc between 1789 and 1820. In 1797, country banks in England collapsed. Financial crises also occurred in Germany in 1799, in the United Kingdom in 1810 after Wellington's Iberian Peninsula campaign, and in France in 1815 after Napoleon was defeated at Waterloo. Denmark suffered inflation and near default in 1813 as a result of its involvement in the Napoleonic Wars. Danish state finances had to be completely reorganized.

Just as World War I brought an end to the world of Free Trade in 1914, the Napoleonic Wars brought a complete transformation of the economy of Europe and laid the foundation for the rapid development of Europe between 1815 and 1914. Bubbles in New York in 1792 and in canal stocks in England in 1810 expanded the number of companies that were listed on exchanges in New York City, Philadelphia, Boston, and London. Before 1800, there was rarely activity in

Exhibit 20. French Livres/Francs per British Pound, 1789–1820



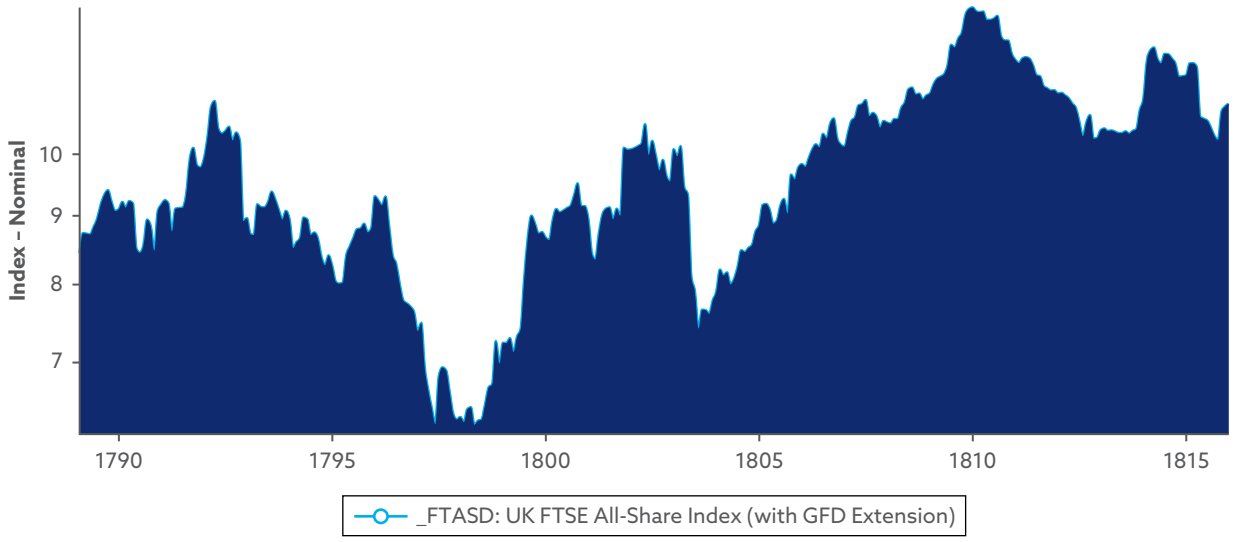
more than a dozen stocks in London, but beginning in 1805, the number of stocks being traded exploded, reaching 100 in 1814, 200 in 1824, and 300 in 1832.

Almost no growth occurred in the stock market between 1720 and 1792, but after 1792, the number of stocks in the United Kingdom, the United States, and Ireland exploded. Data are available on US equities beginning in 1782, Irish equities beginning in 1784, and British canals beginning in 1806, and data on the Banque de France begin in 1801. British government debt grew to more than twice the national GDP by 1815, but few doubted that Britain would not meet the obligations of its debts, which were also held in the Netherlands and the United States, and interest rates remained low relative to other countries. During the next 100 years, debt shrank, stock market capitalization grew, and new companies in railroads and other industries transformed the world.

Returns on stocks and bonds were generally lower between 1789 and 1815 than during 1763–1789 because the Napoleonic Wars absorbed most of the resources of Europe. Despite victories by Napoleon that reordered the continent, the disastrous Russian campaign of 1812 showed that Napoleon was not invincible. This event led to the defeat of Napoleon by the coalition at Leipzig in April 1814 and Napoleon's ultimate defeat after the Hundred Days campaign at Waterloo in June 1815.

As shown in **Exhibit 21**, the British stock market went through several bear markets between 1789 and 1815. The first occurred after French Revolutionaries seized control of the government and declared war on the rest of Europe in 1792. The market took a further slide during the 1797 crisis after the Bank of England suspended specie payments on 25 February 1797. English depositors, fearing a possible French invasion, withdrew cash in sterling coin. The market rallied over the next few years but suffered another bear market when the Treaty of Amiens, signed on 25 March 1802, fell apart on 18 May 1803. A final bear market occurred during the 1810 financial crisis, when Britain suffered commercial failures and merchant bankruptcies. In contrast, as shown in **Exhibit 22**, bond yields moved in the opposite direction of the stock market, because

Exhibit 21. British Stock Market Price Index, 1789–1815



the yield and the price of bonds are inversely related (that is, bond prices fell when stock prices fell).

The French stock market remained steady between 1802 and 1812 as Napoleon succeeded in his campaigns in Europe, but when the Russian campaign failed, the French stock market collapsed, and it fell further after Napoleon's defeats at Leipzig in 1814 and at Waterloo in 1815. This dynamic is illustrated by the behavior of the Banque de France stock between 1802 and 1820, shown in **Exhibit 23**.

Exhibit 22. Yield on British Consols, 1789–1815

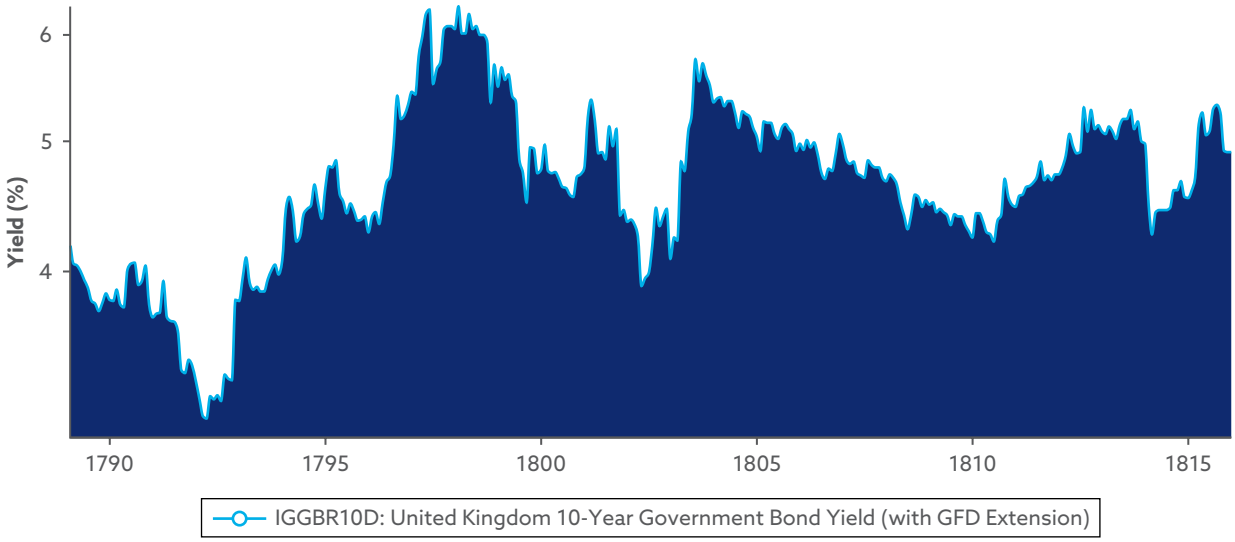


Exhibit 23. Banque de France Stock Price, 1802–1820

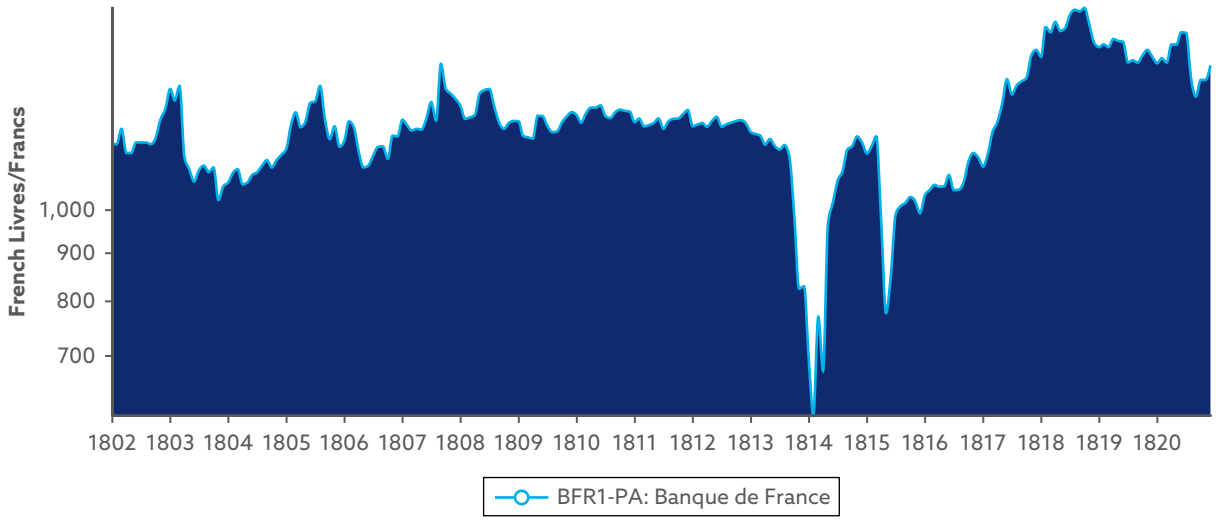


Exhibit 24. Annual Returns on Stocks, Bonds, and Bills in Real US Dollars, 1789–1815 (all data in percent)

Country	Stocks	Bonds	Bills	ERP	Cap/GDP	Inflation	Real GDP
India	4.16	4.58	2.78	–0.51			
Ireland	–3.66	2.00	3.02	–5.54			
United Kingdom	3.75	1.99	2.91	1.72	17.5	1.92	1.63
United States	2.57	2.73	3.26	–0.15	7.1	2.08	3.53
Average	1.71	2.83	2.99	–1.12	12.3	2.00	2.58
World ex-US	4.53	2.05	3.63	2.43	1.2		
World	3.42	1.60	2.79	1.79	1.3		0.86

As **Exhibit 24** shows, returns to stocks and bonds were generally lower between 1789 and 1815 than between 1763 and 1789 and between 1815 and 1848. War generates inflation and default on government bonds. Governments must fund their wars, which draws capital away from the private sector. Wars bring destruction and the absorption of resources. Stock markets respond to the vagaries of war, falling when defeat seems likely and rising when victory seems imminent. Overall, the impact of war on financial markets is negative.

Once the Congress of Vienna brought peace to Europe in 1815, Europe began a century of peace in which there was less government debt and rapid growth in the stock markets of every country in the world. By 1914, thousands of companies were listed on dozens of exchanges around the world, and global market cap had grown from 1% of global GDP to more than 30% of global GDP.

1815–1848: The Railroad Revolution

Wars:	First Opium War (1839–1842), 1848 Revolutions
Trade:	With Napoleonic Wars over, trade increases
Government Intervention:	Minimal
Government Debt:	Decreased due to absence of war
Stock Market Returns:	World ex-US: 6.89%; United Kingdom: 4.76%; France: 7.15%; United States: 6.21%
New Stock Markets:	Poland (1817), Mexico (1824), Australia (1826), Brazil (1826), Canada (1829), South Africa (1834), Czechoslovakia (1836)
New Sectors:	Gas (City of London Gas Light and Coke Co., 1817), real estate (Canada Co., 1824), manufacturing (Irish Manufactory Co., 1825),

	coal (Lehigh Coal and Navigation, 1825), railroads (Liverpool and Manchester Railway, 1825), iron (British Iron Co., 1825), shipping (General Steam Navigation Co., 1825), silks (British Irish and Colonial Silk Co., 1825), food (Droitwich Salt Co., 1825), chemicals (Scarlet Dye Co., 1825), building materials (Devon Haytor Granite Co., 1825), financial exchanges (London New Corn Exchange Co., 1825), railroad equipment (Gas Engine Carriage Co., 1825), indigo (Honduras Indigo Co., 1825), bricks (London Brick Co., 1825), dairy (Great Westminster Dairy Co., 1825), fishing (Pacific Pearl Fishery Co., 1825), glass (Imperial Plate Glass Co., 1825), tunnels (Thomas Tunnel Co., 1825), restaurants (Brasserie Lyonnaise, 1837), leisure facilities (Kent Zoological and Botanical Gardens, 1837), omni-buses (Omnibus des Chemins de Fer, 1838), baths (Bains Vigier, 1838), perfumes (Parfumerie De la Compagnie Parisienne, 1838), tea (Assam Investments, Ltd., 1839), shipbuilding (Dublin and Liverpool Steamship Building Co., 1844)
Stock Market Capitalization:	Global market cap rose from 1.3% to 4.1% of global GDP; more railroads, canals, banks
Bear Markets:	Bubble of 1825, Panic of 1837, Railway Mania (1845)
Financial Crises:	Panics of 1819 (UK and US), 1825 (UK), 1836 (UK), 1837 (US), and 1847 (UK); financial crisis in France (1838); Revolutions of 1848
Sovereign Defaults:	Austria (1816); Spain (1820, 1831, 1834); Chile, Colombia, Peru, Ecuador (1826); Venezuela (1826, 1848); Mexico (1827, 1833, 1844); Argentina (1827); Portugal (1828, 1837, 1841, 1845); Costa Rica, El Salvador, Honduras, Nicaragua (1828); Russia (1839); Greece (1843)
Bond Returns:	World ex-US: 6.82%; United Kingdom: 5.69%; France: 5.28%; United States: 7.45%
Bond Yields:	France: 3.48%–9.05%; United Kingdom: 2.96%–4.99%; United States: 3.00%–6.12%
Central Banks Founded:	Osterreichische Nationalbank (1816), Norges Bank (1816), Danmarks Nationalbank (1818), Banco de Portugal (1846), Preußische Bank (1846)
Commodity Prices:	Collapsed from 1815 to 1825, stable until 1842, declined until 1849
Inflation:	Deflation after Napoleonic Wars
Exchange Rates:	Stable

The period from 1815 until 1848 was one of peace, expanding equity markets, and a reduction in the importance of government bonds relative to equities. The Congress of Vienna attempted to provide a long-term peace plan for Europe by balancing the conflicting interests among the

victors in the Napoleonic Wars. Britain, France, Prussia, Austria, Sweden, and Russia all participated in the Congress of Vienna and reorganized the map of Europe. Peace generally persisted for the next century until World War I broke out in 1914. The hundred years of peace benefited financial markets and the global economy tremendously.

With peace prevailing and governments no longer issuing bonds to fund wars, capital was reallocated from government bonds to corporate bonds and equities. Between 1815 and 1848, the capitalization of the stock market in the United Kingdom as a share of GDP rose from 17% to 52%. Railroads became the new driver of growth in financial markets for the rest of the century. Interest rates declined, providing capital gains to fixed-income investors. Consequently, there was little difference in the returns on stocks and bonds between 1815 and 1848.

Financial crises occurred in 1819 in the United States and the United Kingdom and again in London in 1825, arising from the trade in South American stocks. South American countries gained their independence in the 1820s, and money flowed into South American stocks and bonds, including such countries as "Poyais," which did not even exist! The opportunities in South America were greatly overestimated, and the prices of its stocks and bonds collapsed in 1825. The first global panic occurred in May 1837, when New York banks ran out of gold and silver and suspended specie payments. The panic spread from the United States to Europe, affecting both the United Kingdom and France and impacting the global economy until the rise of the railroads in the 1840s.

Railroads began to be built across Europe and in the United States in the 1830s. By the mid-1840s, the railroad boom had turned into a mania. As was true of the canals in the 1790s, railroad companies initially collected only a portion of the par value (perhaps GBP20 out of the GBP100), with the intention of asking for additional capital contributions as the railroad was built. Asking for small increments made it easier to raise money. There was a flood of half-shares, quarter-shares, eighth-shares, preferred shares, ordinary and deferred shares, and other securities.

The first railroads were built in England in the 1820s. In the 1830s and especially the 1840s, the number of railroads increased dramatically, not only in the United Kingdom but also in France, Germany, Austria, and other continental European countries. British and French investors helped fund railroads in countries without active capital markets. Investors discovered that transportation stocks could provide reliable dividends as well as capital gains. Money poured into railroad stocks, producing a bubble that culminated in the crash of the Railway Mania in 1845 (Odlyzko 2010; Michaelis 1854, 1859, and 1863).

Stocks and bonds took a further tumble during the Revolutions of 1848. These two events drove markets down to multidecade lows. The period from 1845 to 1850 was the worst global bear market as measured in British pounds between 1815 and 1914. The other global bear market in the 1800s occurred between 1872 and 1879. **Exhibit 25** illustrates the declines in the major European countries in the 1840s between the collapse of Railway Mania and the Revolutions of 1848. It shows that coordinated declines occurred in each of the four main European markets and that the United States was immune to Europe's Railway Mania in the 1840s but suffered a bear market after the Panic of 1837. Whereas Europe's railroads connected existing cities to improve transportation, the United States spent the next few decades building the country by using the railroads to link the Atlantic and Pacific coasts and establish new cities along the railroad routes.

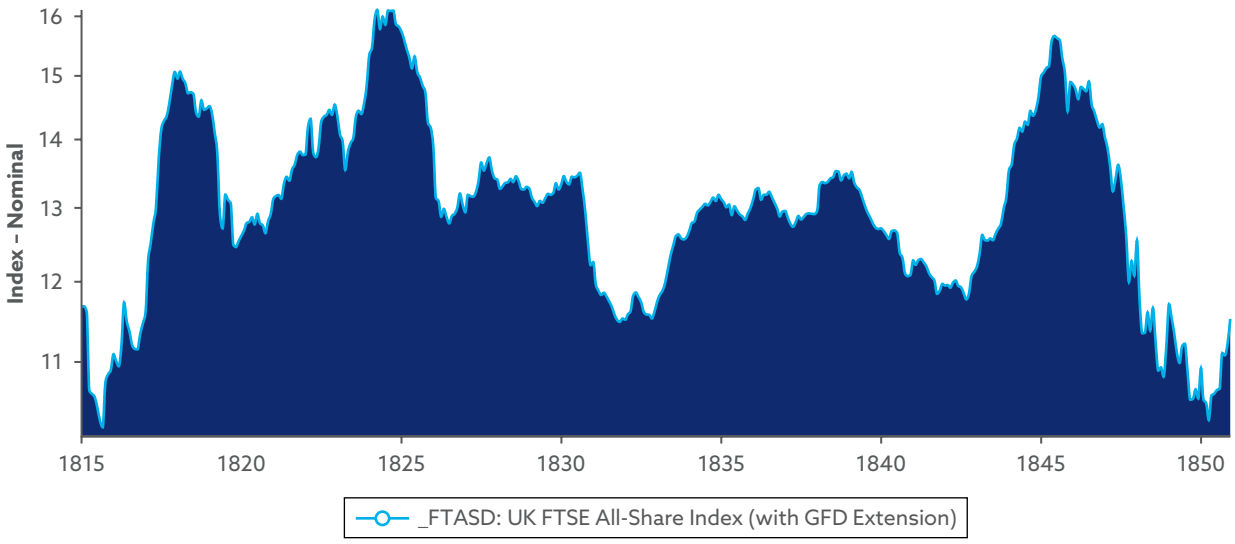
The performance of the British stock market during this era is illustrated in **Exhibit 26**. The recovery from the Napoleonic Wars between 1815 and 1817 is clearly visible. The market peaked in 1825 at the height of the South American bubble and then declined for the next six years. Although Railway Mania drove stock prices up between 1842 and 1845, the combination of the collapse of Railway Mania and the Revolutions of 1848 pushed stock markets back to their levels at the end of the Napoleonic Wars. Banque de France shares lost half their value during the 1848 revolution (Michie 1999, pp. 37–69).

The Napoleonic inflation in Austria, Denmark, Norway, and other countries led to reforms of those countries' currencies and the establishment of new central banks. The Wisselbank (Bank of Amsterdam) was closed, and the Netherlands Bank was founded in 1814. The Austrian

Exhibit 25. Bear Markets in Europe and the United States in Nominal Local Currency, 1836–1849

Region	Top	Bottom	Decline
Austria	8/31/1845	5/31/1849	–35.15%
Germany	4/30/1845	5/31/1848	–47.01%
France	7/31/1840	3/31/1848	–42.41%
United Kingdom	7/30/1845	10/24/1848	–35.69%
Europe	8/31/1845	11/30/1848	–35.77%
United States	2/20/1836	1/07/1843	–51.61%

Exhibit 26. British Stock Price Index, 1815–1850



National Bank was founded in 1816, and the Norges Bank and Danmarks Nationalbank were founded in 1818. These were not central banks in the modern sense, but they provided banking services in each country and made funding available to businesses in their countries while influencing the behavior of the economy.

As **Exhibit 27** shows, returns on stocks, bonds, and bills were higher between 1816 and 1848 than between 1789 and 1815, despite the plunge in the price of stocks and bonds between 1845 and 1848. Although returns in nominal terms were higher between 1789 and 1815, returns after inflation were lower during the Napoleonic Wars. Between 1789 and 1848, there was little difference in the return to stocks and bonds, except in Ireland, where its two canals moved toward bankruptcy. Globally, inflation was kept under control, and money flowed out of government bonds and into equities. The dramatic growth of the railroads began in the 1830s, and by the middle of the century, transportation stocks represented the largest sector in each stock market.

Financial markets were transformed between 1815 and 1848. Before 1789, national monopolies represented the majority of stock market capitalization. After the Napoleonic Wars ended, capital flowed out of bonds and into dozens of new industries. Exchanges throughout continental Europe began trading both stocks and bonds. By 1848, newspapers in England, France, Germany, Austria, the Netherlands, Belgium, the United States, and other countries were listing stock market prices from their own and other countries on a daily basis. The greatest beneficiary of these cash flows was the railroads, which by mid-century had become the largest sector in stock markets worldwide. They remained the largest stock market sector for the rest of the century.

Exhibit 27. Annual Returns on Stocks, Bonds, and Bills in Real US Dollars, 1816–1848 (all data in percent)

Country	Stocks	Bonds	Bills	Bond ERP	Bill ERP	Cap/GDP	Inflation
Denmark		13.48	12.44			27.8	4.20
France	9.05	7.15	5.56	1.78	3.31	8.0	0.39
India	6.89	6.79	5.09	–0.03	1.71		0.86
Ireland	–0.41	6.47	5.26	–6.46	–5.39		0.06
Netherlands	8.79	6.99	4.43	1.68	4.18	15.7	–1.07
United Kingdom	5.53	6.47	5.26	–0.88	0.26	52.8	–0.86
United States	6.21	7.45	6.03	–1.15	0.17	10.9	–1.55
Average	6.01	7.83	6.30	–1.69	–0.27	23.1	0.29
World ex-US	6.89	6.82	6.03	0.07	0.81	3.0	
World	6.73	6.62	6.03	0.10	0.66	3.2	

1848–1873: Nation Building

Wars:	Crimean War (1853–1856); American Civil War (1861–1865); German wars with Denmark (1864), Austria (1866), and France (1870); Italian War for Independence (1848–1861), Second Opium War (1856–1860)
Trade:	Increased in response to free trade and increase in gold supplies
Government Intervention:	Very little outside of wars
Government Debt:	Decreased because of balanced budgets
Stock Market Returns:	World ex-US: 5.00%; United Kingdom: 4.76%; United States: 5.56%
New Stock Markets:	Switzerland (1850); Argentina (1854); Chile (1855); Egypt, Turkey (1856); New Zealand (1862); Hungary, Sweden (1863); Russia (1865); Hong Kong (now Hong Kong SAR; 1865); China (1869); Singapore, Indonesia, Romania (1872)
New Sectors:	Woolens (Hamilton Woolen Co., 1849), transit (Norristown Transit Co., 1851), telegraph (Compagnie du Telegraphe Sous-marin Entre la France et l'Angleterre, 1851), gambling (Kobenhavns Casino, 1854), cemeteries (London Necropolis and National Mausoleum, 1856), hotels (St. James Hotel Ltd., 1863), communications equipment (Telegraph Construction & Maintenance Co. Ltd., 1864), express (American Express, 1865), oil (Trinidad Petroleum Co., 1865), aluminum (Alum and Ammonia Co., Ltd., 1865), fertilizer (Metropolitan Sewage and Manure Co., 1865), steel (Lancashire Steel Co., 1865), plantations (India Rubber, Gutta Percha and Telegraph Works Ltd., 1865), engineering (Allgemeine Oesterreichische Baugesellschaft, 1869), tobacco (Societe Anonyme des Tabacs d'Italie, 1869)
Stock Market Capitalization:	Global market cap rose from 4% to 7.5% of global GDP, increased steadily in nominal terms
Bear Markets:	Panic of 1857, India (1865), American Civil War (1865), Guernsey & Co. (United Kingdom, 1866), Austria Grundjahr (1872), Panic of 1873 (United States, Germany, Austria)
Financial Crises:	Panic of 1857 (global), Panic of 1865–1866 (India), Panic of 1866 (United Kingdom), Panic of 1869 (United States), Panic of 1873 (Germany, Austria, United States)
Sovereign Defaults:	Mexico (1850, 1866); Colombia (1850, 1873); Peru (1850); Spain (1851, 1867, 1872); Portugal (1852); Greece, Peru (1860); Venezuela (1860, 1865); Tunisia, Uruguay (1867); Austria-Hungary (1868); Ecuador (1868); Dominican Republic (1872); Honduras (1873)

Bond Returns:	World ex-US: 4.15%; United Kingdom: 3.10%; United States: 3.04%
Bond Yields:	France: 3.55%–6.60%; United Kingdom: 2.96%–3.46%; United States: 4.31%–6.64%
Central Banks Founded:	Banque Nationale de Belgique (1850), Banco de España (1856)
Commodity Prices:	Rose until 1855, fell until 1861, rose dramatically until 1864, then declined
Inflation:	Rising prices but no large inflation outside of wars
Exchange Rates:	Fixed to gold or silver

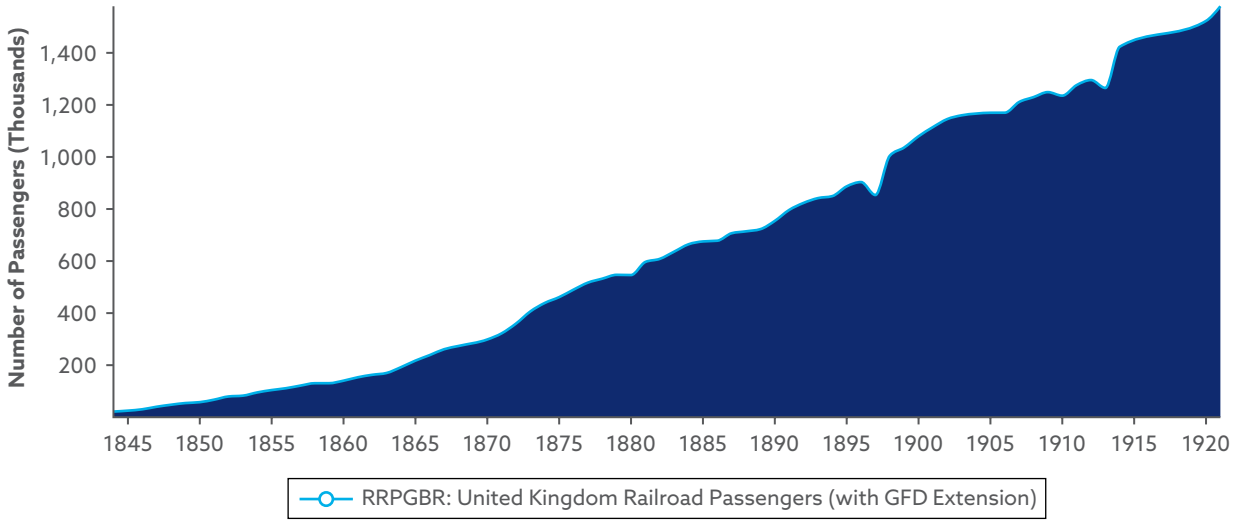
The Revolutions of 1848 led to sharp declines in stock and bond prices throughout continental Europe and brought about the worst bear market in the world between 1815 and 1914. Gold was discovered in California in 1849 and in Australia in 1851, leading to a reflation of the global economy and recovery from the Revolutions of 1848. The Great Exhibition of 1851 at the Crystal Palace in London displayed hundreds of technological innovations that would drive change in the decades to come. It was not until railroads and the telegraph began to spread through the world and oceanic cables were laid that information could be transmitted almost instantaneously worldwide and global markets began to integrate. Thus, the length of global cycles declined.

The Limited Liability Act in 1855, the Joint Stock Companies Act in 1856, and the Companies Act of 1862 in England encouraged individuals to invest in corporations because these acts limited the liability of investors. In 1867, the French approved the *société a responsibilité limitée*, which also limited the liability of investors. Similar laws were passed in Spain in 1869, Germany in 1870, Belgium in 1873, and Italy in 1883. This action encouraged the establishment of corporations that offered shares to investors that could be traded on the stock market (Hunt 1936).

The 1840s laid the foundation for the spread of railroads in Europe, and the 1850s and 1860s saw their continued growth. The increase in the number of passengers on British railroads between 1843 and 1920 is illustrated in **Exhibit 28**. Capital was raised in London and Paris to fund railroads in countries without established capital markets. In India, for example, capital for railroads was raised in London, while capital for domestic banks, tea companies, shipping companies, land companies, spinning and weaving companies, and other domestic industries was raised in Bombay and Calcutta. The transatlantic cable connected Europe and North America in 1866, the Transcontinental Railroad connected the Atlantic and the Pacific in 1869, and the Suez Canal opened in 1869, making it easier, cheaper, and quicker to send goods and information around the world. Transports and telecommunications transformed the world between 1848 and 1873.

The United States, Germany, and Italy each united as single countries during this 25-year period, while Austria became Austria-Hungary. Between 1860 and 1873, investors had the opportunity to invest in thousands of companies in Europe, the United States, and the rest of the world that helped build the world economy. Investors began actively trading shares in Bombay (now Mumbai) in the 1840s, Melbourne in 1860, Hong Kong (now Hong Kong SAR) in 1865, Shanghai in 1869, Singapore in 1872, and Tokyo in 1878. Every region saw the number of companies

Exhibit 28. Thousands of Passengers on British Railroads, 1843–1920



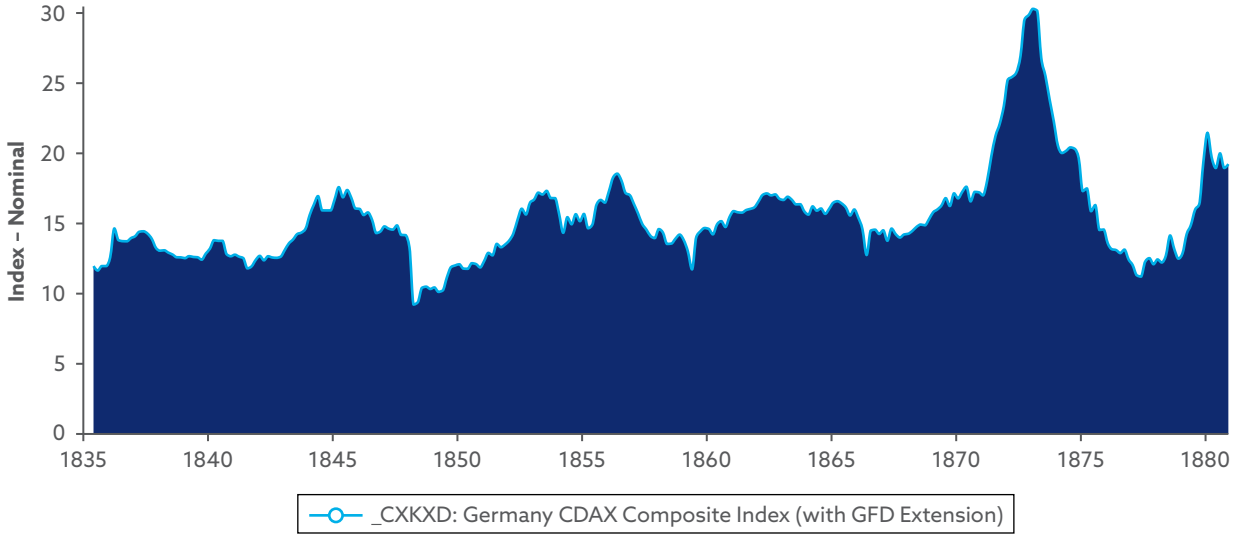
in transport, finance, utilities, and industry expand. Financial markets became globalized, and the transportation revolution enabled the global economy to expand.

Several wars impacted financial markets. The Crimean War (1853–1856) had a minor impact on markets. The Panic of 1857 had a greater impact on the industrialized northern United States than on the agricultural southern states. Because cotton constituted such a large portion of US exports, the South believed it could survive and flourish even if it separated from the North because of the conflict over slavery. However, the American Civil War was won by the North because of the superiority of not only its industries but also its railroads, which played an essential role in the conduct of a war for the first time. The American Civil War affected cotton production and caused inflation in the United States as well as the collapse of the Confederate currency. Lower production of cotton in the South and the Northern blockade of the South led to greater cotton production in other countries. India experienced a stock market bubble between 1863 and 1865 as a result of the increase in the price of cotton.

The American Civil War limited the supply of cotton, which rose in price from under USD10 for 100 pounds of cotton in 1860 to USD177 for 100 pounds in 1864, before collapsing to USD15 for 100 in 1867. The United States went off the gold standard in 1861, and the price of gold relative to the paper dollar fluctuated dramatically, rising when the Confederacy won a battle and declining when the North was victorious. Jay Gould tried to corner the gold market in 1869 but failed.

Prussia fought a series of wars, winning each: with Denmark in 1864, Austria in 1866, and France in 1870. These wars initially led to bear markets in Germany, Austria, and nearby countries, but the markets recovered after each war ended. This pattern is clearly visible in **Exhibit 29**, which shows the performance of the German stock market between 1835 and 1880. Prussia merged the former states of the Holy Roman Empire into Germany and used the

Exhibit 29. German Stock Market Index, 1835–1880



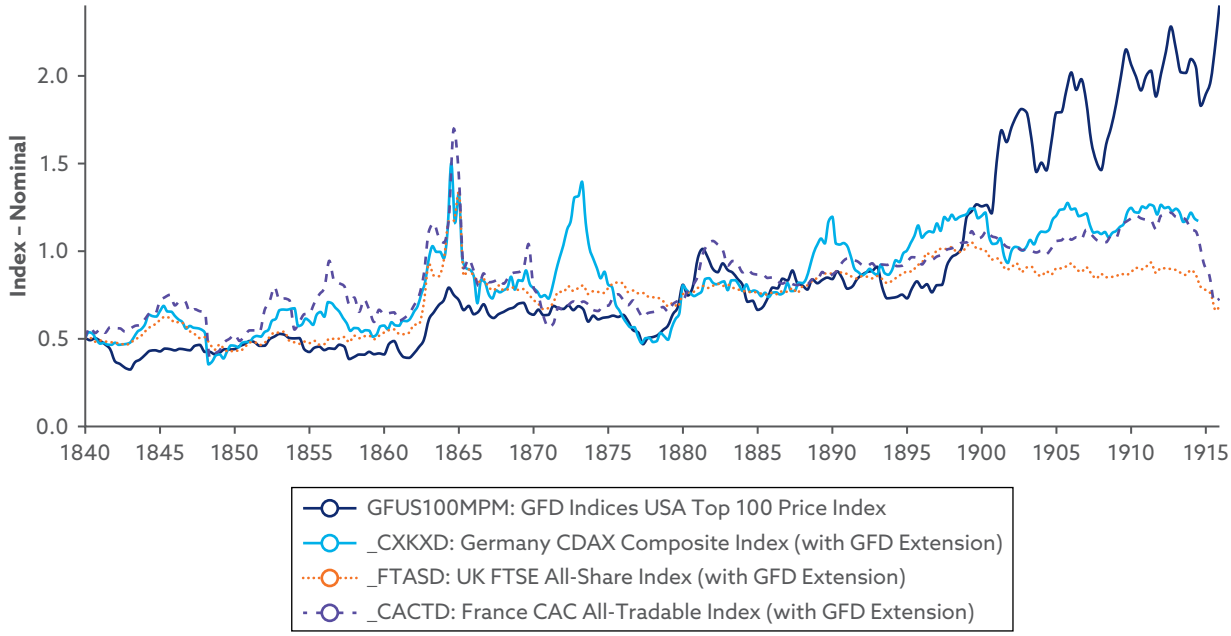
indemnity from France in 1870 to move onto the gold standard, as did every other major country in the world (Breuilly 1996).

