GLOBALIZATION, GATING, and RISK FINANCE

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An in-depth guide to global and risk finance based on financial models and data-based issues that confront global financial managers.

Globalization, Gating, and Risk Finance offers perspectives on global risk finance in a world with economies in transition. Developed from lectures and research projects investigating the consequences of globalization and strategic approaches to fundamental economics and finance, it provides an approach based on financial models and data; supported by many case-study problems. The book departs from the traditional macroeconomic and financial approaches to global and strategic risk finance, where economic power and geopolitical issues are intermingled to create complex and forward-looking financial systems.

Chapter coverage includes: Globalization: Economies in Collision; Data, Measurements, and Global Finance; Global Finance: Utility, Financial Consumption, and Asset Pricing; Macroeconomics, Foreign Exchange, and Global Finance; Foreign Exchange Models and Prices; Asia: Financial Environment and Risks; Financial Currency Pricing, Swaps, Derivatives, and Complete Markets; Credit Risk and International Debt; Globalization and Trade: A Changing World; and Compliance and Financial Regulation.

- Provides a framework for global financial and inclusive models, some of which are not commonly covered in other books
- Considers risk management, utility, and utility-based multi-agent financial theories
- Presents a theoretical framework to assist with a variety of problems ranging from derivatives and FX pricing to bond default to trade and strategic regulation
- Provides detailed explanations and mathematical proofs to aid the readers' understanding

Globalization, Gating, and Risk Finance is appropriate as a text for practitioners and graduate students of global finance, general finance, financial engineering, and international economics.

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Globalization, Gating, and Risk Finance

Dedicated to our parents: Nyambuu Khand, Selenge Tserenvanchig, and Violette Budestchu Tapiero

Chapters' Outline

The book is organized as follows.

Chapter 1, Globalization: Economies in Collision, provides a broad overview by introducing a selected number of problems motivating interest in global risk finance. This chapter provides a summary of foreign exchange (FX) markets, exchange rate regimes, and the evolution of reserve currencies from a macroeconomic perspective. We discuss the emergence of the Chinese yuan as a global exchange currency, its usage in global trade, and its inclusion in the International Monetary Fund's basket of foreign currencies. Further discussion of the yuan is relegated to subsequent chapters. Chapter 1 further outlines the history of globalization and presents a list of special issues for further discussion.

Chapter 2, Data, Measurements, and Global Finance, provides a review of standard statistical measurement approaches commonly used in economics and finance. We discuss national accounts, big data and model-less finance, technology and financial data, and data management. Particular attention is given to multivariate data and its treatment. For example, an introduction to data reduction and statistical measurement, principle component analysis, data modeling, copulas, implied volatility, autoregressive moving average, and related multivariate probability models are presented as an approach to the modeling and the study of global financial data. Autoregressive conditional heteroscedasticity (ARCH) and its extensions (generalized ARCH (GARCH), threshold GARCH, and GARCH-in-mean) are suggested for the measurement of FX volatility. This chapter assumes that the reader is already familiar with basic statistical techniques and seeks only to learn their relevance for practical problems. For the further study of data analytics and statistics, an extensive list of references is given.

Chapter 3, Global Finance: Utility, Financial Consumption, and Asset Pricing, outlines microeconomic and financial approaches to financial and asset pricing models and their extensions to a multi-country and multi-currency world. We develop the theoretical underpinnings underlying the Arrow–Debreu theory for complete market as well as the utility theory and its consumption capital asset pricing model (CCAPM). These theories are applied to valuation pricing in competing and a multi-agent framework. To do so, we introduce an approach based on the financial commitments to consumption. We then apply this framework to both standard and multi-country financial pricing and investment problems. This is shown to be far more representative of global finance based on competing agents. Examples for pricing foreign bonds, investments in securities, debt management, and currency wars are also outlined. CCAPM, in its multi-agent form, is shown to be particularly useful in pricing debt, financial leverage, inequality, swaps, and other aspects of global finance. Our tentative analyses are essentially essays which express the complexity of the pricing of financial products across national boundaries. Throughout the chapter, we introduce pricing and valuation models that are consistent with fundamental approaches, yet seek their marginal expansion to problems recurrent in global finance. The chapter's intent is to provide a relatively simple approach to some theoretical issues that occur in both conventional and multi-agent applications of global finance models.

