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“Credit default sharing”: New Islamic financial instruments for hedging default risk

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Abstract - The central cause of all recent financial crises (including the Asian financial crisis, the European sovereign-debt crisis and the subprime mortgage crisis) was the debt crisis. The primary objective of this study is to examine the principles of risk-sharing promoted by Islamic finance as a possible reform of or complement to the current financial system. The secondary objective of this paper is to explain how and why the famous credit default swap (CDS) markets expanded and why they contributed to the recent financial crisis. In addition, we propose a new financial instrument to hedge default risk (credit default sharing) based on the principles of risk-sharing and Islamic insurance “Takaful” (sharing responsibility and mutual cooperation) as a substitute for CDS. We explain that “credit default sharing” can reduce counterparty risk, improve banks’ monitoring incentives, reduce systemic risk and contagion in financial systems and eliminate “empty creditors.”

Keywords: sustainable finance, Islamic finance, risk-sharing, credit crisis, systemic risk, counterparty risk, credit default swap, Takaful, financial stability.

1. Introduction

The financial crisis of 2007–2008, also known as the global financial crisis and the subprime crisis, started with the collapse of two Bear Stearns hedge funds and peaked with the default of the U.S. investment bank Lehman Brothers. Mian and Sufi (2009) show that mortgage credit-underwriting standards were relaxed from 2001 to 2005 with the significant number of high-risk borrowers. Relaxed standards were associated with increased mortgage lending, growing housing prices, and an increase in defaults. According to Naifar (2011,a), the main problem facing financial institutions that have either invented subprime loans or purchased subprime asset-backed securities is that the decline in housing prices has contributed to the impressive increase in subprime and Alt-A mortgage defaults. Several important credit default events occurred during the subprime crisis, including the bankruptcies of Lehman Brothers on September 15, 2008, Washington Mutual, Circuit City, Chrysler, and General Motors. The acquisition of Bear Stearns by JPMorgan Chase in May 2008, the takeover of mortgage giants Fannie Mae and Freddie Mac, and the bailout of American International Group injured the confidence of investors and creditors. Eichengreen et al. (2012) argue that the decision to let Lehman Brothers fail, which damaged the global economy

and created a financial tsunami, was a critical mistake that will be debated for years. In the aftermath of the subprime crisis, the enormous increase in sovereign debt has emerged as an important negative effect because public debt dramatically increased in an effort by the U.S. and the European governments to reduce the accumulated growth in private debt in the years preceding the subprime crisis.

The global financial crisis and the recent European sovereign debt crisis have raised concerns over the use of CDS. Cont (2010) argue that the effect of CDS markets can contribute either positively or negatively to financial stability depending on how counterparty risk is managed in these markets. Non-standard contract CDS markets in which protection sellers may lack sufficient liquidity resources and capital may amplify contagion. According to Delate et al. (2012), deterioration in budget increases risk and simultaneously increases the bond spread and the insurance cost priced in the sovereign CDS premium. A CDS is a contractual agreement to transfer the credit exposure of fixed income products between parties. The CDS, initially intended to be an instrument for hedging and managing credit risk, has been condemned during the recent financial crisis as being detrimental to financial stability. CDS were supposed to protect lenders against default risk. Instead, they provided a false sense of protection that

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helped propagate the credit crisis. In addition, CDS played a prominent role in the bankruptcy of Lehman Brothers, the collapse of AIG, and the sovereign debt crisis of Greece, and have been pinpointed during the recent crisis as being detrimental to the stability of financial systems.

