SUBPRIME CARBON: FASHIONING AN APPROPRIATE REGULATORY AND LEGISLATIVE RESPONSE TO THE EMERGING U.S. CARBON MARKET TO AVOID A REPEAT OF HISTORY IN CARBON STRUCTURED FINANCE AND DERIVATIVE INSTRUMENTS

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I. INTRODUCTION

Wall Street's most storied financial institutions have collapsed. And along with them, U.S. and global economies. Once lauded for their innovative financial alchemy to engineer high-return, low-risk mortgage-backed securities, Wall Street's finest were permeated by frenzied greed and diminished lending standards. In the years leading up to the lending fallout of 2007, U.S. financial institutions worked around the clock to flood financial markets with securitized and derivative instruments collateralized by mortgage-backed securities whose illusory quality crippled global portfolios. Yet even amidst the most dramatic economic downturn since the Great Depression, U.S. financial institutions continue to seek new ways to bring securitized and derivative instruments to market.

As the international community embraces the greenhouse gas reduction commitments of the Kyoto Protocol, the ears of U.S. financial institutions and investors are perked. A regulatory framework forcing emissions compliance on U.S. corporations and regulated entities, and the establishment of a market-based cap-and-trade scheme to buy, sell, trade, and exchange carbon credits, means participants in a carbon-constrained market will seek low-cost solutions to meet compliance targets. Outside the primary market, secondary market participants, such as banks, financial institutions, hedge funds, and energy speculators, are poised to play a game of store-and-sell—bringing carbon to market when it can fetch the best price. Just as with mortgage-backed securities, U.S. financial institutions seek inventive ways to cross-pollinate markets by securitizing carbon credits and bringing low-cost carbon credits to the marketplace.

The dawn of carbon structured finance is near. But before U.S. financial institutions and investors embark on this endeavor, understanding the mistakes and pitfalls of securitizing mortgage-backed securities provides U.S. policy makers guidance as to where similar mistakes may be made in carbon finance. By understanding the historical miscalculations of the recent financial collapse, policy makers are better equipped to fashion appropriate legislative and regulatory responses so that mistakes may be avoided.

Such issues are becoming increasingly important. Efforts to curtail greenhouse gas emissions spark wide-felt international support.[1] Regulated companies and countries, however, are less enthusiastic,[2] as operating within a greenhouse gas-constrained environment necessarily involves the high cost of compliance.[3] In an effort to provide the most cost-effective means for regulated companies and countries to operate within this greenhouse gas-constrained environment, financial mechanics are being employed to make emission-reduction economically feasible.[4] The most noteworthy, cost-benefiting results will be achieved within the developing carbon market.

Financial institutions and investors are simultaneously recognizing the profit potential within the developing carbon market.[5] Frenzied in their response, such institutions seek new ways to bring securitized and derivative instruments,

1. *See, e.g.*, Kyoto Protocol To The United Nations Framework Convention on Climate Change, Dec. 11, 1997, 37 I.L.M. 22 (signed and ratified by 187 states) [hereinafter Kyoto Protocol].

2. *See generally* Kenneth Green, *High Costs of Kyoto Compliance Punishing Canadians*, ENV'T & CLIMATE NEWS, Dec. 2003, *available at* http://www.heartland.org/publications/environment%20climate/article/13694/High_Costs_of_Kyoto_Compliance_Punishing_Canadians.html.

3. *Id.*

4. *See* EITI International, Kyoto Protocol Creates World's Largest Carbon Market, http://www.eitiinternational.com/carbonprogram/market.html (last visited Feb. 6, 2010).

5. ASSESSMENT OF THE INTERNATIONAL CARBON MARKET 11 (2008), http://whitepaper.climatechange.gov.au/emissionstrading/publications/pubs/081208_DCC_International_Carbon_Market_Assessment_vF.pdf.

collateralized by carbon credits, to the market.[6] Yet with the effects of the recent financial collapse and historical miscalculations made in connection with mortgage-backed securities still reverberating within the U.S. economy, concern should surface as to whether the application of traditional structured finance techniques to carbon credits will cause a relapse of the current financial crisis.[7] With these concerns in mind, before implementing a U.S. carbon market, policy makers should endeavor to temper market forces to avoid similar mistakes in the future.

The aim of this Article is to provide policy makers, who are concerned about tempering market forces and avoiding a repeat of history in an emerging U.S. carbon market, guidance as to the contributing market failures leading to the recent financial collapse. By comparing the recent financial collapse and carbon offset credits under the common framework of mortgage-backed securities, this Article identifies and highlights mistakes and lessons learned, so that policy makers are better equipped to fashion appropriate legislative and regulatory responses to avoid a repeat of history within a U.S. carbon market.