Italy became a united country as a result of the Italian Wars of Independence in the 1850s and 1860s. When Venice and the Papal States were incorporated into Italy by 1870, the latter became a single country. In 1867, Austria became a multinational constitutional monarchy in which the two states of Austria and Hungary were coequal in power. These changes further contributed to the integration of the global economy and provided a stable political foundation for Europe until the Balkan Wars broke out in the 1900s, eventually leading to World War I.

The largest financial crisis during this period occurred during the Panic of 1857, which affected the United States, England, and continental Europe. It spread through the United States after the failure of the Ohio Life Insurance and Trust Co. and the sinking of the *S.S. Central America*, which was bringing gold from Europe to the United States (Calomiris and Schweikart 1991).

Exhibit 30 illustrates the performance of the British, US, French, and German stock markets between 1840 and 1915. The declines in the European stock exchanges in the mid-1840s are visible. The US stock market (dark blue) rose during the Civil War (1861–1865), declined until 1877, rose until 1882, stabilized until 1896, and then rose dramatically during the period leading to World War I, far outperforming the rest of the world. The German stock market (light blue) had a strong bullish period after its victory over France in 1870 and then declined after the bubble burst in 1872. Similar rallies occurred in Germany in the late 1880s, the late 1890s, and around 1905. The United Kingdom remained steady between 1840 and 1915, while the largest declines in French stocks occurred in 1848 and after the collapse of *Union Générale* in Paris in 1883 (White 2007).

Exhibit 30. US, UK, German, and French Stock Market Indexes, 1840–1915



The crash of Guernsey & Co. in 1866 led to a bear market in the United Kingdom, from which the country quickly recovered. Germany's victory over France in 1870 and the FRF5 billion (USD1 billion) indemnity that France paid to Germany (equal to 20% of France's GDP and 30% of Germany's GDP) enabled the latter to go onto the gold standard. This sequence of events led to bubbles in both Germany and Austria between 1870 and 1872, but the bubbles burst in the *Grundjahr* (base year) of 1872. In the ensuing bear market between 1872 and 1877, German and Austrian stocks declined by more than 50% (Baltzarek 1973, pp. 71–85).

The period from 1848 to 1873 was one of financial growth and inflation. By 1873, every developed country in the world had an active stock market on which dozens or even hundreds of companies were traded daily. Many exchanges called out a list of all the stocks on the exchange and traded shares when the name of the company was called. Some exchanges, however, such as those in London and New York, allowed trading in shares throughout the day to meet the increasing demand.

After 1873, most of the developed world was on the gold standard. The price of silver declined as the Comstock Lode and other silver discoveries made the old gold–silver ratio that had prevailed for several centuries untenable because of large declines in the price of silver. After 1873, the world moved into a period of deflation because limited supplies of gold reduced the rate at which the money supply could expand.

Exhibit 31 provides data on returns on stocks, bonds, and bills between 1848 and 1873 for a dozen different countries, as well as two global indexes. The ratio of market capitalization to

Exhibit 31. Annual Returns on Stocks, Bonds, and Bills in Real US Dollars, by Market, 1848–1873 (all data in percent)

Market	Stocks	Bonds	Bills	Bond ERP	Bill ERP	Cap/GDP	Inflation
Australia	8.97		1.31		7.56	21.0	–0.24
Austria	5.65	5.85	2.87	–0.19	2.70	26.8	2.39
Belgium	6.81	4.12	2.41	2.58	4.30	24.0	1.15
Canada	2.92	3.32	2.72	–0.80	0.19	31.4	–0.63
Denmark	2.48	3.93	2.86	–1.39	–0.37	23.7	1.00
France	4.70	4.06	2.36	0.62	2.29	26.6	0.60
Germany	5.54	3.51	1.52	1.96	3.96	20.8	2.58
India	5.25	2.79	1.81	2.39	3.38	10.7	0.33
Ireland	7.61	1.66	2.10	5.85	5.40	58.9	0.33
Netherlands	3.49	3.17	1.73	0.31	1.73	20.4	0.13
United Kingdom	4.89	1.66	2.10	3.17	2.73	74.6	0.33
United States	6.41	2.15	2.72	4.18	3.59	15.5	2.21
Average	5.39	3.29	2.21	2.03	3.11	27.9	0.85
World ex-US	4.12	2.99	2.72	1.10	1.36	17.2	
World	4.38	2.71	2.72	1.63	1.62	14.4	

GDP in 1873 is provided for each country as well. Growth in the stock market was so strong in the United Kingdom that the capitalization of shares was almost 75% of GDP by 1873. Hundreds of stocks from India, Australia, Canada, Brazil, Argentina, the United States, and other countries traded in London, which had the largest and deepest capital market in the world. Corporate bonds and preferred stocks were offered in addition to ordinary shares, providing individuals with more choices for investing their money. Global markets continued to grow and diversify for the next 40 years.

1873–1896: The Gilded Age

Wars: First Sino-Japanese War (1894–1895), imperialism in Africa and Asia

Trade: Free trade, increased globally

Government Intervention: Very little

Government Debt:	Declined in response to balanced budgets, lack of wars
Stock Market Returns:	World ex-US: 6.18%; France: 6.26%; United Kingdom: 6.86%; United States: 7.32%
New Stock Markets:	Greece (1876), Japan (1878), Norway (1881), Nigeria (1887), Malaysia (1889), Serbia (1894), Sri Lanka (1896)
New Sectors:	Electric utilities (Cincinnati Gas & Electric, 1874), oil (Baku Oil Co., 1878), asbestos (United Asbestos Ltd., 1881), diamonds (Central Jagersfontein Diamond Ltd., 1881), bicycles (Rudge Cycle, Ltd., 1888), sewing (International Button-Hole Sewing Machine, 1889), department stores (H.B. Claflin & Co., 1890), meatpackers (Chicago Junction Railways and Union Stock Yards, 1891), matches (Diamond Match Co., 1894), leather (United States Leather Co., 1894), lighting (Welsbach Incandescent Light Co., 1895), ice (Knickerbocker Ice Co., 1895), business equipment (Remington Typewriter, 1893), photography (Eastman Kodak, 1896)
Stock Market Capitalization:	Global market cap rose from 17% to 26% of global GDP, increased with free trade and local markets
Bear Markets:	Panics of 1873 and 1893, Depression of 1882–1885
Financial Crises:	Egypt and Ottoman Empire (1876), France (1882), Baring Crisis/ Panic of 1890, Panic of 1893 (United States, Australia)
Sovereign Defaults:	Costa Rica (1874); Paraguay (1874, 1892); Bolivia (1875); Egypt, Ottoman Empire, Peru (1876); El Salvador (1876, 1894); Paraguay (1876, 1891); Chile, Colombia (1880); Spain (1882); Russia (1885); Portugal, Argentina (1890); Dominican Republic (1892); Venezuela (1892); Greece (1893); Nicaragua, Ecuador (1894); Costa Rica (1895)
Bond Returns:	World ex-US: 6.16%; France: 6.46%; United Kingdom: 4.62%; United States: 6.33%
Bond Yields:	France: 2.91%–5.54%; United Kingdom: 2.43%–3.26%; United States: 3.08%–4.55%
Central Banks Founded:	Reichsbank (1875), Bulgarian National Bank (1879), Bank of Japan (1882), Banca d'Italia (1893)
Commodity Prices:	Declined during the entire period from 1874 to 1896
Inflation:	Deflation and low economic growth
Exchange Rates:	Fixed by gold standard
Real Estate:	Housing prices stable from 1890 to 1896

The period from 1873 to 1896 was a period of mild deflation and falling bond yields, whereas the period from 1896 to 1914 was a period of mild inflation and rising bond yields. The spread of the gold standard in 1873 led to a steady deflation over the next 20 years. Many countries experienced a decline in prices between 1873 and 1896.

Prussia unified the German lands and used the French indemnity from 1870 to adopt the gold standard between 1871 and 1873. In the United States, the "Crime of 1873" demonetized silver and de facto moved the United States onto the gold standard in 1878. The Panic of 1873 affected the United States, England, France, Germany, and Austria. The crash of the Vienna Stock Exchange in May 1873 led to a depression in Austria that lasted until 1879.

The explosion of railroad building in the 1860s led to a bust in the 1870s (Cotter 2021). Between 1869 and 1878, the number of defaults on railroad bonds was high, with 1873–1875 experiencing the highest level of default for US railroad bonds in history. More than one-third of railroad bonds ended up in default during that period. Defaults on US railroad bonds were lower between 1883 and 1885 and again between 1892 and 1894. The Ottoman Empire defaulted on its debts in October 1875, and Egypt defaulted on its debts in May 1876. The combination of US corporate defaults and sovereign defaults in the Ottoman Empire and Egypt led to a crisis in debt markets in the mid-1870s.

The collapse of *Union Générale* in 1883 led to a bear market in Paris. The Barings sovereign debt crisis occurred in London in 1890, when Argentina defaulted on its debts. The Panic of 1893 spread from the United States to the rest of the world. Before the Great Depression of the 1930s, the 1870s and 1880s were referred to as the Long Depression because of the decline in agricultural prices. There were few dramatic bear markets and no coordinated global bear markets, but a general deflation prevailed in the 1870s and 1880s. The discovery of gold in Witwatersrand in 1884 led to an influx of capital into South Africa and an outflow of gold, which caused inflation in the 1890s.

Nevertheless, there was growth in stock markets and in industry in every country in the world. Declining interest rates and bond yields in response to deflation provided relatively high returns for fixed-income investors. Stocks provided high returns that exceeded even the return to bonds. The telegraph, transatlantic cable, and telephone sped up communications dramatically. A permanent transatlantic cable was laid across the Atlantic in 1866, the ticker tape was invented in 1867, and telephones were installed in the New York Stock Exchange in 1878.

Railroads began to lose their role as the most important industry in the economy. Petroleum gradually replaced whale oil between the 1850s and 1890s, and Standard Oil became the largest corporation in the world by market cap in the 1890s, replacing England's London & North Western Railway, which had replaced the Bank of England in the 1860s. Steel and other industries were born, and the electrification of industry was about to begin. Trusts were formed to control the production of consumer goods, and the production of sugar, tobacco, and other goods was centralized in a small number of firms in the United States, leading to the passage of the Sherman Antitrust Act in 1890.

The gold standard enabled the major countries of the world to fix their exchange rates against one another and make possible the free flow of funds between countries. Because the telegraph and eventually the telephone connected the world's exchanges, the need to ship physical gold between markets diminished and eventually disappeared. Although stocks and bonds

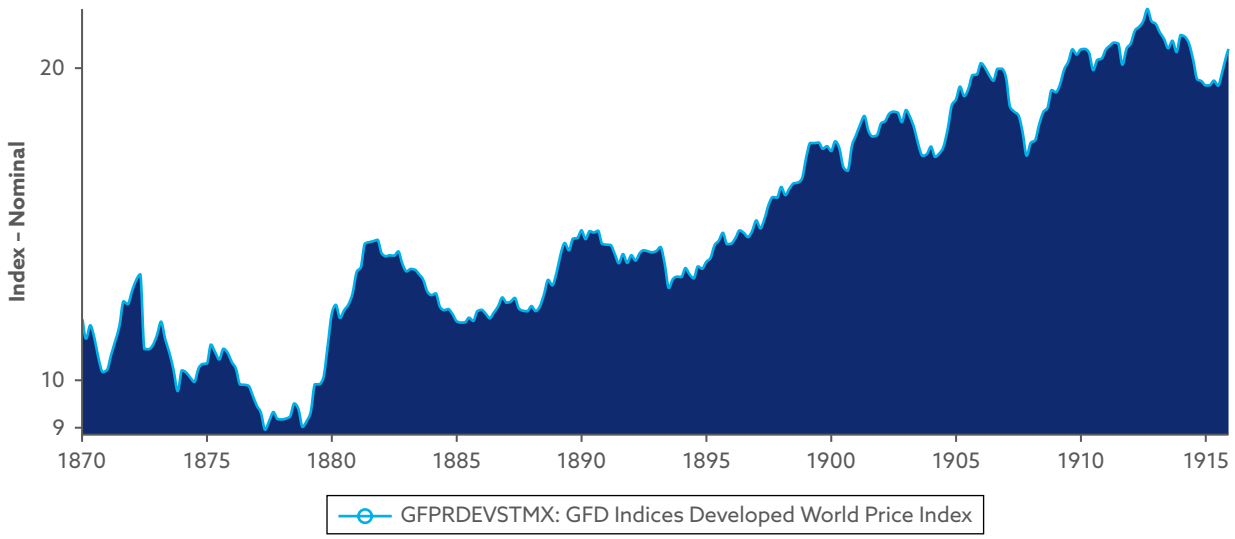
were primarily bought for their returns, they were also bought and sold as a way of keeping currencies in balance with each other. Fixed exchange rates prevailed around the world between 1873 and 1914, which enabled the Russian government and US railroads to issue bonds that were payable in dollars, pounds, francs, marks, rubles, guilders, kronen, and other major world currencies.

Exhibit 32 illustrates the fluctuations of global stock prices between 1870 and 1915. Most of the gains in the GFD Indices Developed World Price Index occurred between 1878 and 1881. No real appreciation occurred between 1873 and 1878 or between 1881 and 1896. Between 1893 and 1912, the index experienced a 20-year bull market that ended shortly before the start of World War I. Although bear markets occurred in almost every country in the world between 1873 and 1914, they were not coordinated. Bull markets in one country offset bear markets in others, so no global bear market emerged.

Interest in the stock market became so widespread that *The London Times*, *Financial Times*, *Figaro*, *Allgemeine Zeitung*, and newspapers in other countries regularly printed the prices of stocks and bonds from the world's major markets. The majority of the quotations were for government bonds, but stocks became more prominent over time. Dow, Jones & Company began calculating averages in 1885, and *The Banker's Magazine* in the United Kingdom started to calculate stock market indexes in 1887.

The returns on stocks, bonds, and bills and the realized equity risk premium for 18 countries between 1873 and 1896 are summarized in **Exhibit 33**. Returns were stronger during this period for most countries in the world than they were between 1848 and 1873. Because of falling

Exhibit 32. GFD Indices Developed World Price Index in British Pounds, 1870–1915



Note: The index includes Canada, the United Kingdom, the United States, Austria-Hungary, Belgium, Denmark, Ireland, Italy, France, Germany, the Netherlands, Spain, Sweden, Australia, New Zealand, and Japan.

Exhibit 33. Annual Returns on Stocks, Bonds, and Bills in Real US Dollars, 1873–1896 (all data in percent)

Country	Stocks	Bonds	Bills	Bond ERP	Bill ERP	Cap/GDP	Inflation
Australia	7.28	5.48	3.33	1.70	3.82	14.3	–1.16
Austria	5.57	7.57	4.30	–1.86	1.22	45.3	–1.04
Belgium	3.70	5.28	3.18	–1.50	0.50	44.2	2.22
Canada	4.39	6.36	1.16	–1.85	3.19	40.2	–1.75
Denmark	7.65	5.04	4.35	2.48	3.16	53.4	–1.19
France	6.49	6.69	2.90	–0.19	3.49	55.9	–0.14
Germany	6.55	5.10	3.01	1.38	3.44	49.1	0.49
India	5.58	3.03	4.55	3.69	0.99	10.0	–0.23
Ireland	5.71	4.13	2.91	1.52	2.72	46.8	–1.11
Italy	5.42	8.48	6.07	–3.06	–0.87	19.3	–0.69
Netherlands	5.90	5.94	3.08	–0.03	2.74	16.3	–1.33
New Zealand	4.35	5.92	2.79	–1.49	1.52	34.4	–1.67
South Africa	8.85	5.28	3.08	3.40	5.60	25.1	–1.39
Spain	2.70	6.97	3.96	–3.99	–1.21	11.0	0.28
Sweden	6.66	5.98	5.11	0.64	1.47	9.0	–0.89
Switzerland	3.17	4.49	4.66	–1.26	–1.42	44.3	–2.49
United Kingdom	6.36	4.13	2.91	2.14	3.35	136.3	–0.87
United States	7.63	6.36	3.89	1.19	3.60	39.2	–0.83
Average	5.96	5.58	3.41	0.36	2.47	41.2	–0.66
World ex-US	6.72	6.58	3.89	0.13	2.72	26.3	
World	6.90	5.23	3.89	1.59	2.90	28.0	

bond yields, bonds outperformed stocks in some countries. Together, stocks and bonds in the 1880s and 1890s provided some of the highest returns for investors until the 1980s and 1990s. By 1881, the market capitalization of the London Stock Exchange was greater than the United Kingdom's GDP—the first time this had happened anywhere in the world. Market cap was greater than half of GDP in several other countries. Stock markets continued to perform well until World War I began in 1914.

With the discovery of gold in South Africa, the global money supply increased, reversing the deflationary trends that prevailed between 1874 and 1896. This shift led to low but positive inflation returning to the global economy. The prices of stocks and goods increased gradually. The high returns of 1874–1896 gave way to mixed returns between 1896 and 1914. Government bond yields hit their low point around 1896 and gave birth to the first interest rate pyramid, which would see rising government bond yields into the 1920s before yields declined until the 1940s. The term "interest rate pyramid" describes a period when bond yields rise dramatically for several decades and then fall just as much and for just as long, creating a mountain- or pyramid-like pattern when graphed as a time series.

1896–1914: The Gold Standard

Wars:	Boer War (1899–1902), Russo-Japanese War (1905), Balkan Wars (1912)
Trade:	Free trade, increased globally
Government Intervention:	Minimal, primarily during wars
Government Debt:	Declined in response to balanced budgets, lack of wars
Stock Market Returns:	World ex-US: 3.07%; France: 2.59%; United Kingdom: 2.22%; United States: 8.17%
New Stock Markets:	Croatia (1907), Finland (1912), Bulgaria (1914)
New Sectors:	Pharmaceuticals (W. J. Bush & Co. Ltd., 1897), nickel (Inco., Ltd., 1906), mail order retail (Sears, 1906), agricultural machinery (International Harvester, 1908), computers (IBM, 1911), radios (Marconi Wireless Telegraph Co. of America, 1912)
Stock Market Capitalization:	Global market cap rose from 26% to 37% of global GDP, exchanges established in all major countries
Bear Markets:	Panic of 1907 (United States, France, Italy)
Financial Crises:	Panics of 1901 and 1907 in United States
Sovereign Defaults:	Dominican Republic (1897, 1899), Mexico (1898, 1914), Venezuela (1898), Brazil (1898, 1902, 1914), El Salvador (1899), Colombia (1900), Costa Rica (1901), Ecuador (1906, 1909, 1914), Nicaragua (1911)
Bond Returns:	World ex-US: 2.52%; France: 0.64%; United Kingdom: –0.455%; United States: 1.47%
Bond Yields:	France: 2.86%–4.16%; United Kingdom: 2.42%–3.68%; United States: 2.86%–3.65%
Central Banks Founded:	Swiss National Bank (1907), US Federal Reserve (1913)

Commodity Prices:	Rose from 1897 to 1920
Inflation:	Low but positive
Exchange Rates:	Fixed by gold standard
Real Estate:	Housing prices rose slightly between 1900 and 1914

The year 1896 saw a secular low in interest rates and commodity prices. The period from 1873 to 1896 was one of mild deflation, and the period from 1896 to 1914 was one of mild inflation. The South Africa gold discoveries in the 1880s and the Klondike gold rush of 1896–1899 replenished the world's stocks of gold. Every country in Europe saw prices rise between 1896 and 1914. Global developed markets remained on the gold standard, and many countries went on a gold exchange standard, enabling capital to flow freely throughout the world. But this free flow of capital would be shattered when World War I began in July 1914.

Stock exchanges in London, Paris, and Berlin provided capital to the rest of the world. Industrial and material stocks grew, and consumer stocks began to attract capital. Oil stocks grew, and automobiles began to replace railroads. Trusts were established in many consumer goods that enabled monopolies to dominate individual markets.

Panics occurred in the United States in 1893, 1901, and 1907, and these spread to the rest of the world (Bruner and Carr 2023). Although there were bear markets in various countries at different points in time, there was no global bear market during these years. There were too many innovations and too much capital being poured into new industries to stop the growth of the economy. Stock markets expanded around the world. Minor wars took place in South Africa (between the Boers and the British between 1899 and 1902) and between Russia and Japan in 1904–1905. The latter led in 1905 to the first Russian Revolution. The first Sino-Japanese War in 1894, the Boxer Rebellion (1899–1901), and the Balkan Wars (1912) did not have a large impact on financial markets. Nevertheless, these events gave Germany and England the impression that when World War I began in 1914, the war would be short. It was not.

This period of free trade, based on the gold standard, lasted until 1914. Capital flowed freely throughout Europe and the rest of the world, enabling investors to optimize returns globally. European countries invested in their colonies and in South America or wherever opportunities presented themselves. Because all the world's major economies were on the gold standard, exchange rates were fixed, and bond coupons could be paid in any major European currency. A Russian bond was payable in Russian rubles, British pounds sterling, French francs, German marks, US dollars, Austro-Hungarian gulden, and Dutch guilders. Returns on stocks, bonds, and bills and the realized equity risk premium between 1896 and 1914 are shown in **Exhibit 34**.

By 1914, the global economy was integrated, and capital and goods flowed freely between countries. No one could imagine that a war would disrupt the progress that was being made, but it did. The nineteenth century of local wars evolved into the twentieth century of world war. One wonders how much further the world would have advanced had World War I never begun.

Exhibit 34. Annual Returns on Stocks, Bonds, and Bills in Real US Dollars by Market, 1896–1914 (all data in percent)

Market	Stocks	Bonds	Bills	Bond ERP	Bill ERP	Cap/GDP	Inflation
Australia	9.25	–0.01	–0.50	9.26	9.80	10.3	1.85
Austria	1.45	–0.22	1.29	1.68	0.16	63.6	1.51
Belgium	3.45	–1.41	0.05	4.93	3.40	82.6	1.40
Canada	7.89	–0.03	2.93	7.92	4.82	49.6	3.72
Denmark	3.42	0.11	2.63	3.30	0.77	34.1	1.70
France	1.07	–0.85	0.67	1.93	0.40	58.5	0.52
Germany	–0.04	–0.76	1.82	0.73	–1.83	45.6	2.80
India	4.73	–0.23	3.98	3.53	0.72	4.6	1.47
Ireland	0.22	–1.68	0.91	1.93	–0.68	56.0	1.10
Italy	1.22	1.99	3.24	–0.75	–1.96	18.2	0.70
Japan	–4.01	1.06	4.21	–5.02	–7.89	19.4	4.32
Netherlands	4.45	–0.44	1.20	4.91	3.21	36.1	1.51
New Zealand	4.00	–0.19	1.91	4.2	2.05	32.2	1.19
South Africa	–1.32	1.86	0.23	–3.12	–1.55	36.3	0.88
Spain	6.92	5.67	3.85	1.19	2.96	29	0.41
Sweden	3.02	–0.22	4.71	3.25	–1.61	42.1	1.59
Switzerland	2.89	0.73	2.11	2.16	0.77	47.2	1.12
United Kingdom	0.92	–1.72	0.91	2.68	0.01	121.8	0.79
United States	7.92	0.65	0.80	7.22	7.06	47.5	2.09
Average	3.03	0.20	1.94	2.83	1.07	43.5	1.64
World ex-US	1.90	1.42	0.80	0.47	1.09	34.2	
World	4.20	–0.78	0.80	5.02	3.37	29.7	

5. WORLD WARS AND COLD WAR

World War I changed financial markets forever. Before July 1914, Europe had integrated exchanges on which thousands of stocks and bonds were traded in every country in Europe. Investors in London and other cities readily bought US railroad bonds, Russian securities, South African gold shares, and government bonds from dozens of countries. With the declaration of war by Austria-Hungary on Serbia on 28 July 1914, fears of mass selling of securities and the repatriation of funds forced the closure of exchanges across the world.

For the next 70 years, governments regulated financial markets extensively, controlling the opening and closing of exchanges, the listing of stocks and bonds, the rights of foreigners to invest in domestic markets, the flow of funds across borders, the link to gold, links to other currencies, and/or the floating of currencies. Before July 1914, governments tried to minimize regulation of financial markets. After July 1914, everything in the world of finance was subject to regulation.

After World War I, the United Kingdom no longer had the financial ability to lead global financial markets the way it had before 1914, and the United States was reluctant to take on the responsibility of directing international political, economic, and financial markets. World War I forced nations to float their currencies and restrict international cash flows. The dislocations that followed World War I led to a severe global recession. The victors in World War I recovered, and their stock markets soared during the 1920s. The losing nations collapsed into political chaos, recession, and hyperinflation.

The recovery from World War I led to the Roaring Twenties. Stock markets peaked in 1929. Economies in Europe and the United States collapsed into the Great Depression between 1929 and 1932 because governments were unable to provide the leadership needed to rescue the global economy. With little trust in foreign trade and international agreements, nations fell back on domestic production. Germany began preparing for World War II, which engulfed Europe between 1939 and 1945.

Nations had learned some lessons from World War I. Governments seized control of their economies and directed all their resources to winning World War II in ways that never occurred during World War I—for example, stock markets did not close when World War II began. Governments controlled interest rates and were able to work more effectively with industry to achieve the war aims. The allies, now led by the United States, created a new international financial system after World War II, based on the 1944 Bretton Woods Agreement, that would avoid the chaos that followed World War I. Governments reasoned that if they had successfully run their economies during World War II, they could do so in the peace that followed. Keynesianism was the economic philosophy that justified the belief in the government's ability to regulate the economy and financial markets successfully. Meanwhile, Communists seized power in Eastern Europe and China after World War II, eliminating financial markets, while many of Europe's former colonies rejected free market capitalism and favored government control over the economy.

The world enjoyed a remarkable recovery in the 1950s and 1960s, referred to as the *Wirtschaftswunder* (economic miracle) in Germany and *les trentes glorieux* (30 glorious years) in France. By the 1970s, however, stagflation had set in, with low growth and high inflation

replacing high growth and low inflation. The price of oil increased tenfold. Economists and the public in developed countries lost their faith in the government's ability to successfully regulate the economy. Milton Friedman and others recommended that governments choose markets over regulation. Ronald Reagan and Margaret Thatcher promoted markets, and in the 1980s, the world moved from Keynesian attempts to regulate the business cycle to a world of floating exchange rates, privatization, globalization, and freer markets. Communist governments collapsed, and by the 1990s, nearly every country in the world was pursuing freer markets and economic growth. The course of global bull and bear markets between 1912 and 1981 is detailed in **Exhibit 35**.

Exhibits 36 and **37** show the sector allocations in the United Kingdom and the United States, respectively, between 1914 and 1981. The largest decline was in the transports sector, which shrank from around 30% of total market cap in 1914 to around 2% by 1981, as the demand for railroads declined and other parts of the sector did not show enough profitability to offset this decline. Finance also declined in both the United Kingdom and the United States, primarily because other sectors rose in importance.

Market capitalization became more evenly distributed between the various sectors over time as the benefits of new industries spread to the rest of the economy. Energy gained a larger share, while materials maintained a 10% share of total market capitalization in both the United States and the United Kingdom. Health care and information technology both rose in importance, especially in the United States, as did consumer goods. Overall, the trend was away from finance and transports as the economy diversified into other sectors.

Changes in the market capitalization of stock markets around the world are illustrated in **Exhibit 38**. When World War I began, the United Kingdom had the world's largest stock market, but it had to sell securities to fund the war and the US market increased in size during World War I. Germany and France each represented about 8% of global stock market capitalization in 1914. By the end of the war, the United States had the largest stock market in the world and would keep that title until the capitalization of the Japanese stock market briefly exceeded that of the United States in the late 1980s.

Exhibit 35. GFD Indices Developed World Price Index Bull and Bear Markets, 1912–1981

Bottom	Bear Decline	Top	Bull Rise
		9/30/1912	128.61
7/31/1921	–37.82	9/30/1929	211.61
6/30/1932	–75.56	2/28/1937	198.25
5/31/1940	–39.65	5/31/1946	86.43
9/30/1949	–25.57	1/31/1969	525.23
6/30/1970	–24.63	2/28/1973	64.73
9/30/1974	–43.39	4/27/1981	116.51

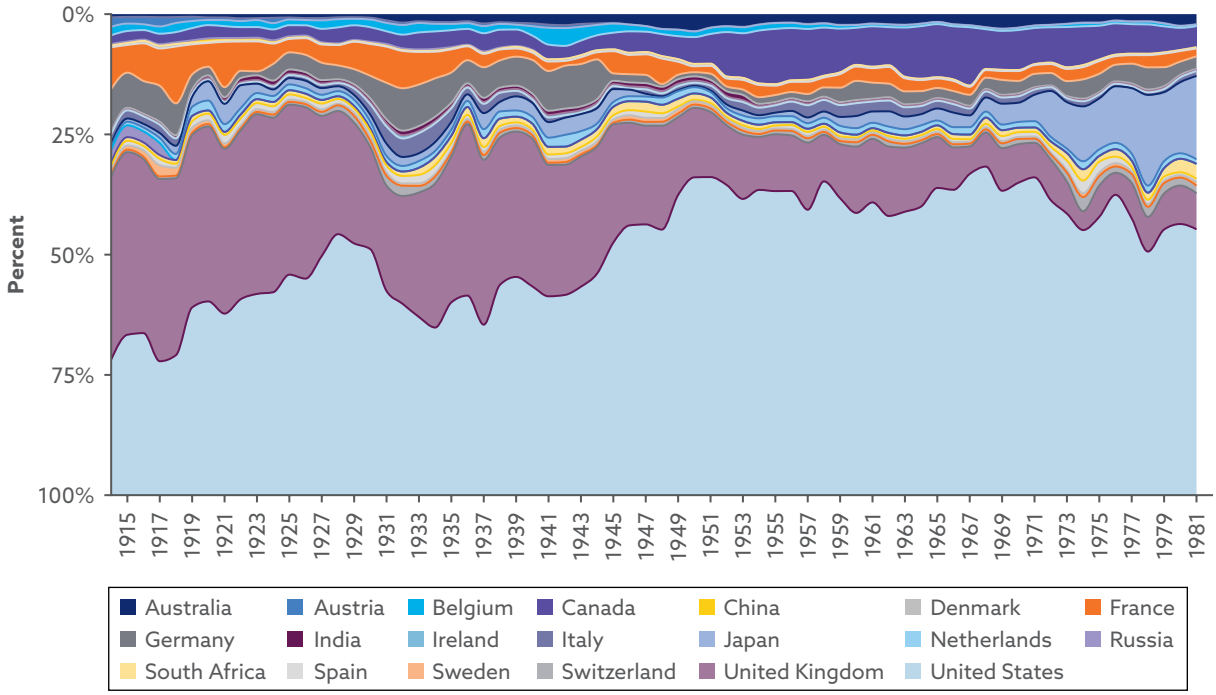
Exhibit 36. Sector Allocations in the United Kingdom, 1914–1981 (all data in percent)

Year	1914	1929	1949	1968	1981
Communications	1.74	2.85	2.63	4.48	2.41
Consumer Discretionary	7.31	10.99	15.03	15.71	13.14
Consumer Staples	8.29	24.80	23.33	16.27	16.51
Energy	5.37	10.22	10.97	15.58	13.38
Finance	29.72	24.19	19.24	11.86	13.14
Health Care	0.09	0.06	0.94	2.06	2.88
Industrials	3.12	3.95	7.47	11.98	15.75
Information Technology	0.38	0.23	0.36	1.35	4.03
Materials	8.47	7.73	15.66	15.31	12.94
Real Estate	0.37	0.60	0.69	2.81	3.95
Transports	31.41	9.47	3.11	1.55	1.51
Utilities and Telecommunications	3.73	4.91	0.55	1.04	0.33

Exhibit 37. Sector Allocations in the United States, 1914–1981 (all data in percent)

Year	1914	1929	1949	1968	1981
Communications	0.92	1.36	1.29	1.89	2.55
Consumer Discretionary	5.66	10.23	14.45	15.62	9.54
Consumer Staples	5.00	8.69	10.16	7.56	6.94
Energy	11.69	14.46	17.61	13.80	21.92
Finance	17.14	17.48	10.15	8.23	8.72
Health Care	0.22	0.67	1.90	4.15	6.18
Industrials	6.25	9.49	8.53	11.39	11.33
Information Technology	0.05	0.45	1.09	9.80	8.90
Materials	11.72	11.00	16.97	13.75	10.00
Real Estate	0.60	0.74	0.23	0.67	0.77
Transports	29.55	9.68	4.00	2.60	2.30
Utilities and Telecommunications	11.20	15.74	13.62	10.56	10.84

Exhibit 38. Share of Global Stock Market Capitalization by Country, 1914–1981



The United Kingdom's share of global stock market capitalization gradually declined, falling to single digits by the 1960s. The United States' share gradually rose, exceeding 50% after World War II and reaching almost 70% by 1968. Canada's share gradually rose from around 2% in 1914 to more than 10% in the mid-1950s. Both France and Germany shrank in size, falling to around 2% after World War II. After World War II, Japan's stock market increased in size dramatically, rising from less than 0.3% of global market cap in 1949 to 2.5% in 1960. By 1974, it represented more than 10% of global stock market capitalization, and between 1987 and 1989, Japan had the largest stock market in the world, representing more than 40% of global market capitalization. Today, that figure is around 6%.