Chapter 4, Macroeconomics, Foreign Exchange, and Global Finance. Global finance and international macroeconomics are intimately related to one another, yet they differ by the time scale of their statistics and by their concern with economic and financial global policies. This chapter presents several fundamental macroeconomic FX rate models required to provide a broader appreciation of global finance as well as to better predict sovereign state policies based mostly on macroeconomic statistics and political and geo-political factors. We refer to the closed economy model introduced by Keynes and study its extension to an open economy by the Mundell–Fleming model. In this context, the implications of monetary and fiscal policies under the IS–LM–balance of payments model are discussed, describing the relationship between the goods and money markets and the balance of payments. Also, an equilibrium exchange rate determined by the demand and supply of currency is described, with further discussion on major factors affecting the exchange rate. Interactions between expenditures by the private sector, government, and transactions with foreign economies are highlighted. Their evolution underlies the relationships between cross-border trade, capital, and job flows. We discuss the importance of balance of payments in global finance and its implications. The sustainability of external debt, trends in foreign direct investment, and capital flows are highlighted. This chapter discusses recent trends in macroeconomic policies and exchange rate movements that shape global finance. At the same time, it highlights practical policy concerns and predictable scenarios concordant with macroeconomic finance. In addition, we analyze a correlation between globalization and income inequality and present the existing literature.

Chapter 5, Foreign Exchange Models and Prices, assesses FX rate pricing based on different models for FX. Purchasing power parity is explained using an application of the law of one price (concurrent to the no-arbitrage principle in finance) and empirical findings for its validity. Furthermore, FX rates and interest rates are studied based on covered interest arbitrage and uncovered interest parity (UIP). Monetary and asset-based approaches to FX rate determinations are presented along with the UIP model. We cover the Balassa–Samuelson model, the Dornbusch overshooting model, and the present-value models, all of which are outlined as extensions together with empirical evidence. A list of works for econometric and statistical analysis is suggested.

Chapter 6, Asia: Financial Environment and Risks, provides an overview of Asia's financial and economic development, emphasizing engines of growth and implications for the global economy and finance. Included is discussion of Asia's increasing international trade and its regional interdependence, FX rate issues, and foreign investment. We analyze the financial environment in Asia with an emphasis on the banking sector, bond market, and stock market development, and use different approaches to assess the financial and investment risks that Asia's financial industry is facing. Based on currency data, we discuss FX risks. We also consider regional systematic risk based on local stock exchange data. In addition to the study of Eastern and South-Eastern Asia, a detailed discussion on China and Japan is presented. In the case of China, while stressing the importance and achievements of the banking sector, we analyze the problem of shadow banking and look at challenges in equity markets, and corporate debt in particular. Econometric and statistical analyses for selected problems are provided.

Chapter 7, Financial Currency Pricing, Swaps, Derivatives, and Complete Markets, provides analysis of pricing the consumer price index and the FX-based securities in complete financial markets using modeling as well as empirical approaches. We present both relative and martingale-based FX models with an emphasis on risks and approaches found in US currency indices, global index reversion, the Ricatti FX model, and basket-based price reversion. We introduce a partial generalization by considering multivariate stochastic models and outline mean-reverting volatility-based models. Given the extensive use of options in finance, we assess their use only through some simple examples pertaining to FX options, cross-national boundary investments, and so on. The currency option pricing models and their applications are presented with further examples using spreads and other options (with references directing the reader to the extremely rich family of optional models). Furthermore, we look at option-based trading strategies, emphasizing protective puts, foreign trading, the covered call, and others. Finally, this chapter presents the, so-called, Greek analysis, which measures the sensitivity of option prices to parameters defining the price (e.g., interest rates, volatility). Although, in a global and heterogeneous economic world, "assumed complete markets" may in fact be incomplete, we note that the complete market framework may also be used to price specific and tailor-made financial products adapted to the needs of international financial transactions. To this purpose, we have also introduced swaps and some of their applications. More detailed developments and applications of swaps, accounting for a substantial part of foreign transactions, are introduced in Chapter 8, where loan-debt contracts are also defined as swaps.