II. STRUCTURED FINANCE: A CONVENIENT FRAMEWORK

The convenient framework of structured finance opens the door to allow Wall Street institutions and investors easy access to the complex and rapidly evolving world of carbon credits.[8] By commoditizing assets, institutions and investors are connected to international efforts to reduce greenhouse gas emissions and are able to fuel the cost-effective growth of carbon initiatives through financial means.[9] How this process takes shape is

6. *See* MICHELLE CHEN, FRIENDS OF THE EARTH, SUBPRIME CARBON? RE-THINKING THE WORLD'S LARGEST NEW DERIVATIVES MARKET 2 (2009), http://www.foe.org/pdf/SubprimeCarbonReport.pdf.

7. *Id.*

8. Matthew Goldstein, *Cut Out the Carbon Middleman*, REUTERS, June 26, 2009, http://www.carbonoffsetsdaily.com/usa/cut-out-the-carbon-middleman-matthew-goldstein-9298.htm.

9. *See* David Greising, *The Carbon Frontier*, 64 BULL. OF THE ATOMIC SCIENTISTS 32, 32–37, Jul./Aug. 2008, *available at* http://thebulletin.metapress.com/content/00143k749w7p8307/fulltext.pdf.

discussed in the following Section. And how this process may cause a relapse of the recent financial crisis is addressed through the lens of mortgage-backed securities.

A. Mortgage-Backed Securities

1. Introduction

U.S. financial institutions possess the wizardry to transmute an assortment of assets into monetized commodities through complex securitization and structured finance techniques.[10] The terms *securitization* and *structured finance* are used to describe the financial processes in which the payment streams of groups of similar assets ultimately provide returns to investors holding securities backed by such assets.[11]

Varieties of assets yielding a payment stream can be securitized and used to collateralize an underlying financial instrument.[12] The most common types of securitized assets include mortgage loans, automobile loans, credit card receivables, student loans, and lease payments.[13] The focus of this Article examines one specific type of asset-backed security, the mortgage-backed security. A mortgage-backed security is a security collateralized by residential or commercial mortgage loans.[14] In light of the recent financial collapse, policy makers can use the mistakes within the U.S. financial marketplace (largely attributable to mortgage-backed securities[15]) to devise

10. Jill Drew, *Frenzy*, WASH. POST, Dec. 16, 2008, http://www.washingtonpost.com/wpdyn/content/article/2008/12/15/AR2008121503561_pf.html.

11. *See generally* Joshua D. Coval et al., *The Economics of Structured Finance* (Harvard Bus. Sch. Working Paper, Paper No. 09–060), *available at* http://www.hbs.edu/research/pdf/09-060.pdf (explaining the essence of structured finance).

12. ASSET SECURITIZATION—COMPTROLLER'S HANDBOOK 39 (1997), *available at* http://www.occ.treas.gov/handbook/assetsec.pdf.

13. Securitization, http://www.riskglossary.com/link/securitization.htm (last visited Feb. 6, 2010).

14. Mortgage-Backed Securities, http://www.secondmarket.com/markets/mortgage-backed-securities.html (last visited Feb. 6, 2010).

15. Raymond H. Brescia, *Capital in Chaos: The Subprime Mortgage Crisis and the Social Capital Response*, 56 CLEV. ST. L. REV. 271, 282–92 (2008).

appropriate regulatory and legislative responses to a U.S. carbon market.

2. Early Beginnings

The concept of securitization dates back to the 1970s when the Government National Mortgage Association ("*Ginnie Mae*") responded to the need for a more affordable residential housing market.[16] Acting to address this need, Ginnie Mae produced the first financial instrument backed by a mortgage, known as the mortgage-backed security.[17] This financial engineering sparked a subsequent and immediate interest in the capital markets.[18] Investors quickly recognized the incidental and unprecedented financial benefit gained via such a security, *i.e.*, it provided a vehicle for shifting the default risks associated with mortgages to the capital markets of Wall Street, where investors were willing to commoditize, and in turn, be compensated for taking on, such risks.[19]

Before undertaking a discussion of these risks and the role securitization and structured finance played in the recent financial collapse, a discussion regarding the mechanics of the securitization process itself is necessary.

3. The Process

Mortgage-backed securities involve two distinct markets: the primary market and the secondary market.[20] The primary market describes the initial relationship between the mortgage

16. About Ginnie Mae, http://www.ginniemae.gov/about/about.asp?subTitle=About (last visited Feb. 6, 2010). Ginnie Mae is a government-created agency that guarantees the payment of principal and interest on mortgage-backed securities backed by federally insured or guaranteed loans. *Id.*

17. *Id.*

18. Christopher L. Peterson, *Predatory Structured Finance*, 28 CARDOZO L. REV. 2185, 2199–2200 (2007).

19. Alyssa Katz, *The Dubious Birth of Mortgage Backed Securities*, THE BIG MONEY, June 25, 2009, http://www.thebigmoney.com/articles/historylesson/2009/06/25/dubious-birth-mortgage-backed-securities?page=0,1.