As risk-sharing financial instruments gain large acceptance, a financial system founded on risk-sharing principles will become the basis for a sustainable financial system. According to Askari (2012), excessive leverage combined with an inherent mismatch in assets and liabilities exposes institutions to unsupportable risk and threatens the overall soundness of the financial system. Firms in emerging markets and developing countries must avoid debt-creating flows and adopt financing systems founded on “risk-sharing” promoted by Islamic finance instead of “risk-shifting” as a basis for a sustainable finance. The majority of emerging countries in Asia are actively considering risk-sharing-based instruments through Islamic finance (e.g., Islamic bonds or Sukuk) as a possible alternative. This paper reviews the recent financial crises with a special focus on the subprime crisis, examines the principles of risk-sharing promoted by Islamic finance and studies its implications on sustainable financing. The paper then explains how and why CDS markets expanded and why they contributed to the recent financial crisis. Finally, the paper develops a new financial instrument for hedging default risk (credit default sharing) based on the principles of risk-sharing and “Takaful” as a substitute for CDS.

The remainder of the paper is organized as follows. Section 2 presents the principle of risk-sharing promoted by Islamic finance. Section 3 presents CDS contracts and studies the contribution of this instrument to the credit crisis and financial instability. Section 4 provides the structure of the new financial instrument “credit default sharing,” and discusses the possible contribution of this instrument to financial stability. The article ends with a conclusion.

2. Risk-sharing and Islamic finance

At their root, all recent financial crises are debt crises. Excessive leverage combined with a very poor regulatory framework exposes corporations to unsupportable risk and threatens the overall soundness of the financial system. An alternative to the current financial system must be founded on risk-sharing instead of risk shifting as a basis for sustainable finance. In this section, we study the principles of risk-sharing promoted by Islamic finance to reform or complement the current financial system. Islam is not only a divine service like Judaism and Christianity but also involves a code of conduct that regulates and organizes humankind in both spiritual and material life (Presley and Sessions, 1994). An Islamic economic system operates on the basic principle of markets (supply and demand should determine prices). Islamic finance is finance in compliance with the rulings and principles of Islamic law (or Shariah). The central feature of Islamic finance is the prohibition of the payment and receipt of interest (or Riba). The best definition of “Riba” is the prohibition of charging interest when lending money and of any addition to money that is unjustified (such as a penalty). Based on Islamic principles, all profits should match work effort. Lending money by charging interest permits the lender to increase his capital without any effort because money by itself does not create surplus value. The lender does not receive profits for offering

money unless he shares in the provision of the enterprise, and profits must be variable (not fixed or guaranteed).

In addition, Islamic finance prohibits investing in transactions involving gambling, alcohol, and drugs, and transactions including uncertainty about the subject matter and contrast terms (or Gharar). Selling something that one does not own is also prohibited. In addition, contracts with uncertain fundamental terms regarding price, time, delivery and each party’s obligations and rights are prohibited under Shariah. Furthermore, under Islamic law, the transfer of debt and, therefore, the buying and selling of debt are prohibited under Shariah. The sale of an asset followed by a buy-back of the same asset at an increased price is also not permitted under Islamic law. Islamic finance precludes the assumption of excessive risk by prohibiting excessive debt instruments.

The governance structure in Islam differs from common corporate governance practices in its standardization of rules, which must obey the Shariah rules stated in the holy Quran and Sunnah (prophet saw). Effectively, the governance structure should meet the expectations of Muslim investors by providing financing modes that are compliant with Shariah. The association between risk–return and the notion of profit and loss sharing and partnerships inherent in Islamic contracts are central to Islamic finance. To enhance corporate governance, regulators must adopt policies and practices that eliminate moral hazard, excessive debt creation, and leverage. Corporate governance requires a reduction in debt financing and leverage in favor of the expansion of risk-sharing-based instruments.

Insurance in Islamic finance also differs from common insurance practices and is based on the principle of “Takaful” and cooperation. Islamic insurance (or Takaful) has emerged as a complementary Islamic banking system throughout the world. The concept of “Takaful” implies compensation and sharing responsibilities among the community. Conventional insurance involves elements prohibited by Islamic law such as uncertainty (Gharar), gambling and interest (Riba). Islamic insurance generally uses contracts based on joint venture partnerships.