Chapter 8, Credit Risk and International Debt, presents the growth of debt and debt dependency, highlighting both credit and global risks. This chapter analyzes country-specific risks, FX risks, credit trading, sovereign bond risks, as well as credit derivatives. In this context, different swaps (e.g., currency swaps, swaptions, credit default swaps, and securitized volatility) are defined and explained. This is important because, under assumptions of complete markets, option-based products (e.g., swaptions) are used extensively in global financial exchanges. We present credit and default risk pricing based on reduced-form models. Under this framework, bond prices are defined by the financial market in which they are traded. Then, we consider foreign bonds issued in a foreign currency as a pointer to the risk of bonds compounded by FX risk and extend this idea through the use of martingales. The utility approach is used to price and manage international credit risk and its option-based derivatives. Finally, this chapter describes the Merton debt model and its relationship to FX markets; it provides an example of the market pricing of both debt and credit risk and outlines Merton's continuous-time model for debt and options.

Chapter 9, Globalization and Trade: A Changing World, provides an overview of the evolution of trade based on conventional approaches, as well as its financial and gating aspects. We highlight the importance of trade in globalization and discuss its contributions to the changing world by analyzing its risks and other related issues; for example, inversion, outsourcing, risk externalities, strategic trade and gating, and trade barriers. This chapter reviews trade models based on Ricardo's theory and the implications of trade models for FX rates in a Cournot game. We introduce a strategic global and financial pricing approach to heterogeneous (and competing) agents (financial agents or countries) based on dependent utilities as well as competing suppliers. Therefore, our multi-country financial consumption approach is presented starting with a one-period utility consumption demand model integrated with a supply problem including imports and exports between two parties. Extensions to a Cournot multi-period financial consumption model accounting for both current and future consumption are, for brevity, considered in research papers we refer to. Owing to their complexity, the problems defined are relatively simple, providing a guideline for the development of a far more complex trade model that can be analyzed using simulation techniques. In this context, this chapter outlines our belief that essential issues underlying globalization (for the "rich" Western world, in particular) are their relationships between local consumption prices and strategic (game) problems fueled by cheap imports, the creation/loss of jobs, foreign dependence and the pursuit of short- and long-term political and geopolitical agendas.

Chapter 10, Compliance and Financial Regulation. Given the complex, growing, multi-headed, and multi-country financial and economic regulatory environment, this chapter is focused on compliance risks. A current trend, initiated by the USA, to regulate and tax globally will most likely lead to retaliatory actions by other countries. These retaliatory actions assume many forms; for example, creating competing markets where US laws cannot be enforced, a move away from the US dollar as the main exchange currency, stealthy finance seeking to elude controls, and so on. These and other new elements in global finance are having an impact which may be difficult to ascertain. Justice Stephen Breyer, in his book *The Court of the World: American Law and the New Global Realities*, raised some fundamental issues confronting the US legal framework and the future of democracy. One specific question he raised is, "Does foreign law have a place in interpreting the American Constitution?" Such a question is most relevant to almost all aspects of sovereign states' exchanges and relationships and, as a result, the world of global business and finance. On the one hand, legal isolationism would entail a USA divorced from the world; on the other hand, globalization renders foreign laws and international affairs simply unavoidable. From a practical viewpoint, regulated finance, both domestic and global, is confronted with an application of laws and asks "How do we comply?" and "Can we comply in a multi-polar world, with sovereign states and regulators pursuing multiple agendas?" These are complex questions that this chapter avoids. Instead, we introduce some of the issues and problems; we provide a partial view that emphasizes compliance in light of regulatory risks and their controls. We also point to the increased complexity of regulatory risks and compliance in a global, gated, and strategic finance. A number of quantitative and statistical compliance models are introduced based both on statistical and (random payoff) game constructs, raising a greater awareness of regulation and compliance risks and the consequences of these risks.

Although this book spans a wide breadth of problems, it is far from being exhaustive. The number of books and research papers that relate to the themes of study and featured in important international economics and financial journals, as well as those found in mathematical and quantitative finance and engineering books, is much larger. Our contribution seeks to create a greater awareness to the transformation of finance in an era confronting globalization and its gating and introduce their effects to financial pricing, trade, and compliance. In addition, we hope to provide the reader rational guidelines to economic and financial modeling in a global environment.