1914–1929: World War I and the Roaring Twenties

Wars:	World War I (1914–1918)
Trade:	Reduced in response to war; trade picked up in the 1920s
Government Intervention:	High intervention because of World War I and aftermath
Government Debt:	Increased significantly to fund World War I
Stock Market Returns:	World ex-US: 4.36%; France: 0.85%; United Kingdom: 4.13%; United States: 10.45%

New Stock Markets:	Lebanon (1920); Colombia, Luxembourg, Philippines (1927); Morocco, Venezuela (1929)
New Sectors:	Retail – drugs (United Drug Co., 1916), movies (Famous Players Lasky Co., 1919), phonographs (Victor Talking Machine Co., 1919), airplane manufacturing (Wright Aeronautical Corp., 1920), advertising (General Outdoor Advertising Co., 1925), airplane transportation (Transcontinental Air Transport Inc., 1928)
Stock Market Capitalization:	Global market cap rose from 37% to 55% of global GDP, grew as Allies recovered from war
Bear Markets:	Markets closed during World War I, bear markets after World War I, hyperinflation
Financial Crises:	World War I (1914); postwar (1920–1921); Germany, Austria (1923); United States (1929)
Sovereign Defaults:	Ottoman Empire, Nicaragua (1915); Russia (1918); Paraguay (1915, 1920); China, El Salvador (1921); Bolivia (1927); Ecuador (1929)
Bond Returns:	World ex-US: –0.51%; France: –6.37%; United Kingdom: 0.16%; United States: 0.16%
Bond Yields:	France: 3.61%–6.97%; United Kingdom: 3.65%–5.67%; United States: 1.55%–4.26%
Central Banks Founded:	South African Reserve Bank, Banco Central de Chile, Banco de Mexico (1925); Bank of Greece (1928)
Commodity Prices:	Rose until 1920, then declined until 1932
Inflation:	General during war, hyperinflation after World War I in central Europe
Exchange Rates:	Attempts to return to pre–World War I levels failed
Real Estate:	Housing prices rose between 1914 and 1922, then declined thereafter

The period of globalized financial markets came to an end on 31 July 1914, when the world's stock markets closed after World War I began. Markets closed to prevent massive sales and to stop capital from leaving each country and causing financial collapse. During the war, capital was directed toward paying for the war and funding the debt of each government, not toward funding investment in new industries. Although stock markets in London, New York City, and Paris reopened in 1915, the markets in Berlin, St. Petersburg, and Vienna remained closed until 1917. Nevertheless, stocks and bonds traded off the exchanges. The US stock market did well in 1915 as the United States became a source for matériel for the war. As the United States was drawn into the war in 1917, however, its stock market started to falter.

The end of the war was followed by the 1918–1920 flu pandemic and the global recession of 1920. The boundaries of Europe were redrawn after World War I. Germany, Austria-Hungary,

and the Ottoman Empire were forced to give up territory. Germany had to pay an indemnity that was beyond its means. Austria-Hungary was broken up and its territories distributed among 10 countries. The Ottoman Empire was broken up into the independent states of Turkey, Iraq, Lebanon, Syria, Palestine, and Jordan, some of which were under British or French mandates. What had been regional stock exchanges in Prague, Budapest, and Warsaw became national stock exchanges once the new countries emerged.

Because the new central and eastern European countries had not established the political and economic tools to run their nations, chaos ensued after World War I ended. Hyperinflation occurred in Germany, Austria, Hungary, and Poland in 1923. When Germany replaced the mark in 1923, it took 1 trillion old marks to obtain one new rentenmark. Hyperinflation caused equity markets to crash in real terms in those countries, and bondholders were wiped out. The impact on German stocks is illustrated in **Exhibit 39**. It shows the steep declines at the end of World War I and during the hyperinflation in 1923, as well as the quick recovery after prices were stabilized in 1924. Germany placed a floor on prices during World War II, which prevented share prices from falling until these restrictions were lifted after World War II ended.

Financial markets grew slowly and performed poorly in the rest of northern Europe. Italy and France also suffered inflation, which imposed losses on fixed-income investors. Attempts after World War II to restore globalized financial markets failed. Most countries wanted to return to the *status quo ante bellum*, but doing so proved impossible. The prewar financial world was gone forever. Despite attempts by the League of Nations and international economic conferences to find a common ground for countries to abide by, the world lacked economic leadership, and agreement on how to resolve these global economic problems could not be reached.

Exhibit 39. Germany CDAX Composite Index (with GFD Extension) in US Dollars, 1910–1950

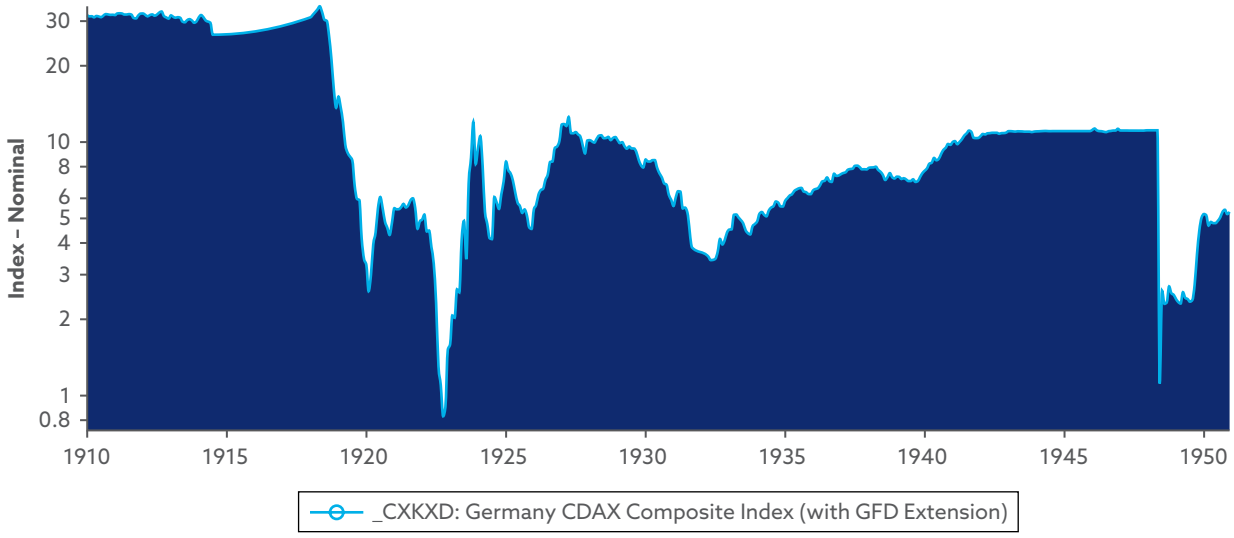


Exhibit 40. Declines in the 1920–21 Bear Market

Market	Top	Bottom	Decline	Country	Top	Bottom	Decline
Belgium	3/31/1920	6/30/1921	–37.0%	Netherlands	5/31/1920	8/31/1922	–62.3%
Canada	9/30/1912	8/31/1921	–36.2%	Norway	9/30/1917	6/30/1932	–81.3%
Czechoslovakia	2/29/1920	10/31/1922	–77.9%	Poland	3/31/1921	8/31/1922	–82.8%
Finland	9/30/1918	4/30/1925	–49.6%	Spain	3/31/1913	11/30/1921	–41.9%
France	4/30/1920	7/31/1921	–42.5%	Sweden	4/30/1917	3/31/1922	–73.2%
Germany	5/31/1918	2/29/1920	–92.5%	Switzerland	12/31/1910	12/31/1921	–65.0%
India	4/30/1920	6/30/1932	–75.4%	United Kingdom	1/28/1920	10/24/1921	–38.0%
Ireland	2/28/1898	3/31/1921	–32.0%	United States	7/16/1919	8/24/1921	–35.1%
Italy	7/31/1918	7/31/1921	–51.3%	World	9/30/1912	7/31/1921	–37.8%
Japan	1/31/1920	6/30/1924	–63.1%	World ex-US	8/31/1918	7/31/1921	–49.4%

Although the world's stock markets had not experienced a coordinated bear market since 1873, almost all stock markets declined during the postwar bear market of 1920. The end of World War I was followed by inflation, rising interest rates and bond yields, and large declines in the price of stocks as corporations were forced to adjust to the uncertain economic environment that followed the end of the war. **Exhibit 40** documents the declines in 18 countries and the world.

Following World War I, financial markets operated on a national, not an international, level. There were restrictions on capital flows, and national economies behaved independently of each other. Before World War I, markets in different countries provided similar returns because markets were integrated. Lower returns in one country caused money to move to countries with higher returns. After World War I ended, however, national equity market returns diverged significantly because capital was unable to flow between countries as easily and each country pursued its own economic goals. Exchange rates were no longer fixed, and they fluctuated dramatically, both because of attempts to return to the gold standard in some countries and because of hyperinflation in others. The boom of the 1920s mainly occurred in the countries that were victorious in World War I, whereas countries in northern Europe and countries defeated during this war did poorly during the 1920s.

European countries left the gold standard when the war began and stayed off it during the war. Each country suffered different inflation rates during World War I, making it impossible to realign at the old exchange rates after the war. The Peace of Versailles imposed excessive

indemnities on Germany, which the nation was unable to meet. Political chaos was compounded by economic chaos, leading to hyperinflation in Germany, Austria, Hungary, and other countries. Great Britain was forced to deflate to return to the pound sterling's prewar parity with the US dollar, but this created a deflation that ultimately forced the British economy into a recession and off the gold standard in 1931.

The Federal Reserve, Bank of England, Banque de France, and Reichsbank attempted to coordinate their central bank policies during the late 1920s but failed (Ahamed 2009). The United States funded debt in Germany during the mid-1920s, but these funds stopped flowing in the late 1920s. Instead, capital flowed into the US stock market, leading to a dramatic bubble that popped in 1929.

Exhibit 41 charts the rise in stocks before the 1929 bubble. France, Poland, and the United States saw increases of more than 400%, and a dozen other countries saw their stock markets at least double in price. The rally started in 1921 in most countries but began later in central Europe. The top was reached between 1927 and 1929, peaking in September 1929 in the United Kingdom, Canada, and the United States. After that, stock markets declined sharply for at least the next three years.

Although financial markets marched in tandem between 1897 and 1914, each country followed its own path between 1914 and 1929. This dynamic can be seen in the large differences in returns on stocks, bonds, and bills, as well as the equity risk premium and inflation rates, provided in **Exhibit 42**. The US stock market peak in September 1929 was followed by more than a decade of market declines, economic depression, and ultimately World War II. The international coordination of financial markets no longer existed.

Exhibit 41. Bull Markets in the 1920s by Country

Country	Bottom	Top	Rise	Country	Bottom	Top	Rise
Australia	1/31/1917	2/28/1929	179.0%	Italy	7/31/1921	2/28/1929	134.7%
Austria	12/31/1925	11/30/1927	56.8%	Japan	6/30/1924	2/28/1926	41.2%
Belgium	8/31/1926	6/30/1928	164.0%	Netherlands	8/31/1922	2/28/1929	53.1%
Canada	8/31/1921	9/30/1929	299.8%	Poland	5/31/1926	10/31/1927	402.9%
Finland	4/30/1925	3/31/1928	169.1%	Spain	11/30/1921	2/28/1929	131.7%
France	7/31/1921	2/28/1929	426.8%	Sweden	3/31/1922	8/31/1929	84.2%
Germany	12/26/1925	5/7/1927	182.8%	Switzerland	12/31/1921	9/30/1928	165.1%
Hungary	5/31/1926	4/30/1927	166.6%	United Kingdom	10/31/1921	9/30/1929	73.2%
Ireland	3/31/1921	7/31/1929	30.1%	United States	8/24/1921	9/7/1929	409.0%

Exhibit 42. Annual Returns on Stocks, Bonds, and Bills in Real US Dollars by Market, 1914–1929 (all data in percent)

Market	Stocks	Bonds	Bills	Bond ERP	Bill ERP	Cap/GDP	Inflation
Australia	6.84	0.44	−0.16	6.37	7.01	13.3	2.72
Austria	−17.33	−20.84	−45.15	4.43	50.72	63.6	66.98
Belgium	4.65	0.38	−0.11	4.26	4.77	24.9	16.56
Canada	7.22	0.61	0.40	6.59	6.79	87.2	2.89
Denmark	3.43	1.61	2.48	1.78	0.93	38.2	4.44
France	−1.25	−8.32	−9.30	7.71	8.88	72.2	12.87
Germany	−5.72	−39.19	−82.37	55.04	434.77	27.4	452.95
India	−2.95	0.35	2.46	−3.45	−5.28	6.5	3.00
Ireland	−0.13	0.56	1.51	−0.68	−1.62	35.0	3.96
Italy	−6.39	−8.86	−5.95	2.70	−0.47	28.0	12.91
Japan	4.27	2.69	1.75	1.53	2.48	19.7	2.84
Netherlands	0.52	0.32	0.39	0.19	0.13	67.7	2.76
New Zealand	5.31	0.74	0.19	4.54	5.11	59.4	2.08
Norway	7.43	0.98	1.28	2.17	6.07	22.3	3.34
South Africa	8.01	−0.18	2.77	8.22	5.10	31.4	2.12
Spain	3.31	−0.38	−0.96	3.70	4.31	33.7	2.73
Sweden	−0.46	1.94	−0.06	−2.35	−0.40	40.9	3.44
Switzerland	1.43	0.93	0.67	0.50	0.75	127.5	3.20
United Kingdom	4.13	−0.68	0.70	4.84	3.41	123.9	2.74
United States	10.45	0.16	−0.21	10.28	10.68	86.5	3.61
Average	1.64	−3.34	−6.48	5.15	8.68	53.3	30.41
World ex-US	0.65	−3.76	−0.21	4.58	0.86	28.8	
World	5.91	−2.61	−0.21	8.75	6.13	46.7	

1929–1949: The Great Depression and World War II

Wars:	World War II (1939–1945), Pacific War (1937–1945), Italo-Ethiopian War (1935–1936)
Trade:	Reduced in response to Great Depression, domestic autarky
Government Intervention:	High because of World War II and Great Depression; control of economy
Government Debt:	Increased significantly to fund wars and because of the Great Depression
Stock Market Returns:	World ex-US: 4.36%; France: –3.37%; United Kingdom: 4.81%; United States: 7.14%
New Stock Markets:	Korea (1932), Zimbabwe (1948), Israel (1949)
New Sectors:	Gaming (GRA Group p.l.c., 1932)
Stock Market Capitalization:	Global market cap fell from 55% to 32% of global GDP, shrank as investment declined during wars
Bear Markets:	Great Depression of 1929–1932, Recession of 1937–1938, postwar recession of 1946–1948
Financial Crises:	United States (1929–1932), Creditanstalt (United Kingdom, Europe, 1931–1933), postwar dislocations
Sovereign Defaults:	Turkey, Dominican Republic, Boliva, Brazil, Chile, Peru (1931); China (1932, 1939); El Salvador (1932, 1938); Germany (1932, 1939); Hungary (1932, 1941); Bulgaria, Greece, Costa Rica, Nicaragua, Panama, Colombia, Paraguay (1932); Romania, Guatemala, Paraguay (1933); Colombia (1935); Poland (1936); Spain (1936–1939); Brazil, Paraguay (1937); Turkey (1940); Japan (1942); Austria (1945); Soviet Union (1947)
Bond Returns:	World ex-US: –0.51%; France: –6.66%; United Kingdom: 4.82%; United States: 1.81%
Bond Yields:	France: 2.94%–4.61%; United Kingdom: 2.83%–4.74%; United States: 1.55%–4.26%
Central Banks Founded:	Central Bank of the Republic of Turkey (1930); Reserve Bank of New Zealand, Bank of Canada (1934); Central Bank of Argentina, Reserve Bank of India (1935); Central Bank of Ireland (1943); People's Bank of China, State Bank of Pakistan (1948)
Commodity Prices:	Declined until 1933, rose until 1948
Inflation:	Deflation in the 1930s, price controls during World War II
Exchange Rates:	Countries exited gold standard, government-controlled exchange rates, Bretton Woods and IMF introduced
Real Estate:	Housing prices declined until 1940, rose thereafter

The stock market crashed in the United States in October 1929, and the Creditanstalt bank failed in Austria in July 1931, leading to a global economic depression and the collapse of the gold standard (Schubert 1992). The US stock market fell by more than 86% between 1929 and 1932. No other country saw such a dramatic decline, and some countries, such as the United Kingdom, suffered a greater decline in the 1970s than in the 1930s. **Exhibit 43** charts the declines that occurred in 21 countries between 1927 and 1936. Every country suffered a bear market, although some bear markets were worse than others. Belgium, Canada, the United States, and some other countries suffered their worst bear markets in history. In each case, the stock market would rally, making it appear as if the bear market was over, only collapsing further when there were new financial crises. By 1932, most countries had hit their bottom, and the rally into 1937 began before the "Roosevelt recession" hit.

Countries redirected capital from the stock market to the government bond market during World War II. By the end of World War II, the government debt of the United States exceeded its GDP, and the government debt of the United Kingdom was twice its GDP. Meanwhile, Germany and other Axis countries defaulted on their debt, which would not be reorganized until the 1950s.

British sterling countries left the gold standard in 1931, and the United States left it in 1933. By 1936, every country in the world was off the gold standard. The attempts to return to the pre-1914 financial world had failed. Economies worldwide suffered deflation and a dramatic reduction in international trade as countries pursued "beggar thy neighbor" policies in which they lowered their exchange rates to drive exports to their countries. The Smoot–Hawley Tariff Act of 1930 raised tariffs on more than 20,000 imported goods. When every country restricted

Exhibit 43. Bear Markets in the 1930s by Country

Country	Top	Bottom	Decline	Country	Top	Bottom	Decline
Australia	2/28/1929	8/31/1931	–46.5%	Japan	2/28/1926	10/31/1931	–49.9%
Austria	11/30/1927	1/31/1934	–63.2%	Netherlands	2/28/1929	6/30/1932	–76.4%
Belgium	6/30/1928	2/28/1935	–80.8%	New Zealand	12/31/1929	4/30/1932	–37.2%
Canada	9/30/1929	6/30/1932	–80.1%	Norway	9/30/1917	6/30/1932	–81.3%
Denmark	9/30/1918	4/30/1932	–63.1%	Poland	10/31/1927	10/31/1931	–80.5%
Finland	3/31/1928	9/30/1931	–50.2%	Spain	2/28/1929	7/31/1936	–60.6%
France	2/28/1929	8/31/1936	–75.0%	Sweden	8/31/1929	5/31/1932	–66.1%
Germany	5/7/1927	4/16/1932	–73.6%	Switzerland	9/30/1928	5/31/1932	–61.2%
Ireland	7/31/1929	12/31/1931	–32.0%	United Kingdom	9/30/1929	6/30/1932	–52.3%
Hungary	4/30/1927	8/31/1934	–68.8%	United States	9/7/1929	7/8/1932	–86.2%
Italy	2/28/1929	5/31/1932	–65.4%				

imports, no country ended up benefiting from the reduced trade and lower exchange rates. Every country suffered (Kindleberger 1984, pp. 364–400).

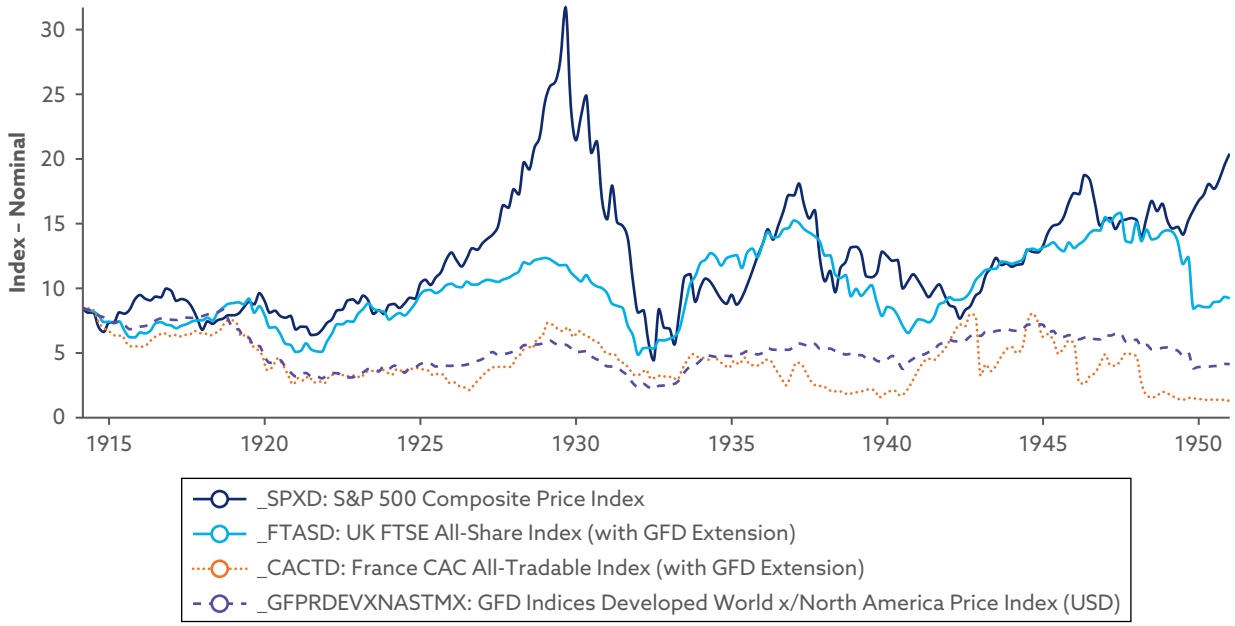
Stock markets and the economy rose between 1932 and 1937, and some believed the world was on the road to recovery, but the recession of 1937–1938 raised concerns that the Great Depression was not over. Some referred to the decline as the "Roosevelt recession" because of the perception that Roosevelt's efforts to balance the budget at that time were premature and unwise. During the 1930s, countries relied increasingly on domestic production after international trade collapsed in the early 1930s.

The Great Depression in the United States consisted of major recessions in 1929–1932 and 1937–1938. Unemployment hit 25%. The recovery between 1933 and 1937 was brief. Many countries seemed helpless to stop the Great Depression from spreading. Nations relied more and more on domestic production and prepared for war.

Exhibit 44 illustrates the performance of stock markets in the United States, the United Kingdom, France, and the world excluding North America between 1914 and 1950. Markets declined into 1920 and then had a huge rally in the United States and France in the 1920s. Global markets crashed in the early 1930s. During the 1930s and 1940s, each country took a different path according to the victories and defeats of the war.

After 1937, markets quickly began to reflect concerns about war. The world plunged into World War II in September 1939. Unlike in 1914, nations were prepared for war and most stock markets remained open, except when their country was invaded by Axis or Allied forces. For the next six years, the behavior of stock markets depended on the war. Between 1939 and 1941,

Exhibit 44. United States, United Kingdom, France, and World ex-North America Price Indexes, 1914–1950



the German stock market did well while the stock markets of the Allies declined. Once the tide of the war turned against Germany and Japan in 1942, their governments set price floors on their stocks, which effectively froze trading at the stock market floors until the war was over. Allied markets rallied from 1942 through the end of the war, after which a postwar recession occurred. The size of post–World War II bear markets is illustrated in **Exhibit 45**. Many countries suffered some of their worst bear markets in history, with drops of more than 50% in Austria, Germany, India, Italy, Japan, and Spain. The GFD Developed World Excluding the United States index declined by more than 50% between 1944 and 1949.

In wartime Germany and in the Soviet Union, growth was driven by government spending, not by free market capitalism. These two nations' success with economic growth appealed to other countries for a while. When World War II began in 1939, governments restricted trade and redirected capital to help pay for the war rather than for new industries. During the war, governments controlled production and the stock market shrank as a share of GDP. Very little money was put into the stock market, and money was redirected to war bonds, though as much to control spending and inflation as to fund the war. Most countries had learned the lessons of World War I and quickly took control over their economies to avoid the dislocations that occurred during that war. Whereas World War I followed a period of free trade, World War II followed a period of government intervention. The private sector was crowded out by the government. Nevertheless, World War II led to many innovations that would benefit the world after the war ended.

Exhibit 45. Postwar Bear Markets, 1944–1949

Market	Top	Bottom	Decline
Austria	9/30/1947	8/31/1950	–82.8%
Denmark	5/31/1944	6/30/1949	–28.1%
France	8/31/1944	7/20/1945	–45.6%
Germany	2/28/1946	8/31/1948	–79.7%
India	7/26/1946	7/1/1949	–62.7%
Italy	5/31/1947	3/31/1948	–65.1%
Japan	8/31/1949	6/30/1950	–51.1%
Netherlands	2/29/1944	11/30/1946	–35.7%
Portugal	11/6/1946	8/3/1949	–45.6%
Spain	3/31/1947	6/30/1949	–50.1%
United Kingdom	1/17/1947	6/20/1952	–27.4%
United States	5/29/1946	6/13/1949	–29.6%
World	5/31/1946	9/30/1949	–25.6%
World ex-US	7/31/1944	10/31/1949	–50.0%

Exhibit 46 compares the returns on stocks, bonds, and bills between 1929 and 1949. There is no consistency in these returns. South Africa provided the highest returns, primarily because of the revaluation of gold and the country's lack of participation in World War II. Belgium, Germany, Italy,

Exhibit 46. Annual Returns on Stocks, Bonds, and Bills in Real US Dollars by Market, 1929–1949 (all data in percent)

Market	Stocks	Bonds	Bills	Bond ERP	Bill ERP	Cap/GDP	Inflation
Australia	3.84	−0.06	−3.39	3.90	7.48	33.3	0.66
Austria	−4.73	−5.54	−5.07	0.86	0.36	34.9	0.97
Belgium	−8.90	−6.78	−9.16	−2.27	0.29	35.9	7.34
Canada	2.50	2.21	−1.25	0.28	3.80	54.3	−0.17
Denmark	2.95	3.76	0.85	−0.78	2.08	23.5	3.50
Finland	4.18	−1.15	−2.93	5.39	7.32	36.3	9.17
France	−5.85	−10.84	10.96	5.60	−15.15	37.1	11.51
Germany	−6.98	−2.68	−1.34	−4.42	−5.72	4.8	−0.20
India	1.67	4.21	−0.97	−2.44	2.67	10.8	2.63
Ireland	2.31	0.18	−2.07	2.13	4.47	52.3	3.24
Italy	−1.92	−8.95	−9.17	7.72	7.98	14.8	24.07
Japan	−12.59	−20.60	−21.59	10.09	11.48	4.0	10.98
Netherlands	1.05	0.20	−2.65	0.85	3.80	74.9	2.45
New Zealand	2.10	0.03	−2.09	2.07	4.28	24.1	0.69
Norway	6.29	5.48	−0.87	0.77	7.22	13.8	3.07
South Africa	−4.87	0.30	−1.87	−5.15	−3.06	48.4	1.44
Spain	3.50	1.18	1.51	2.29	1.96	25.6	7.71
Sweden	5.23	3.81	1.09	1.37	4.10	21.8	2.11
Switzerland	6.14	5.36	2.66	0.74	3.39	31.5	1.55
United Kingdom	0.01	−1.12	−3.96	1.14	4.13	103.3	1.27
United States	−7.82	1.71	−1.05	−9.37	−6.84	39.5	0.35
Average	−0.57	−1.39	−2.49	0.84	1.98	43.0	4.49
World ex-US	0.62	−5.72	−1.05	6.72	1.69	26.8	
World	2.06	0.13	−1.05	1.93	3.14	30.4	

and Japan all did poorly. Despite the Great Depression and World War II, some countries showed gains in equities between 1929 and 1949. In countries that suffered inflation, such as France, Italy, and Japan, fixed-income investors suffered losses. Most countries, however, repressed interest rates to reduce the cost of funding the war. GDP declined in countries that suffered from the destruction of World War II, while those that avoided it, such as the United States, benefited. By the end of the war, global financial power had clearly shifted from Europe to the United States.

After World War II, unlike after World War I, the United States was willing to take on the leadership of the free world and promote free trade and markets to encourage growth. By 1945, the United States represented more than half of global stock market capitalization. It remained the strongest economy in the world for the rest of the century.

1949–1968: Bretton Woods

Wars:	Korean War (1950–1953)
Trade:	Expanded through Bretton Woods and GATT
Government Intervention:	Increased as government tried to manage business cycle
Government Debt:	Declined because there were few wars and governments balanced budgets
Stock Market Returns:	World ex-US: 5.34%; Germany: 6.62%; United Kingdom: 9.13%; United States: 9.52%
New Stock Markets:	Bangladesh, Kenya (1954); South Korea (1956); Pakistan (1960); Singapore, Taiwan (1961); Malaysia (1964); Iran (1967); Jamaica (1968)
New Sectors:	Data processing (Ceridian Corp., 1958), waste management (Culligan International Inc., 1960), international banking (Salomon, Inc., 1960), electronic equipment (Clairtone Sound Corporation Ltd., 1961), semiconductors (Needco Frigistors, Ltd., 1962), nuclear power (Western Nuclear, Inc. 1962), software (Electronic Data Systems, 1968)
Stock Market Capitalization:	Global market cap rose from 32% to 41% of global GDP, increased during postwar recovery
Bear Markets:	Few domestic bear markets in the 1950s and early 1960s, no global bear markets
Financial Crises:	None
Sovereign Defaults:	Brazil, Chile (1961); Costa Rica (1962); Rhodesia (1965); Indonesia (1966)
Bond Returns:	World ex-US: –3.56%; Germany: –7.10%; United Kingdom: –3.25%; United States: –0.89%
Bond Yields:	United Kingdom: 2.74%–8.03%; Germany: 4.35%–7.70%; United States: 1.57%–6.27%

Central Banks Founded:	Bank of Korea, State Bank of Czechoslovakia, Central Bank of Sri Lanka (1950); State Bank of Vietnam (1951); Central Bank of Paraguay (1952); Bank Negara Malaysia, Reserve Bank of Australia (1959); Central Bank of Brazil (1964)
Commodity Prices:	Stable between 1948 and 1970
Inflation:	Mild inflation during the 1950s
Exchange Rates:	After realignment in 1949, fixed rates until 1973
Real Estate:	Housing prices rose dramatically from 1942 to 1953, moderately after that

When World War II ended in 1945, there was concern that the world would return to another Great Depression. Not all of the causes of the Great Depression had been identified at the time, and the uncertainty and dislocations caused by the end of the war, combined with the postwar recessions and bear markets, caused investors much worry. Instead, the world began one of the most powerful economic recoveries and stock market rallies in history. The Bretton Woods system provided a framework that oversaw the global economy and allowed developed countries to recover from the destruction of World War II (Steil 2013).

Colonial countries eventually gained their independence during the 1950s. India regained its sovereignty in 1947, and the People's Republic of China was founded in 1949. In 1952, Alfred Sauvy divided the world into the First World (capitalist countries), the Second World (Communist countries), and the Third World (emerging markets and former colonies). During the 1950s and 1960s, some third-world countries established stock exchanges, but it was not until the 1980s that "emerging markets" became a separate investing group.

After World War II, Europe nationalized many of its heavy industries and the United States regulated its economy more intensively. Some government officials reasoned that they had successfully managed the economy during World War II and that capitalism had failed the world during the 1930s, so why should the government be unable to regulate the economy after the war? Keynesianism provided the economic justification for the government regulating and smoothing out the business cycle—better this than return to free trade and usher in another Great Depression. Nationalization of banks, utilities, heavy industry, and other sectors of the economy dramatically reduced stock market capitalization as a share of GDP in Europe. Bretton Woods and the General Agreement on Tariffs and Trade (GATT) laid the foundation for recovery from World War II and from the Great Depression. The government promoted trade and reinvestment to help grow the economy. The Marshall Plan helped Europe and Japan rise again and regain its economic freedom when the Korean War began. The stock market grew rapidly as the economy recovered.

A global bear market occurred between 1946 and 1949 as the world adjusted to the dislocations created by the war, nationalizations, and the move into a peacetime economy. After 1949, there was steady growth for the next 20 years. Despite minor bear markets in individual countries, no global bear markets took place until the 1970s.

Exhibit 47 shows the dramatic growth that occurred in developed countries' stock markets after the postwar recession ended and the United States used the Marshall Plan to promote Europe's recovery. After 1945, Eastern Europe was under the control of Communist governments,

Exhibit 47. Post–World War II Bull Markets by Country

Country	Bottom	Top	Rise	Country	Bottom	Top	Rise
Australia	11/7/1952	9/16/1960	164.3%	Italy	3/31/1948	4/24/1970	727.7%
Austria	8/31/1950	2/28/1962	1,671.0%	Japan	7/6/1950	4/6/1970	2,872.9%
Belgium	12/31/1948	1/31/1964	247.0%	Netherlands	11/30/1946	3/31/1961	410.4%
Canada	6/30/1949	5/16/1969	436.9%	New Zealand	4/30/1953	7/6/1973	433.4%
Denmark	6/30/1949	7/31/1966	179.7%	Portugal	7/31/1949	11/30/1973	738.5%
Finland	4/30/1949	7/31/1963	445.9%	Spain	6/30/1949	4/24/1974	1,629.3%
France	7/31/1950	4/30/1962	827.7%	Sweden	4/30/1940	4/30/1969	867.4%
Germany	8/31/1948	9/30/1960	2,847.8%	Switzerland	7/31/1940	3/9/1962	799.2%
India	6/30/1949	6/30/1974	119.8%	United Kingdom	6/30/1952	1/15/1969	410.9%
Ireland	8/31/1940	3/31/1969	553.6%	United States	6/13/1949	11/29/1968	699.8%

and the Cold War separated the world into "East" and "West." The dates when the postwar bull markets started and ended varied widely by country. Most countries suffered at least one bear market between the bottom in the 1940s and the tops in the 1960s or 1970s, but all the developed markets showed some of their greatest gains in the twentieth century during the 1950s and 1960s. Although the countries defeated in World War I performed poorly after that war, the countries defeated in World War II thereafter showed some of the fastest rates of growth of any country in the world.

There was a realignment of currencies in 1949, and Germany was divided into the capitalist West and the communist East in 1948. Stock markets in Eastern Europe were closed by the Communists; the Shanghai Stock Exchange closed in 1949. Tokyo reopened its stock exchange in May 1949, and when the Korean War began in 1950, Japan's economy began its recovery. The two countries with the greatest recoveries between the 1940s and the 1960s were Germany and Japan. After European countries overcame the postwar inflation and recession, the *Wirtschaftswunder* in Germany and *les trente glorieuses* in France produced the highest levels of economic growth in those countries' history. The foundation for the European Economic Community was laid to avoid future wars in continental Europe.

Governments believed they had successfully run their national economies during World War II and expected to do equally well after the war. Major industries were nationalized, shrinking the number of companies listed on stock exchanges in Europe. The Cold War helped focus governments on growing their economies and making Europe's economies succeed. Governments encouraged investment, recovery, and new technologies as stock markets provided their best performance since World War I.

Exhibit 48 shows the performance of an index of developed world stocks between 1900 and 2000. Stock markets showed very little progress between 1900 and 1950 as two world wars and the Great Depression buffeted the global economy. The bull market of the 1920s and the collapse in the early 1930s are clearly visible. After 1949, stock markets went up steadily for the next 50 years, in both nominal and real terms.

After World War II, the Federal Reserve chose to no longer repress interest rates. The Monetary Accord, or Treasury–Fed Accord, of 1951 reestablished the Federal Reserve's independence, and bond yields rose steadily for the next 30 years, peaking in 1974 in some countries, such as Germany and the United Kingdom, and in 1981 in other countries, such as the United States. The second interest rate pyramid, which lasted from 1945 to 2020, was more dramatic than the first. Governments avoided deep recessions by using expansionary monetary and fiscal policies to limit recessions and unemployment, but these actions led to rising inflation and rising interest rates. Increases in bond yields reduced the return to fixed income. After inflation, investors in fixed income generally lost money or earned low returns between 1945 and 1981.

The combination of high returns to equities and low returns to fixed income produced the highest realized equity risk premiums in history. Interest in the stock market grew during the 1950s and 1960s as stocks experienced a long bull market. Double-digit annual returns over a period of two decades occurred in many countries, while bond returns were modest or negative. Following World War II, some analysts, observing recent returns in the stock market, concluded that the postwar returns were the norm for financial markets and would continue in the future. But they did not. The high returns of the period from 1949 to 1968 led to low returns between 1968 and 1981. Data on stock, bond, and bill returns and the realized ERP appear in **Exhibit 49**.