20. INTEGRATED FINANCIAL ENGINEERING, INC., EVOLUTION OF THE U.S. HOUSING FINANCE SYSTEM—A HISTORICAL SURVEY AND LESSONS FOR EMERGING MORTGAGE MARKETS 25 (2006), http://www.huduser.org/publications/pdf/US_evolution.pdf.

borrower and the mortgage lender.[21] A borrower's relationship with the bank, or the direct relationship between a buyer and a seller, are each representative of a primary market relationship.

The secondary market—the focal point of the analysis of this Article—is defined as the relationship between the mortgage lender and third-parties—namely, investors, banks, financial institutions, and brokerage houses that enter the process subsequent to the mortgage borrower's involvement.[22] The door to the secondary market is opened when a mortgage lender transfers its mortgage loans to these third-party entities, which in turn trade, exchange, and hedge mortgage loans on stock exchanges and over-the-counter markets.[23]

In the pre-securitization era, lenders made mortgage loans to borrowers, commonly for terms of ten to thirty years, and waited the course of the term of the mortgage loan to be made whole again.[24] As compensation to the mortgage lender for parting with its financial resources and the risk associated with lending to the mortgage borrower, the lender is paid interest on the loan. However, over the course of a mortgage loan's term, the mortgage lender has fewer funds by which it can redeploy to make other loans to prospective borrowers. Thus, it is deprived of the profit it could have made from additional mortgage borrowers. At its worst, mortgage lenders incur risk that a mortgage borrower will default on its payment obligation and be unable to repay the mortgage altogether, thereby leaving the lender shorthanded.[25] Thus, protecting against a lender's

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21. Primary Mortgage Market, http://www.mortgageloan.com/finance-glossary/Primary_mortgage_market (last visited Feb. 6, 2010).

22. Brescia, *supra* note 15, at 290.

23. Secondary Mortgage Market, http://www.investopedia.com/terms/s/secondary_mortgage_market.asp (last visited Feb. 6, 2010).

24. Richard J. Rosen, *The Role of Securitization in Mortgage Lending*, CHICAGO FED LETTER, Nov. 2007.

25. While lenders have recourse options, such as seizing the assets of the borrower, liquidating them, and selling them to repay the loan, the ultimate price obtained for the assets is often less than the value of the loan. Moreover, one can easily imagine the resources expended in possessing and re-selling a mortgaged property, each of which deprives the lender of resources it could better spend on pursuing its own core objectives, *e.g.*, lending.

exposure to these risks is of paramount concern. Securitization takes shape amidst these fears.

Securitization transfers the burden of having to wait to receive a mortgage borrower's periodic loan payments and the risk that the borrower may default to investors who are rewarded returns on investment for undertaking such risk.[26] The mortgage lender accomplishes this by selling the mortgage loan to a special purpose entity, or *SPE*.[27] By doing so, the lender removes the mortgage loan debt off its books and is subsequently paid value for its loan.[28] This enables the lender to redeploy its reacquired funds to other borrowers seeking mortgage loans.

Within the SPE, the borrower's mortgage is pooled with other mortgage loans by the same lender.[29] Similarly, other lenders also contribute loans—each selling its originated mortgages into the same pool, which may ultimately consist of thousands of different mortgages from different lenders.[30] After a characteristically diverse mix of mortgage loans is collected and the pool achieves a predetermined value and sustainable level of risk, the SPE transfers each of the mortgages into a trust that is overseen by an underwriter.[31]

Loan payments by mortgage borrowers are used to fuel the return on investment payment to investors of mortgage-backed securities,[32] therefore it is crucial to consider factors that can

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26. *See* Brescia, *supra* note 15, at 290.

27. *See* Special Purpose Vehicle/Entity—SPV/SPE, http://www.investopedia.com/terms/s/spv.asp (last visited Feb. 6, 2010) (indicating that the terms SPV and SPE are synonymous); Brescia, *supra* note 15, at 290.

28. THOMAS L. PORTER & AIRAT CHANYSHEV, THE SUBPRIME MELTDOWN: UNDERSTANDING ACCOUNTING-RELATED ALLEGATIONS 3–5 (2007), http://www.mmc.com/knowledgecenter/SubprimeMeltdown_AccountingAllegations.pdf.

29. Brescia, *supra* note 15, at 290.

30. U.S. Sec. & Exch. Comm'n, Mortgage-Backed Securities, http://www.sec.gov/answers/mortgagesecurities.htm (last visited Feb. 6, 2010).

31. *See* ASSET SECURITIZATION—COMPTROLLER'S HANDBOOK, *supra* note 12, at 12–16, 23.

32. *See* ASSET SECURITIZATION—COMPTROLLER'S HANDBOOK, *supra* note 12, at 6 (explaining that for this reason, mortgage-backed securities are commonly known as "pass-through" assets because the payment streams from borrower mortgage payments are passed through to investors).

disrupt the anticipated repayment of a mortgage loan by a borrower that may subsequently expose U.S. financial institutions and investors to unanticipated risk.