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This book has profited from contributions from both authors' previous publications in academic journals and in books published by John Wiley & Sons, Springer, Elsevier, and others. In addition, we have referred, wherever we could, to our and others' many academic and professional publications that have addressed global finance from multiple perspectives. We apologize to those we missed and did not refer to. Throughout our research, we have benefitted from discussions with a number of students, academic researchers and practitioners. There may be too many to list, but among the many we thank Alain Bensoussan, Lucas Bernard, Dan Goroff, Ben Golub, Laurent Jacque, Konstantin Kogan, Peter Lewis, George Papanicolaou, Lorne Switzer, Pierre Vallois and three additional Tapieros: Daniel, Dafna and Oren, who are all immersed in real and global finance. Finally, Prof. Tapiero's involvement was supported by the endowment of the Topfer Chair and by the Sloan Foundation (for its support for the Regulation Chapter 10). To all we acknowledge our gratitude.

Motivation

Tom Friedman's (2005) book, *The World Is Flat,* has popularized the conventional wisdom that, in a global world, we are all codependent and that events occurring in one place may affect others. Globalization is a manifestation of this codependence. It underlies major economic, financial, and political trends with opportunities and risks. The purpose of this book is to outline perspectives on a gated global and risk finance, in a world where real finance is mutating into a far more complex finance, with political and social agendas, geopolitical realignments and the growth of A-national global enterprises, altering the conventional premises of economics and finance. Increasingly, sovereign states gate their economies explicitly and implicitly (through trade controls, taxation, and regulation, for example) to maintain economic advantages or pursue sovereign agendas. In this process, it is transforming underlying theoretical and rational financial foundations and free market principles, to be far more in "markets in collision" (and thus strategic). Currency, trade, and regulatory "wars," together with extreme economic inequality, underscore the concern that, despite its many benefits, globalization also embodies structural changes and comes with costs; further, global economic equalization is not always as "equal" as many would like. In such an environment, economic and financial exchanges are far more complex; for example, expanding from a mere exchange of goods to an exchange of "lower consumption prices" for a loss of "jobs"; from a gated environment to the free migration of people, technologies, industries, money, capital, and so on. Financial risks and pricing models, for example, are then far more subjugated to macroeconomic, political, geopolitical and social concerns, gating, regulation and its compliance, and to the many new and far more complex risks and opportunities that globalization entails. This book seeks to approach some of these issues using conventional economic and financial methods and to provide readers a broad outline of the challenges that global and risk finance raises. At the same time, we consider alternative and multivariate financial models that seek to appreciate the consequences of globalization and its strategic implications to fundamental issues in economics and finance.

The book is the product of our lectures and research projects, and is conducted with the intention of motivating students and professionals alike to be more aware of the complexity, the opportunities, and the consequences of a globalized and gated financial world. Therefore, we emphasize a global and strategic risk finance where economic powers, risks, and geopolitical issues are intermingled, creating a more real and complex finance. To do so, we emphasize both descriptive and qualitative aspects of current economic and policy issues as well as review a plethora of tools and statistical financial and economic models engineered to assess problems such as foreign exchange (FX) modeling, pricing and investing in a global and gated economy, compliance and risk pricing, related issues.

We review fundamental macroeconomic theories and their associated empirical evidence. We further point out that globalization contributes to a "global equalization of means and know-how" of developed and less developed economies which is intrinsic to their competition and gating for economic advantage. We emphasize that the growth of economic inequality within developed economies, where the rich get richer and the poor get poorer. Although such a process is ascribed at times to globalization, technology and the prominence of "capital over labor," in no small part, also contributes to such inequalities. Furthermore, issues that redefine the global economy relating to the migration of jobs, industrial capacities, and capital, are also assessed from the viewpoint of quantitative integrated models (e.g., Chapters 3, 7, 8, and 9). In Chapter 9, for example, trade is not presumed to be based entirely on comparative advantages and specialization, but also defined in terms of a far broader set of issues (e.g., socioeconomic and national agendas, supply risks, technology, loss of jobs, capital flows, and regulation). As a result, we conclude that the unhindered growth of globalization is also leading to a global competition and to a tendency to gate their national economies, yet confronted by consequences they failed to predict. Manifestations of globalization and gating risks abound, including a plethora of economic and finance "wars." For example, national and retaliatory explicit (or implicit) regulations, currency wars, financial and economic policies that seek to sustain their national and geopolitical agendas, and so on.