Exhibit 48. GFD Indices Developed World Price Index in US Dollars, 1900–2000

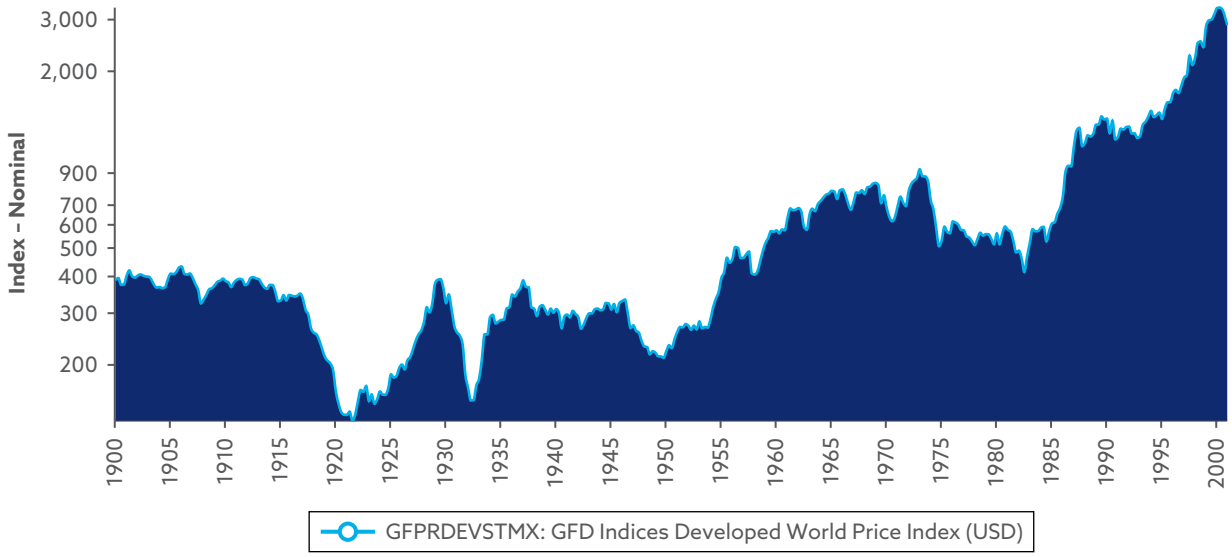


Exhibit 49. Annual Returns on Stocks, Bonds, and Bills in Real US Dollars, 1949–1968 (all data in percent)

Country	Stocks	Bonds	Bills	Bond ERP	Bill ERP	Cap/GDP	Inflation
Australia	12.14	1.57	0.20	10.41	11.92	95.0	5.11
Austria	11.79	6.13	3.70	5.33	7.80	3.7	11.43
Belgium	6.52	2.11	2.86	4.32	3.56	22.9	1.91
Canada	10.14	0.73	1.12	9.34	8.92	134.4	3.26
Denmark	4.61	–0.24	0.96	4.86	3.62	23.0	4.14
Finland	3.68	1.05	–1.42	2.60	5.17	9.9	8.16
France	8.36	0.99	–21.76	7.30	38.50	17.9	10.16
Germany	11.75	2.95	0.08	8.55	11.66	36.2	2.95
India	1.37	–3.05	–3.91	4.56	5.49	7.1	3.96
Ireland	10.36	2.11	2.43	8.08	7.74	90.9	3.44
Italy	10.94	2.44	1.74	8.30	9.04	38.6	5.88
Japan	19.52	7.57	4.94	11.11	13.89	23.0	18.02
Netherlands	10.66	–0.22	0.97	10.90	9.60	60.1	4.11
New Zealand	9.98	–0.65	2.13	10.70	7.69	26.5	4.13
Norway	0.97	–3.73	–2.00	4.88	3.03	20.2	3.69
South Africa	17.61	–1.56	–3.44	19.47	21.80	89.4	3.41
Spain	6.49	–3.38	–2.56	10.22	9.29	28.0	5.75
Sweden	8.02	–0.74	–0.33	8.83	8.38	19.1	3.88
Switzerland	6.69	0.41	0.15	6.25	6.53	43.3	2.07
United Kingdom	13.35	–0.94	1.77	14.43	11.38	77.8	4.08
United States	26.08	–0.41	0.93	26.60	24.92	86.5	2.95
Average	10.05	0.63	–0.54	9.36	10.65	50.7	5.36
World ex-US	11.19	1.62	0.93	9.42	10.17	26.9	
World	11.72	–0.80	0.65	12.62	11.00	57.1	

By the end of the 1960s, the developed world had fully recovered from World War II; however, government regulation of the economy and associated fiscal and monetary policies were leading to higher inflation. In the 1970s, the world would no longer be able to maintain the dollar-linked fixed exchange rates that had been established after Bretton Woods. OPEC would limit its petroleum exports to the West, and the world would suffer two of the most severe economic recessions since World War II. The world would move from the high growth and low inflation of the 1950s and 1960s to the high inflation and low growth of the 1970s. The *Wirtschaftswunder* was over.

1968–1981: OPEC and Stagflation

Wars:	Vietnam War (1965–1973), Arab–Israeli War (1973)
Trade:	Grew because of GATT, slowed down because of OPEC and embargos
Government Intervention:	Increased as government tried but failed to manage the business cycle
Government Debt:	Declined as governments balanced budgets, inflation reduced real levels
Stock Market Returns:	World ex-US: 4.42%; Germany: –1.17%; United Kingdom: –2.75%; United States: 0.22%
New Stock Markets:	Ecuador, Tunisia (1969); Bermuda (1971); Kuwait (1973); Thailand (1975); Costa Rica (1976); Jordan (1978); Trinidad and Tobago (1981)
New Sectors:	Computer peripherals (Seagate Technology, 1981), cable (Comcast Corp., 1986), education (DeVry, Inc., 1991)
Stock Market Capitalization:	Global market cap fell from 41% to 22.5% of global GDP, declined because of inflation
Bear Markets:	OPEC embargo (1973), Iranian Revolution (1979–1981)
Financial Crises:	OPEC (1973 and 1979), Mexico (1981–1982)
Sovereign Defaults:	Peru (1969, 1976, 1978); North Korea, South Vietnam (1975); Angola (1976); Paraguay (1977); Turkey, Jamaica (1978); Ghana, Zaire, Nicaragua (1979); Mozambique, Bolivia (1980)
Bond Returns:	World ex-US: –1.06%; Germany: 1.64%; United Kingdom: –3.84%; United States: –3.17%
Bond Yields:	Germany: 6.13%–10.83%; United Kingdom: 7.91%–17.39%; United States: 5.38%–15.34%
Central Banks Founded:	Monetary Authority of Singapore (1971)
Commodity Prices:	Rose from 1970 until 1980
Inflation:	Accelerating inflation, reached double digits in most countries

Exchange Rates: Fixed rates until 1968, floating rates thereafter

Real Estate: Housing prices rose between 1969 and 1980

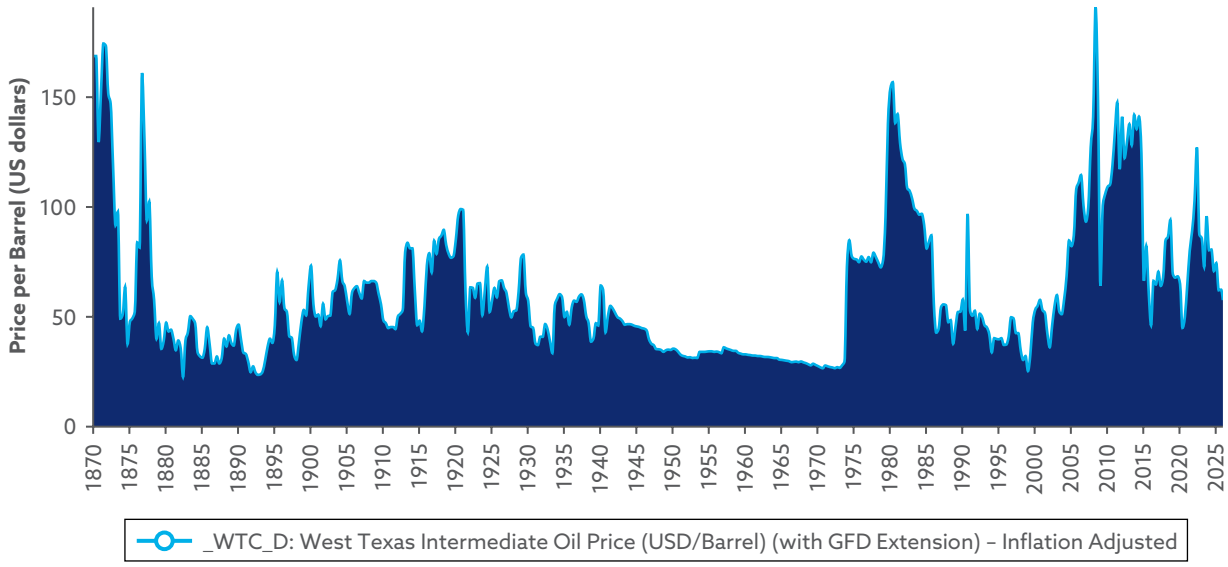
In many ways, 1968 was a watershed year. The Tet Offensive made Americans question their commitment to win the Vietnam War. Martin Luther King and Robert Kennedy were both assassinated. There was student rebellion in Paris, and the Soviet Union invaded Czechoslovakia. Richard Nixon was elected president of the United States, promising peace in Vietnam, although not saying how. Inflation was 3% in the United States in 1967 but rose to 14.8% by 1980. Government bond yields were on a similar rising trajectory. Gold prices floated freely in the market in London, replacing government-controlled pricing.

If everything went right in financial markets between 1949 and 1968, everything went wrong between 1968 and 1981. The biggest contributor to this reversal was OPEC, which raised the price of oil tenfold between 1973 and 1981. This can be seen in **Exhibit 50**, which shows the behavior of inflation-adjusted oil prices between 1870 and 2025.

The first oil price increase was caused by the embargo that OPEC introduced after the 1973 Arab–Israeli War. The second increase, between 1979 and 1981, was caused by the Iranian Revolution, which further constrained supplies. During the 1970s, many countries faced their deepest recessions and largest bear markets since the 1930s. Contrary to the predictions of the Philips Curve, both inflation and unemployment rose together. A "misery index" was constructed, consisting of the sum of the inflation and unemployment rates. This index rose to new highs around the world. The result was stagflation—a stagnant economy and high inflation.

The postwar recovery between 1945 and 1968 was a bounce back from the destruction of World War II. In contrast, the period from 1968 to 1981 exhibited faltering growth, rising inflation, and an inability to find solutions to the problems that existed. In this way, the 1970s were similar

Exhibit 50. West Texas Intermediate Oil Price, Inflation Adjusted (US dollars per barrel), 1870–2025



to the 1930s, but they were less severe. The United States became fully committed to the war in Vietnam, setting off an inflationary spiral that lasted for the next 15 years. Inflation was 3% in 1967, but between then and 1981, inflation gradually crept upward to double-digit levels, the highest peacetime inflation in US history.

As inflation rose, contracts for labor, interest rates, and other financial assets were tied to the inflation rate, creating an inflationary spiral. Governments raised interest rates in the 1960s and 1970s as inflation accelerated in developed economies. Some emerging markets suffered hyperinflation, leading to economic stagnation or worse as consumers focused more on avoiding inflation than increasing production. Some countries, such as Argentina and Brazil, introduced new currencies every few years to get rid of the zeroes that had accumulated through inflation.

Governments tried to inflate their way out of economic problems, further pushing down total market capitalization. By 1981, stock market capitalization as a percentage of GDP had fallen to pre–World War I levels. The Vietnam War (1965–1973) was followed by the 1973 Arab–Israeli War, which led to the quadrupling of oil prices and an economic embargo of the West by OPEC in 1973. A second oil crisis occurred between 1978 and 1979, at the end of which the price of oil was 10 times what it had been in the 1960s. The impact on oil prices is shown in Exhibit 50.

The economic growth of 1945 to 1968 was followed by the stagflation of 1968–1981. The 1973 bear market provided some of the worst returns of the twentieth century, as shown in **Exhibit 51**. The decline in the British stock market between 1972 and 1974 was worse than the decline during the Great Depression of the 1930s. Keynesianism appeared to have failed. Many governments saw no way out of the economic problems of the 1970s. In 1975, the G7 countries

Exhibit 51. Declines in the 1973 Bear Market by Market

Market	Top	Bottom	Decline	Country	Top	Bottom	Decline
Australia	6/23/1972	9/27/1974	–59.4%	Japan	1/24/1973	10/9/1974	–40.4%
Austria	6/30/1973	10/31/1982	–36.2%	Netherlands	5/31/1969	10/31/1974	–47.9%
Belgium	6/30/1973	9/30/1981	–49.6%	New Zealand	7/6/1973	11/5/1974	–39.8%
Canada	10/26/1973	12/6/1974	–37.8%	Norway	1/31/1974	3/31/1978	–62.2%
Denmark	8/31/1973	11/30/1974	–38.2%	Portugal	11/30/1973	11/30/1978	–94.2%
Finland	10/31/1973	11/30/1977	–51.1%	Singapore	2/13/1973	12/18/1974	–76.0%
France	5/7/1973	9/27/1974	–50.0%	Spain	4/24/1974	5/13/1980	–74.1%
Germany	3/23/1973	10/7/1974	–34.9%	Sweden	4/30/1969	10/31/1970	–36.3%
Hong Kong	3/9/1973	12/10/1974	–91.5%	Switzerland	9/11/1972	12/30/1974	–52.2%
Ireland	3/31/1973	1/31/1975	–61.2%	United Kingdom	5/1/1972	12/13/1974	–72.9%
Italy	6/19/1973	12/22/1977	–66.2%	United States	1/5/1973	10/3/1974	–48.0%

(Canada, Germany, France, Italy, Japan, the United Kingdom, and the United States) met in France to try to find a solution to the world's economic problems.

Exhibit 52 documents the poor performance of stocks, bonds, and bills from 1968 to 1981. A comparison of the performance of stocks in Exhibits 52 and 49 shows a dramatic difference in returns between the two periods. The only country that provided double-digit returns between

Exhibit 52. Annual Returns on Stocks, Bonds, and Bills in Real US Dollars, by Market, 1968–1981 (all data in percent)

Market	Stocks	Bonds	Bills	Bond ERP	Bill ERP	Cap/GDP	Inflation
Australia	2.05	–2.36	0.25	4.52	1.80	28.6	9.61
Austria	3.47	3.36	3.62	0.09	–0.14	2.1	6.51
Belgium	–0.08	0.43	3.20	–0.51	–3.18	8.6	7.03
Canada	0.50	–2.66	0.01	3.23	0.49	34.7	7.96
Denmark	4.53	2.11	4.67	2.38	–0.13	10.7	9.51
Finland	6.63	–0.65	1.47	7.32	5.09	4.5	10.08
France	–1.14	–3.15	0.82	2.08	–1.94	6.9	9.62
Germany	0.62	3.48	2.62	–2.76	–1.95	9.2	4.93
India	7.49	–4.14	–0.11	10.87	7.61	3.7	7.90
Ireland	–0.28	–4.88	–0.55	4.83	0.27	18.9	13.79
Italy	–6.36	–6.82	–1.08	0.49	–5.34	6.2	13.08
Japan	10.26	3.52	1.73	6.52	8.38	35.2	8.15
Netherlands	0.84	1.65	1.57	–0.80	–0.72	15.1	7.11
New Zealand	1.81	–5.05	–0.74	7.22	2.57	9.9	11.92
Norway	0.73	–1.55	–0.74	2.32	1.48	5.4	8.69
South Africa	3.67	–3.65	–2.09	7.59	5.88	101.0	10.24
Spain	–3.20	–2.54	0.12	–0.68	–3.32	9.5	14.67
Sweden	3.23	–2.20	–0.42	5.55	3.67	16.0	8.89
Switzerland	0.70	3.70	2.91	–2.89	–2.15	34.0	4.91
United Kingdom	–0.22	–1.33	0.36	1.14	–0.58	37.4	12.50
United States	–1.42	–3.01	–0.63	1.65	–0.80	42.6	8.41
Average	1.61	–1.23	0.81	2.87	0.79	24.8	9.31
World ex-US	2.22	–1.00	–0.63	3.25	2.87	14.7	
World	0.10	–1.92	–0.63	2.06	0.73	22.5	

1968 and 1981 was Japan, which was in the middle of a bubble. France, the United Kingdom, and the United States all registered real stock market losses between 1968 and 1981, and the GFD Indices Developed World Price Index barely changed. Bonds and bills registered real losses in almost every country. Inflation was in double digits annually in seven countries, and it imposed a dramatic drop on stock markets.

By 1981, inflation and bond yields were at their highest levels of the twentieth century in many countries. The stock market had sunk to valuation levels not seen since before World War I. It appeared there was no way out for investors who were losing money in stocks, bonds, and bills. Investors had nowhere to turn that would allow them to make profits and beat inflation. Few suspected that a golden age was about to begin in which two decades of solid returns on stocks and bonds would reverse the losses of 1968–1981 and provide both stock and bond investors with the highest returns in the twentieth century.

6. GLOBALIZATION

Although the post–World War II economy provided spectacular growth and investment returns during the 1950s and 1960s, stagflation in the 1970s led to losses among both stock and bond investors. Some countries faced the worst returns in their history during the 1970s. The world economy would have to change if growth were to continue.

During the 1960s, Japan and the markets known as the East Asian Tigers (South Korea, Taiwan, Singapore, and Hong Kong) achieved spectacular rates of growth through regimes aimed at exporting their goods to the rest of the world. Later, Ronald Reagan and Margaret Thatcher rejected Keynesian policies of government regulating the business cycle, pointing out that these policies produced stagflation, not high growth and low inflation. During the 1970s and 1980s, governments began emphasizing the private sector, deregulation, tax cuts, privatization, freer markets, and other policies designed to rely on the market and not the government.

Exchange rates fixed to the US dollar under Bretton Woods were replaced with floating rates. European leaders replaced policies of nationalization and socialism with privatization and freer markets; even the Socialist French president, François Mitterand, joined in. Countries that were previously considered "Third World" began to be regarded as emerging markets that relied on foreign investment and the stock market to promote growth, not government ownership, import substitution, and socialist policies. Communist governments in the Soviet Union and Eastern Europe collapsed and were replaced by more market-oriented governments that wanted to transition from communism back to capitalism. Meanwhile, China promoted export-driven trade, opening up to the rest of the world. Technology brought the world closer together, as satellites, personal computers, and the internet transformed society.

By 2000, the world was barely recognizable to an observer from 20 years before. Although stock market capitalization was less than 20% of GDP in many countries in 1980, by 2000 it often exceeded GDP. This transition was not without its costs, however. There were financial crises in Mexico in 1982, Japan in 1989, several Asian markets in 1997, and Russia in 1998. The savings and loan crisis struck the United States in the 1990s. The Japanese stock market bubble began to burst in 1989, when Japan's market capitalization was greater than that of the United States. Japan began a multidecade adjustment to contain the crisis.

The combination of the internet bubble, the September 11 attacks, and a general overvaluation of stocks led to the sharp decline of 2000–2003. It was the worst bear market since the 1970s. Stocks recovered between 2003 and 2007. Money flowed into the United States from Asia, and central banks provided funding to banks, which lent the money to individuals, funding a real estate boom that began to crash in 2007. Stock markets fell again in 2007–2009, even more sharply than in 2000–2003. Thus, for the first time in history, the GFD Indices World Developed Price Index suffered two bear markets of 50% or more in the same decade.

To help the world recover from the Great Recession of 2007–2009, central banks pushed down interest rates to their lowest levels in history, in some cases to negative levels. New central bank policies were used, such as quantitative easing, whereby the Federal Reserve bought financial assets and added them to its balance sheet to push down long-term bond yields. By the end of the 2010s, some European 10-year bond yields had sunk to negative levels and US bond yields were lower than the inflation rate. After 40 years of declining bond yields between

1981 and 2020, interest rates reached a point where they could go no lower. After the COVID-19 pandemic of 2020 brought inflation to its highest levels since the 1980s, central banks raised interest rates, finally ending the 40-year interest rate downtrend.

Between 2009 and 2026, technology companies drove US stock indexes higher, but recovery outside the United States was slow. Many countries failed to recover the highs their markets had reached in either 2000 or 2007. US stocks (especially in the information technology, communications, and biotechnology sectors) soared, driven by technology stocks, which had an international reach. The market capitalization of US stocks rose to almost double the country's GDP, and the 10 largest stocks represented the highest percentage of total market cap ever recorded. By 2026, US stocks represented more than 60% of S&P Global's investable global market.

The COVID-19 pandemic pushed financial markets into a new period of higher inflation, higher interest rates, and lower returns on bonds. The United States and other countries responded to the COVID-19 shock of high unemployment and a rapid, short-term decline in output by running large government deficits. This action led to the highest inflation rates since the early 1980s, forcing central banks to raise interest rates in an effort to reduce inflation to the 2% level that had prevailed between 2000 and 2020. As of this writing in 2026, however, this 2% goal has still not been achieved.

In 2022, Russia invaded Ukraine. In 2023, Hamas attacked Israel, leading to wars between Israel and multiple enemies: Hamas in Gaza, Hezbollah in Lebanon, the Houthis in Yemen, and Iran. The world had to endure proxy wars between the East and the West, with technological development as a key to the success in these wars. In 2025, after Donald Trump became president of the United States for the second time, he began the most significant increase in tariff rates since the Smoot–Hawley tariffs of the 1930s, threatening global supply chains and world trade dynamics that had been in place since the end of World War II.

In 2020, advances in mRNA technology enabled researchers to quickly find a vaccine for COVID-19. Advances in AI and in the semiconductors needed for this technology led to the investment of trillions of dollars in new technology. Drones, hypersonic missiles, ballistic missiles, and cruise missiles led to a new kind of war based on rapid technological advances. Western countries focused on monopolizing control over AI, solar technology, information technology, communications, biotechnology, autonomous electric vehicles, and other areas to forestall China's and Russia's advances in these technologies. The West used a combination of trade controls, tariffs, sanctions, and other restrictions to achieve these goals.

To develop these technologies independently of the West, China poured massive amounts of money into them. The development of these technologies was seen as instrumental in maintaining and promoting economic growth. Technology wars became the focus of the conflict between the East and the West. Technological change will determine the returns to investors between 2020 and 2040. The global bull and bear markets that occurred between 1981 and 2025 are shown in **Exhibit 53**.

Changes in the shares of market capitalization of various sectors for the United States are provided in **Exhibit 54**. The most obvious change between 1981 and 2025 is the rise in communications, health care, and information technology. Finance grew after the government removed many of the regulatory restrictions on banks. Meanwhile, energy, materials, and utilities shrank

Exhibit 53. GFD Developed World Index Bull and Bear Markets, 1981–2025

Bottom	Bear Decline	Top	Bull Rise
		4/27/1981	116.51
8/12/1982	–26.56	8/27/1987	318.87
10/26/1987	–23.70	1/4/1990	50.92
9/28/1990	–25.90	7/20/1998	170.11
10/8/1998	–20.05	3/27/2000	58.49
10/9/2002	–51.41	10/31/2007	139.07
3/9/2009	–59.07	5/2/2011	102.13
10/3/2011	–22.93	1/26/2018	109.65
12/25/2018	–20.17	2/12/2020	35.63
3/23/2020	–34.20	1/4/2022	102.74
10/12/2022	–27.11		56.60

Note: No bear market occurred between 2022 and the time of this writing in 2026.

in importance, and the old, regulated telecommunications sector lost much ground to the new communications category. Technology has come to dominate the stock market and the economy of the United States during the past 50 years. This trend is expected to continue in the future.

The United States remains the world's largest market, representing more than 50% of global stock market capitalization and more than 60% of investable global stocks. Japan, which in 1988 had the largest stock market in the world, with more than 40% of global market cap, shrank to 6% by 2025. The United Kingdom and Canada each represented about 3% of global stocks, while France, Germany, and Switzerland each represented about 2%. The Chinese Mainland represented 10% of global market cap but only 3% of the investable market, primarily with stocks listed on the Hong Kong Stock Exchange. India represented about 4% of the global market and 2% of the investable market in 2025. The trends in the share of global market capitalization between 1981 and 2024 can be seen in **Exhibit 55**.

If you had to use one word to sum up the future of the stock market during the next 10 years, it would have to be technology. Such countries as the United States, China, Russia, and Ukraine are fighting technology wars to determine which countries will dominate the 2020s and 2030s. Trillions of dollars are being poured into these new technologies to develop them and dominate both consumer markets and military battlefields. Success in technology will determine which countries will lead the global economy in the 2030s.

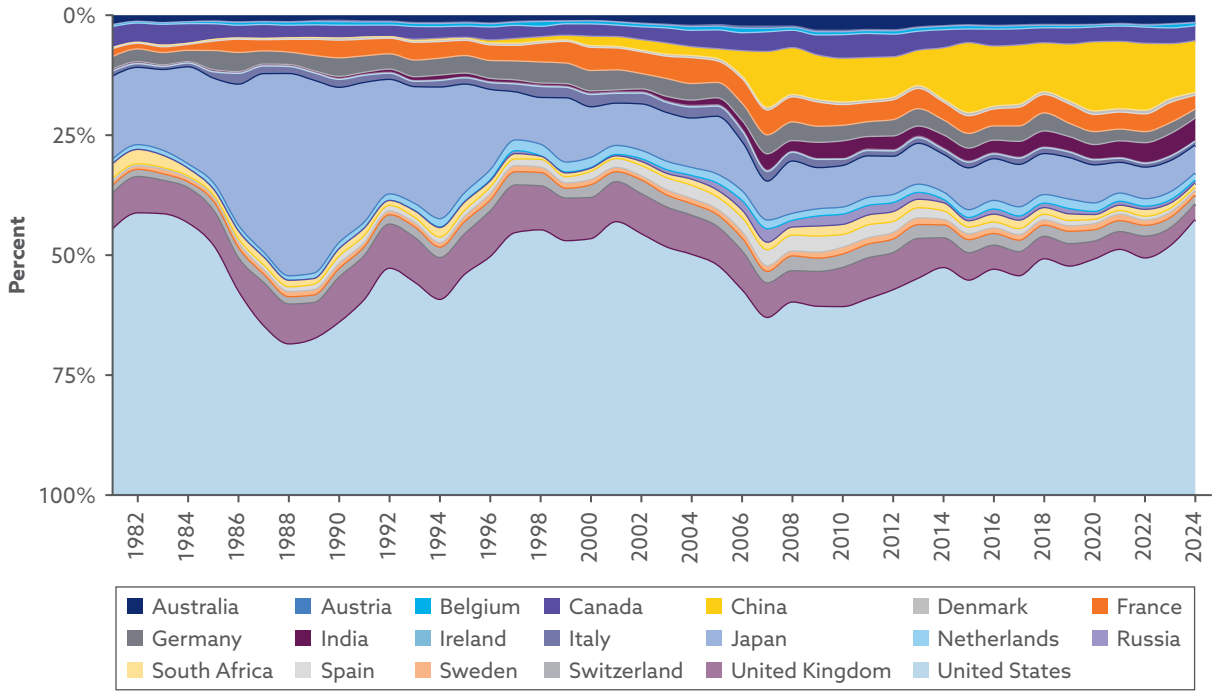
Exhibit 54. Sector Allocations in the United States, 1981–2025 (all data in percent)

Sector	1981	1999	2019	2025
Communications	2.55	5.64	11.24	10.58
Consumer Discretionary	9.54	6.98	10.69	10.41
Consumer Staples	6.94	5.95	7.70	4.71
Energy	21.92	4.35	3.44	2.81
Finance	8.72	12.35	15.57	13.4
Health Care	6.18	7.41	11.77	9.59
Industrials	11.33	6.25	7.29	6.63
Information Technology	8.90	20.97	19.04	34.43
Materials	10.00	2.63	2.78	1.83
Real Estate	0.77	0.94	2.62	1.83
Transports	2.30	0.73	1.98	1.53
Utilities and Telecommunications	10.84	25.79	5.87	2.25

1981–1999: Privatization

Wars:	Iran–Iraq War (1980–1988), Soviet–Afghan War (1979–1989), Gulf War (1990–1991)
Trade:	Globalization increased trade; China, India, other countries joined
Government Intervention:	Reduced, privatization was favored
Government Debt:	Increased as governments ran budget deficits
Stock Market Returns:	World ex-US: 11.90%; Germany: 12.72%; United Kingdom: 14.28%; United States: 15.44%
New Stock Markets:	Côte d'Ivoire (1982); Cyprus (1983); Saudi Arabia (1985); Bahrain, Barbados, Guatemala, United Arab Emirates (1987); Mauritius, Oman (1988); Botswana, Panama, Slovenia (1989); Eswatini, Ghana, Nicaragua (1990); Dominican Republic, Mongolia, Slovakia (1991); Malta, Namibia (1992); Bhutan, El Salvador, Honduras, Kazakhstan, Montenegro, Nepal (1993); Czech Republic, Kyrgyzstan, Moldova, Sudan, Suriname, Uzbekistan, Zambia (1994); Estonia, Malawi, North Macedonia, Palestine, Qatar (1995); Albania, Latvia, Lithuania, Myanmar (1996);

Exhibit 55. Share of Global Stock Market Capitalization by Country, 1981–2024



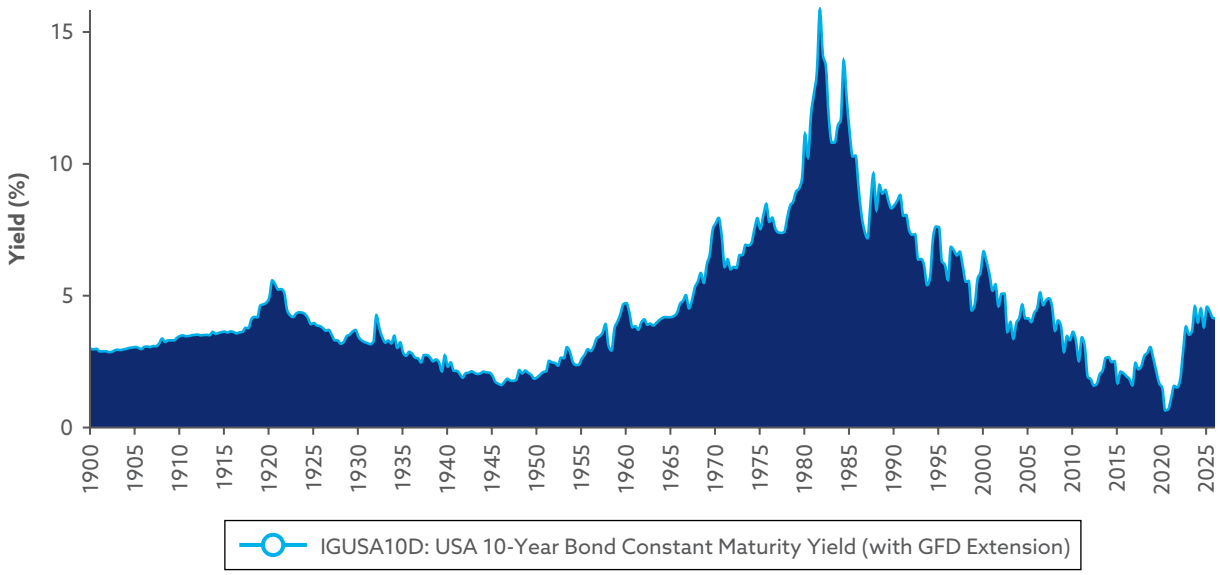
	Algeria, Uganda (1997); Belarus, Cape Verde, Tanzania, Ukraine (1998); Bahamas, Georgia, Mozambique (1999)
New Sectors:	Biotech, information technology, communications
Stock Market Capitalization:	Global market cap rose from 22.5% to over 100% of global GDP; privatization and globalization drove the increase
Bear Markets:	Stock market crash of 1987, Gulf War (1990), dot-com bubble (2000)
Financial Crises:	Latin America (1980–1989), stocks (1987), Japan (1990), S&L crisis (1989), Asia (1997), Russia (1998)
Bond Returns:	World ex-US: 8.03%; Germany: 6.63%; United Kingdom: 8.51%; United States: 7.76%
Bond Yields:	Germany: 3.83%–9.95%; United Kingdom: 4.18%–15.15%; United States: 4.16%–14.95%
Central Banks Founded:	Reserve Bank of Fiji (1984); Central Bank of Russia (1990); Bangko Sentral ng Pilipinas, Hong Kong Monetary Authority (1993); European Central Bank (1999)
Commodity Prices:	Fell during entire period until 1999

Inflation:	Declined from double digits in most countries to around 5%
Exchange Rates:	Floating
Real Estate:	Prices stabilized between 1980 and 1985, rose until 1991, stable to 2000

There is no definitive date when governments began focusing on globalization and the private sector rather than on fiscal policy and government regulation to promote growth. This transition took place slowly during the 1970s and 1980s. Was it during the collapse of fixed exchange rates in 1973? Paul Volcker's determination to squash inflation in 1979? The election of Margaret Thatcher and Ronald Reagan? The emphasis on supply-side rather than demand-side economic policies? London's Big Bang (deregulation of financial markets) in 1987? The fall of the Berlin Wall in 1989? The opening of the Shanghai Stock Exchange in 1990? Or the collapse of the Soviet Union in 1991?

From a financial point of view, the most important transition was the bottom of the bear market in bonds and equities in 1981 (see **Exhibit 56**). In October 1979, US Fed Chair Paul Volcker decided to stop the inflationary and interest rate spiral that had strangled financial markets during the 1970s no matter what the cost to the economy. Interest rates peaked in 1981, so this date marks the starting point of the Privatization period. Although investors were ultimately rewarded by this emphasis on global trade and freer markets, many crises in the 1980s and 1990s slowed the transition. As with a patient in the hospital, emergency care needed to be introduced to resolve each crisis as it came along. The Mexican debt crisis in 1982, the 1987 stock market crash, the savings and loan (S&L) crisis in the late 1980s and early 1990s, the Asia crisis in 1997, the Russian crisis in 1998, and the popping of the dot-com bubble in 2000 all proved to be hiccups in the robust growth of the global economy as technology and changes in policy transformed it.

Exhibit 56. US 10-Year Bond Constant Maturity Yield, 1900–2025



The year 1981 marked both the nadir of the decline in global stock markets and the peak of global interest rates and bond yields. The period between 1981 and 1999 was a golden age for investors, providing some of the strongest returns on stocks and bonds in history. In contrast to the high returns on stocks and low returns on bonds from 1945 to 1968, the period between 1981 and 1999 provided high returns to both stocks and bonds, with each asset class sharing in the benefits of globalization. The goal, as they said in the 1990s, was to have a Goldilocks economy in which everything was "just right." Trillions of dollars flowed into financial assets. The average investor simply could not lose. If there was little confidence in financial assets in 1981, there was complete confidence in financial assets in 1999.

Communism collapsed in the 1980s, and by the 1990s, every major country in the world, including the former Communist countries, had stock markets that could drive growth. In the 1970s, because of high inflation and the poor development of local financial markets, many emerging markets were unable to issue long-term government bonds. This began to change in the 1980s, after the crisis in lending to Latin America by banks led to the Brady Plan for emerging market debt restructuring. Once high inflation was eliminated, most emerging markets and countries agreed to follow the "Washington consensus" of free trade and less regulation, so capital could flow into these emerging markets to find new outlets for investing. Dozens of stock markets opened in emerging markets in the 1980s and 1990s to promote growth in their economies. These capital inflows also had a downside, leading to financial crises in several countries in 1997 and 1998.

It was not until the 1980s that equity markets became globalized for the first time since World War I. It took more than 70 years for the world to return to the globalized system of free trade that existed before World War I. The poor performance of markets and the economy in response to the OPEC oil crises of 1973 and 1979 brought the role of government in regulating the economy into question. The government had clearly failed to regulate the business cycle successfully. In the 1980s, privatization swept over capitalist economies, and governments promoted trade and freer markets. Communist countries collapsed, and many chose capitalism over socialism. The former Communist countries opened stock markets and began to integrate into the world's financial markets. China began its rapid growth, becoming the second largest economy in the world by the 2020s. The ratio of global market capitalization to GDP had its most dramatic increase in history, going from single digits in some countries to more than 100% by 1999.