The strong condemnation of interest by Islamic law led Muslim thinkers to explore ways to finance firms and investors on an interest-free basis. In Islamic financial markets, Sukuk (or Islamic bonds) are the fastest growing part of Islamic finance. The investment concept of Sukuk was created in the last few years as an alternative to interest-bearing instruments, namely conventional bonds. Sukuk represents a proportional ownership of tangible assets or a pool of assets. The features of Sukuk securities are similar to those of a conventional bond, which has a fixed-term maturity and is tradable based on normal yield prices. However, major differences include the fact that conventional bonds that yield fixed interest rates are prohibited under Shariah principles. A basic principle of Sukuk is highlighted in the sharing of profits and losses among parties in a business transaction.

As the previous discussion attests, Islamic finance reduces debt financing and promotes direct asset financing, which allows for risk-sharing instead of risk shifting.

3. CDS and the recent financial crisis

One of the most important changes in the lender–borrower relationship in the past few years has been the creation and subsequent development of the credit derivatives market, particularly CDS. In this section, we present the main characteristics of CDS and discuss the contribution of this instrument to the recent financial crisis.

What is a CDS?

The most widely traded credit derivative product is the CDS, which is a contract between two parties—the protection buyer and the protection seller—through which the protection buyer is compensated for the loss generated by a credit event in a reference instrument. If the buyer owns the reference entity, the CDS acts as a hedge against default. The protection against default was the initial motivation for introducing CDS. A default is often referred to as a credit event and includes such events as failure to pay, restructurings and bankruptcy. Generally, the protection seller compensates the buyer for the difference between the face value of the debt and its market value following the occurrence of a credit event. The protection buyer pays the protection seller a premium in basis points of the notional. The premium paid to the protection seller is called CDS spreads and reflects both the probability of default and the loss given a default. Figure 1 presents the cash flow structure in a CDS transaction.

Since its creation in the mid-1990s as a means to transfer credit exposure for commercial loans, the CDS market has experienced dramatic growth and approximately doubled in size each year between 2002 and 2007, reaching a peak of \$62 trillion in 2007. Despite a significant contraction and recession after the 2008 global financial crisis, the CDS market is still valued at \$30 trillion, more than double the total capitalization of all U.S. stock markets. The notional amount of outstanding CDS decreased by 19 percent in the first six months of 2009, from \$38.56 trillion to \$31.22 trillion. The notional amount of outstanding CDS was \$26.3 trillion at mid-year 2010, a decrease of 13.7 percent from \$30.4 trillion at year-end 2009. The notional amount of outstanding CDS was valued at \$26.93 trillion at mid-year 2012, according to the Bank for International Settlement.

CDS have several advantages for portfolio managers, including mitigating concentrations of credit risk, promoting diversification, enhancing trading liquidity and signaling creditworthiness. Many studies on credit risk management have concentrated on estimating default

probabilities from corporate bond data and exploring the determinants and the dynamics of the term structure of credit spreads. Prior empirical research has been conducted on single-name CDS products. Longstaff et al. (2005) explore the notion that a significant part of the bond spread is the result of illiquidity, making bond prices a poor proxy for credit risk. Blanco et al. (2005) argue that CDS spreads are more sensitive to firm-specific factors than bond spreads. Abid and Naifar (2006) show that CDS spreads are useful indicators of credit risk, particularly in contexts in which the underlying debt markets are less liquid. CDS spreads are generally considered a market consensus on the creditworthiness of the underlying entity. Alexander and Kaeck (2008) argue that credit spreads inferred from corporate bond prices are affected by tax considerations and illiquidity.