Legions of financial analysts and lawyers undertake this responsibility by reviewing the terms of each mortgage loan and the underlying characteristics of each physical property to assess these risks.[33] The list of considerations is too exhaustive to mention here, but important considerations include: the geographic location of the property; encumbered interests on the property (*e.g.*, fee, fee/leasehold, leasehold); environmental regional factors (*e.g.*, earthquakes, floods, forest fires, hurricanes); acts of God, which may result in uninsured losses; zoning restrictions; the laws of the state in which the property sits; the market value of the property; the property's primary purpose (*e.g.*, multifamily, office, retail, hotel, mixed use, industrial, self storage); the strength, stability, number and quality of the tenants; changes in governmental rules and fiscal policies; and national, regional and local economic conditions (*e.g.*, plant closings, military base closings, industry slowdowns, unemployment rates).[34] This detailed review of the mortgage pool allows the underwriter to determine the pool's overall volatility and make a determination as to how to "tranche" the pool into manageable securities attractive to U.S. financial institutions and investors.[35]

Tranche is derived from French origin, meaning slice.[36] Each tranche of the pool is characterized by a specific set of criteria that make it more or less appealing to U.S. financial institutions and investors.[37] The simplest example consists of two tranches: a senior and junior tranche (the latter also known as the

33. Kyle G. Lundstedt, *Understanding Mortgage Risk in Perilous Times*, http://www.lpsvcs.com/IndustryExpertise/Articles/Pages/AA-10-17-3.aspx (last visited Feb. 6, 2010).

34. *See*, *e.g.*, Credit Suisse First Boston Mortgage Securities Corp., *Commercial Mortgage Pass Through Certificates, Series 2007-C3* (Free Writing Prospectus to Accompany Prospectus dated Apr. 10, 2007).

35. Brescia, *supra* note 15, at 290.

36. BLACK'S LAW DICTIONARY 1535 (8th ed. 2004).

37. *See* What is a Tranche?, http://www.investopedia.com/ask/answers/04/081304.asp (last visited Feb. 6, 2010).

subordinate or mezzanine tranche).[38] The payment streams of mortgage borrowers are used to satisfy each investor investing in securities within a particular tranche.[39] The cascading effect amongst each of the tranches is illustratively termed a "waterfall," in that payments fill each senior tranche before pouring over into the immediately subsequent, subordinate tranche.[40] The senior tranche is closest to the cash flow of monthly principle and interest mortgage payments.[41] Once investors of the senior tranche are paid, the remaining payment stream pours over to satisfy the next subordinate tranche of investors until its bucket is filled. This continues down to the lowest, most junior tranche, or until no more payments exist to satisfy the remaining tranches.[42]

Because the senior tranche is more likely to be paid, it enjoys the lowest risk of default and receives a modest rate of return to investors.[43] Conversely, more junior tranches bear succeeding increased risk that there will not be enough cash flow to fulfill each payment obligation on its securities.[44] Investors are thus compensated with successively higher rates of return for undertaking successively higher risk.[45] Stated another way, the lowest subordinate tranches absorb the first risk of not being paid if sufficient cash flow is not available from the pool of mortgages to satisfy each of the more senior tranches.[46] Thus, the risk of mortgage default is absorbed by subordinate tranches first before more senior tranches are affected.

Equipped with an adequate understanding of the structured finance process, the following discussion identifies parallels between mortgage and carbon markets, and identifies problems

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38. Steven L. Schwarcz, *Protecting Financial Markets: Lessons from the Subprime Mortgage Meltdown*, 93 MINN. L. REV. 373, 377–78 (2008).

39. *Id.* at 378.

40. *Id.*

41. *Id.*

42. *See id.*

43. Drew, *supra* note 10.

44. *Id.*

45. *Id.*

46. *Id.*

that may arise in a U.S. carbon market if such a market and its issues are not addressed at the outset.

III. WILL HISTORY REPEAT ITSELF? AVOIDING A REPEAT OF HISTORY IN CARBON SECURITIZED AND DERIVATIVE INSTRUMENTS

A. Risk Reallocation and Diversification

A unique feature of structured finance is its ability to transfer risk from one party to another. In connection with mortgage-backed securities, lenders are able to transfer the risk of a mortgage borrower's default to financial institutions and secondary markets. In connection with carbon securitization and derivative instruments, financial institutions would be able to similarly transfer the risk of a project's failure to materialize viable carbon credits to financial institutions and secondary markets.