Technology aided economic growth as computers, satellites, telecommunications, biotechnology, and other innovations flourished. Although there had been some growth in technology stocks in the 1960s and electronic stocks grabbed many investors' attention, interest exploded when personal computers became available and the internet and World Wide Web linked the world together in the late 1990s. The combination of privatization, expanding markets, and technological change produced the greatest expansion in the number of companies and stock market capitalization in history and the highest returns in decades for almost every country in the world. Declining bond yields meant that fixed-income investors received high returns. Everywhere one invested, returns were high.

This situation is illustrated in **Exhibit 57**, which documents returns on stocks, bonds, and bills between 1981 and 1999. Double-digit returns on stocks occurred in 11 countries, while high returns on bonds occurred in all the developing countries. Only emerging markets experienced low fixed-income returns. By 1999, financial assets had provided two decades of high returns no matter where the money was invested.

Exhibit 57. Annual Returns on Stocks, Bonds, and Bills in Real US Dollars, by Market, 1981–1999 (all data in percent)

Market	Stocks	Bonds	Bills	Bond ERP	Bill ERP	Cap/GDP	Inflation
Australia	7.41	7.41	3.76	0.00	3.52	102.2	4.70
Austria	7.71	6.62	4.26	1.03	3.31	16.1	2.21
Belgium	14.06	8.12	4.09	5.49	9.58	76.0	2.93
Canada	7.02	8.30	3.71	–1.18	3.19	113.2	3.34
Denmark	11.02	11.26	7.52	–0.22	3.26	58.3	3.46
Finland	23.80	8.11	4.78	14.51	18.15	273.4	3.76
France	15.57	8.82	4.23	6.21	10.88	106.6	3.33
Germany	12.34	6.27	2.86	5.71	9.22	69.2	2.13
India	7.65	–2.59	–0.89	10.49	8.62	42.4	8.87
Ireland	14.48	9.70	5.15	4.35	8.87	74.8	3.93
Italy	9.76	10.62	5.56	–0.78	3.98	61.6	5.93
Japan	8.31	8.72	4.65	–0.37	3.50	86.1	1.25
Netherlands	18.59	6.86	3.30	10.97	14.80	164.3	2.08
New Zealand	6.13	6.92	6.32	–0.74	–0.18	48.9	5.53
Norway	8.94	7.44	3.86	1.40	4.89	40.4	4.46
South Africa	3.74	1.45	–0.54	2.25	4.30	172.8	11.62
Spain	14.76	9.05	4.28	5.22	10.05	71.8	5.45
Sweden	16.74	7.10	4.00	9.00	12.25	141.0	4.63
Switzerland	12.24	2.89	1.38	9.08	10.71	242.9	2.43
United Kingdom	14.35	8.58	4.78	5.31	9.13	175.3	4.31
United States	15.44	7.76	2.95	7.12	12.13	177.8	3.29
Average	11.91	7.11	3.81	4.47	7.80	110.3	4.27
World ex-US	11.90	8.03	2.95	3.58	8.69	78.6	
World	13.28	7.6	2.95	5.28	10.03	109.3	

1999–2019: Financial Repression

Wars:	Afghanistan War (2001–2021), Iraq War (2003–2011)
Trade:	China, India, other countries integrate into global supply chains
Government Intervention:	Governments spent more money to support the economy
Government Debt:	Increased as governments ran budget deficits
Stock Market Returns:	World ex-US: 2.27%; Germany: 2.52%; United Kingdom: 1.22%; United States: 3.02%
New Stock Markets:	Azerbaijan, Vietnam (2000); Armenia, Bosnia, Cameroon (2001); Maldives (2002); Gabon (2003); Iraq (2004); Libya (2007); Afghanistan, Syria (2009); Cambodia, Laos, Rwanda (2011); Seychelles (2012); Gibraltar (2014); Somalia (2015); Angola, Lesotho (2016); Macau (2018)
New Sectors:	Information technology, communications, biotechnology
Stock Market Capitalization:	Global market cap rose from 109% to 114% of global GDP, fluctuated with business cycle, stayed high
Bear Markets:	Dot-com bubble (2000), Great Recession (2007–2009)
Financial Crises:	Global (2000–2003, 2007–2009); eurozone crisis (2008–2014)
Bond Returns:	World ex-US: 3.40%; Germany: 3.52%; United Kingdom: 2.52%; United States: 3.04%
Bond Yields:	Germany: –0.74%–5.79%; United Kingdom: 0.41%–5.95%; United States: 1.37%–6.79%
Commodity Prices:	Rose until 2010; declined until 2020
Inflation:	Declined from around 5% to around 2%
Exchange Rates:	Floating rates, euro established in 1999
Real Estate:	Housing prices rose from 2001 to 2008, stable until 2015, then rose

The dot-com bubble in the late 1990s, the September 11 attacks in 2001, the Afghanistan War, the Iraq War, the Global Financial Crisis of 2007–2009, and the eurozone crisis involving Portugal, Ireland, Italy, Greece, and Spain in 2010 contributed to the volatility of the period from 1999 to 2019. It was a period of lower returns than the preceding period from 1981 to 1999. None of these crises, however, was able to keep stock markets from rising in value (although they rose at a slower rate) or stock market capitalization from remaining high.

From an equity perspective, these 20 years can be divided into two periods. The period from 1999 to 2009 was one of low returns on stocks in the United States and Europe, as the developed world suffered two major financial crises, but high returns occurred in emerging markets.

The period from 2010 to 2019 was one of high returns to US Stocks, low returns to European stocks, and stagnation among emerging market stocks. The declines during the bear markets of 2000–2003 and 2007–2009 are illustrated in **Exhibit 58**.

The common factor during these two decades was the continued decline in bond yields and interest rates to negative levels in Europe by the end of the 2010s. Bonds continued to provide high returns as bond yields continued to decline and the price of government bonds rose. Bonds provided higher returns between 1999 and 2009 than between 2010 and 2019, but returns were still positive during 2010–2019. Real bill returns were low in the 2000s but negative during the 2010s. By the end of the 2010s, yields were pushed down to negative levels in Europe and negative real levels in the United States.

Central banks saw it as their mission to save the economy from the periodic crises that buffeted the global economy. The European Central Bank came into existence in 1999 with the mandate of controlling inflation. It did so successfully, although European GDP growth remained stagnant in some countries. During the 2010s, the European Central Bank (ECB) focused on dealing with the eurozone crisis of 2010, and in 2012, the ECB president, Mario Draghi, said he would do anything to save the euro, including bond buying to lower borrowing costs. To achieve this goal, European central banks pushed down interest rates, and bond yields and central bank policy rates reached their lowest levels in history by the end of the 2010s. Once European central banks lowered interest rates to negative levels, interest rates ended their 40-year decline and set up the prospect of a sudden rise in rates when inflation hit in the 2020s.

Exhibit 59 illustrates the impact of rising housing prices between 1944 and 2025 in the United States. The shortage of housing during World War II and the postwar boom caused housing prices to rise dramatically between 1944 and 1952. For the next 45 years, housing prices rose at the rate of inflation. Beginning in 1997, however, housing prices rose much faster, peaking in 2006, before declining dramatically between 2006 and 2011. A second wave of increases in housing prices occurred between 2011 and 2022. In real terms, housing prices in 2022 were twice as high as they were in 1997. Housing price increases were higher in places such as California than in such regions as the midwestern United States.

Exhibit 60 illustrates the declines in global stock markets in 2000–2003 and 2007–2009. It also shows the difference in the return on stocks between the United States and the rest of the developed world since 2008. The United States underperformed both the MSCI EAFE (Europe, Australasia, and Far East) Index and the MSCI Emerging Markets Index between 2000 and 2007. Emerging markets far outperformed developed markets between 2000 and 2007. But between 2007 and 2020, both the EAFE and the emerging markets indexes failed to rise above the highs they reached in 2007.

US stocks steadily outperformed the rest of the world between 2008 and 2025. The United States has benefited from the outperformance of information technology, communications, and biotechnology stocks. The market capitalization of US stocks is now around twice US GDP because of the global reach of its technology companies. In 2025, all 5 of the largest companies and 17 of the 20 largest companies in the world were based in the United States. How much longer this outperformance will continue remains to be seen.

Worldwide, although returns on stocks and bonds were spectacular in the 1980s and 1990s, returns between 1999 and 2019 were lower because of the two 50% or larger bear markets in 2000–2003 and 2007–2009. Rather than stimulate the economy through government

Exhibit 58. Bear Market Declines in 2000–2003 and 2007–2009

Market	Top	Bottom	Decline	Top	Bottom	Decline
Australia	3/7/2002	3/13/2003	–22.3%	11/1/2007	3/6/2009	–54.6%
Belgium	1/6/1999	3/12/2003	–58.3%	5/23/2007	3/3/2009	–64.5%
Canada	9/1/2000	10/9/2002	–50.0%	5/20/2008	3/9/2009	–49.7%
Chinese Mainland	4/17/2001	6/3/2005	–53.3%	10/16/2007	11/4/2008	–72.0%
Denmark	10/6/2000	3/12/2003	–48.5%	10/11/2007	3/9/2009	–62.1%
France	9/4/2000	3/12/2003	–62.9%	6/1/2007	3/9/2009	–59.5%
Germany	3/7/2000	3/6/2003	–70.0%	7/16/2007	3/6/2009	–58.7%
Hong Kong SAR	3/28/2000	4/25/2003	–54.1%	10/30/2007	10/27/2008	–65.2%
India	2/11/2000	9/17/2001	–54.8%	1/8/2008	3/9/2009	–60.9%
Ireland	6/22/2001	10/9/2002	–43.9%	2/20/2007	3/9/2009	–80.8%
Italy	3/10/2000	3/12/2003	–56.4%	5/18/2007	3/9/2009	–69.3%
Japan	2/7/2000	3/11/2003	–56.1%	2/26/2007	6/4/2012	–61.7%
Netherlands	9/4/2000	3/12/2003	–66.9%	7/16/2007	3/5/2009	–63.6%
Norway	9/14/2000	2/25/2003	–57.9%	7/19/2007	11/21/2008	–64.7%
Portugal	3/3/2000	2/25/2003	–64.8%	7/17/2007	6/13/2012	–67.8%
Singapore	1/3/2000	3/10/2003	–53.1%	10/11/2007	3/9/2009	–65.2%
South Korea	1/4/2000	9/25/2001	–55.4%	10/31/2007	10/24/2008	–54.5%
Spain	3/6/2000	10/9/2002	–50.4%	10/31/2007	3/9/2009	–58.5%
Sweden	3/6/2000	3/12/2003	–68.3%	7/16/2007	11/21/2008	–58.7%
Switzerland	8/23/2000	3/12/2003	–56.5%	6/1/2007	3/9/2009	–55.0%
Taiwan	4/5/2000	10/3/2001	–66.2%	10/29/2007	11/20/2008	–58.3%
United Kingdom	9/4/2000	1/27/2003	–46.8%	6/15/2007	11/21/2008	–43.8%
United States	3/24/2000	10/9/2002	–49.2%	10/9/2007	3/9/2009	–56.8%
MSCI World Index	3/27/2000	10/9/2002	–51.4%	10/31/2007	3/9/2009	–59.1%
MSCI EAFE Index	6/6/2000	3/12/2003	–43.3%	10/31/2007	3/9/2009	–62.4%
MSCI Emerging Markets Index	2/10/2000	9/21/2001	–53.7%	10/29/2007	10/27/2008	–66.1%

Exhibit 59. Case–Shiller House Price Index Adjusted for Inflation, 1944–2025

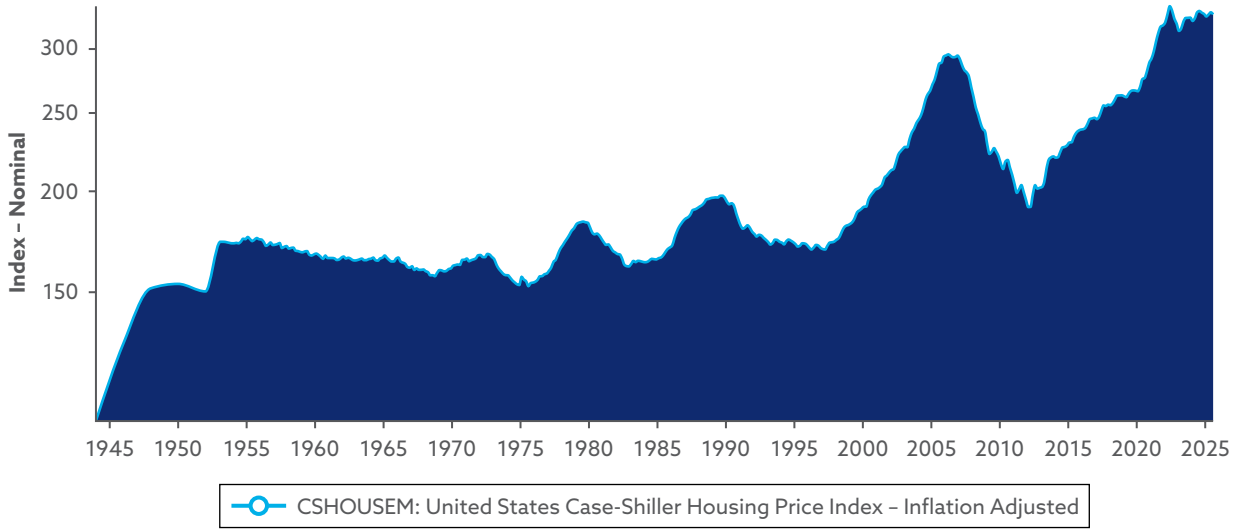
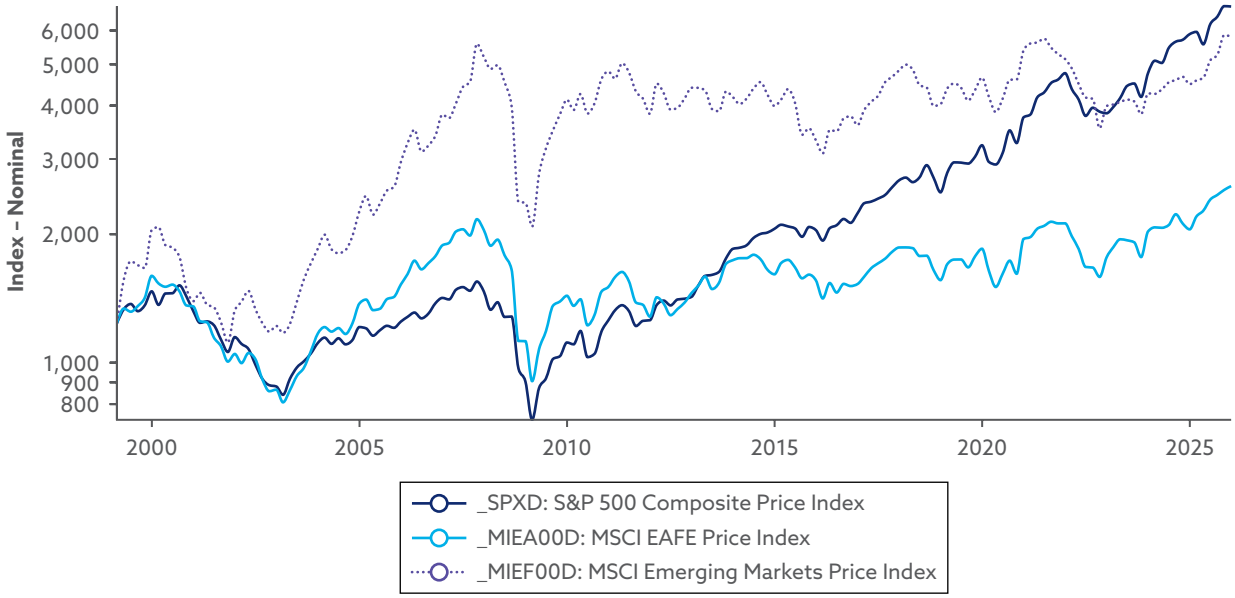


Exhibit 60. S&P 500, MSCI EAFE, and MSCI Emerging Markets Indexes, 1999–2025



expenditures, as Keynes recommended, central banks in Europe and Japan lowered interest rates to unprecedented negative levels and expanded their balance sheet to keep capital flowing into their economies. Central banks successfully controlled inflation, which remained below 2% throughout the developed world in the 2010s. Quantitative easing was used to drive long-term interest rates down.

After years of central bank intervention, interest rates reached levels where they could decline no more. Governments worldwide felt free to run deficits, which accumulated over time because the rising levels of government debt did not cause bond yields to increase. Before 1981, equity market capitalization and the size of government debt usually moved inversely to one another, but since 1981, both increased as a share of GDP. Any return to higher interest rates will place a severe strain on the budgets of any country that has accumulated debt. The returns on stocks, bonds, and bills between 1999 and 2019 are provided in **Exhibit 61**.

2019–2026: Technology Wars

Wars:	Ukraine (2022 to present), Middle East (2023 to present)
Trade:	Trade restrictions with Russia and China, Trump tariff regime
Government Intervention:	Governments ran deficits to support the economy during COVID-19 and afterward
Government Debt:	Increased as governments ran budget deficits
Stock Market Returns:	World ex-US: 6.18%; Germany: 5.64%; United Kingdom: 4.67%; United States: 10.71%
Major Markets and Sectors:	Information technology, communications, biotech grew
Stock Market Capitalization:	Globally over 100% of GDP, fluctuated with the business cycle
Bear Markets:	COVID-19 (2020), inflation and Ukraine War (2022)
Financial Crises:	Russia (2022)
Bond Returns:	World ex-US: –5.84%; Germany: –6.27%; United Kingdom: –6.14%; United States: –4.19%
Bond Yields:	Germany: –0.83%–2.86%; United Kingdom: 0.75%–4.93%; United States: 0.52%–4.98%
Commodity Prices:	Rose between 2020 and 2022, fell thereafter
Inflation:	Post–COVID-19 spike drove inflation to levels not seen since the 1980s
Exchange Rates:	Floating
Real Estate:	Rising prices

Exhibit 61. Annual Returns on Stocks, Bonds, and Bills in Real US Dollars by Market, 1999–2019 (all data in percent)

Market	Stocks	Bonds	Bills	Bond ERP	Bill ERP	Cap/GDP	Inflation
Australia	6.53	5.03	2.16	1.43	4.28	105.9	2.64
Austria	4.74	3.52	–0.08	1.18	4.82	28.8	1.94
Belgium	2.81	3.87	–0.10	–1.02	2.91	78.6	1.93
Canada	4.59	3.58	0.45	0.97	4.12	135.2	1.90
China	4.08	2.51	1.09	1.53	2.96	60.9	2.34
Denmark	8.83	3.66	0.30	5.00	8.50	118.2	1.59
Finland	0.38	3.64	–0.08	–3.13	0.46	104.3	1.50
France	2.51	3.64	–0.10	–1.09	2.61	105.5	1.42
Germany	2.38	3.38	–0.09	–0.97	2.47	51.1	1.45
India	7.63	3.05	2.30	4.46	5.21	78.7	6.32
Ireland	2.55	4.57	–0.09	–1.94	2.64	40.6	1.73
Italy	–0.31	4.24	–0.11	–4.36	–0.20	40.8	1.66
Japan	–0.74	–0.45	–2.23	–0.29	1.52	113.0	0.15
Netherlands	1.36	3.50	–0.09	–2.07	1.45	132.9	1.87
New Zealand	9.30	6.39	3.60	2.74	5.50	50.0	2.15
Norway	6.34	2.32	0.15	3.93	6.18	66.6	2.06
South Africa	6.12	3.73	1.43	2.31	4.62	243.8	5.59
Spain	0.84	4.31	0.10	–3.33	0.74	57.1	2.06
Sweden	3.52	2.65	–0.95	0.85	4.51	153.0	1.32
Switzerland	5.22	3.44	1.16	3.18	4.01	247.5	0.43
United Kingdom	0.89	2.19	–0.76	–1.28	1.66	112.4	2.82
United States	3.02	3.04	–0.48	–0.03	3.52	155.6	2.14
Average	3.75	3.45	0.34	0.30	3.40	103.7	2.14
World ex-US	2.27	3.40	–0.48	–1.09	2.76	90.9	
World	2.75	2.78	–0.48	–0.03	3.25	113.7	

Technology became the focus of industrial policy in the United States, China, and the rest of the world during this period. Between 1999 and 2019, supply chains connecting the United States, China, Europe, and other countries enabled new technology to spread around the world and share the benefits of new hardware and software with everyone. Statista estimates that there are more than 7 billion smartphones in the world today (Statista 2025). Semiconductors are embedded in almost every consumer good, and software drives the performance of billions of goods. COVID-19 vaccines used mRNA technology to immunize people against the pandemic. The development of CRISPR (clustered regularly interspaced short palindromic repeats) technology allows scientists to edit genes to correct genetic disorders. Genomic sequencing helps to identify at-risk populations and target therapies. Wearable devices provide continuous, remote monitoring of patient data and allow individuals to track this information on their smartphones. The global economy has been completely transformed since 1981. Who knows what the world will look like in 2050?

Every nation recognizes that technology will be the key factor in driving economic growth in the future. However, technology is important not only for consumption but also for war. Drones have become one of the key components for armies in the Ukraine, including hypersonic missiles, cruise missiles, and ballistic missiles. Although open markets were the key to growth during the first two decades of the twenty-first century, technology restrictions are now seen as a key to maintaining economic, military, and political leadership. The fear is that cyberwars may replace military wars. Mastering artificial intelligence is seen as the key to maintaining economic growth in the future. Instead of emphasizing free trade and international supply chains, economic sanctions, embargoes, tariffs, and other restrictions have become the focus of economic policy. US President Trump has used tariffs to influence the behavior of other countries. The world has progressed from two world wars to the Cold War to the Technology Wars.

Central banks pushed interest rates and bond yields down to their lowest levels in history between 1981 and 2020. The COVID-19 pandemic led to record stimulus from both monetary and fiscal policy to offset the declines in GDP that occurred when governments restricted economic activity to stop the spread of the disease. However, the decline in international trade, stimulus to the economy, and labor shortages increased inflation to levels that had not occurred in the developed world since the 1980s. Rising inflation pushed central banks to raise interest rates dramatically in the 2020s, breaking the 40-year rate downtrend that had persisted since 1981. In addition, wars in Ukraine and the Middle East pushed up commodity prices, feeding the inflation that followed.

Bond returns in 2021, 2022, and 2023 are shown in **Exhibit 62**. A dramatic increase in bond yields led to declines in bond prices and losses for fixed-income investors. After inflation, bond investors in most developed countries lost more than 30% of their investment summed across those two years. These were the worst losses, outside of hyperinflationary periods, to fixed-income investors in history. It will take the rest of the decade for fixed-income investors to recover from these losses.

Bond returns for the United States and Germany are illustrated in **Exhibit 63**. Bond prices increased consistently from 2000 to 2020 but declined in 2021 and 2022, returning to 2012 levels and wiping out 10 years of nominal bond returns to investors. After inflation, it will take even longer to recover from those losses.

The world suffered two bear markets within two years of each other, the first from the COVID-19 pandemic in 2020 and the second from the combined impact of inflation and higher interest rates in 2022. Neither one, however, was of the magnitude of the 2000–03

Exhibit 62. Global Stock and Government Bond Returns, by Market, in 2021, 2022, and 2023 (all data in percent)

Market	2021 Bonds	2022 Bonds	2023 Bonds	2022 Stocks	2023 Stocks	2022 Inflation	2023 Inflation
Australia	–4.92	–16.59	4.92	–2.56	12.98	7.83	5.37
Belgium	–4.43	–23.20	7.80	–23.20	9.94	10.35	1.35
Canada	–5.35	–13.14	5.32	–5.84	11.75	6.32	3.40
China	6.77	2.04	5.34	–13.09	0.36	1.87	–0.39
France	–3.27	–26.11	8.22	–7.69	19.12	5.86	3.70
Germany	–3.91	–21.79	7.77	–16.9	19.02	8.55	4.28
India	2.04	0.78	8.60	5.69	19.17	5.78	5.69
Italy	–5.08	–24.70	12.1	–9.33	34.39	11.63	0.59
Japan	–0.35	–3.00	–1.72	–2.45	14.85	4.00	2.31
Netherlands	–4.11	–22.63	8.45	–12.86	16.40	9.59	4.31
Spain	–4.60	–23.45	9.71	2.47	12.19	5.70	3.10
Switzerland	–3.58	–13.89	10.18	–16.48	6.09	2.87	1.72
United Kingdom	–6.25	–20.20	5.56	4.70	7.93	13.44	5.16
United States	–3.93	–16.97	4.35	–18.11	26.29	6.45	3.35

and 2007–09 declines. Both were short and shallow. Returns on stocks, especially technology stocks in the United States, produced the highest spread between stock and bond returns since the 1950s. The equity risk premium was in double digits in the first half of the 2020s. The success of technology companies led to greater concentration in the stock market. In 2025, the combined capitalization of just three stocks—Microsoft, Apple, and Nvidia—was greater than the market capitalization of any non-US stock market in the world.

Most periods in my analysis last between 15 and 20 years. Typically, the pattern is that the high returns in one period are followed by low returns in the next, and vice versa. Because of the low returns between 1999 and 2019, one can expect, based on this pattern, that equities will provide a higher return between 2020 and 2040 and fixed income will not. The fixed-income losses of 2021 and 2022 mean that fixed-income returns between 2020 and 2030 will probably be lower than between 1981 and 2020. The primary uncertainty is over equity returns. As **Exhibit 64** shows, returns on equity have been lower in most countries between 2020 and 2025 than during the period of 2000–2019, with the exception of the United States and Denmark (the latter primarily because of one company, Novo Nordisk).

Exhibit 63. US and German 10-Year Bond Total Returns in US Dollars, 2000–2025

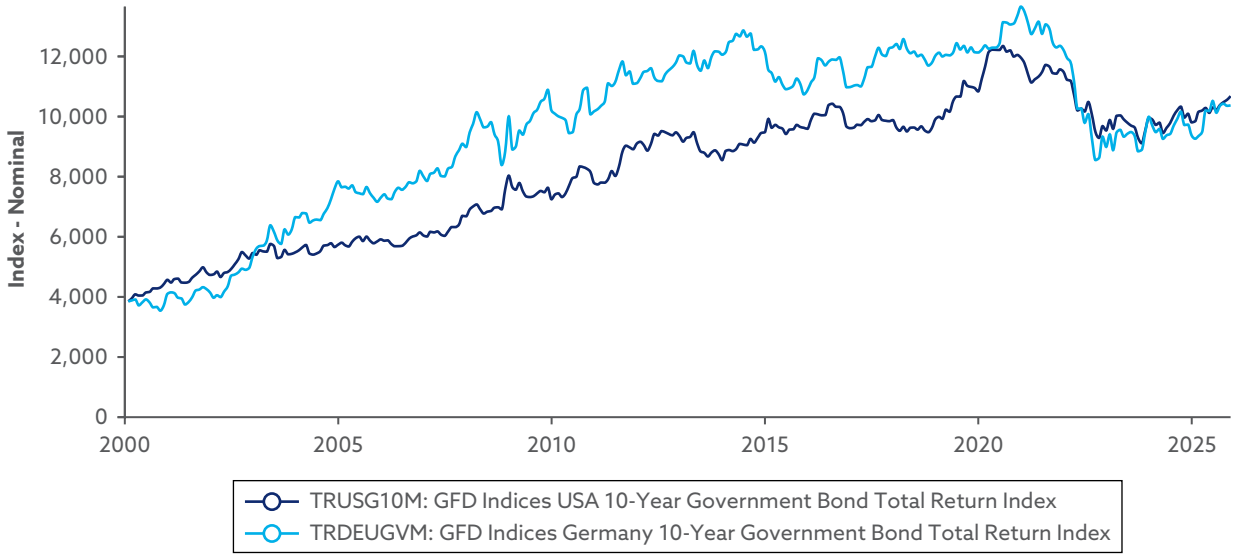


Exhibit 64. Annual Returns on Stocks, Bonds, and Bills in Real US Dollars, by Market, 2019–2025 (all data in percent)

Market	Stocks	Bonds	Bills	Bond ERP	Bill ERP	Cap/GDP	Inflation
Australia	3.38	–6.42	-2.34	10.47	5.85	116.30	3.59
Austria	2.45	–6.15	-1.88	9.17	4.42	34.90	5.90
Belgium	4.14	–6.14	-1.53	10.95	5.76	120.10	3.78
Canada	4.05	–4.73	-2.31	9.22	6.51	145.50	3.27
China	0.40	0.71	-1.58	-0.32	2.02	76.50	0.62
Denmark	4.61	–5.38	–1.64	10.55	6.36	125.90	2.84
Finland	5.19	–6.19	–1.54	12.14	6.84	108.40	2.80
France	4.41	–7.05	–1.53	12.33	6.02	109.00	2.37
Germany	5.64	–6.27	–1.61	12.70	7.37	54.80	3.69
India	6.26	–1.10	–2.43	7.44	8.90	147.40	4.68
Ireland	9.30	–5.75	–1.59	15.97	11.06	26.70	3.46

(*continued*)

Exhibit 64. Annual Returns on Stocks, Bonds, and Bills in Real US Dollars, by Market, 2019–2025 (all data in percent) (*continued*)

Market	Stocks	Bonds	Bills	Bond ERP	Bill ERP	Cap/GDP	Inflation
Italy	12.53	–3.77	–1.57	16.95	14.33	46.20	2.97
Japan	3.89	–11.93	–9.42	17.96	14.70	194.80	2.00
Netherlands	5.82	–5.88	–1.59	12.43	7.53	142.20	4.02
New Zealand	–3.64	–7.01	–3.48	3.62	–0.17	42.30	3.97
Norway	4.44	–7.12	–3.66	12.45	8.40	77.90	3.76
South Africa	9.15	4.64	–0.21	0.31	9.38	281.20	5.55
Spain	5.57	–5.29	–1.58	11.46	7.27	64.80	3.35
Sweden	6.26	–6.02	–1.92	13.07	8.33	181.60	3.61
Switzerland	5.43	–0.69	–0.09	6.16	5.52	250.80	0.85
United Kingdom	4.67	–6.14	–0.93	11.51	5.65	139.90	5.64
United States	12.82	–4.19	–0.11	17.76	12.95	244.00	3.94
Average	5.31	–4.90	–2.02	10.65	7.50	124.15	3.48
World ex-US	6.18	–3.74	–0.11	10.31	6.30	108.50	
World	8.99	–5.17	–1.03	14.93	9.11	142.80	

There are many reasons to believe equity returns should not be high during the coming decade. Stock markets worldwide are already at high valuations, with market capitalization equal to or greater than GDP, and some would argue there is little room for growth. Many countries are focusing more on generating growth internally rather than relying on international trade. Rather than opening up their economies to international trade and entrepreneurial capitalism, as they did in the 1990s, the United States and China are now restricting international trade and placing limits on corporate investments. The primary prospect for growth is technology, including communications, information technology, and biotechnology. Given President Trump's emphasis on domestic production and higher tariffs, whether technology will be the savior of equities and whether countries will favor free trade over internal growth in the decade to come remains to be seen.

7. TWENTY LESSONS FOR INVESTORS ABOUT FINANCIAL MARKETS

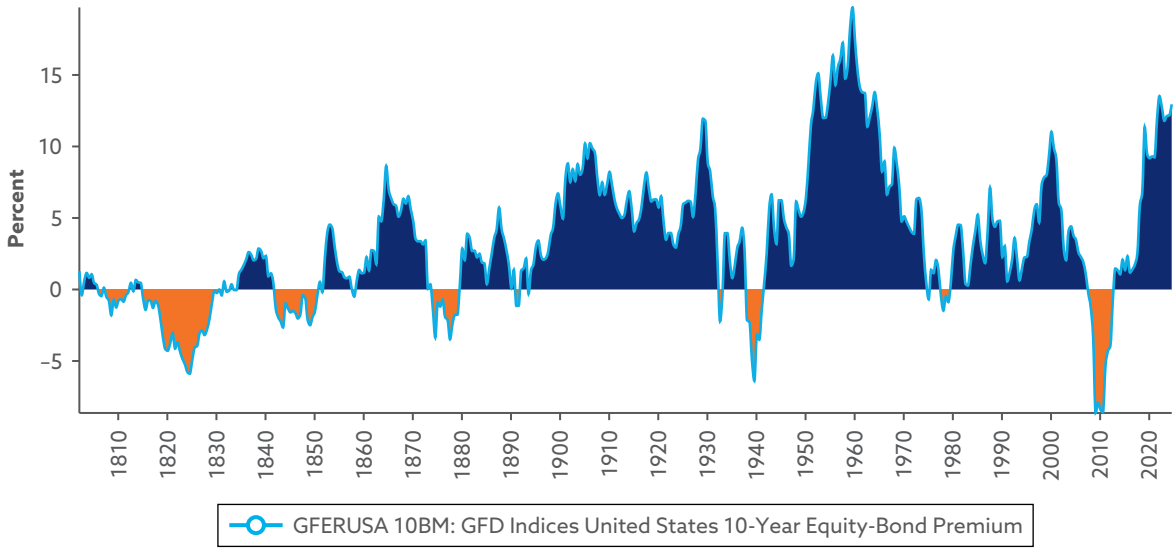
My analysis of stocks, bonds, bills, real estate, and commodities over the past 900-plus years enabled me to reach some general conclusions about financial markets. Ten of these conclusions concern factors that influence returns, and an additional ten offer lessons based on my analysis of financial markets in the past.

Ten Lessons for Investors About Returns

1. There is no fixed equity risk premium. The ERP fluctuates dramatically over time and between countries. In addition, the future or expected ERP may be only distantly related to the ERP achieved over some past period.

Exhibit 65 shows the 10-year realized ERP for the United States, calculated as the difference between the average annual return to equities over the 10-year period ending on the date shown in the graph and the return to bonds over the same 10 years. The 10-year ERP varies widely over time for every country covered. Sometimes the ERP was strongly positive, sometimes it was positive in single digits, and sometimes it was negative (the return to bonds exceeded the return to stocks).

Exhibit 65. US 10-Year Equity Risk Premium (in percent), 1802–2025



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The 10-year realized ERP for the United States ranged from almost 20% in the 1950s to –10% in the first decade of the 2000s. It returned to double digits in the 2020s. Although one can calculate an average of these values over a century or more, the result has little meaning for investors. On average, stocks provide a higher rate of return than bonds, and the longer the period of time, the more likely this is true. But there can also be long periods when bonds outperform stocks.

We can also measure the ERP relative to bills. By comparing stock returns with the performance of a portfolio of short-term, sovereign-issued bills, we can remove any variability in the measured ERP that comes from variation in the bond return. Thus, readers can choose whichever ERP measure (the bond ERP or bill ERP) they prefer.

If we compare the ERP across countries, the international differences become as wide as the those between different time periods. People who insist on estimating the future or expected ERP accurately are trying to do the impossible. The ERP cannot be observed independently in financial markets the way that a bond yield or dividend yield can be. Any expectations that you have of what the ERP will be in the future will be subject to very wide variability or what statisticians call an "error term."

2. Cash (as measured by Treasury bills) usually keeps up with inflation but does not significantly beat inflation over the long term. During periods of accelerating inflation, cash underperforms inflation, and during periods of disinflation, cash can beat inflation.

The return on bills will generally reflect the inflation rate in the economy. If you calculate the inflation-adjusted return to cash (three-month T-bills) in the United States, you will find that since 1900, the real return to cash has been 0.31%. In some countries, the long-term return from cash has been negative, especially in countries that have suffered from high inflation. **Exhibit 66** compares the return to cash and the annual inflation rate in the United States, and although the relationship is imperfect, the inflation rate appears to be an important factor influencing the yield on Treasury bills.