Traded indices also exist that are based on CDS and that are averages of these contracts under different names. The indices are constructed based on a set of rules, with the overriding criterion being that of the liquidity of the underlying CDS. CDS indexes have been introduced that give investors an efficient method to buy and sell market-wide or sectoral credit risk. According to Naifar (2011,b), single-name CDS spreads are much less liquid than indices, and the credit spreads that are inferred from corporate bond prices are affected by tax considerations and illiquidity. Liquidity for benchmark indices is enhanced by including only the most liquid single-name CDS. In June 2004, the iBoxx and Trac-x CDS indices emerged to form the Dow Jones iTraxx index family. The iTraxx indexes also cover credit derivatives markets in Europe, Asia and Australia. The iTraxx CDS index provides liquid market prices of credit spreads of different maturities and in different economic sectors. Therefore, CDS index spreads have become a preferred proxy for the default risk premium, rather than single-name CDS spreads.

The contribution of CDS to the credit crisis

In principle, CDS should make financial markets more efficient and improve the allocation of capital. Yet, many observers have identified that CDS have contributed to the recent financial crisis. CDS were supposed to protect lenders against default risk. Instead, they provided a false sense of protection that helped propagate the credit crisis. CDS reduce the incentives of banks to be cautious regarding credit quality; thus, banks become more indifferent to risk. Creditors may not be as attentive in monitoring borrowers once they hedge their credit exposures using CDS contracts. Morrison (2005) argues that because CDS can undermine bank monitoring, borrowers may inefficiently switch to bond financing; CDS can weaken bank monitoring and therefore reduce welfare. Using a model with banking and insurance sectors, Allen and Carletti (2006) show that credit risk transfer can lead to contagion between the two sectors and increase the incidences of financial crises.

According to Stulz (2010), the separation of risk bearing and funding made possible by CDS can also create problems with the incentive to monitor and resolve situations of financial distress. Then, for a bank that made an important loan to a firm and simultaneously buys CDS protection against a default event of that loan

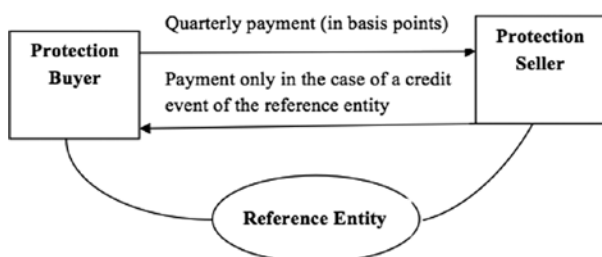


Figure 1. A common CDS transaction.

has lower incentives to monitor the loan. The seller of protection (who guarantees the creditworthiness of the debt security) cannot monitor the firm's debt because it has no contractual relationship with the firm. In addition, banks can borrow more money and increase the amount of loans to firms because they can hedge their risk exposure to such firms by using CDS. Hirtle (2008) argues greater use of CDS protection leads to an increase in bank credit supply and improved credit performance. Ashcraft and Santos (2009) show that the use of CDS protection has led to an improvement in borrowing terms, primarily for safety and transparency. Such improved access to capital may increase borrowers' financial flexibility and resilience to financial distress.

Another related study addresses CDS and empty creditors. According to Mengle (2009), an empty creditor hedges its exposures and is indifferent to a firm's survival. Bolton and Oehmke (2011) formally modeled the empty creditor problem. Credit insurance with a CDS instrument affects the borrower–lender relationship in the event of financial distress because it separates the creditor's control rights from his cash flow rights. Hu and Black (2008), Yavorsky (2009) and Subrahmanyam et al. (2012) have raised concerns about the possible consequences of such a separation, arguing that CDS may create empty creditors (holders of debt and CDS) who no longer have an interest in the continuation of the borrower, and may push the borrower into inefficient bankruptcy or liquidation.

An investor might prefer to drive the firm into bankruptcy and, hence, trigger payments under the CDS contract rather than work out a restructuring plan. According to Bolton and Oehmke (2011), projects that can be financed in the absence of CDS may obtain more efficient financing because the presence of CDS lowers the borrower's incentive to inefficiently renegotiate down payments for strategic reasons. In addition, CDS protection is fairly priced and correctly anticipates creditors' potential value-destroying behavior after a non-payment. Thus, creditors have an incentive to over-insure, which results in inefficient empty creditors who refuse to renegotiate with lenders to collect payment on their CDS protection.