Before structured finance became common practice in the mortgage lending industry, the failure of a mortgage borrower to meet its payment obligations meant a mortgage lender suffered a direct financial loss from the borrower's default.[47] The exposure to such payment-default risk could not be mitigated easily through external measures.[48] Rather, the most effective means to eliminate payment-default risk was through internal measures, *i.e.*, the bank's own lending criteria, standards and due diligence.[49]

Through its own adequate due diligence a lender is able to reduce the number of loans it originated to risky mortgage borrowers, and thus retain only those that were unlikely to default.[50] Such due diligence considerations included carefully

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47. *See* Eamonn K. Moran, *Wall Street Meets Main Street: Understanding the Financial Crisis*, 13 N.C. BANKING INST. 5, 32 (2009) (explaining that traditionally banks managed loans from "cradle to grave"—making mortgage loans and retaining the risk of default).

48. *See id.* (explaining the need for lenders to evaluate borrowers).

49. *See id.*

50. *See generally* Kathleen C. Engel & Patricia A. McCoy, *Turning a Blind Eye: Wall Street Finance of Predatory Lending*, 75 FORDHAM L. REV. 2039 (explaining both

reviewing the creditworthiness and financial strength of each mortgage borrower; the mortgage borrower's work history; history of prior liens, judgments, and bankruptcies; the nature and size of assets possessed by the mortgage borrower; and the mortgage borrower's income and its source.[51] Even still, cautious lenders nevertheless suffered occasional direct financial losses from mortgage borrowers who failed to make loan payments despite their appearance of strong creditworthiness.[52] The advent of structured finance reduced these concerns for lenders by volleying risk elsewhere.[53]

As discussed above, the mechanics of structured finance allow mortgage loans originated by a lender to be sold and transferred.[54] Simultaneously transferred with this sale is the lender's receipt of principle and interest payments during each payment period on the mortgage loan.[55] In return for the sale, the lender receives value for the loan.[56] More importantly, also transferred with the sale of the mortgage loan is the lender's risk of payment default by the borrower.[57] A win-win situation for the lender—not only is the lender able to transfer risk externally, but it receives value for doing so, thereby enabling it to redeploy capital to originate additional mortgage loans, which, once originated, can be sold externally once again.[58]

Carbon securitization and derivative instruments are geared to take on a similar risk-reallocation approach. Take for example

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traditional due diligence and what it means today).

51. Brescia, *supra* note 15, at 289.

52. *See* Moran, *supra* note 48, at 32 (explaining that mortgage lenders retained the risk of default).

53. *Hearing on Protecting Homeowners: Preventing Abusive Lending While Preserving Access to Credit Before Subcomm. on Fin. Insts. & Consumer Credit & the Subcomm. on Hous. & Cmty. Opportunity, of the House Comm. on Fin. Servs.*, 108th Cong. 5 (2003) (statement of Cameron L. Cowan, Partner, Orrick, Herrington, & Sutcliffe, LLP), *available at* http://commdocs.house.gov/committees/bank/hba92983.000/hba92983_0f.htm [hereinafter *Hearing on Protecting Homeowners*].

54. *Id.* at 2.

55. *Id.*

56. *Id.*

57. *See generally* Moran, *supra* note 48 (explaining how mortgage lenders were able to transfer and diffuse risk).

58. *See id.*

a rural farmer operating in the Philippines (a non-Annex I country).[59] Part of the farming operations may include the raising of 10,000 pigs.[60] Waste produced by the pigs would be collected and left to decompose naturally—emitting methane, a harmful greenhouse gas recognized by the Kyoto Protocol, into the air.[61] Were the farmer unwilling to make the approximately $200,000 investment in biogas emitting technology to capture the released methane, the release of methane into the air would continue unabated.[62]

On the other hand, the farmer may be approached by a carbon-mitigation firm interested in sponsoring the biogas emitting technology and compensating the farmer annually in return for the carbon offset credits generated.[63] Such a firm may estimate that trapping the methane would generate 3,000 CERs.[64] The carbon-mitigation firm might offer to pay the farmer $4 per credit (or $12,000 annually) to undertake the project.[65] In turn, the firm could sell the carbon credits to the financial markets for $18 per credit (or $54,000 annually).[66] In this way, the farmer acts like the mortgage borrower, and the carbon-mitigation firm like the mortgage lender. In the transfer, the carbon-mitigation firm would be compensated for the sale of carbon credits and would shift the risk that the carbon credits would not materialize elsewhere.[67]

Within this fundamental feature of risk reallocation lies the problem itself. By enabling the originator of an asset to transfer the asset elsewhere, the originator has little incentive to ensure

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59. Marc Gunther, *Carbon Finance Comes of Age*, Apr. 17, 2008, http://money.cnn.com/2008/04/15/technology/Gunther_carbon_finance.fortune/index.htm. The following example is loosely based on a transaction between Uni-Rich Agro Industrial and EcoSecurities. *Id.*

60. *Id.*

61. *See* Kyoto Protocol, *supra* note 1, Annex A (listing methane as a greenhouse gas).

62. Gunther, *supra* note 60.

63. *Id.*

64. *Id.*

65. *Id.*

66. *Id.*

67. *Id.*

the quality of the underlying asset.[68] Once sold, the consequences of an unsavory asset are felt by investors, not the originating lender.[69] Thus, the lender retains little responsibility (or concern) for the consequences that may follow the loan, and is instead motivated by volume and lucrative fees associated with the sale of the credit into the secondary market.[70] Risk is borne, instead, by the investor.