3. The current yield on the 10-year bond is the best predictor of future returns on bonds.

There is a strong correlation between the current yield on 10-year government bonds and the total return over the subsequent 10 years. Few people realize that you can use the current yield to predict the future return on government bonds. The reason is that when an investor buys a 10-year bond today, barring default, the return is locked in for the next 10 years. If the bond yield changes, the price of the bond will change to provide a capital gain or loss that will offset the change in the yield. The market currently predicts that investors will receive about a 4%–5% return on government bonds between 2026 and 2036.

This relationship is illustrated in **Exhibit 67**. The dark blue line shows the historical yield on US 10-year Treasury bonds, and the light blue line shows the return to bonds during the subsequent decade. As bond yields rose between 1945 and 1981 and declined between 1981

Exhibit 66. Yield on T-Bills and the Annualized CPI in the United States, 1951–2025 (all data in percent)

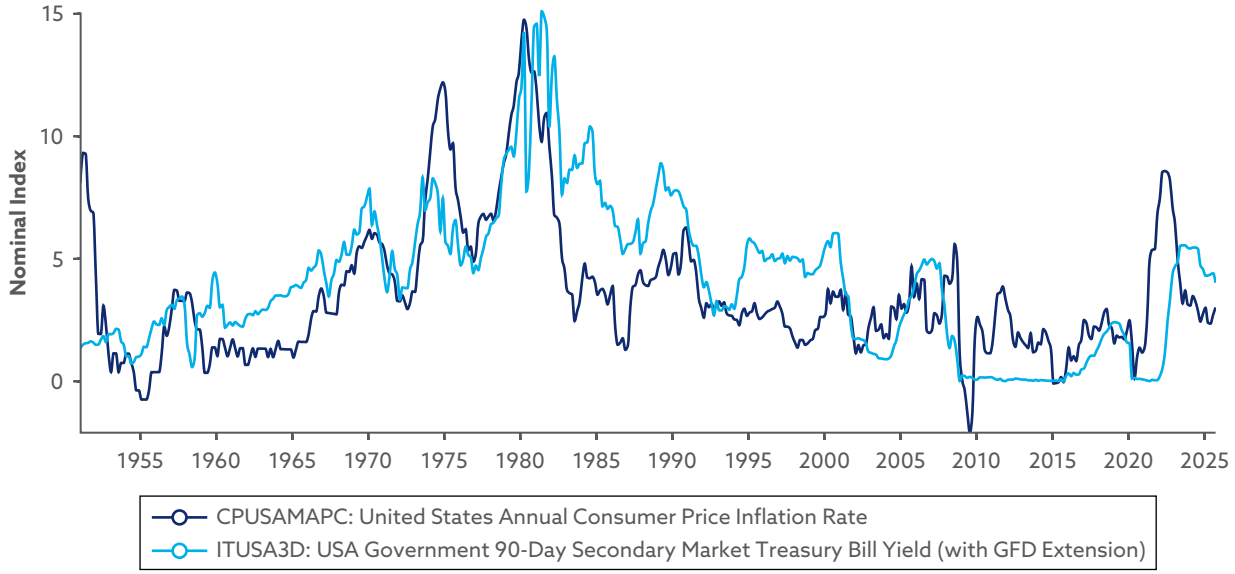
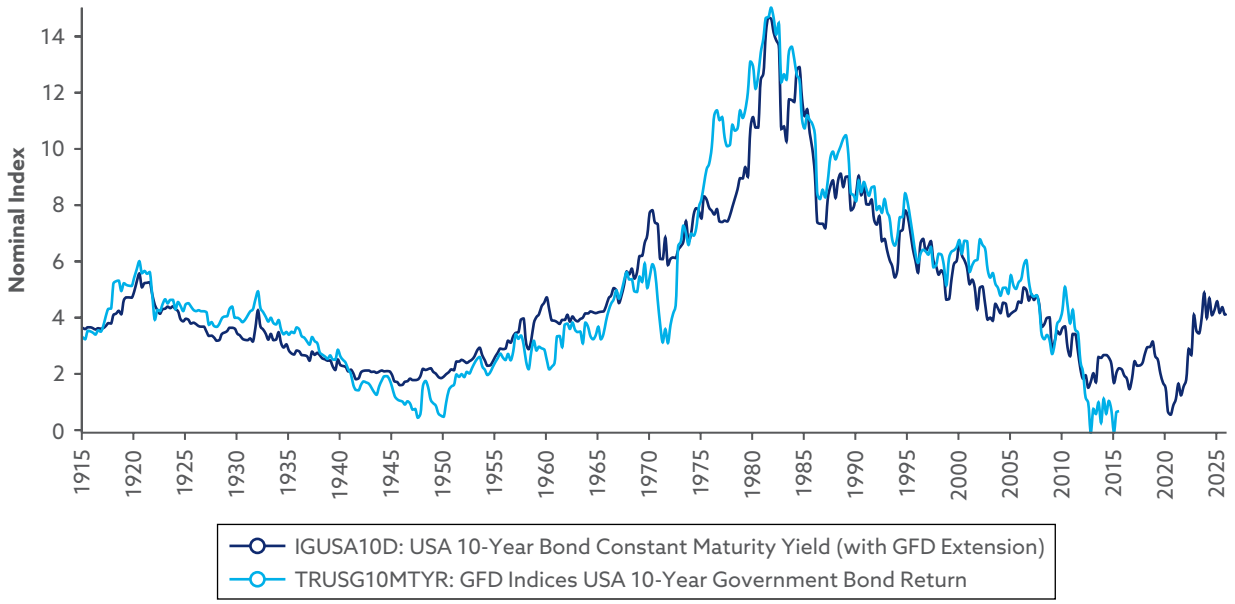


Exhibit 67. US 10-Year Government Bond Yield and Returns, 1915–2025 (all data in percent)



and 2020, fixed-income investors received capital losses or capital gains that largely offset the change in bond yields. Although yields fluctuate up and down from year to year, bond yields can trend up or down for decades. Bond yields generally declined from 1920 until 1945, rose until 1981, and declined until 2020. US 10-year government bond yields have increased from a low of 0.5% in 2020 to over 4% in 2026.

Countries in default on their government bonds provide inferior returns to both equities and bonds. Default is evidence that investors face difficult economic conditions that affect both the economy and the government. There are fewer economic opportunities for investment in a country where government bonds are in default. Investors will avoid providing capital to the economy of a country in default. Consequently, capital will be less available for either corporate bonds or equities. Many corporate bonds are likely to be in default as well, and because shareholders are the residual owners of the firm, returns to shareholders will decline. The causes of the default will need to be resolved before capital will once again flow into the economy.

Countries in default during the 1800s, such as Greece, Egypt, the Ottoman Empire, Portugal, and some South American countries, were unable to develop their economies and capital markets and attract investment from internal or external sources and countries that were not in default. Similarly, countries that went into default between 1930 and 1950 provided low returns to equity investors. Measured in real US dollars, many of these countries provided negative returns during those two decades. Hyperinflation prevented many emerging markets from being able to issue bonds in the 1970s. A government that cannot provide risk-free bonds to investors cannot provide the environment for high returns to equities.

4. Unexpected inflation—that is, inflation not reflected in the yield of the bond at the time of purchase—is the worst enemy of fixed-income investors because it reduces the value of the interest and principal that investors receive from bonds. Unlike stock investors, fixed-income investors are unable to recover the returns lost to inflation.

Periods of inflation impose losses on investors in both bonds and cash. When a bond or bill is bought, it is bought with the anticipation that the investor will receive a certain return after inflation, usually less than 1% for the Treasury bill and 2%–3% for the Treasury bond. If inflation accelerates after the investor purchases the bond, the price of the bond will decline while the bond yield rises, which will impose losses on the owner of the bond. Unless the bond is an inflation-adjusted security, it pays coupons and then matures in nominal, not real, currency. The money lost to inflation can never be recovered. During the German hyperinflation in the 1920s, fixed-income investors lost essentially all the value of the bonds they had purchased because prices rose one-trillion-fold.

Equities, in contrast, can recover some of their value because they are real assets that provide future cash flows to shareholders. In theory, the company's assets could be sold in the inflated currency to compensate shareholders, which reduces the impact of inflation on the purchaser. During the time that inflation is accelerating, no one knows when the inflation will end, and so stocks can continue to decline in value in real terms. When disinflation begins and uncertainty is reduced, however, stocks typically recover at least a portion of their real value.

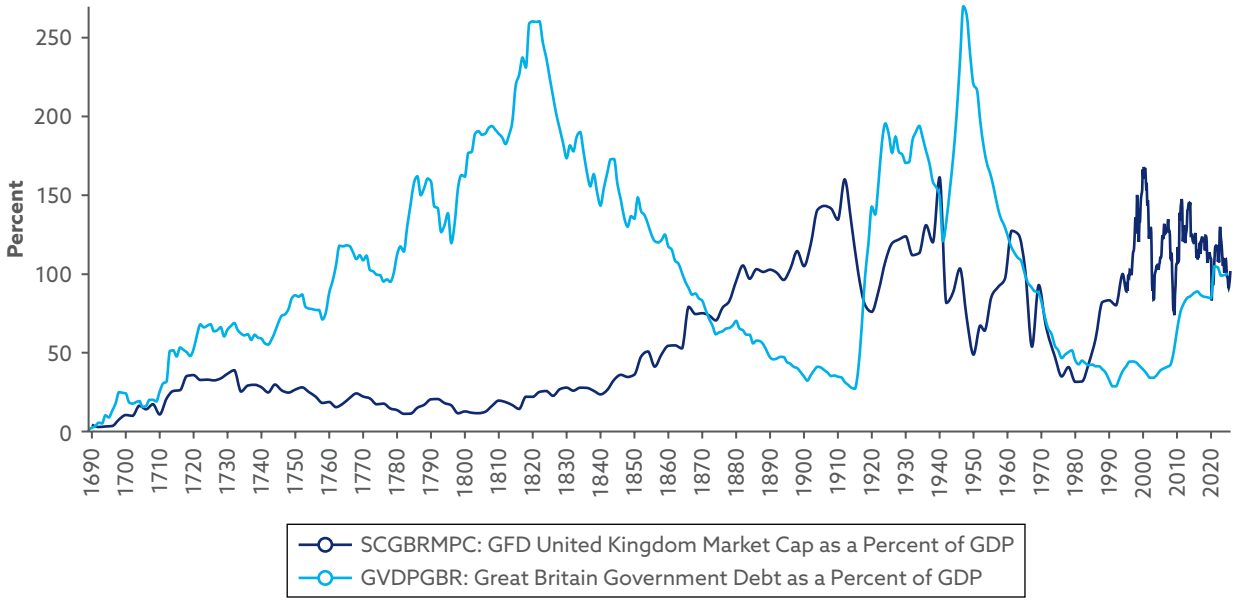
5. Countries in which stock market capitalization is greater than government debt outperform countries in which government debt is greater than stock market capitalization.

This dynamic is true both between countries and over different periods of time. But there is a question of cause and effect. Is the market capitalization greater than government debt because stocks performed well in that country, driving up the capitalization? Or does poor performance lead to lower capitalization? High returns on stocks encourage firms to issue capital, increasing the market capitalization of the stock market. High market capitalization reflects the fact that financial markets help corporations earn profits.

Government debt increases and decreases independently of the stock market; however, changes in government debt affect the amount of money available for the stock market and corporate bond markets. During a war, the government must raise capital to fund the war, leaving less capital for the stock market. After the war, when government bonds are gradually redeemed, the money that is freed up can be redirected to the stock market. Until the 1980s, there was often an inverse relationship between the amount of outstanding government debt and stock market capitalization. Since the 1980s, however, both have increased together.

This dynamic is illustrated in **Exhibit 68**, which graphs government debt and stock market capitalization as a share of GDP for the United Kingdom. Debt and market capitalization moved in opposite directions between 1800 and 1980. But since 1980, both market capitalization and government debt have increased. In some countries, such as the United States and Japan, both government debt and market capitalization now exceed GDP.

Exhibit 68. UK Stock Market Capitalization and Government Debt as a Percentage of GDP, 1689–2025



6. Financial markets do poorly during war because of the destruction of resources, government control over the economy, high taxes, and inflation.

War directs economic activity away from the production of consumer goods. War also creates massive destruction, reducing the supply of resources to the market. Governments often take over production during a war and redirect industries toward the war effort. Consumer goods become short in supply, and the government limits the profitability of corporations. Taxes rise. Countries directly involved in a war suffer, while countries supplying matériel to belligerent countries but that are not involved in the war may benefit. Countries often default on government bonds during wars and cause inflation, because governments find it difficult to raise enough taxes to pay for wars. After a war, there is dislocation in the economy and recovery may be slow. Recessions often follow the end of a war. Once a war and its subsequent dislocation are over, the economy can recover quickly, but during a war, returns on stocks, bonds, and bills falter.

The economic impact of a war often occurs both during the war and after its conclusion, and markets must deal with the dislocation created by the war as they adjust to a non-war economy. The world suffered global recessions in 1920 and 1946 after each world war. Both Japanese and German stocks collapsed in price in 1948, when the economic impact of the war was felt in both countries.

In contrast, "war bubbles" occur when a country benefits financially from defeating another country in a war. This situation happened in Germany after the Franco–Prussian War (1870) and in Japan after the Russo–Japanese War (1905). In addition, Denmark benefited from its neutrality during World War I. These "war bubbles" collapse after the war is over, however, and prices return to their prewar levels, as occurred in each of these three cases.

7. Financial markets perform poorly when the government restricts markets, limits free trade, or nationalizes industries.

Governments often try to control market outcomes, but in doing so, the cure is often worse than the disease. After World War II, many industries were nationalized, and as former European colonies gained their independence, they nationalized industries to control production. Few of those industries succeeded. Many of the nationalized firms lost millions or billions of dollars and had to be bailed out by taxpayers.

Socialism refers to government ownership and control of industry. It can come in the form of government regulation of an industry, government nationalization of an industry, government restrictions on operating in an industry, or any other restriction on the market. The mere threat of government intervention in the market can hold back returns for decades out of fear that either the government may pay too low of a price for the assets it nationalizes or that it may seize assets without compensation. The government may also impose restrictions on companies' ability to earn a profit. When the Communists took over in Russia and Eastern Europe, investors were not compensated for the loss of their assets. Some investors lost everything.

8. Markets perform better during periods of international free trade than when there are tariffs, import substitution, or autarky reducing trade between countries.

Autarky refers to a policy of trying to produce goods domestically instead of pursuing international trade. Barriers to trade may help companies in their own domestic market but limit their ability to sell goods and services to other countries. The rest of the world provides more market opportunities than any domestic market. Higher tariffs make foreign goods more expensive than domestic goods, reducing the demand in the tariffing country for foreign goods.

Exchange rates can be manipulated to limit trade between countries, but this approach has costs as well. Trade restrictions were used at various times between 1914 and 1981 to limit trade, causing a reduction in the return to stocks below what it would otherwise have been. The most successful economies and stock markets, such as the Anglosphere countries and the markets known as the East Asian Tigers, are ones that promoted international trade. Countries such as those in South America that have relied on import substitution, a policy of building up domestic industries to reduce reliance on imports, have suffered from those policies through lower rates of return.

9. Export-oriented economies have higher market caps than largely domestic economies.

If you rank economies by stock market capitalization as a share of GDP, those that rely on exports, such as Hong Kong SAR, Switzerland, South Africa, and Japan, have a higher capitalization-to-GDP ratio than largely insular economies, such as Austria and Portugal. In small economies, if one company relies on exports to the rest of the world, the national capitalization-to-GDP ratio can quickly soar to more than 100%. This is true of Finland (when Nokia was the dominant company in that market), Denmark (Novo Nordisk), and Saudi Arabia (Saudi Aramco). Investors in those markets benefit from the company finding a foreign market for its product, and both the returns to the economy and market cap can increase dramatically as a result. If the company declines in importance, however, as Nokia did, the whole economy's capital markets can suffer.

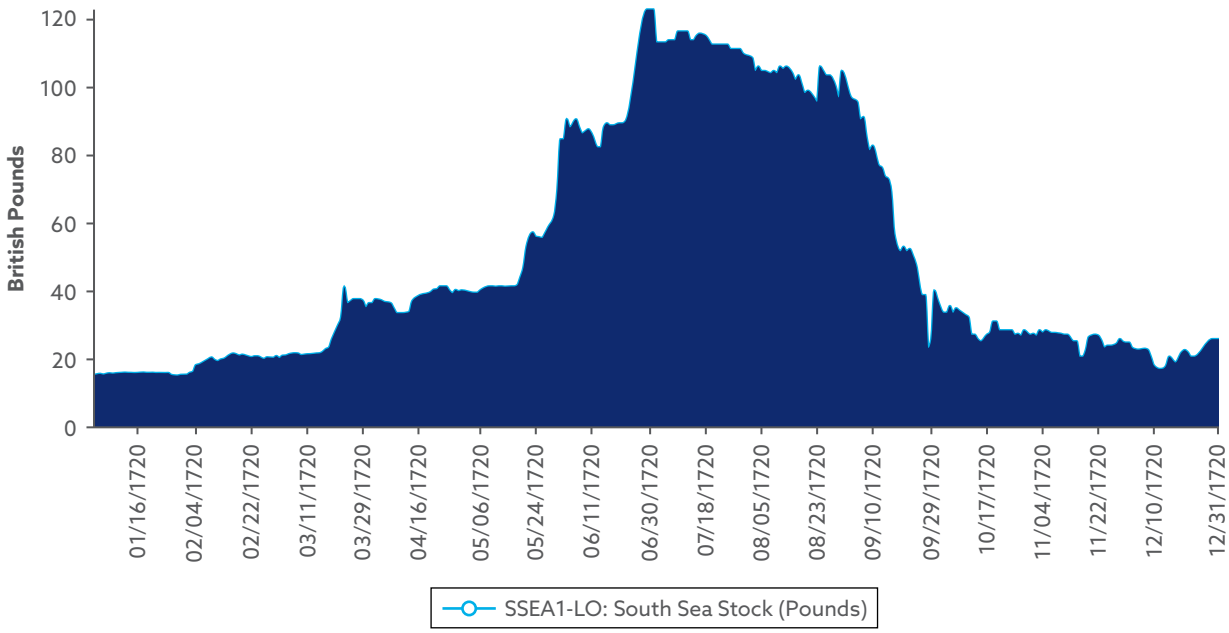
10. Bull markets are exogenous; bubbles are endogenous.

Bull markets are driven by increases in expectations of higher profits in corporations. When governments reduced market intervention in the 1980s and allowed corporations to pursue more profits, markets soared. Technology drove the profitability of US firms in the tech sector between 2009 and 2025, allowing the United States to outperform the rest of the world.

However, a market bubble is by definition temporary. Hyman Minsky (2008) studied bubbles and developed a theory of endogenous bubbles, pointing to the "Minsky moment" when the bubble collapses. An expansion in capital allows money to flow into the market and drive up prices. Once the conditions that fed the market expansion change, however, shares collapse back to their original level.

This phenomenon was first illustrated by the South Sea and Mississippi bubbles of 1719–1720. Governments in England and France encouraged investors to convert their holdings of

Exhibit 69. South Sea Stock in British Pounds, 1719–1721



government bonds into shares in a debt–equity swap, with the promise that the South Sea and Mississippi Company shares would provide a higher rate of return than government bonds. Investors did not have to pay for their shares in full, and they could redeem government bonds at their par value, rather than their market value, to purchase shares. Once there were no more investors to drive up the artificially high price of shares, however, prices collapsed back to where they had been before the bubble began (see **Exhibit 69**). The same result occurs when a market is cornered (that is, when a single owner holds most or all of the market capitalization). At some point, prices return to reality and the price of the asset or stock will collapse.

Bull markets are sustainable because the causes are external to the stock market. In contrast, bubbles are not sustainable because they can continue only as long as money is poured into the stock market.

Ten Lessons for Investors from History

1. Stocks have followed an approximate 30-year cycle since 1900.

Looking at the average return per annum to the stock market in the United States in real US dollars shows that the highest returns occurred in the 1920s, 1950s, 1980s/1990s, and 2010s. The lowest returns occurred in the 1910s, 1940s, 1970s, and 2000s. The data that verify these results for the United States, as well as for the world and other countries, are provided in **Exhibit 70**.

Exhibit 70. Returns in Real US Dollars by Decade for Five Countries and Two Regions, 1900–2019 (all data in percent)

	Canada	France	Germany	United Kingdom	United States	World ex-US	World
1900–1909	7.39	0.79	3.15	0.60	9.02	2.26	4.71
1910–1919	–1.95	–9.97	–24.21	–2.49	0.51	–7.05	–3.08
1920–1929	16.47	8.56	19.22	9.19	15.56	8.46	12.65
1930–1939	2.06	–4.98	12.32	3.86	3.96	4.77	4.14
1940–1949	2.94	–6.71	–13.35	–3.70	3.68	–3.36	0.03
1950–1959	12.57	17.28	20.34	18.00	17.98	14.87	15.79
1960–1969	6.00	0.68	4.65	5.36	5.30	6.05	5.57
1970–1979	1.99	2.75	2.73	1.00	–0.61	3.05	0.90
1980–1989	6.87	11.89	10.51	14.05	12.72	16.48	13.87
1990–1999	5.05	9.69	7.36	12.47	18.44	5.39	10.15
2000–2009	6.33	0.76	0.13	–1.64	–5.26	0.35	–2.03
2010–2019	2.87	4.29	4.68	3.48	12.77	4.24	7.77

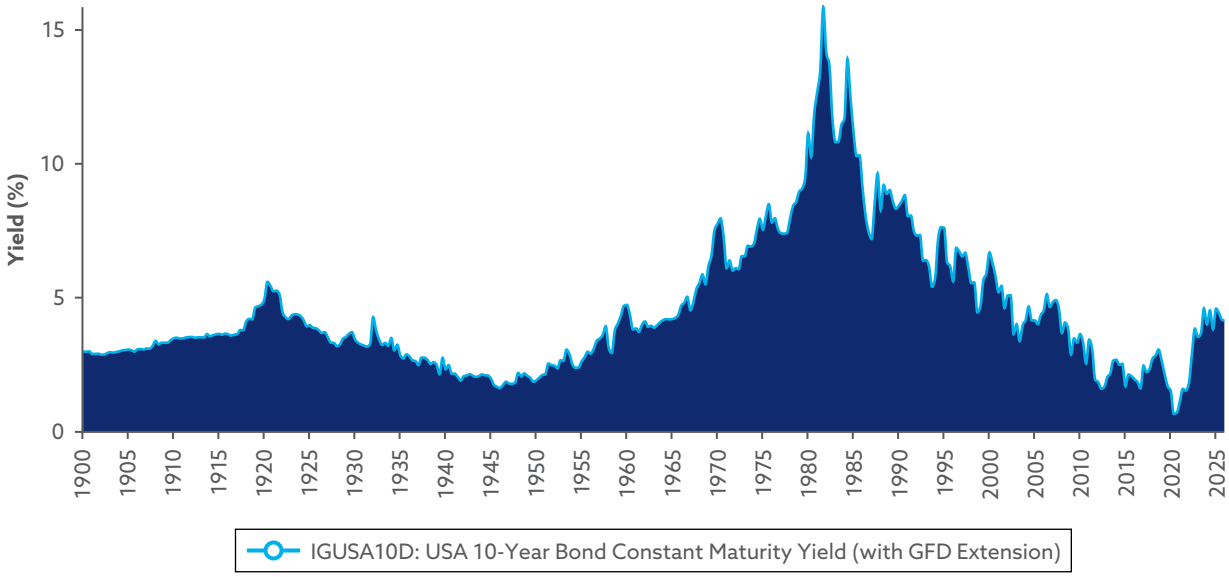
The numbers are not consistent for every country, but a fair generalization is that superior returns and inferior returns happen every 30 years. The cycle is strongest in the United States and weakest in Canada, which is a more materials-based economy. Strong returns are driven by recoveries from wars or recessions or by the commercialization of new technologies. The decades of low returns were driven by war or financial recessions. If this pattern were to continue, returns should be lower in the 2020s than in the 2010s, reach their nadir in the 2030s, and then rise again in the 2040s.

2. Two interest rate pyramids have influenced fixed-income and equity returns since 1900.

Global finance has gone through two interest rate pyramids during the past 130 years. Examining the bond yield for the United States (illustrated in **Exhibit 71**), the United Kingdom, and other countries uncovers two interest rate pyramids. The first occurred between the 1890s and the 1940s, and the second, larger one occurred between the 1940s and 2020. An interest rate pyramid is a multidecade pattern of rising then falling interest rates. The twentieth century could even be called the century of two interest rate pyramids.

The first interest rate pyramid occurred between 1896 and 1945. This process began in the 1790s, when war between France and the rest of Europe drove bond yields up to levels not seen

Exhibit 71. US Government 10-Year Bond Yield, 1900–2025 (data in percent)



since the War of the Spanish Succession in the 1710s. Bond yields steadily declined between the 1790s and the 1890s, bottoming out around 1896. Britain took advantage of the lower bond yields to refund the 3% consols and reissued them at 2.75% in 1889 and then at 2.5% in 1907. Other countries issued perpetual bonds at low interest rates as well. As the deflation of the 1880s turned to low levels of inflation in the 1890s, the decline in bond yields began to reverse. Bond yields spiked during World War I and the inflation that followed in the 1920s. Yields began a gradual decline through the deflation of the 1930s and the controlled interest rates of World War II. The dates for the lows at the beginning of the first interest rate pyramid, the highs in the 1920s, and the lows in the 1940s are provided for 20 countries in **Exhibit 72**.

After World War II, a second, much more pronounced interest rate pyramid occurred as governments allowed inflation to build up in their economies, driving bond yields back up. Bond yields rose between 1945 and 1974 in the United Kingdom and between 1945 and 1981 in the United States. By the 1974–81 period, bond yields had reached levels unprecedented in peacetime, hitting double digits in every country except Switzerland. Until bond yields peaked, central banks had tried to avoid controlling inflation because of the cost in output and unemployment that would occur.

When bond yields reached double-digit levels and looked like they would continue to rise, however, Paul Volcker in the United States, along with other central bankers, made a concerted effort to stop inflation. After 35 years of rising bond yields between 1945 and 1981, central banks began to fight inflation. Fiscal policy had pushed both inflation and bond yields upward; monetary policy pushed them downward. The low points for bond yields in Europe occurred primarily on two dates that fell close together: 9 March and 4 August 2020. The lows for

Exhibit 72. First Interest Rate Pyramid for 20 Markets, 1895–1949 (data in percent)

Market	Low	Rate	High	Rate	Low	Rate
Australia	11/30/1897	2.89	1/31/1931	8.07	1/31/1941	2.99
Belgium	9/30/1893	2.90	3/30/1920	6.65	5/31/1937	3.25
Canada	11/30/1897	2.78	11/30/1920	6.52	7/31/1947	2.55
Denmark	3/31/1895	3.41	9/30/1920	6.57	3/31/1946	3.51
France	7/31/1897	2.86	6/30/1925	6.97	9/30/1944	2.88
Germany	3/31/1896	3.02	6/14/1924	13.78	11/30/1943	4.21
India	4/30/1896	2.88	11/30/1931	7.00	8/31/1946	2.83
Ireland	5/31/1897	2.41	8/31/1941	10.42	12/31/1954	4.19
Italy	1/31/1912	3.50	12/31/1926	5.81	4/30/1945	2.43
Japan	4/30/1910	4.15	6/30/1920	8.16	8/31/1945	3.69
Netherlands	3/31/1895	2.63	3/31/1920	7.06	4/30/1946	2.88
New Zealand	8/31/1896	2.91	3/31/1920	5.26	8/31/1946	2.92
Norway	8/31/1896	3.03	8/31/2020	7.53	2/28/1949	2.12
Portugal	10/31/1902	3.16	3/31/1921	15.00	7/31/1946	2.84
South Africa	10/31/1900	3.60	11/30/1927	5.05	2/28/1947	2.5
Spain	4/30/1909	4.07	11/30/1931	6.72	9/30/1944	4.3
Sweden	8/31/1896	3.52	10/31/1920	6.67	6/30/1938	2.18
Switzerland	3/31/1896	2.86	10/31/1920	7.43	2/6/1954	2.45
United Kingdom	11/30/1897	2.42	11/30/1920	5.67	1/8/1947	2.74
United States	1/31/1902	2.86	8/31/1920	5.67	11/30/1945	1.55

the 1940s, the highs for the 1980s, and the lows for the 2020s for 20 countries are provided in **Exhibit 73**.

By 2020, bond yields had fallen to negative nominal levels in Europe and negative real levels in the United States. Inflation returned in 2021 because of various governments' response to the COVID-19 pandemic. Bond yields increased to the 3%–4% level they had been at historically when inflation was around 2%. Will developed economies begin a third interest rate pyramid, or have governments and central banks learned their lesson?

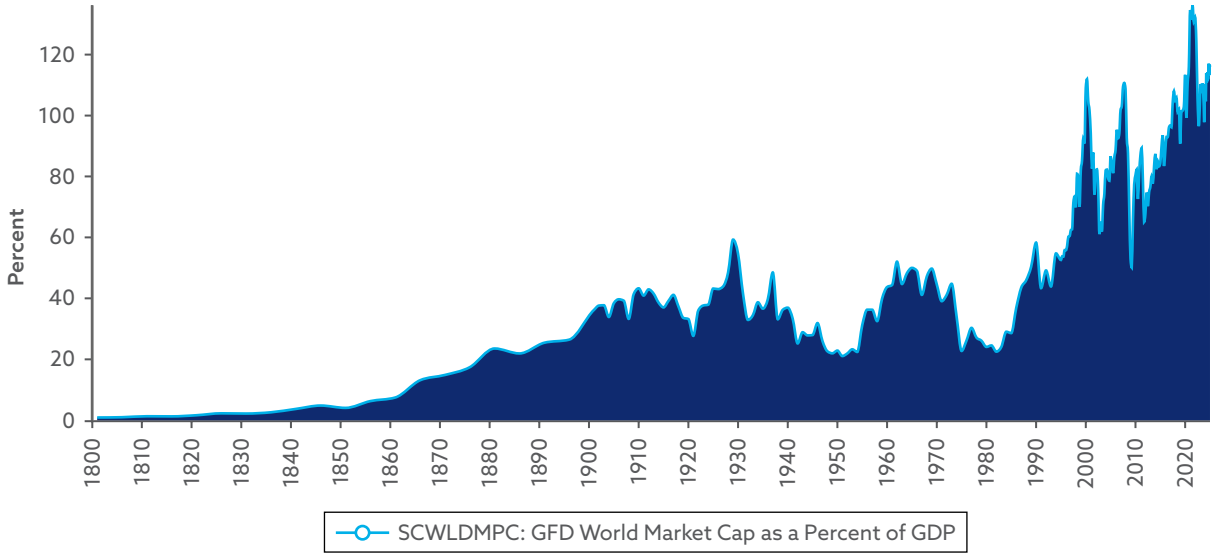
Exhibit 73. Second Interest Rate Pyramid for 20 Markets, 1937–2021 (data in percent)

Market	Low	Rate	High	Rate	Low	Rate
Australia	1/31/1941	2.99	8/18/1982	16.50	3/9/2020	0.60
Belgium	5/31/1937	3.25	1/31/1982	14.25	12/11/2020	–0.40
Canada	7/31/1947	2.55	9/30/1981	17.66	8/4/2020	0.44
Denmark	3/31/1946	3.51	9/20/1982	23.48	3/9/2020	–0.80
France	9/30/1944	2.88	6/30/1981	17.32	12/11/2020	–0.38
Germany	11/30/1943	4.21	7/31/1974	10.83	3/9/2020	–0.83
India	8/31/1946	2.83	10/31/1994	15.82	4/17/2004	5.22
Ireland	12/31/1954	4.19	2/28/1982	19.16	1/1/2021	–0.32
Italy	4/30/1945	2.43	9/30/1981	22.37	2/11/2021	0.46
Japan	8/31/1945	3.69	4/30/1962	14.09	7/27/2016	–0.29
Netherlands	4/30/1946	2.88	9/9/1981	12.63	3/9/2020	–0.64
New Zealand	8/31/1946	2.92	5/17/1985	19.20	9/28/2020	0.44
Norway	2/28/1949	2.12	2/28/1982	14.19	5/15/2020	0.34
Portugal	7/31/1946	2.84	11/30/1983	22.80	8/15/2019	0.08
South Africa	2/28/1947	2.50	12/31/1985	18.09	11/5/2010	7.70
Spain	9/30/1944	4.30	10/31/1983	18.11	12/16/2020	–0.01
Sweden	6/30/1938	2.18	7/31/1984	14.32	3/9/2020	–0.51
Switzerland	2/6/1954	2.45	4/9/1974	7.44	8/15/2019	–1.02
United Kingdom	1/8/1947	2.74	12/13/1974	17.39	8/4/2020	0.08
United States	11/30/1945	1.55	9/30/1981	15.84	8/4/2020	0.52

3. Market capitalization increased between the Napoleonic Wars (1815) and World War I (1914), declined between World War I and the end of the Cold War (1981), and increased dramatically thereafter.

This finding is illustrated in **Exhibit 74**, which shows global stock market capitalization as a share of world GDP. Capitalization consistently increased between 1800 and 1914, with the number of countries with stock markets, the number of companies listed on those stock markets, and the capitalization of individual companies all increasing. There were peaks and valleys between

Exhibit 74. World Stock Market Capitalization as a Percentage of GDP, 1800–2024



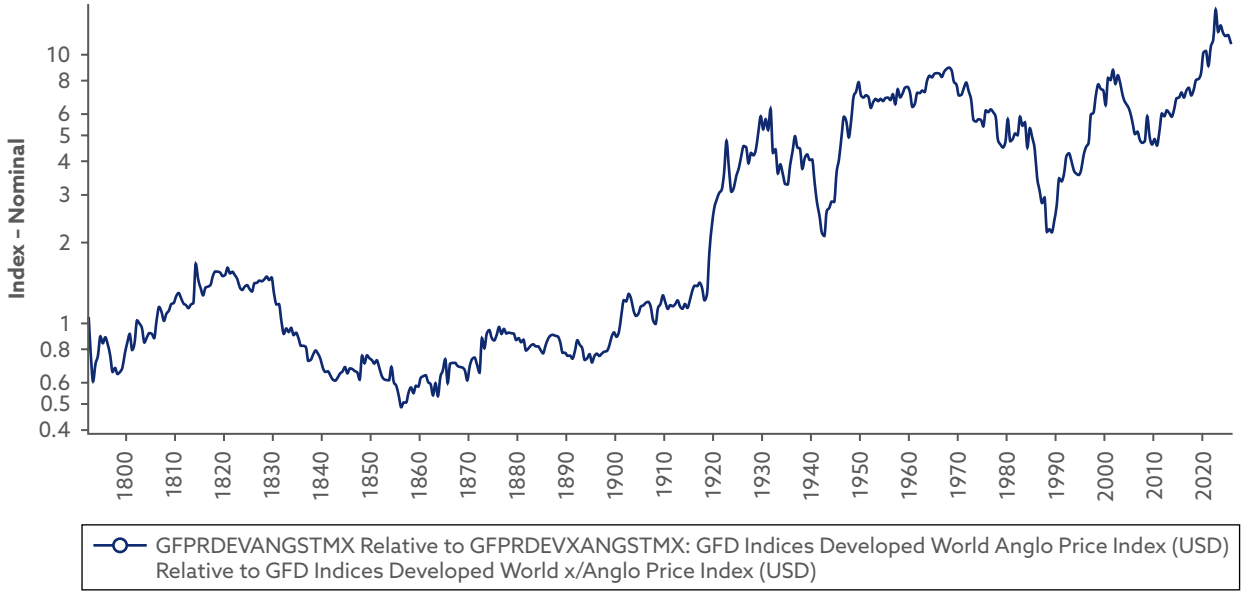
1914 and 1981. Stock markets reached a peak of capitalization in 1929 when capital flowed into the US stock market, declined from 1929 until World War II, rose during the recovery from World War II until the 1960s, and declined during the stagflation of the 1970s. Global stock market capitalization as a percentage of GDP was lower in 1980 than it had been in 1914. Since 1980, stock market capitalization as a share of GDP has increased until the time of this writing in 2026, and global stock market capitalization now exceeds world GDP.