Globalization and gating are then parts of A-national enterprises (corporate entities increasingly independent of a national identification, regulation, or taxation) and global banking and finance and the many factors they set that underlie their governance, their financial and strategic policies, and their expansion of economic and financial outreach. Countries also implement gating policies and selective "openness" in order to achieve their economic, social, and political agendas.

However, in a "flat world," national powers are no longer as powerful as they once were. In such a world, financial agents are equally equipped with (or increasingly able to use) technologies that overcome distance, space, and time, and therefore are far less dependent on a home base. Further, globalization has led to a geographical diversification of consumption and supply markets as well as their many services. The business landscape has also been transformed from large corporate entities to global and extremely large networks of national and A-national entities. Global businesses, thus, are no longer a matter of orchestrated exchanges between national entities, a "few" importers or exporters, or international trading firms, but a far more diversified group of business entities that are self-serving and fuel the growth process of economic, industrial, and business entities that pursue the opportunities that an open world may provide. Examples of such processes are abundant, including competitive tax and supportive policies by sovereign states fueling inversions (firms moving their legal entities where their regulation and taxation advantages are greatest). For example, financial products, such as swaps, have been used increasingly in international exchanges to individualize economic and financial exchanges across national borders (Chapters 7 and 8). To meet new demands, traditional banking and finance and their associated regulatory sectors are changing. The former are expanding globally, while the latter leads to gating and attempts to manage the financial system.

Globally, we are witnessing the launch of financial exchange markets "everywhere," as well as the rise of electronic markets and IT systems supporting and managing an evolutionary development of finance. These include trading, information management and financial engineering, the stealthy movement of capital, and the core businesses of finance—banking, lending, liquidity supply, and trading, which are now embedded in a far more globally networked and complex finance. These transformations have important consequences for the quality of jobs in finance and its logistics. For example, increasingly, as savvy job seekers know, financial jobs require backgrounds in technology, risk finance, and regulation. These jobs are sought at the expense of traditional banking professional openings. Investment banking is shifting to standardized exchange traded funds, engineered to suit all potential investors' wants. In other words, in addition to a *boutique* finance, a *supermarket* finance with a global reach is altering the face of financial retail. Technologically, back-office automation, electronic markets, e-banking, e-currency, crypto-currency, artificial intelligence and robo-advisors are transforming the traditional financial environment. Such transformations combined with a banking system regulated by thousands of laws and costly sanctions have consequences, but it is not yet clear what these may be. For example, the global networking of financial institutions into a worldwide complex, together with unregulated networks, may emerge as A-national global financial systems, consisting of entities that need not function through conventional financial systems; they may appreciably affect their mechanisms.

Global equalization combined with the growth of inequality in rich Western economies, as pointed out earlier, have far-reaching consequences for their economic and political agendas, for industrial trade, and so on. A migration of industrial capacity in an increasingly sophisticated and technologically open world is also contributing to the growth of lagging economies equipped with newly found means and expectations that, in the near future, may lead the "haves" and "have-nots" to confront each other. When these trends are combined with job migration and losses accruing to the middle class, social and adverse economic effects arise, feeding a transformation of the job market, and challenging the globalization process and its underlying economic and financial processes. Global finance in such contexts is derived from "the global, political and social transition" to uncertain futures. For example, regulation and its compliance, currency wars, global warming, wars and peace, political and economic unions, and other issues are challenging globalization and, in their wake, financial futures. The challenges of globalization, raised daily by the media and in academic circles, define whether globalization is a win or lose proposition and for whom. Their outcome transcends their financial pricing and has consequences we can hardly assess. At the same time, it has radically changed the competitive economic platforms globally and challenged theoretical and conventional financial models.

Trade and investment policies have also become increasingly difficult to articulate when faced with unpredictable futures and conflicting sovereign policies. In such an environment, uncertainty prevails, financial theorists and practitioners emphasize risk management, the valuation of financial assets, and the legal and accounting aspects of compliance with regulations; all have a structural impact on the world of finance and its many institutions. Theoretically, complete market models are challenged by the increased complexity of trades and regulation, as well as by the many factors that contribute to financial markets' incompleteness. For example, international asset pricing, risk management, FX, external debt, trade financing, global investing, and assessing both currency and commodity price fluctuations are but samples of the many issues that global finance is confronting. They all involve a great number of risks (i.e., sources of randomness), often contagious and interdependent, and require more information to assess their consequences.