As with other OTC derivatives, CDS are exposed to counterparty risk, and they facilitate speculation involving negative views of a firm's financial stability. Traditionally, CDS have been traded in the over-the-counter (OTC) market, meaning that buyers and sellers independently negotiate terms and settle contracts. CDS contracts are generally considered a zero-sum game within the financial system, as there is a buyer for each seller of CDS contracts. Counterparty risk exposure affects CDS spreads and can be important in a case in which the default dependence structure between the protection seller and the underlying entity is important. Because credit events for reference entities occur suddenly (reference entities jump to default), counterparty risk is important in CDS transactions. Moreover, the risk is significant if the protection seller has insufficient reserves to cover CDS payments in the case of a credit event. CDS protection sellers such as American International Group (AIG) and Ambac faced ratings downgrades because of large mortgage defaults and increases in their potential exposure to CDS payment losses.

AIG had CDS that insured \$440 billion of MBS (mortgage-backed securities) and obtained a government bailout. In addition, no central clearinghouse existed to pay CDS in the event that a party to a CDS proved unable to honor its obligations under the instrument's protection contract. The bankruptcy of Lehman in September 2008, a major CDS dealer, aggravated the market's perception of counterparty risk. Furthermore, CDS can be used to hedge risks and to speculate, and it then presents a source of systemic risk. Systemic risk is generally defined as the probability that the financial system is incapable of supporting economic activity. In other words, systemic risk refers to possibilities of propagating default among other financial institutions during a short period. According to a European central bank report (2009), a number of structural features in the CDS market contribute to transforming counterparty risk into systemic risk. First, most of the CDS market remains concentrated in a small group of dealers with large exposure. Second, the interconnected nature of these dealers can result in large trade replacement costs for market participants in the event of dealer failures. Third, many banks appear to have become net sellers of standard single-name and index CDS contracts, which imply exposure to market risk.

Many observers focused on counterparty risk on credit derivatives and CDS that caused a worse credit crisis. Credit derivatives greatly expose financial institutions to credit risk. The failure of a financial institution to honor its payments may cause other financial institutions to fail as they experience losses on their exposures, and this contagion may cause a collapse of the financial system. Jorion and Zhang (2007) analyze the intra-industry information transfer effect of credit events as captured in the CDS and equity markets. They find that contagion is reliably associated with industry characteristics. Moreover, contagion effects are better captured in the CDS market than the equity market. When Lehman failed to reach a deal with any of a number of possible buyers and investors, and then collapsed on September 2008, several firms and financial institutions became financially weaker, causing a contagion effect of Lehman's failure through losses on credit derivatives contracts because of the failure of the counterparty. The financial system bears systemic risk caused by the interconnectedness of the CDS market.

4. “Credit default sharing”: New financial instrument

This section presents a new financial instrument for hedging default risk based on the “risk-sharing” principle. The concept underlying this instrument is based on the combination of the most important characteristics of CDS (hedging default risk) with the principles of Islamic cooperative insurance (Takaful) and the laws and regulations governing the protection of many of the world's financial markets (clearinghouse or central counterparty).

Structure of “credit default sharing”

In simple terms, “credit default sharing” is a financial contract between cooperative banks for hedging default risk based on the principles of risk-sharing and “Takaful,” which means guaranteeing one another. Banks are both buyers and sellers of protection. We present the main steps of “credit default sharing” transactions.

Step 1: Some cooperative banks organized in a country constitute a guaranty fund that represents all cooperative banks. The resources of the constituted fund are from the cooperative banks’ donations, margin calls and investment returns of surplus cash-savings.