Moreover, once the security has exchanged hands multiple times within the secondary market, it is difficult to determine who originated the underlying loan. Thus, structured finance disperses risk so widely that there is little incentive for the originating lender to monitor the performance of the underlying asset.[71]

The initial design of a U.S. carbon market should recognize the problems associated with the risk reallocation function of structured finance. Policy makers should recognize that without proper regulation or legislation, emission-reduction project developers will likely devise projects without consideration as to the individual problems that a project will face or the risk that the project will fail. Without any repercussions, project developers may be quick to generate emission-reduction projects, obtain carbon credits, and quickly sell credits to U.S. financial institutions willing to repackage the credits into larger pools of carbon credits.

As a result, the risks associated with an individual project may become quickly clouded and a project's potential instability may be pushed on to unsuspecting investors. In situations where there is strong demand for a security, natural market forces may cause the security to rapidly be absorbed by global portfolios and investment funds before the true risks of the original emission-reduction project become fully known.

Add to this equation the factor that one of the failures leading to the recent financial crisis was the market-created volume and speed that dominated the structured finance

68. *See* Brescia, *supra* note 15, at 296–97.

69. *Id.*

70. *Id.*

71. Schwarcz, *supra* note 39, at 390.

process.[72] Without intervention by policy makers, similar market failures could become ever-present in a U.S. carbon market. As underwriters demanded more mortgage-backed securities (so that they could deliver them to profit-driven investors), mortgage lenders were driven by short-term, deal-driven incentives.[73] As demand for mortgage-backed securities continued to grow, so did the financial incentives offered to mortgage lenders who originated mortgage loans, thereby proliferating the market's natural demand for volume and speed within the process.[74]

As investors became increasingly drawn to mortgage-backed securities for high return on investment, demand skyrocketed.[75] Mortgage lenders scrambled to originate mortgage loans to meet growing demand, but faced the reality that current lending standards prevented many would-be borrowers from seeking credit.[76] To compound issues further, investors were unwilling to purchase individual mortgage loans from lenders.[77] Rather, investors demanded securities backed by mortgage loans—securities produced only once a pool of thousands of mortgage loans were amassed and tranched by U.S. financial institutions.[78] Faced with an almost insatiable appetite for mortgage-backed securities, lenders compensated by relaxing lending standards.[79] By doing so, lenders were now able to make mortgage loans to borrowers who would have not otherwise previously qualified for such loans.[80]

Despite these concerns, investors remain drawn to carbon securitization and derivative instruments because of the

72. Drew, *supra* note 10.

73. Offsets & Lessons, *supra* note 76, at 2.

74. *See* Vikas Bajaj, *Mortgages Grow Riskier, and Investors Are Attracted*, N.Y. TIMES, Sept. 6, 2006, http://www.nytimes.com/2006/09/06/business/06place.html.

75. *See id.*

76. This American Life, *The Giant Pool of Money* 5–6 (Program #355, Originally Aired May 9, 2008) (quoting NPR International Business and Economics correspondent, Adam Davidson) (transcript available at http://www.thislife.org/extras/radio/355_transcript.pdf) [hereinafter This American Life].

77. *Id.* at 6–7.

78. *Id.* at 7.

79. *Id.*

80. *Id.*

tremendous value estimated to be gained within a U.S. carbon market. [81] Advocates of the structured finance process argue that the pooling of mortgage loans or carbon credits dilutes the risk that the underlying assets are flawed.[82]

These advocates argue that pooling several assets together (whether they are mortgage loans or carbon credits) reallocates risk through diversification.[83] A well designed U.S. carbon offset market will soften risk via the characteristically varied mix of emission-reduction projects that comprise the pool. Moreover, no one investor bears the entire burden of failure. Each investor shares in the profits or losses of the pool in relative proportion to the investors' stake in the pool. A correctly balanced pool of emissions-reduction projects will contain a sufficient number of financially stable projects to offset those which may be unable to meet their carbon credit delivery obligations. The over-collateralization of the pool also serves this end.[84] By constructing a pool of projects whose collective value exceeds the value of securities issued, investors provide an additional buffer against a project's default.[85] Thus, the financial risk of carbon credit default is mitigated by the likelihood that other projects will meet their obligations.

However, in order for the value of investments to remain high, the quality of the underlying asset (*i.e.*, carbon credits) must remain high. The worry is that a flood of cheap carbon credits into the market will dilute the value of credits and reduce or eliminate incentives to invest in emission-reduction projects.[86] This flood of assets is exactly what happened with mortgage-backed securities.[87]

81. *See* Offsets & Lessons, *supra* note 76, at 1–2.

82. *Hearing on Protecting Homeowners*, *supra* note 54, at 8.