4. The Anglosphere countries have represented the majority of global stock market capitalization and historically have outperformed the non-Anglosphere countries.

The Anglosphere, or English-speaking, countries include the United Kingdom and several of its former colonies: the United States, Canada, Australia, and New Zealand. These five countries have represented more than half of the world's market capitalization historically, and their markets have generally outperformed the non-Anglosphere countries. During the 1950s, the United States, the United Kingdom, and Canada together represented almost 80% of world stock market capitalization. Successful former British colonies also include South Africa, Hong Kong SAR, and Singapore, all of which have provided strong consistent returns relative to the rest of the world.

The relative performance of Anglosphere and non-Anglosphere countries is illustrated in **Exhibit 75**. Between 1820 and 1856, the non-Anglosphere countries outperformed the Anglosphere countries. During the past 170 years, however, the Anglosphere countries have been the superior performers in the long run and during most decades. A number of other former British colonies have been less successful.

Exhibit 75. Relative Performance of Anglosphere and Non-Anglosphere Countries, 1792–2025



5. Bear markets have increased in number over time and are more coordinated internationally in the twenty-first century than they were in previous centuries.

Better telecommunications have improved the transmission of information among stock markets around the world. The world's economies are more integrated than they were a century ago. Better integration of world markets and better communication have in turn increased the number of bear markets and their synchrony. Overall, using the GFD Developed World stock market index, there were five bear markets in the 1700s, only two in the 1800s, seven in the 1900s, and four in the twenty-first century so far. In the United States, there were 5 bear markets in the 1800s, 17 in the 1900s, and 4 in the twenty-first century so far. Stock markets were not as integrated in the 1800s as they became in the 1900s.

In the 1700s, there was no way of instantly sharing information about the stock market between exchanges. Solutions for sending information included carrier pigeons in Europe and semaphores in the United States. The introduction of the telegraph, transatlantic cable, and telephones linked up the entire world so that information on stock prices could be transmitted almost instantly between one exchange and the rest of the world. In the twenty-first century, satellites enable information to be transmitted throughout the world almost instantly. Exchanges in Tokyo, London, and New York City constitute a 24-hour stock market, as trading is passed from one country to the next. This around-the-clock trading has made stock markets more integrated. During the COVID-19 pandemic, world stock exchanges moved in lockstep with one another to a degree that had never been seen before.

Exhibit 76. Bull Market Tops and Bear Market Bottoms in 25 Developed Countries, 1800–2024

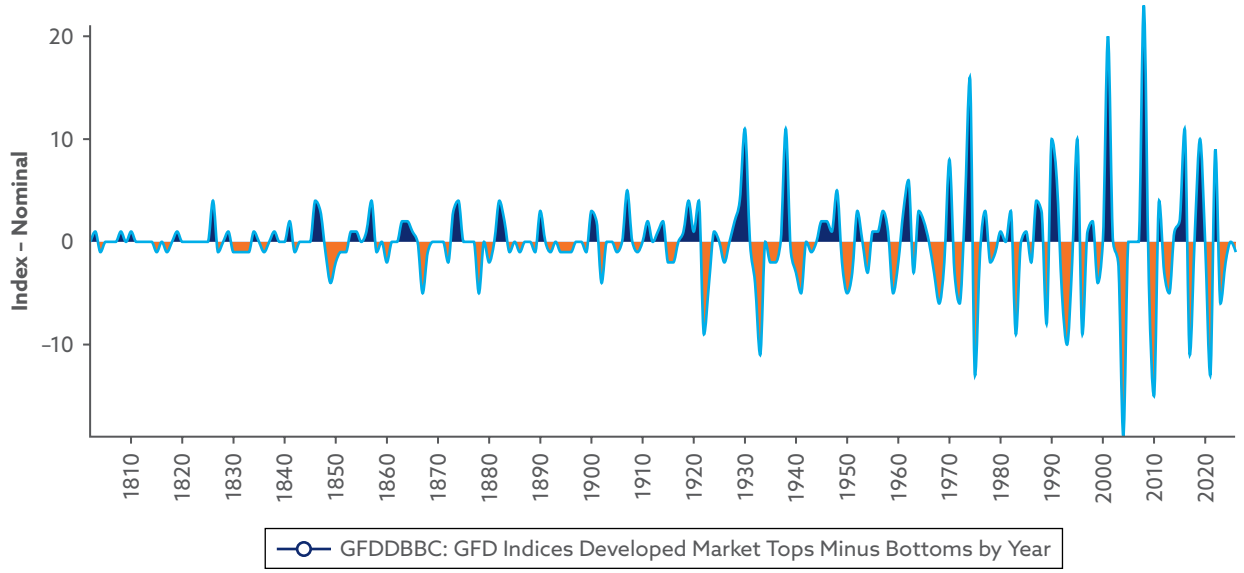
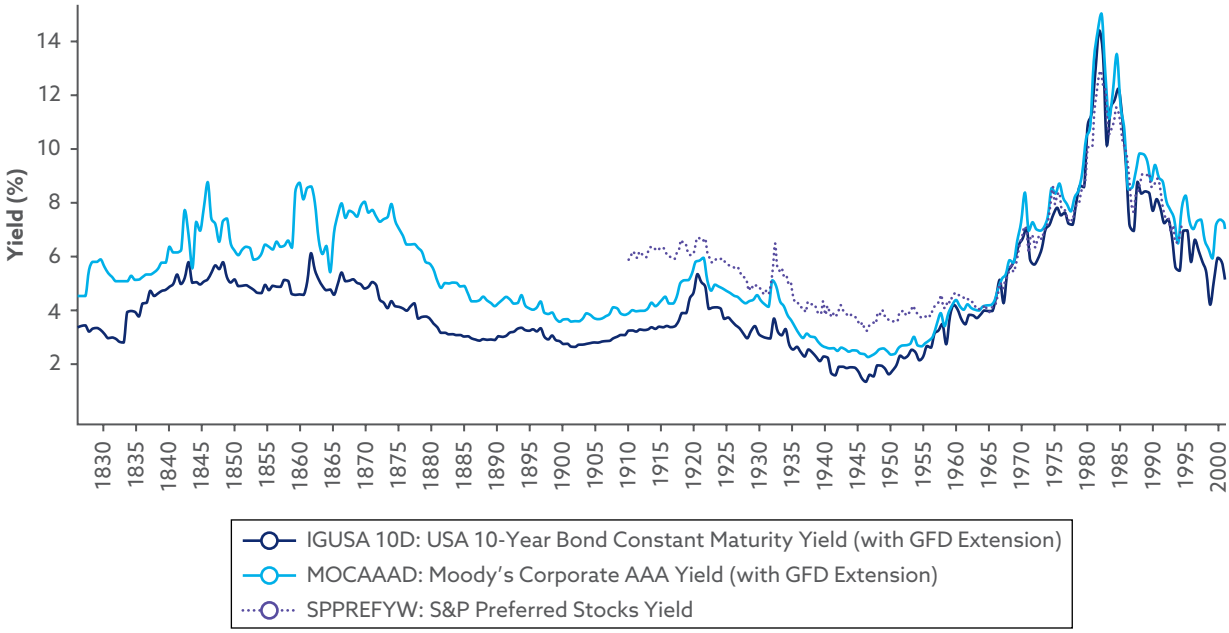


Exhibit 76 compares the number of bull market tops and bear market bottoms in 25 developed countries between 1800 and 2024. The date of each market top and each market bottom in 25 countries was calculated. The number of market tops and market bottoms in those 25 countries was summed for each year, creating an index of bull market tops and bear market bottoms. Market tops are positive numbers in blue, and market bottoms are negative numbers in orange. The number of market tops and bottoms increased over time, showing greater coordination of international stock markets.

6. Until World War II, investors relied on interest rates and dividend yields as their primary guide for choosing between stocks and bonds. Since World War II, larger capital gains and higher taxes on interest and dividends have caused investors to place more emphasis on capital gains than on interest and dividends.

Historically, investors focused on the income return (yield) on capital, not the total return on capital. Risk and yield were directly related. Government bonds, such as the British consol, had the lowest risk and paid the lowest yields. British consols paid a 3% coupon rate until 1888 and a 2.5% coupon rate beginning in 1907. High-grade corporate bonds had the second-lowest risk, and they paid a higher yield than government bonds but less than preferred stocks. When a corporate bond was guaranteed by the government, as was the case of some railroad bonds in England and France, the yields were similar to the yields on central government bonds.

Exhibit 77. Yields on Government Bonds, Corporate Bonds, and Preferred Stocks (percent), 1825–2000



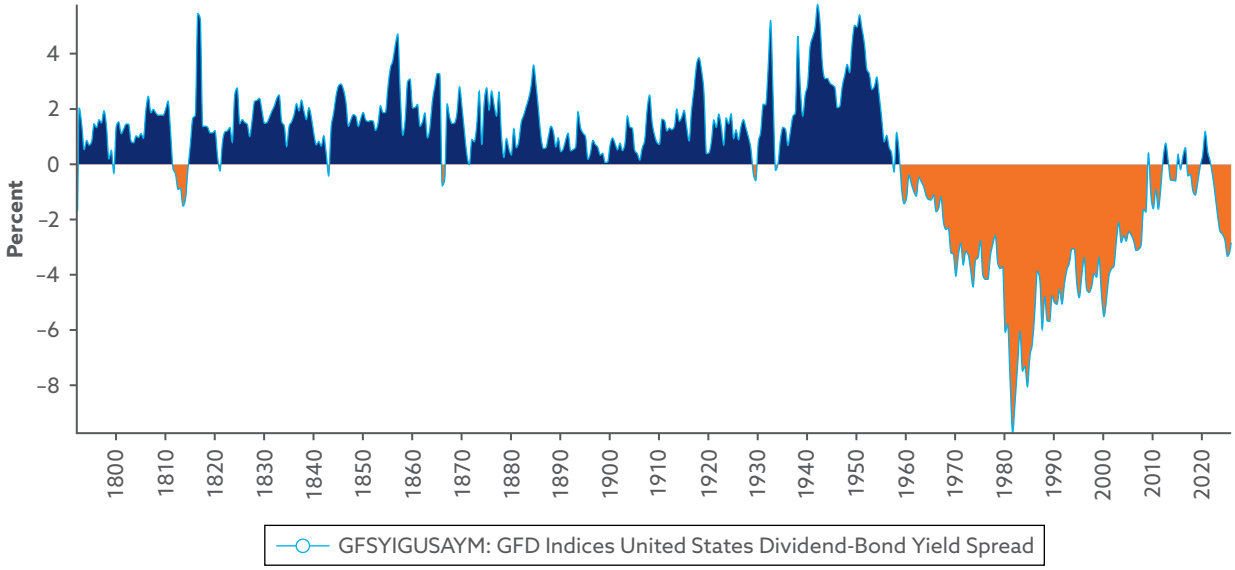
Preferred stocks, especially cumulative preferred stocks, were paid off before common stocks, so they were generally expected to pay a higher yield than corporate bonds but provide a lower return than common stocks. This is illustrated in **Exhibit 77**, which compares the yields on government bonds, corporate bonds, and preferred stocks in the United States between 1825 and 2000. The spread between government bonds, corporate bonds, and preferred stocks persisted until the 1950s.

Because common stocks, which pay a variable dividend yield or none at all, are not guaranteed a dividend, their price fluctuates more dramatically than preferred stocks. Because of higher taxes and different tax rates on bonds and stocks after World War II, however, this relationship broke down. Investors in stocks focused more on capital gains than on dividends. Consequently, in the 1950s, government bonds began paying a higher yield than stocks, as illustrated in **Exhibit 78**.

7. Returns on equities were lower during the era of World Wars and Cold War between 1914 and 1981 than during the eras of Free Trade and Globalization that preceded and followed the period of government intervention and inflation that occurred between 1914 and 1981.

Between 1914 and 1945, World War I and World War II engulfed the world. This was followed by the Cold War between the United States and the Soviet Union, which included proxy wars in Korea and Vietnam. During those 67 years, especially in Europe, countries suffered from the

Exhibit 78. US Stock Dividend–Government Bond Yield Spread (percent), 1792–2025



impact of trade restrictions, war, inflation, and government control of the economy (the TWIG theory). The global integration of financial markets was reduced, and rates of return between countries differed dramatically. The coefficient of variation, the ratio of risk to return, was higher between 1914 and 1981 than between 1815 and 1914. Many investors in Europe suffered the impact of war through reduced returns.

Exhibit 79 compares the returns in 21 markets and three regions between 1848 and 2025. The impact of these policies on European countries that were involved in the wars is visible. Some European countries suffered cumulative losses in real US dollars over the 67 years between 1914 and 1981. Economies that were not directly involved in Europe in World War I and World War II did not experience such losses. There was little difference in returns on the GFD Indices Developed World Price Index between the two periods, primarily because the United States represented a larger share of global capitalization and thus of the index.

8. Returns in financial markets change between financial periods and are cyclical. High returns in one period are followed by lower returns in the next period.

This finding is illustrated in **Exhibit 80**, which provides returns for five countries and the world. High returns in the periods that began in 1815, 1873, 1914, 1949, and 1981 followed lower returns in the periods beginning in 1789, 1848, 1896, 1929, 1968, and 1999. Although the cyclical pattern is not perfect, there is enough consistency from one cycle to the next to justify this conclusion. This is particularly true of the returns to the GFD Indices Developed World Price Index. The differences have become stronger over time.

Exhibit 79. Returns on Stocks in Real US Dollars Between 1848 and 2025 by Market (all data in percent)

Market	1848–1914	1914–1981	1981–2025	1848–2025	1899–2025
Australia	8.45	6.45	6.45	7.19	6.64
Austria	4.46	–1.87	5.63	2.3	1.03
Belgium	4.8	0.01	7.64	3.62	2.54
Canada	4.77	5.27	5.5	5.14	5.45
Denmark	4.51	3.83	9.13	5.38	4.98
France	4.31	–0.03	7.93	3.52	2.53
Germany	4.34	1.56	6.8	3.88	3.31
Hong Kong SAR		5.59	6.24		4.73
India	5.22	1.63	7.45	4.61	4.15
Ireland	4.89	3.45	8.21	5.15	4.66
Italy		–0.68	5.42		1.5
Japan		3.95	3.51		4.21
Netherlands	4.59	3.52	8.72	5.84	5.49
New Zealand		4.94	6.15		5.16
Portugal		–0.25	8.67		3.1
South Africa	6.90	5.69	5.55	6.1	6.71
Spain		0.63	6.98		3.11
Sweden		3.80	9.13		5.42
Switzerland		3.88	8.07		5.21
United Kingdom	4.30	4.49	6.73	4.97	4.8
United States	7.25	6.28	9.11	7.38	6.56
Europe	4.21	2.93	6.84	4.77	4.42
World ex-US	4.40	3.84	6.03	4.72	4.14
World	5.20	5.19	8.14	5.92	5.74

Exhibit 80. Returns in Real US Dollars to Five Countries and World, 1789–2025 (all data in percent)

	Canada	France	Germany	United Kingdom	United States	World ex-US	World
1789–1815		–19.00		3.69	2.57	4.01	3.28
1815–1848		9.05		5.96	6.21	6.89	6.84
1848–1873	2.92	4.70	5.54	4.89	6.41	4.12	5.41
1873–1896	4.39	6.49	6.55	6.36	7.63	6.72	6.76
1896–1914	7.89	1.07	–0.04	0.92	7.92	1.90	3.71
1914–1929	7.22	–1.25	–5.72	3.99	10.45	0.65	5.99
1929–1949	2.50	–5.85	–6.98	0.01	–7.82	0.62	2.23
1949–1968	10.14	8.36	11.75	13.35	26.08	11.19	11.84
1968–1981	0.50	–1.14	0.62	–0.22	–1.42	2.49	–0.04
1981–1999	7.02	15.57	12.34	14.35	15.44	11.56	12.71
1999–2019	4.59	2.51	2.38	0.89	3.02	1.59	2.84
2019–2025	4.05	4.41	5.64	4.67	12.82	6.18	8.99

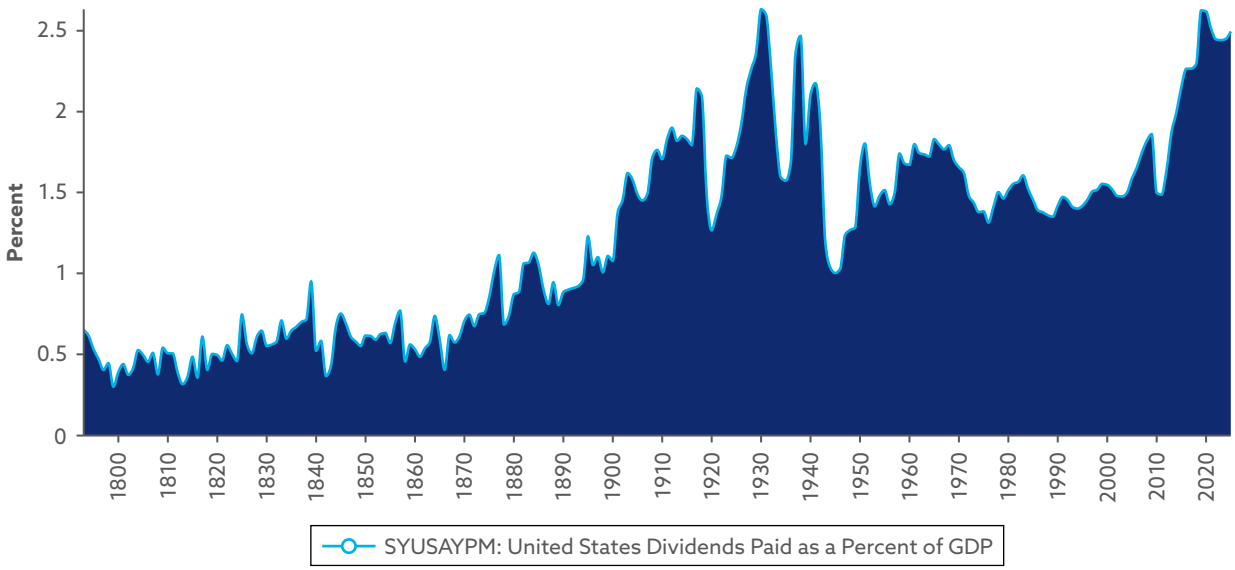
I surmise that exogenous events caused high returns and overvaluation in certain periods, such as the recovery from the Napoleonic Wars between 1815 and 1848, the recovery from the wars of the 1860s between 1873 and 1896, the recovery from World War I and the Roaring Twenties between 1914 and 1929, the recovery from World War II and the Great Depression between 1949 and 1968, and the opening up of markets and the technological boom between 1981 and 1999.

Lower returns occurred during the Napoleonic Wars (1789–1815), the nation building between 1848 and 1873, the prelude to World War I between 1896 and 1914, the Great Depression and World War II between 1929 and 1949, stagflation between 1968 and 1981, and the collapse of the internet bubble and the Global Financial Crisis between 1999 and 2019. This would lead one to suspect that there should be higher returns between 2019 and whenever the current era ends than occurred between 1999 and 2019.

9. Although the dividend yield is currently close to its lowest level in history, dividend payments as a share of GDP are at nearly all-time highs.

The dividend yield declined from around 7% in the 1870s to 5% during World War II and to 4% in the 1980s, and it has been around 2% since the 1990s. In the United States, stock market

Exhibit 81. US Dividends as a Percentage of GDP, 1792–2025



capitalization as a percentage of GDP was less than 50% between 1974 and 1985 but is more than twice GDP in 2025. The market capitalization of the US stock market has risen as the dividend yield has fallen, so dividends as a share of GDP have increased. This dynamic is illustrated in **Exhibit 81**.

Between the end of World War II and 2003, corporate dividends were about 1.5% of GDP. This ratio rose to 2.5% in 2018 and has remained at this level since then. Although analysts point to a low dividend yield as a weakness in the stock market, dividends as a share of GDP remain high in the United States.

10. Decade-to-decade stock returns were more consistent in the 1800s than in the 1900s and 2000s.

Returns for the United Kingdom, the United States, the world excluding the United States, and the world between 1800 and 2019 are provided in **Exhibit 82**, which provides annualized stock returns for various decades in real US dollars. In all four examples, there were no decades during the 1800s in which stocks on average provided a negative return. There was also no decade in the United Kingdom, world, or world excluding the United States in the 1800s in which average annual returns were more than 10%. In contrast, all four regional examples contained at least one decade in the 1900s during which returns were negative. Three countries had negative returns in first decade of the 2000s. Double-digit positive decade-long returns were also more common in the 1900s than in the 1800s. Since 1800, there were three double-digit decades in the United Kingdom, seven in the United States, two in the world excluding the United States, and four in the world index. Analyzing other countries would produce results similar to what is shown in Exhibit 82. Returns are likely to remain volatile during the twenty-first century.

Exhibit 82. Returns to US, UK, World ex-US, and World Stocks in Real US Dollars by Decade, 1800–2019 (all data in percent)

	United Kingdom	United States	World ex-US	World
1800–1809	9.14	8.93	8.59	8.50
1810–1819	3.65	1.17	3.77	3.34
1820–1829	7.87	8.79	7.81	7.86
1830–1839	1.80	3.17	4.87	4.40
1840–1849	5.17	9.35	5.32	5.78
1850–1859	5.41	5.21	5.85	5.64
1860–1869	3.56	8.21	3.13	3.52
1870–1879	7.88	12.76	6.48	7.47
1880–1889	6.20	6.62	6.91	6.67
1890–1899	5.14	10.24	4.94	6.31
1900–1909	0.60	9.02	2.26	4.71
1910–1919	–2.49	0.51	–7.05	–3.08
1920–1929	9.19	15.56	8.46	12.65
1930–1939	3.86	3.96	4.77	4.14
1940–1949	–3.70	3.68	–3.36	0.03
1950–1959	18.00	17.98	14.87	15.79
1960–1969	5.36	5.30	6.05	5.57
1970–1979	1.00	–0.61	3.05	0.90
1980–1989	14.05	12.72	16.48	13.87
1990–1999	12.47	18.44	5.39	10.15
2000–2009	–1.64	–5.26	0.35	–2.03
2010–2019	3.48	12.77	4.24	7.77

8. CONCLUSION

Our understanding of the equity risk premium has come a long way since it was first studied back in the 1960s, mainly because the accumulation of return data on stocks, bonds, and bills during the last four centuries has enabled us to understand how the realized ERP has changed over time. It is apparent that there is no single equity risk premium. The ERP changes over time and differs between countries. The return to stocks changes more than the return to bonds or bills and largely determines the value of the ERP. Even if one were to calculate 10-year average returns on stocks, bonds, and bills and thus the ERP, dramatic fluctuations in the ERP would still appear over time.

There is no point in trying to find "the" equity risk premium. It simply does not exist independently of other factors. Instead, I have focused on the factors that have influenced the ERP. I found that exogenous factors have caused the ERP to rise and fall according to the financial and economic factors that influence financial markets and the economy. I introduced the TWIG theory, discussing how trade, war, inflation, and the role of government have played primary roles in determining changes to the return on stocks, bonds, and bills over time. Free trade, the absence of war, low inflation, and a minimal role of government led to higher returns, while the opposite led to lower returns.

I have divided the past nine centuries of financial markets into five eras and 20 periods. I provided evidence that the return to stocks and bonds and the realized ERP differ from one period to the next, with returns rising or falling from one period to the next.

Although we do not know how long the current era of Globalization in financial markets will last, I suspect that the current period of Technology Wars will last into the 2030s before a new period begins. How long these patterns will persist remains to be seen. We can only hope that the economic and political conditions underlying globalization continue in the decades to come, because those conditions have provided high returns to investors in the past. It is important that politicians understand the causes of high returns and be willing to support those policies in the future.

SOURCES

Sources for the United States

Price data come primarily from four sources. Data before the Civil War are primarily taken from the Early American Securities Database, put together by Richard E. Sylla, Jack Wilson, and Robert E. Wright, which takes data from contemporary newspapers. In addition to the database, various newspapers and magazines were used for price data from 1850 on. These include primarily the *New York Times*, the *Commercial and Financial Chronicle*, the *Bank and Quotation Record*, the *Wall Street Journal*, *Barron's Magazine*, *Standard and Poor's Stock Guide*, and the *Investor's Pocket Manual*.

The same sources were used to collect dividend data, but dividend data sources also include the *Manual of Statistics* and both Standard & Poor's (now S&P Global) and Moody's *Dividend Record*. Fundamental data were collected primarily from the Moody's and Poor's *Manuals for Industrials*, *Utilities*, *Finance*, *Transports and Railroads*. Data were verified by consulting the *Stock Market Encyclopedia*, *Moody's Handbooks*, the *Commercial and Financial Chronicle*, and related resources.

Information on individual companies was taken from various sources. For the United States, the primary sources include *Poor's Manual of Railroads* from 1868/1869 to 1940, *Poor's Public Utility Manual* (New York: Poor's Publishing Co.) from 1919 to 1940, and *Poor's Manual of Industrial Securities* (New York: Poor's Publishing Co.) from 1910 to 1940. Poor's Corp. was taken over by Standard Statistics Corp. to form Standard & Poor's in 1941, and these publications were discontinued. The *Manual of Statistics* (New York: Financial News Association), published between 1880 and 1923, proved to be a useful supplement to Poor's manuals. Information on corporate actions was found in the annual issues of the Standard & Poor's *Dividend Record* (New York: Standard & Poor's Corp.) and the Moody's Corp. *Dividend Record* (New York: Moody's Corp.). Both the *New York Times* (from 1851 on) and the *Commercial and Financial Chronicle* (New York: National News Service) from 1865 to 1972 were used to obtain price data and information on corporate actions.

Moody's/Mergent provided important information on individual companies both before and after the discontinuation of the Poor's manuals in 1940. Sources include *Moody's Manual of Railroad Securities* (New York: Moody's Corp.) published from 1909 through 1951, which changed its name to *Moody's Manual of Transportation Securities* (New York: Moody's Corp.) in 1952. *Moody's Manual of Government and Municipal Securities* (New York: Moody's Corp.) was used from 1919 to date, *Moody's Manual of Bank & Finance Securities* (New York: Moody's Corp.) was used from 1929 to date, *Moody's Manual of Industrial Securities* (New York: Moody's Corp.) was used from 1914 to date, *Moody's OTC Industrial Manual* (New York: Moody's Corp.) was used from 1970 to date, *Moody's OTC Unlisted Manual* (New York: Moody's Corp.) was used from 1986 to date, and *Moody's Public Utility Manual* (New York: Moody's Corp.) was used from 1914 until 2002. The *Utility Manual* merged with the *Transportation Manual* in 2003. Mergent Corp.'s *Mergent's International Manual* (New York: Moody's Corp.) was published beginning in 1981. All the Moody's manuals changed their name to Mergent in 1999. These books were supplemented by *Standard and Poor's Stock Reports* (New York: Standard and Poor's Corp.) for the NYSE, OTC/NASDAQ, and ASE, which were published from the 1950s on. Early data were

taken from Sylla, Wilson, and Wright (2005). This included data from Alexandria (1806–1814), Baltimore (1803–1862), Boston (1789–1859), Charleston (1803–1860), New Orleans (1810–1858), New York (1790–1853), Norfolk (1804–1819), Philadelphia (1786–1850), and Richmond (1814–1859).

Books on securities on different exchanges include *Chicago Securities*, by F. M. Lester (1988); *St. Louis Securities* (Francis Bro. & Co., 1906); and *Handbook of Chicago Stocks and Bonds*, volume 1 1890 to volume 16 1906, with data back to 1889 (Chicago: Chicago Directory Co.). This publication later became James J. Fitzgerald's *Burnham's Manual of Chicago Securities*, published 1917–1921, which became *Burnham's Manual of Mid-Western Securities* (1921ff). Other books include Thompson (1900); Crittenden (1892); Martin (1898), which covers 1798–1898; *Stock Fluctuations* (Boston: Kidder, Peabody & Co., 1902–1919); and *Bank and Quotation Record* (February 1928). The *Commercial and Financial Chronicle* began monthly stock market high/low prices in 1886 for Boston, Philadelphia, Baltimore, San Francisco, and Los Angeles (1905), Pittsburgh (1907), Detroit (1926–1941), Cleveland (1924–1941), Cincinnati (1929–1941), Chicago (1904–1941), Pittsburgh (1907–1941), Los Angeles (1928–1940), and St. Louis (1926–1941).

Other periodicals used included *Barron's* (1922–1931), the *Investor's Pocket Manual* from 1912 to 1931, Boston Stock Exchange, used local newspapers from 1859 to 1877, the *New York Times* from 1851 to 1903, and issues of different Philadelphia newspapers from 1861 to 1865. The *Commercial and Financial Chronicle* began publishing a quotation supplement in 1895, which had quotations of bank stocks. I also used the *Guide to Investors* (New York: Haight & Freese, 1898–1904) and the *Handbook of Securities*. *The Commercial and Financial Chronicle* (New York: W.B. Dana & Co.) provided information on the operations of the company and the company's income and data on stock prices and dividends paid. Monthly data was provided between 1875 and 1925 for New York, Boston, and Philadelphia and for Baltimore between 1881 and 1925. The *Investor's Pock Manual* provided coverage beginning in 1913 for stock markets in Boston, Philadelphia, Baltimore, Detroit, St. Louis, Chicago, Pittsburgh, Cleveland, Toronto, Montreal, Salt Lake City, Cincinnati, San Francisco, Washington, New Orleans, Colorado Springs, and Los Angeles, as well as the New York Curb. In 1939, it also covered the New York Real Estate Securities Exchange, Calgary, Columbus, Hartford, Minneapolis-St. Paul, Richmond, Seattle, Spokane, Vancouver, and Winnipeg. *Walker's Manual of California Securities* provided data on the San Francisco stock market beginning in 1905.

Sources for the United Kingdom

The London Stock Exchange was founded in 1801, and until then, no organized exchange existed in England. The *Course of the Exchange* recorded the prices of stocks and bonds traded in London in the 1700s but included primarily the English funds. Before 1864, when the *Economist* began to publish the *Investors Monthly Manual*, the only way to obtain a comprehensive overview of shares that traded in England was to go to provincial newspapers that provided data on the prices of locally traded stocks. The *London Times* from 1821 to 1985 was used to record the data in each daily issue during that 165-year period.

Newspapers in Dublin began providing information on Irish stocks as early as 1784. Beginning in the 1830s, newspapers in Edinburgh, Liverpool, Manchester, Coventry, Exeter, and other cities began publishing the prices of local shares. In many cases, these share lists were published by enterprising brokers trying to drum up business for their firm.

Were it not for the willingness of stockbrokers in the Midlands to provide share lists in provincial newspapers to drum up business, it would be impossible to trace the gradual decline of canal stocks as railroads rose at their expense. Similarly, the history of the banking sector would be limited to London banks and would exclude many provincial banks if local newspapers were ignored, and the behavior of Welsh mines in the 1840s and 1850s would be lost were it not for the invaluable information provided by newspapers in Exeter and Cornwall.

Global Financial Data has investigated dozens of local newspapers and magazines to collect data from every corner of Britain, not just in London, to ensure its database recorded all aspects of the British economy and not only the companies that traded in London.

Information on individual companies listed on the London Stock Exchange was obtained primarily from the London Stock Exchange's *Stock Exchange Official Yearbook* (London: London Stock Exchange), published from 1875 until present, and *The Stock Exchange Official Intelligence* (London: Spottiswoode, Ballantyne), published from 1882 until 1933, when it merged with *The Stock Exchange Official Yearbook*. Information on railway companies was obtained from *Bradshaw's Railway Manual, Shareholder's Guide and Directory* (London: W. J. Adams), which was published from 1869 through 1923, when British railways were consolidated into four companies. Information on government securities was taken from *Fenn's Compendium of the English and Foreign Funds, Debts and Revenues of All Nations* (London: Effingham Wilson). Both the *Statist* and the *Economist* also provided useful information at different points in time.

Sources for Australia

Finaeon's coverage of Australia relies upon several sources. Australian companies listed on the London Stock Exchange before exchanges opened in Australia. Data for the GFD Indices use Australian stocks that were listed and traded in London from 1825 until 1936. The data for mining and finance stocks that listed in London is combined with data from Lamberton's *Share Price Indices in Australia* for Commercial/Industrial stocks from 1875 to 1936 to get an index of Australian stocks. We have combined data for mining stocks from the GFDatabase with Lamberton's data on commercial and industrial stocks that were listed in Australia to provide a more complete index of stocks in Australia. The dividend yield from the GFD Indices is used to calculate the total return from 1825 to 1936. For more information on the index, see Lamberton's article, "A Revised Stock Index for Australia." Real-time indices from the Sydney stock exchange are available beginning in 1936. The Australian exchanges combined into a single exchange in 1979. We have chain-linked these series to produce an index of Australian stocks that extends from 1825 until the present.

Sources for Austria, Hungary, and Czechoslovakia

Finaeon has collected data on companies listed on the Vienna Stock Exchange between 1818 and 1925 to create stock indices for Austria, Hungary, and Czechoslovakia. No real-time indices for the Vienna stock exchange were available before World War I. Monthly data for the Vienna stock exchange begins in 1922 after Austria recovered from the post–World War I hyperinflation and replaced the krone with the schilling. Austria was incorporated into Nazi Germany between 1938 and 1945 and emerged as an independent, though neutral, country after World War II.

Data from Austria-Hungary was collected from several sources. *Compass-Kalender und Jahrbuch für Handel, Gewerbe und Industrie* provided data on stock prices, dividends,

and shares outstanding annually from 1868 until the 1970s for Austria, Hungary, Czechoslovakia, Yugoslavia, Romania, and Bulgaria. In addition, several newspapers were used, including *Die Freie Presse* and *Wiener Zeitung* in Vienna. Once the data on stock prices, dividends, corporate actions and shares outstanding were collected, the GFD indexes for Austria, Czechoslovakia, and Hungary as well as Austria-Hungary before World War I were calculated.

Stock market indices for the Vienna Stock Exchange have been calculated by Finaeon from 1818 until 1922 using data collected on individual stocks. Domestic indices have been used since 1922. Various indices were calculated by national statistical agencies until the 1960s, and a daily index of the Vienna Stock Exchange was introduced in 1967. We used dividend yields calculated from our data on companies listed on the Vienna Stock Exchange between 1817 and 1922, yields on the Vienna Stock Exchange between 1922 and 1939, German yields as a proxy for Austrian yields between 1940 and 1968, and yields on Viennese stocks from 1969 until the present.

Data for government bonds is based upon bonds issued by the Austrian government beginning in 1732. Data for Austria, as opposed to Austria-Hungary, is used beginning in 1922. Data for cash depends the central bank discount rate from 1817 to 1959 and either treasury bills or the interbank rate since 1960.

- Compass-Verlag. 1868. *Compass-Kalender und Jahrbuch für Handel, Gewerbe und Industrie*. Vienna.
- Compass-Verlag. 1929. *Prager Boerse-Compass*. Prague: Compass-Verlag.
- Hanll, Rudolf. 1924. *Aktien Compass der Wiener Boerse*. Vienna: Compass-Verlag.

Sources for Belgium

Belgicapress provides daily copies of newspapers from 1800 to 1989. Prices for stocks traded on the Brussels stock exchange were provided in each issue, though only the prices for stocks that were traded were provided. Price data was provided, but rarely dividends and shares outstanding. The Official Lists from the Brussels stock exchange provided information on dividends beginning in 1873 and on shares outstanding beginning in 1878. We primarily used the *Journal de Bruxelles* to collect stock price data, but at any point in time there are at least ten newspapers that provide the same information on the Brussels, Antwerp, and Ghent stock exchanges. The Studie Centrum voor Onderneming en Beurs (SCOB) is a research center at the University of Antwerp that maintains historical databases for the Belgian stock exchanges, particularly the Brussels Stock Exchange (BSE), now known as Euronext Brussels, providing crucial data for financial history research. While the BSE itself evolved into part of Euronext, SCOB preserves the rich historical records, including data on all listed stocks, IPOs, and market activity from the 19th century onward, offering invaluable resources for academic study.