Step 2: Each bank pays a variable sum of money in the form of a donation depending on the degree of risk of each bank portfolio (without recovery). The guaranty fund also functions as a clearinghouse that becomes the counterparty to all trades. The fund can select credit (through screening process), diversify and manage the credit risk of the total credit portfolio through membership requirements based on minimum capital requirements for cooperative banks (in the form of a donation).

Step 3: The guaranty fund prevents cooperative banks from facing additional exposures to the total credit portfolio and special margin calls depending on the degree of risk. The guaranty fund may adjust collateral requirements several times daily to account for changes in parties’ creditworthiness. Margins are requested to absorb short-term losses and first losses in the case of default. All cooperative banks pay an equally fixed sum of money to cover losses in the case of a default event. The amount of equally fixed sums of money is determined by the amount of expected losses in the case of default (loss given default) divided by the number of all cooperative banks. In the case of credit risk reduction, the amount of margin available is invested in a short-term horizon or refunded to banks according to the agreement within credit default sharing contracts.

Step 4: Even with continual collateral adjustments and margin calls, guarantee funds sometimes have difficulty collecting sufficient collateral to account for “jump-to-default risk.” In the case of large losses not covered by margin calls, cooperative banks contribute to the guaranty funds with additional equally payments in accordance with the principle

of Takaful (and not according to the risk of their position). The sharing responsibility and mutual cooperation of all banks reduce extreme risks, contribute to overall financial stability and reduce systemic risk by immunizing each bank from the default of others. Computing an appropriate additional payment for bank members should be based on loss given a default and a default dependence structure between all names in the total credit portfolio using copula functions. In case of a default, no payment will be made by the guaranty fund. Figure 2 illustrates the main steps of “credit sharing transactions.”

“Credit default sharing” and financial stability

This section presents the possible implication of “credit default sharing” on financial stability compared with CDS. “Credit default sharing” can eliminate the empty creditor problem caused by CDS (see Hu and Black, 2008; Bolton and Oehmke, 2011). Creditors protected by CDS have little incentive to participate in out-of-court restructurings of firms in difficulty, even when continuation is optimal. The incentives to the restructuring are even lower if creditors are over-insured and then their protection reward exceeds the maximum amount that they can receive during restructurings. However, “credit default sharing” based on a risk-sharing principle increases incentives to exert monitoring efforts to reduce default risk because losses from defaults will be supported by all cooperative banks. Moreover, margin calls improve incentives for monitoring and mitigating risk.

CDS contracts, which provide a form of insurance against losses, pay off only as long as the seller of protection itself is solvent. CDS markets suffer from counterparty risk created by their trading partners’ potential default. According to Kress (2011), trading partners, however, are not always able to fulfill their contractual commitments; bankruptcy or illiquidity may prevent the protection seller from satisfying the contract. “Credit default sharing” transactions mitigate

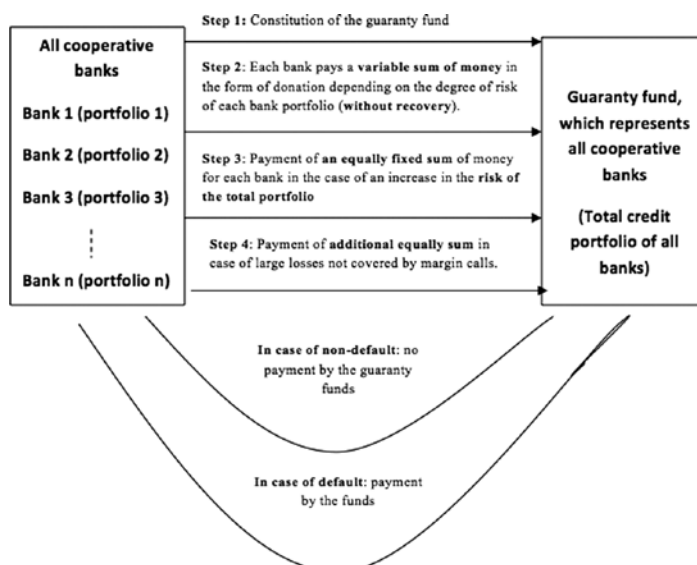


Figure 2. A “credit default sharing” transactions.