For example, the growth of and the complexity of compliance with the varying interpretations of the Dodd–Frank Act (2007–2009) have opened new vistas for financial regulators, causing financial institutions to scramble to comply with the thousands of ambiguous regulations. Financial reports are experiencing an increased demand by multiple regulators, domestically and across national borders; these are contributing to a gated and costly finance. These are due, in no small part, to the global reach of financial institutions and the sophistication of emerging financial products and the proliferation of financial markets and platforms globally. As a result, just as, at times, currency wars occur, regulatory wars occur as well. These elements underlie a regulatory eagerness, yet they are merely symptoms of the increased helplessness of sovereign states that seek to manage their economy as closed in an open and globalized economy.

Our Approach

The approach we chose to use in this book is based on broad and implied perspectives encompassing financial globalization, national (macro) economics, and the rational principles of fundamental finance. From a practical point of view, macroeconomic, sociopolitical and geopolitical factors are assuming greater importance. Although financial models are, by definition, restricted to specific problems, global finance may, in fact, be derived from macro-political and economic factors that alter and lead global finance. In this sense, our approach is based on the definition of "multiple factors," and thereby multivariate models as well as alternative models, some motivated by our observation of current financial practices. Figure 0.1 summarizes dependent factors omnipresent in the media and in the public discourse on globalization. Owing to their complex interactions, only some of their issues and mutual effects were selected for analysis.

Figure 0.1 Globalization and transformational finance.

At a mundane level, finance raises numerous questions and challenges. These include: How are currencies and FX priced? Why are efficient and stable currency prices important for trade? What are regulatory and compliance risks? How are gating policies applied through tariffs-taxation, controls, and incentives? Does globalization contribute to countries' economic welfare and to economic equality (or inequality)? What are the centrifugal and centripetal forces that fuel globalization, and why do they exist? How do contagious and extreme risks affect global sustainability? What are the policies and the repressive actions that sovereign states take (and why) to stifle their exposure to globalization?

These are a sample of many questions that global finance is concerned with. A seemingly endless number of newspapers and publications, statistics, and data sources provide a steady stream of information relating to political and geopolitical events, their analysis, their effects, theirs risks, and the opportunities they reveal. These data streams have redefined global finance into a new theoretically based profession that defines and evaluates the subcontexts of macroeconomics and geopolitics. The current economic and political discourse on jobs and their migration and on consumption prices (both as means to stimulate economic activity and prevent increasing inequalities) underlies political debates. For example, current US taxation on corporations' foreign income, not taxed unless repatriated, has created an incentive not to repatriate profits as well as to provide US corporate entities with a competitive advantage over foreign competitors (in their own land). Furthermore, untaxed profits accumulated over decades have been reinvested in foreign countries, thus contributing to the decline of job opportunities in the USA and the migration of US corporate and industrial might out of the country. These policy contradictions are contributing to self-defeating gating and a complex system of regulation based on political efforts to meet national agendas.

In its conventional and restricted sense, globalization is a term we use to describe the growing freedom of capital flows; to exchange and to trade economic resources among countries; to invest and to share opportunities and risks. In an ideal global finance there are no frontiers; in fact, media are increasingly pointing to sovereign gating policies, balking at impeded globalization, and raising trade restrictions, regulations, and providing incentives to their own while pursuing both geopolitical and economic agendas. At the same time, financial and statistical data are pointing to global finance pursuing a strong and unabated expansion fueled by the search for profits, tax and regulatory avoidance, and free financial flows seeking to capitalize on global financial opportunities. Global financial markets exchange trillions of dollars every day across a broad range of markets; this leads to a migration of capital, jobs, and people as never before, due to the continuously mutating economic and financial world. This mutation is assuming a life of its own, independent of sovereign rules, and is based on a global realignment based on the emerging perceptions of and the reality of globalization and its consequences. Some of these are based on previous economic misalignments; for example, the north–south euro economic imbalance (e.g., the Greek crisis and persistent weaknesses in the southern euro-based economies, compared with those economies to the north). We should also emphasize an increased vitality and development in emerging countries and in Asia that reflect new-found freedom, and the combating of economic inequalities everywhere.

Opportunities to borrow and lend money globally have increased, with well-informed and savvy traders speculating on global economic trends, currencies, and sovereign bonds. At the same time, global financial platforms may have created greater credit risk