83. U.S. Sec. and Exch. Comm'n, Beginners' Guide to Asset Allocation, Diversification, and Rebalancing, http://www.sec.gov/investor/pubs/assetallocation.htm (last visited Feb. 6, 2010).

84. *Hearing on Protecting Homeowners*, *supra* note 54, at 5.

85. *Id*.

86. Gunther, *supra* note 60.

87. *See* Drew, *supra* note 10.

B. Predictive Models and Irrelevant Data

1. Mortgage-Backed Securities

Miscalculations related to mortgage-backed securities stemmed, in part, from reliance on irrelevant data[88] and the erroneous belief that history was a reliable predictor of future events.[89]

Until recent years, the historical value of real estate nationwide since the post-War era had generally increased.[90] Based on this positive historical data, elaborate financial models were constructed to predict the future strength of the mortgage lending industry.[91] These models forecasted that real estate prices would continue to rise.[92] Built into these models were stress tests designed to measure worst-case and break-even scenarios that tested the financial viability of mortgage lenders under the most economically dire, hypothetical circumstances.[93]

By using historical data as a baseline, and assuming continued positive growth, analysis gathered from these models suggested a positive outlook.[94] Even at its worst, the default of a less-than-ideal mortgage borrower on its payment obligations, and the ultimate foreclosure and liquidation of the underlying asset, would not drastically affect a lender's profitability.[95] Lenders posited that because real estate values increased, a mortgage borrower who underwent default and foreclosure

88. *See* This American Life, *supra* note 81, at 10–11.

89. *See id*.

90. *See* U.S. Census Bureau, Historical Census of Housing Tables—Home Values (2004), http://www.census.gov/hhes/www/housing/census/historic/values.html.

91. *See* This American Life, *supra* note 81, at 10; *see also* Lauren E. Willis, *Will the Mortgage Market Correct? How Households and Communities Would Fare if Risk Were Priced Well*, 41 CONN. L. REV. 1177, 1224 (2009).

92. *See* This American Life, *supra* note 81, at 10; *see also* Willis, *supra* note 98, at 1224.

93. *See* This American Life, *supra* note 81, at 10; SENIOR SUPERVISORS GROUP, OBSERVATIONS ON RISK MANAGEMENT PRACTICES DURING THE RECENT MARKET TURBULENCE 16 (2008) (defining "stress tests" as encompassing "static single-factor changes to market variables calibrated to extreme moves in historical data series, historically based scenarios, and forward-looking scenarios").

94. *See id*.

95. *See id*.

nevertheless left the lender with an asset worth more than the value of the mortgage loan itself.[96]

Moreover, mortgage borrowers had a powerful incentive not to default on their payment obligations.[97] Increases in real estate value meant a mortgage borrower's investment in real estate also increased, and could be profitably sold at a later date. Thus, data suggested that all parties stood to gain in the mortgage market.

Historically positive data also bolstered the value of mortgage-backed securities.[98] On Wall Street, increases in the value of the underlying asset meant default rates would remain low, thus guaranteeing stable and predictable cash flow to investors—a necessary element to the liquidity (*i.e.*, success) of mortgage-backed securities. With no data to suggest negative consequences, mortgage lenders and Wall Street investors believed that only catastrophic failure could devalue the mortgage-backed securities industry.[99] Absent from this economically positive outlook was the simple recognition of the irrelevance of the baseline data.

Historical mortgage lending data was not a viable predictor of future success for the simple reason that lending criteria—the first line of defense for mortgage lenders when trying to protect themselves against financially unstable mortgage borrowers—was, until most recently, stringent.[100] Furthermore, real estate data reflected creditworthy mortgage borrowers with

96. *Id.* at 8.

97. *Compare* Posting of Richard Green to The Growth Blog, http://growthcommissionblog.org (Nov. 2, 2008, 13:41) ("So long as house prices rose, these investors reasoned, mortgage borrowers would retain a powerful incentive not to default."), *with* INT'L MONETARY FUND, WORLD ECONOMIC OUTLOOK HOUSING AND BUSINESS CYCLE 67–68 (2008) ("Rising negative equity on home ownership and resets of variable-rate mortgages are likely to push defaults and foreclosures up still higher, putting further downward pressure on house prices, which will ratchet up incentives to default.").

98. *See generally* This American Life, *supra* note 81 (describing the confidence of investors in U.S. housing prices, which contributed to the value of mortgage-backed securities because they were seen as having a low risk of default).