counterparty risk because it requires cooperative banks to post collateral through the constitution of a guarantee fund, contributions to the fund through donations and daily margin calls. This collateral is intended to minimize losses sustained by the banks. In addition, the principle of “Takaful” founded on the cooperative principle and mutual help among the group eliminates the counterparty risk in “credit default sharing” transaction.

The global financial crisis has also revealed that CDS markets increased systemic risk in the financial system. The default of Lehman Brothers created a potential systemic risk because market participants and investors did not expect this bankruptcy. An increase in systemic risk in the financial sector should increase the default risk of each institution, generating an increase in the CDS spread. One way to mitigate systemic risk is to impose capital requirements. In the case of “credit default sharing,” requiring the cooperative banks to hold capital in proportion to its hedging activities counters the hidden leverage embedded in these activities. The presence of the guarantee fund (which represents all cooperative banks) minimizes risks to the financial system by reducing interconnections and dispersing losses. Margin calls and extra capital requirements strengthen the balance sheet of the guarantee fund for a given amount of hedging. The systemic benefits of the guarantee fund are manifest, but we anticipate that some readers will consider the downsides of the guarantee fund, which are primarily concentrated risk and posing threats to financial stability. In contrast, “credit default sharing” is based on risk-sharing and “Takaful,” which means guaranteeing one another. Each of the cooperative banks pools resources and efforts to support the losses of participants within the group.

As the previous discussion attests to, “credit default sharing” can eliminate “empty creditors,” reduce counterparties, improve a bank’s incentive for monitoring and reduce contagion and systemic risk in financial systems.

5. Conclusion

The emergence of Islamic finance as a new paradigm in financial systems has been met with widespread indifference by many western economists. However, the recent financial crisis appears to be a moment of epochal change and the current financial system has been seriously questioned. The current financial system is inherently unstable because it is pre-eminently a debt- and interest-based system, creating excessive debt and leverage through the credit multiplier. Whereas many papers exist that discuss how the subprime mortgage crisis has wide-ranging effects on the housing market, the economy, regulators, central banks, stock markets, and exchange rates movements, little research has been conducted on policies and regulations adopted in the aftermath of the crisis.

An alternative to the current model is the Islamic model that reduces debt financing and instead promotes equity- and risk-sharing-based instruments. Islamic finance, which conducts finance in compliance with the rulings of Islamic law, is not only a fast-growing field but has now officially moved into mainstream financial markets. In this paper, we attempt to stimulate policy makers, regulators and supervisors about the principles of risk-sharing and “Takaful” promoted by Islamic finance as a possible reform

or complement for current financial systems and efficient financial markets. Financial institutions in emerging and developed markets must avoid “risk-shifting” instruments and adopt hedging instruments that allow for risk-sharing and mutual cooperation.

To enhance financial market stability and to reduce systemic risk, regulators must adopt policies and practices that eliminate moral hazard and excessive debt creation and leverage, and that provide efficient insurance solutions that match market needs and ensure financial stability. In this paper, we explain how and why the markets of the famous CDS expanded and why they contributed to the recent financial crisis. In addition, we propose a new financial instrument for hedging default risk (credit default sharing) based on the principles of risk-sharing and mutual cooperation as a substitute for CDS. We explain that “credit default sharing” can reduce counterparty and systemic risk, improve a bank’s incentive for monitoring and, therefore, increase welfare, reduce contagion in financial systems and eliminate empty creditors. Whereas the future remains uncertain and open, an analysis of the past financial crisis along these lines provides crucial insights for policymakers into strategies for shaping that future.

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