Monthly data on Belgian stocks are available beginning in 1897. The Belgian stock market was closed between 1914 and 1918, in 1940, and in 1944–1945 because of World War I and World War II. GFD has chain-linked the various stock market indices that have been calculated to provide monthly data from 1897 until the present.

When Belgium gained its independence in 1831, one-third of the Dutch debt was transferred to Belgium. The Belgian 5% Rentes were gradually converted into 3% Perpetual Bonds that continued to exist until World War II and are used as the basis for returns to government bonds in Belgium. Data on private bills was available beginning in 1848, and the Central Bank Discount

Rate is available beginning in 1858. The overnight call rate was used from 1927 to 1948 and the Treasury bill yield from 1948 until the present.

- *Le Recueil Financier Annuel*. 1893–1975. Brussels: L'Industrie, revue technique, scientifique et financière.

Sources for Canada

GFD's index of Canadian stocks relies on stocks that listed in London, New York, Toronto, and Montreal. The index relies upon GFD's index of the shares of Canadian companies that are in our database from 1824 until 1914. The Dominion Bureau of Statistics calculated indices for Canada beginning in 1914. This source was used from 1914 until 1955. Data from the Toronto Stock Exchange is used beginning in 1956, and in 1977, the TSX-300 index replaced the Toronto indices.

Canadian bonds traded in London beginning in 1853. Bonds were originally issued at 6%, but coupons declined over time until they hit 2.75% in the 1930s. Quotations for bonds quoted in Canada begin in 1919. Ten-year bonds are used beginning in 1949. The bill index uses data on private bills traded in either the United States or Canada beginning in 1824 and 1934 and uses Canadian T-bills beginning in 1934.

Sources for China and Hong Kong SAR

The London and China Telegraph provided quotes of companies in Africa and Asia that listed on the London Stock Exchange between 1859 and 1869. In 1870, the periodical began publishing quotes from the HKSE and the SSE until the periodical's demise in 1875. *The North China Herald* was a weekly newspaper from Shanghai published between August 3, 1850, and December 8, 1941. The publishers also produced *The North China Daily News*. These two newspapers provided share lists from the SSE between August 1870 and December 1941 and enable us to analyze 70 years of Chinese stocks in Shanghai.

The prices of Hong Kong shares were published between 1870 and 1961 in *The China Mail*, an English language newspaper that was published in Hong Kong between 1845 and 1974. The newspaper provided daily share lists from either local brokers or the Hong Kong Stock Exchange.

The North-China Herald also published the *China Stock and Share Handbook* between 1912 and the 1930s, listing all the companies in Shanghai, Hong Kong, and Tientsin as well as Japanese companies such as the South Manchurian Railway. Many companies cross-listed between Hong Kong and Shanghai. Chinese companies listed in Chinese tael (Chinese yuan after 1931), Hong Kong companies listed in Hong Kong dollars, and British companies listed in British pounds.

Sources for Denmark

The first publication of Danish share prices occurred in 1759. Share prices were occasionally published along with commodity prices. In 1806, newspapers began publishing bond prices as well, but up until 1813, published prices of stocks were more common than those of bonds.

In the 1830s, official price lists of stocks were published, and in the 1850s, a broader range of stocks was published.

I have used a number of resources in order to put together a history of Danish stocks. Bent Stancke provided data on Copenhagen stocks from 1759 to 1830 in *The Danish Stock Market 1750–1840*, published in Copenhagen in 1971. Several newspapers were consulted, including *Dagen* (1835–1843), *Faedrelandet* (1840–1852), and *Dagbladed* of Copenhagen (1851–1872), to cover the period from 1836 to 1872. Data for individual companies from 1873 to 1912 were taken from various issues of Medarbejdere H. Green's *Fonds og Aktier* (Copenhagen: L. Jorgensen, 1883–1912). Data on individual companies were also obtained from Danske Statistiske Department's *Statistisk Årbog* (Copenhagen: Statistiske Dept.) from 1893 to 1937. By combining these sources, I obtained data on Copenhagen stocks from 1759 to 1937. Danish bond prices were available from Amsterdam between 1788 and 1830.

Stancke provided information on several banks, including the Kurantbanken (1736–1773), Speciesbanken (1791–1813), and Centralkassen (1829–1839); on several insurance companies, including the Søassurancekompagnie (1726–1927), Almindelig Brandassurance (1798–1891), and Københavns Mobel-Brandassurance (1778–1891); and several trading companies, including the Det Kongelige Octroyerede Danske Asiatiske Kompagni (1732–1844), Det Almindelige Handelskompagnie (the General Trading Co.; 1747–1774), Det Ostersoisk-Guineiske Kompagni (1781–1786), and Det Vestindiske Handelskompagni (1778–1786). Periodic price data as well as shares outstanding data were provided, but limited information on dividends was available.

The newspapers provided periodic data on companies listed in Copenhagen, and data were collected each month on the last available date for that month. Data for the Danmarks Nationalbank was collected beginning in June 1837. Data for the København-Roskilde Jernbane (Railroad) began in June 1845, but data for other companies did not begin until September 1854, when prices for the three insurance companies mentioned previously, as well as the Københavns Tivoli and Københavns Kasino, began. By 1871, data on 15 different companies were available. Green's *Fonds og Aktier* and the *Statistisk Arbog* provided comprehensive coverage of the Copenhagen stock exchange from 1873 to 1937, covering more than 100 companies. *Fonds og Aktier* provided price data, dividends, and shares outstanding, while *Statistisk Årbog* provided only price data and dividends.

Data before 1835 are periodic, with the availability of data depending on the year. There are multiple years when no data were available, such as 1776–1780 and 1791–1802, and no data were available after 1830. Monthly data were available from June 1836 to 1925 and bimonthly data were available up to 1937. Monthly indexes for the Copenhagen Stock Exchange were calculated beginning in 1921, and the indices GFD calculated based on individual stocks were linked up to the real-time indexes calculated in Copenhagen to provide a continuous series for stocks.

- Newspapers: *Dagen* (1835–1843), *Faedrelandet* (1840–1852), and *Dagbladed of Copenhagen* (1851–1872).
- Danmarks Nationalbank. *Danmarks Nationalbank, 1818–2018*. Copenhagen.
- Danske Statistiske Department. *Statistisk Årbog*. Copenhagen: Statistiske Dept.
- Green, Medarbejdere H. *Fonds og Aktier*. Copenhagen: L. Jorgensen.
- League of Nations. 1922–1946. *Monthly Bulletin of Statistics*. Geneva: League of Nations.

- Maercher, Michael. "Danish Banking Before and After the Napoleonic Wars: A Survey of Danish Banking, 1736–1857." Memo.
- Stancke, Bent. 1971. *The Danish Stock Market 1750–1840*. Copenhagen: University of Copenhagen Institute of Economic History.

Sources for Finland

Peter Nyberg and Mika Vaihekoski put together a historical index of Finnish stocks based upon stocks traded on the Helsinki Stock Exchange which calculated returns through 1987 when the OMX indices were introduced. The Unitas Index was used from 1933 until 1986, and the Helsinki Stock Exchange indices were used from 1987 until the present.

No data are available on domestic government bond yields before 1960, so bonds traded in London and Berlin are used. This includes the 3.5% Grand Duchy of Finland bonds from 1863 to 1909, the 4.5% Grand Duchy of Finland Railroad Bonds from 1909 to 1924, the Finland 6s of 1945 from 1924 to 1945, the Helsingfors 6.5% municipal bonds of 1960 from 1946 to 1948, and the Finland 5s of 1961 through 1953. Finlands Bank was established in 1860, and the discount rate of the Finlands Bank is used from 1860 to 1976, the Finland Overnight Rate from 1977 to 1986, 3-month Helibor from 1986 to 1998, and 3-month Euribor from 1999 until the present.

Sources for France

The *Compagnie des Indes* traded in Paris between 1718 and 1793, providing an investment vehicle for traders in Paris, Amsterdam and London. All corporations were closed down during the French Revolution. The Banque de France started trading in 1801, and in the 1830s, France began building railroads that stretched out from Paris to the rest of the country. France showed good growth between the 1840s and 1880s, with French capitalists investing not only in France but other parts of Europe as well; however, between the 1880s and the 1980s, there was little return to equity to shareholders and a decline in the ratio of market cap to GDP. GFD's stock index is based upon the *Compagnie des Indes* in the 1700s and the *Banque de France* from 1801 to 1841. Most French railroads traded in London between 1841 and 1900, and the index is based upon shares that traded in Paris and in London. The INSEE calculated stock indices from 1900 through the 1950s, and beginning in the 1960s, indices calculated by the Paris Stock Exchange are used.

France has a long history of government bonds stretching back to the 1300s. Bond yields steadily declined from the 1400s to the 1700s. France defaulted on its bonds during the Franco-Spanish War in the 1650s and the Napoleonic Wars in the 1790s. Under the Law system, shares in the *Compagnie des Indes* replaced government bonds. Under Napoleon, fixed-income investors received one-third of a new bond for each old bond as a way of reducing the level of outstanding debt. Rentes yielding 3% or 5% were the benchmarks for France between 1800 and the 1970s. Bond yields hit peaks in 1848, during World War I, during World War II, and during the inflation of the 1970s and 1980s. All these inflations reduced returns to fixed-income investors who lost ground to inflation during the 1900s. Banque de France Discount Rates and the yield on private bills are used between 1800 and 1930, and the yields on Treasury bills are used since 1930.

Gallica provides access to newspapers such as *Le Figaro*, the *Gazette de France* and the *Journal de Chemins de Fer*. The *Tableaux des Cours des Principales Valeurs* provides annual highs and lows for stocks traded on the Paris stock exchange between 1797 and 1872. The *Annuaire*

Desfossés provide extensive information on individual companies listed in France. They are similar to the Mergent Manuals published in the United States. The Data for Financial History (DFIH) provides a comprehensive database on the French stock market since 1795 which includes data on prices, dividends, shares outstanding, and personnel and other information for French companies.

- *Le Figaro*. 1826–1950. Paris.
- *Gazette de France*. 1746–1917. Paris.
- *Journal de Chemins de Fer*. 1864–1930. Paris.
- *Almanach Financier, Guide des Rentiers et Capitalistes*. 1867–1939. Paris: Bureau du Journal Financier.
- *Annuaire Desfossés*. Various years. Paris: R Desfossés & Cie.
- Courtois, Alphonse. 1877. *Tableaux des Cours des Principales Valeurs*, 3rd ed. Paris: Garnier Freres.

Sources for Germany

For the German stock market, I used data on individual railroads, banks, and other companies between 1835 and 1870 to track the behavior of German stocks before the Berlin stock market was established as the principal stock market in Germany in 1870. Germany's railroads were nationalized in the 1870s, and heavy industry and finance became the mainstay of the German economy. After World War II, Frankfurt became the financial center of West Germany. Both the European Central Bank and the Bundesbank are located in Frankfurt-am-Main, and the city will remain the financial center of Germany for decades to come. The Reichsbank calculated indices of stock prices after World War I, and the Deutscher Aktienindices (DAX) were introduced in 1987. The DAX used the Frankfurter Allgemeine Indices to extend the data for the DAX back to 1959. GFD has calculated indices for Germany before the 1870s.

Paul Schmelzing has collected data on German bond yields back to 1326. Since Germany didn't exist as a single entity until the 1870s, the yields on bonds issued by different states are used until the 1870s. The Saxon 3% bonds of 1764 are used until 1806. Prussian bonds are used from 1807 until 1891, and German bonds are used beginning in 1891. The yield on Hamburg commercial bills is used from 1814 to 1875, and the yield on Berlin bills is used from 1876 to 1945. Treasury bills are used beginning in 1954.

Newspapers from Germany that provide historical prices for different exchanges can be obtained from the Deutsches Zeitungportal. Two excellent newspapers that provide data for the Berlin and other German exchanges are *Allgemeiner Anzeiger* from 1850 to 1890 and *Berlin Borsen Zeitung* from 1873 to 1930.

- *Allgemeiner Anzeiger für Rheinland-Westphalen, Organ für Handel, Gewerbe, Verkehr und Anzeigen*, various issues, 1850 to 1890.
- *Berliner Börsen-Zeitung, Tageszeitung für Politik und Wirtschaft, für Wehrfragen, Kultur und Unterhaltung*, various issues, 1873 to 1930.

The *Handbuch der Deutschen Aktiengesellschaft* and the *Kleines Saling's Börsen Jahrbuch* provide extensive information on individual firms similar to the Mergent Manuals in

the United States. *Neumann's Cours-Tabellen der Berliner Fonds-Börse* provided monthly high-low-close for all shares listed on the Berlin stock exchange between 1888 and 1925.

- *Handbuch der Deutschen Aktiengesellschaft*, various issues. 1895–1943.
- *Jahresbericht der Handelskammer in Leipzig*. 1869–1903. Leipzig.
- *Kleines Saling's Boersen-Jahrbuch*, various issues. Berlin: Rambaum & Co.
- Michaelis, Julius. 1854, 1859, and 1863. *Deutschlands Eisenbahnen: Ein Handbuch fuer Geschaefsleute, Capitalisten und Speculanten*. Leipzig: Amelangs Verlag.
- Neumann, Alfred. 1888–1925. *Neumann's Cours-Tabellen der Berliner Fonds-Börse*, various issues. Berlin.
- Saling, Alfred. 1871. *Die Boersen-Papier, 1870–1871*. Berlin: Haude & Spener'sche Buchhandlung.

Sources for Greece

Annual data on companies is available from 1890 to 1920 from the *Manuel des sociétés anonymes helléniques* (Athens: Banque d'Athenes, 1919) which provided price data, shares outstanding, and dividends. Beginning in 1895, we obtained data on individual stocks from two Athens newspapers: *Εμπρός* (*Forward*) and *Scrip*. The newspapers provided data on stock prices but no data on shares outstanding or dividends. The newspapers were published daily, and we collected data on an end-of-month basis from September 1895 to January 1929. In 1929, the Hellenic Statistical Authority (ELSTAT) began publishing a monthly index of the Athens Stock Exchange as well as data on individual banking stocks.

Sources for India

GFD's index for India uses data on the East India Co. exclusively from 1692 until 1845. A second East India Co. existed between 1698 and 1708, but it merged with the old East India Co. in 1708 because the competition between the two was eliminating their profitability. Data for the East India Railway begins in 1846, and the number of Indian companies that listed in London grew to 20 in the 1860s and peaked at around 50 in 1900. During the late 1800s, the shares of over 200 companies, mainly textile, tea, rubber, and mining companies, traded in Bombay. Data for Indian companies listed in London is used from 1690 to 1914. The number of companies remained around 50 until 1914 when a stock index based upon shares that traded in India was introduced. The domestic India index used data from over 100 companies from the Calcutta, Bombay, and Madras stock exchanges. By linking together data from the East India Co. from 1690 to 1845, the London Stock Exchange from 1846 to 1914, and Indian stock exchanges from 1914 to the present, we have been able to provide over three centuries of data on companies that operated in India.

The government bond series uses the yield on East India Co. stock from 1722 until 1864 when the Government of India issued its first bonds. The dividend was set at 10.5% in 1793 and remained at that level until the dissolution of the company in 1874. India issued a 4% bond in 1864, which was later replaced by bonds yielding 3.5% and then 3%. Unlike many other emerging markets, India has never defaulted on its bonds, a fact that is reflected in the yield remaining around 4% until India's independence. Today, Indian bonds yield around 7%. The data for cash is based upon the Bank of England Central Bank Discount Rate from 1694 to June 1718,

the Call Rate for Cash in London from July 1718 to 1869, the deposit rate in London from 1870 to November 1873, the India Reserve Bank Discount Rate from December 1873 to March 1925, the Call Rate from April 1925 to 1930 and August 1948 to 1992, and the yield on T-bills from 1931 to 1948, from 1952 to 1972, and since 1992.

Historically, there were two primary stock exchanges in India—in Bombay (Mumbai) and Calcutta (Kolkata). The primary newspapers we used to collect data on India were the *Bombay Gazette*; the *Times of India*, published in Bombay; the *Civil & Military Gazette*, published in Lahore; and the *Englishman's Overland Mail*, published in Calcutta. *Joint Stock Companies in British India and Mysore* was published between 1918 and 1925 and provided information on individual companies. *Manual of Rubber, Tea and Oil Companies* is another source of information for hundreds of resource companies.

The individual stock exchanges published yearbooks that provided extensive information on companies listed on their stock exchanges. This included the *Calcutta Stock Exchange Official Yearbook*, which began publication in 1937; *Manumehta's Bombay Stock Exchange Yearbook*, which began publication in 1943; and the *Madras Stock Exchange Official Yearbook*, which began publication in 1952.

Sources for Ireland

We have been able to collect data from Dublin newspapers until the 1980s to create an index that links up with the indices calculated by the Dublin Stock Exchange today. Data on bonds issued on behalf of Ireland and guaranteed by London were issued in 1891. Since the Irish bonds were guaranteed by London, British consols can be used as a proxy for Irish bonds before 1891. In 1923, Ireland issued its own bonds, and Irish bonds have been used since then. Cash data uses UK T-bills before 1923, Irish Central Bank Deposits from 1923 to 1969, and Irish T-bills since 1969.

Sources for Italy

The primary source that GFD used for Italy during the nineteenth century was Mario da Pozza and Giuseppe Felloni's *La Borsa Valori di Genova nel Secolo XIX* (*The Genoa Stock Market in the Nineteenth Century*). Pozza and Felloni collected data for 14 stocks on the Genoa stock exchange between 1856 and 1896 and provided price, capitalization, dividend, and corporate action data on those companies. In addition, GFD used various issues of *Indici e Dati Relativi ad Investimenti in Azioni Quotate Nelle Borse Italiana*, which provided price, dividend, and share outstanding data on companies listed on the Milan Stock Exchange beginning in 1928. For the years between 1896 and 1928, GFD relied on two newspapers to collect data: *Corriere della Sera*, which was published in Milan and provided data on the Milan and Rome stock exchanges from 1881 until the present, and *La Stampa*, a newspaper published in Turin that continued the data series in *La Borsa Valori* from 1897 until 1914. *Annuario Italiana del Capitalista* provided price data, dividend data, shares outstanding, par values, and founding dates for corporations listed on all the exchanges in Italy. Finally, *La Societa Quotate alla Borsa Valori di Milano dal 1861 al 2000* provided histories of each company that listed on the Milan Stock Exchange between 1861 and 2000. By combining the resources of these books and newspapers, GFD was able to put together data histories on over 100 stocks that traded in Milan, Rome, and Genoa between 1856 and 1947 so indexes could be calculated for Italy over a 90-year period.

Finaeon has collected data from the Genoa, Milan, and Rome stock exchanges from 1856 to 1947 to provide an index of Italian stocks until 1929. Indices were calculated by Prof. Guarneri from 1930 to 1939 and the Gruppo Edison from 1939 to 1973. The Banco Commerciale Italiana calculated an index beginning in 1973, but the BCI index was discontinued in 2019. The FTSE Italia All-Share Index is currently used.

Schmelzing provides annual interest rate data from different states that existed in Italy until 1806. Since Italy didn't exist as a unified country until 1861, bonds from Naples are used from 1807 to 1834 and from Rome from 1835 until Italy emerged in 1861. The Italian Rentes, which initially paid 5% interest, which was lowered to 3.75% in 1906 and 3.5% in 1912, are used from 1862 to 1954. Between 1954 and 1988, bonds with a maturity of six years are used, and beginning in 1989, the 10-year bond is used. The Banca d'Italia Discount Rate is used from 1867 until 1921, private bills from 1922 to 1939, and Treasury bills from 1939 to date.

Sources for Japan

A number of sources were used to put the data together for Japan. Nomura Shoten's *Handbook of Japanese Securities* was published in 1911 in Osaka and provided not only data on prices for Japanese securities but also information on shares outstanding and dividends. The *Japan Weekly Mail* was published in Yokohama and provided data on individual stocks between 1897 and 1909. Another publication that listed stock price data in Japan was the *Financial Economist*, which provided data between 1908 and 1913.

Probably the most important periodical from Japan that helped data be collected for the Japanese economy was the *Oriental Economist*. The *Oriental Economist* annually published the *Oriental Economist Year Book*, which provided extensive information on both the Japanese economy and financial markets in Japan. The *Oriental Economist* also calculated stock market indexes that began in 1913. In 1934, the *Oriental Economist* began publishing a monthly magazine in English that kept track of the Japanese economy, including the prices, shares outstanding, and dividend yield for about 100 stocks that traded in Tokyo and Osaka. Although the Japanese stock market was closed between August 1945 and May 1949, the *Oriental Economist* kept track of the price of shares that were traded over the counter in Tokyo and Osaka. It also calculated a stock market index that GFD uses to fill in the gap when the official Japanese stock markets were closed.

GFD has calculated an index of Japanese stocks between 1878, when the Tokyo Stock Exchange opened, and 1914 using data on individual Japanese companies. The National Bank Index is used from 1914 until 1932, and the Oriental Economist Index is used from 1932 until 1949, when the Tokyo Stock Exchange reopened and the Nikkei 225 was introduced. The two main indices for Japanese stocks are the Nikkei 225 and the TOPIX index. The Nikkei 225 has been calculated daily since 1949 and is an average modelled after the Dow Jones Industrials Average. The Topix covers the entire Tokyo stock market, is cap-weighted, and was introduced in 1968.

Japan issued bonds in London in 1870, and sterling-denominated bonds are used from 1870 until 1930. Bonds issued in Tokyo are used beginning in 1930. Seven-year bonds are used between 1961 and 1971, and 10-year bonds are used beginning in 1972. Cash relies upon the overnight discount rate or overnight call money between 1882 and 1959. Treasury bills are used beginning in 1960.

Sources for the Netherlands

The Delpher website provides access to Dutch newspapers from 1610 until the 2000s. The *Algemeen Handelsblad* and *De Tijd* are particularly helpful. Data on individual stocks traded in Amsterdam begins in 1789. The *Van Oss' Effectenboek* provide information on individual companies similar to the Mergent Manuals in the United States. The *Effectenboek* comes in two volumes, one for domestic (*binnenland*) and one for foreign (*buitenland*) stocks. The domestic issues include companies from the Netherlands East Indies.

Finaeon has calculated an index of Dutch shares before the Napoleonic Wars and an annual index of shares for both the Netherlands and Netherlands Indies before World War I. The Central Bureau of Statistics (CBS) calculated an index for Netherlands shares beginning in 1919 which included 50 stocks. Royal Dutch Shell, now Shell plc, represented over one-third of the market capitalization of the Dutch stock market during the past 100 years, so there was a high correlation between the performance of Royal Dutch Shell and the Dutch stock market in general. The Amsterdam Stock Exchange All-Share index has been calculated daily since 1980.

Paul Schmelzing has calculated annual data on Dutch government bonds since 1400. Monthly data on Dutch government bonds begins in 1788. Outstanding Dutch bonds were consolidated into a single 2.5% bond in 1814, and this bond is used through 1930. Daily data for the 10-year Dutch bond is used beginning in 1978. The Central Bank Discount Rate is used from 1814 to 1860, the yield on private bills is used from 1860 to 1914, the Central Bank Discount Rate is again used from 1914 to 1918, the contango rate is used from 1919 to 1940, and the yield on T-bills is used from 1941 to date.

- Petram, Lodewijk. "The World's First Stock Exchange: How the Amsterdam Market for Dutch East India Company Shares Became a Modern Securities Market, 1602–1700." Unpublished PhD dissertation, University of Amsterdam.
- *Van Oss' Effectenboek*. 1938–1973. Buitenland Fondsen and Binnenlandsche Fondsen. Gravenhage: H. P. Leopolds U.M. N. V.
- *Algemeen Handelsblad*. Newspaper, various issues.
- *De Tijd: Godsdienstag Staatkundig Dagblad*. Newspaper, various issues.

Sources for New Zealand

Data for New Zealand stocks that listed in London are used from 1862 until 1930. Stock market data based upon stocks that listed in New Zealand begins in 1930, and daily data begins in 1970. New Zealand government bonds first listed in London in 1861. Domestic quotations begin in 1941. The New Zealand Reserve Bank Discount Rate is used from 1923 to 1964, the yield on time deposits from 1965 until 1973, and the yield on T-bills since 1973.

Sources for Norway

Indices for stocks in Norway begin in 1914. Data for the Norsk-Hydro Electric shares are used between 1909 and 1914, and the share indices calculated by Norges Bank are used from 1914 to 1989. The OBX-25 Stock Index is used today. The dividend yield is taken from the Statistisk Arbok for Norge and used to calculate the Total Return Index using data from the price index

until 1969, when the Oslo SE Return Index was introduced. Daily data for the All-Share Index has been used since 1983.

The Norges Bank has done research on the returns to government bonds with data beginning in 1822. GFD relies upon the series provided by the Central Bank to calculate the returns to bonds. Monthly data are used from 1822 to 1985 and daily data from 1986 to the present. The bill index uses the Norges Bank Discount Rate from 1818 to 1914, deposit rates from 1915 to 1983, and 3-month Treasury bills from 1984 until the present. Norway has not defaulted on its bonds since it began issuing bonds after the Napoleonic Wars.

Sources for Portugal

Fewer than 50 stocks traded on the Lisbon Stock Exchange before World War I because some issuers preferred to list on the larger exchanges of Europe. The Companhia Real dos Caminhos de Ferro Portugueses was established in 1860 and traded along with a handful of other Portuguese stocks in Paris. The *Gazeta dos Caminhos de Ferro de Portugal e Hespanha* provides data on Portuguese shares traded in Lisbon and Paris between 1888 and 1923. Most shares that traded on the Lisbon exchange were local or colonial shares. It was primarily government debt that traded outside of Portugal. Maria Eugenia Mata, Jose Rodrigues de Costa, and David Justino have put together data for Portuguese listed shares since 1900, and our data on the share market relies upon their work.

Portuguese bonds traded in Amsterdam between 1803 and 1815. New bonds were issued in London in 1823; however, Portugal had one of the poorest records for paying interest on bonds in the 1800s. Portugal frequently missed interest payments or refunded old bonds with new bonds and reduced coupon payments to as low as 1% in 1892. Major refundings occurred in the 1850s and 1890s. Fear of default in the 1930s and 2000s drove bond yields over 10%, as did inflation in the 1980s. Nevertheless, Portugal did not default on its bonds during the twentieth century and avoided bankruptcy in the twenty-first century. To calculate the return to cash, data are available on the discount rate for the Banco de Portugal since 1863 and on Treasury Bills since 1985.

Sources for Singapore and Malaysia

The Singapore *Straits Times* newspaper began recording prices of Singapore shares in 1872. The newspaper received quotes from local brokers who traded shares regardless of whether they were industrial shares in Singapore or rubber and tin shares in Malaya. In 1930, the Singapore Stockbrokers' Association was formed to organize securities trading. It was renamed the Malayan Stockbrokers' Association in 1937. The Malayan Stock Exchange was established on May 9, 1960, when public trading of shares began. It was renamed the Stock Exchange of Malaya in 1964 and changed to the Stock Exchange of Malaysia and Singapore in 1965. The *Manual of Rubber, Tea and Oil Companies* provides information for hundreds of resource companies from Malaysia.

Sources for South Africa

Data before 1947 uses indices from C. G. W. Schumann and A. E. Scheurkogel's *Industrial and Commercial Share Price Indices in South Africa*. Unfortunately, Schumann and Scheurkogel

did not include mining shares in their indices, and as in Australia, their exclusion produced an upward bias to the South African indices. We have combined the data from mining shares listed in London with commercial and industrial shares that listed in Johannesburg to create GFD's index for South Africa. It is curious that most of the outperformance of the Schumann and Scheurkogel index occurs before 1947, but since 1947 when the South African index was calculated in "real time," the outperformance disappears. We weighted both the London mining shares and South African Commercial and Industrial shares at 50% between 1910 and 1960 and used the JSE All-Share index from 1960 until 2024. We used the dividend yield on South African shares in London before 1960 to produce a return index that included not only capital gains and losses but reinvested dividends as well. Daily data begins in 1970. South Africa provides countercyclical behavior relative to the rest of the world because its returns are more dependent upon gold and other minerals than industrials and it is an emerging market. This helps portfolios that include South African stocks to reduce the volatility of their investments.

The Cape of Good Hope issued bonds beginning in 1860. Union of South Africa bonds were issued beginning in 1914, and 10-year bonds are used beginning in 1972. Yields on private bills in London are used as a proxy for cash returns in South Africa before 1913. The South Africa Reserve Bank discount rate is used from 1913 until 1935, and South African treasury bills are used beginning in 1936.

Sources for Spain

Spain had exchanges in Madrid, Bilbao, and Barcelona before World War I, with minor exchanges in Asturias, Santander, Navarra, Zaragoza, Valencia, Valladolid, Reus, Alava, and the Canarias. During the 1800s, only government debt and Banco de España stock traded in Madrid. Finaeon uses the price of Banco de España stock from 1832 until 1855. Monthly data on Spanish stocks begins in 1856 using data on the Banco de España and Spanish companies that traded in Paris. Beginning in 1918, an index of stocks trading in Madrid is used. No data are available during the Spanish Civil War between 1936 and 1940 when the stock exchanges were closed. Monthly data are available from 1940 to 1971, and daily data begin in 1971 using companies listed on the Madrid Stock Exchange. There are also regional exchanges in Barcelona and Valencia. The market capitalization of Spanish stocks is around USD750 billion and includes almost 3,000 companies.

Spanish bonds traded in Amsterdam in 1788 and are used from 1788 to 1824. Spanish bonds that traded in London are used from 1824 to 1912. Madrid-based bonds are used from 1912 until the present. Spain went through frequent defaults during the 1800s. Spain defaulted on its bonds in 1808, renewed paying interest in 1820, defaulted again in 1824, and reorganized its debt in 1834, providing bondholders with 2/3 of active interest paying bonds and 1/3 of passive non-interest-paying bonds. Spain defaulted again in 1837 and reorganized its bonds again in 1851, paying 1% interest on new bonds, which gradually rose to 3% interest. New bonds were issued in 1870, but Spain defaulted once again, making no interest payments between 1873 and 1876, and reduced its interest rate in 1881. There was a lot of political turmoil in Spain in the 1800s, and this is reflected in the poor performance of its government bonds. Spain has not defaulted since 1881. Beginning in 1898, Spain passed several laws to convert its external debt into internal debt, and Banco de España stock traded regularly in Madrid.

The Spanish discount rate is used from 1863 to 1968, the deposit rate is used from 1969 to 1973, and Spanish T-bills are used from 1973 to 2019.

Sources for Sweden

Data are annual for Sweden from 1870 through 1900 using the Affärsvälden Index. The Affärsvälden monthly index is used from October 1901 to 1912. The Riksbank Index is used from 1913 to 1943. From 1944 to 1985, the Affärsvälden General Index is used. Daily data is available beginning in 1980. NASDAQ OMX took over the calculation of the index, and data is available from NASDAQ OMX beginning in 1986.

Swedish bonds traded in Amsterdam in 1788, and data are available from Amsterdam through 1815. New data from Sweden begins in 1845 using individual bonds through 1918. An average of several bonds is used beginning in 1918, and beginning in 1980, the yield on the 10-year bond is used. Sveriges Riksbank's discount rate is used from 1814 to 1932, the Swedish deposit rate is used from 1933 to 1954, and Swedish T-bills are used from 1955 to date.

Sources for Switzerland

Switzerland provides access to historical newspapers from which we collected data on share prices. The *Neuer Zürcher Zeitung* was first published in 1780, and share prices were published beginning in 1851 when the newspaper started providing prices for the Bank in Zurich and the Credit Bank in St. Gallen stock. The *Neuer Zürcher Zeitung* published share prices for Zurich, Geneva, and Basel, making a search in newspapers outside of Zurich unnecessary. In addition to the newspapers, we used the *Vade Mecum* distributed by Credit Suisse for information on shares outstanding and dividends. We also consulted books on Swiss railroads and banks to supplement the *Vade Mecum*.

The Swiss National Bank published indices of Swiss stocks from 1914 until they were discontinued in 1988. The Vereinigung Schweizerischer Effektenborsen (now the SIX Swiss Exchange) has calculated daily indices of Swiss stocks since 1987, and between these two sources, a complete picture of the performance of Swiss stocks is available. Swiss government bonds were traded from 1857 until 1899. Swiss Railroad bonds were used from 1899 to 1923, and Confederation bonds have been used since then. The deposit rate on savings accounts is used from 1837 to 1894, the Swiss National Bank's discount rate is used between 1895 and 1956, bank deposits are used between 1956 and 1979, and T-bills are used since 1980.

Sources for World Index

Global Financial Data's World Index extends from the beginning of stock markets in Amsterdam in 1602 to the present day. Until now, no one has calculated a world index that precedes 1900 and no one has calculated an index which is reweighted on a regular basis. Now, an index that provides a complete history of global equity markets is available. GFD also provides world bond indices that can be compared to the global equity indices and calculates global sub-indices that include the World excluding the United States, the World excluding the US and UK, a European index, and an index for emerging markets, among others. Without these global composites, it is impossible to understand the behavior of stocks, bonds, and bills over the past 400 years.

Data from 1602 to 1792 is market-cap weighted by company. The index includes 38 companies from the United Kingdom, 3 from France, 3 from the Netherlands, and 29 from

the United States. We have data on the price, dividends, and shares outstanding for each of the 73 companies. If any of those three variables was unavailable, we excluded the company from the index.

Beginning in 1792, we use indices from each country as the basis for the index and weight each country according to actual or estimated market caps for that country. The market caps are revised every five years, and these are used to weight each country in the index for the next five years. We use the market caps on December 31, 1914, for the weights between 1915 and 1919, the market cap on December 31, 1919, for the weights between 1920 and 1925, etc. Price and return indices are monthly in periodicity using end-of-month values. All values were converted to British pounds for the data through 1792, and all data after 1792 were converted to US dollars. Data for the price indices, return indices, and stock market capitalization that were used to calculate these indices are available from Global Financial Data.

Since 1792, we have calculated indices for each country that had trading going on within that country or had companies listed on exchanges in London, Paris, Amsterdam, or another exchange. The index includes data for the Netherlands (1602), India (1657), the United Kingdom (1694), France (1718), Denmark (1759), the United States (1784), Ireland (1792), Austria (1817), Mexico (1824), the Netherlands Indies (1824), Australia (1825), Brazil (1825), Canada (1825), Belgium (1831), Spain (1833), South Africa (1834), Germany (1835), Czechoslovakia (1836), Egypt and Italy (1856), Turkey (1856), Hungary (1859), New Zealand (1862), Argentina (1865), Russia (1865), Sweden (1870), China (1871), Japan (1878), Portugal (1899), and Switzerland (1899) as well as countries for which data begins in the twentieth century.

Bond data for Europe begins in 1700 when data for England is available. Although GFD has data on government bond yields for several European countries before 1700, the data are annual and sporadic. Bond data begins in Britain in 1700, in France in 1746, and in many other countries in 1788 when data on bonds traded in Amsterdam became available. Countries are weighted by their GDP rather than by the value of bonds outstanding since data on GDP are readily available for most countries, but historical data on the amount of bonds outstanding is not available for each country. Returns are converted into US dollars to make the data comparable. A constant value is used prior to the introduction of the US dollar in 1792. Since there are no Europe-wide Treasury bills, data from the United Kingdom is used until 1918 and an index for US Treasury bills is used beginning in 1919.

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