99. Drew, *supra* note 10.

100. *See* This American Life, *supra* note 81, at 7.

corresponding low default rates.[101] Absent from the historical data was any evidence of default and foreclosure rates within the real estate market if less creditworthy mortgage borrowers were introduced into the market.[102]

Predictive models prove useful in their application only when the baseline data used to compute predictions are similarly situated to the future data. This had not been the case. By the time it was discovered that the mortgage lending industry had relied on irrelevant data, financial markets had already began to unravel.[103]

Under the guise of infallible real estate prices, mortgage lenders had saturated the lending sector by lending to subprime mortgage borrowers who would have never qualified for loans before.[104] By the end of 2006, the average home was valued at almost four times what the average family made.[105] And mortgage lenders began noticing something that they had not seen before: mortgage borrowers would complete the mortgage lending process, sign the papers, and then default on the very first payment.[106] Mortgage borrowers were under water before they even started.[107]

To make matters worse, the volume of subprime loans generated was staggering.[108] As a percentage of total mortgage loan originations, subprime originations went from 6.3% in 2002 to 19.1% in 2006.[109] The collapse of Countrywide Financial

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101. *See id*. at 7, 10.

102. *See id*. at 10.

103. *See id*. at 11.

104. *See id*. (explaining how individuals who historically would not have qualified for mortgage loans received them because of the belief the loans would be protected by infallible real estate prices).

105. *Id*. at 13. In the past, the average home value was between two and three times what the average family made. *Id*.

106. This American Life, *supra* note 81, at 13.

107. *Id*.

108. Rick Brooks & Constance M. Ford, *The United States of Subprime*, WALL ST. J., Oct. 11, 2007, at A1.

109. Jonathan Cary et al., *Acquisition Financing: The Current Landscape Causes and Consequences of the US Credit Crunch*, *reprinted in* MERGERS & ACQUISITIONS 2008: WHAT YOU NEED TO KNOW NOW 513, 517 (Practicing Law Institute ed., 2008).

Corporation in the summer of 2007[110] was perhaps Wall Street's, and the public's, first realization that securities collateralized by such subprime mortgages were predicated on a house of cards.

In lockstep with mortgage lenders' origination of mortgage loans, the secondary market gobbled up as many (subprime) loans as it could and quickly injected the repacked security into the marketplace for investors to purchase.[111] These investments infused the marketplace and seeped into the depths of investment portfolios, retirement funds, and mutual funds.[112] The discovery that the value of real estate and the subsequent mortgage-backed securities collateralized by such real estate was hyper-inflated, immediately collapsed their value, and with it the value of portfolios and the value of entities holding such portfolios worldwide.[113]

Miscalculations made with respect to mortgage-backed securities can, and should, provide valuable lessons to policy makers as financial institutions seek to devise models that are able to value the potential worth of a market for carbon-backed securities.[114] As global interest in the potential value of carbon credits increases,[115] it is important to temper these predictions

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110. *See Countrywide Financial Corporation*, Oct. 9, 2008, http://topics.nytimes.com/topics/news/business/companies/countrywide_financial_corporation/index.html (explaining that Countrywide's financial problems began in August 2007).

111. *See* Kimberly Blanton, *Dark Side of Subprime Loans*, BOSTON GLOBE, Aug. 3, 2005, at D1, *available at* http://www.boston.com/business/personalfinance/articles/2005/08/03/dark_side_of_subprime_loans/ (explaining the "leap in popularity" of subprime loans).

112. *See* Cary et al., *supra* note 117, at 518–19 (noting that institutional investors were especially eager to invest in mortgage-backed securities and similar collateralized debt obligations in lieu of traditional debt instruments).

113. *See id.* at 517 ("However, once it became obvious that a significant number of subprime borrowers could not meet their debt obligations, the credit market collapsed.").

114. *See* Joel Kirkland, *MARKETS: The Possibility of Carbon-Trading Fraud Elbows Into Senate Debate*, CLIMATEWIRE, Sept. 25, 2009, http://www.eenews.net/public/climatewire/2009/09/25/1 ("From the perspective of the Senate's toughest critics of using a cap-and-trade program to combat global warming, the size and scope of a potential carbon market look too much like those of the market that created mortgage securities and credit default swaps that collapsed the housing bubble.").

115. *See* STEVE SUPPAN, INST. FOR AGRIC. & TRADE POL'Y, SPECULATING ON

by understanding that, as with mortgage-backed securities, historical data—or the lack thereof—provides valuable insight as to the future success of carbon securitized and derivative instruments.

2. Carbon

As the dawn of carbon finance is upon us, lenders and investors must be cautious to not overvalue the profit potential of carbon credits. Although widespread speculation exists as to the potential profitably of carbon trading and carbon derivatives,[116] attention should be paid to the underlying data on which such speculation rests. For instance, historical trading and valuation data gathered from the U.S. Acid Rain Program is minimal and potentially irrelevant, and trading and valuation data gathered from the already operational EU ETS suggests the value of EUA credits is already inflated.

a. U.S. Acid Rain Program

The United States has yet to implement a formal cap-and-trade scheme to allow entities to trade, exchange, and value carbon credits. But the concept of a cap-and-trade scheme is not unique to carbon.

In the 1990s, the Bush administration (George H. W. Bush) crafted an emissions trading system to help regulated entities comply with mandatory reductions in sulfur dioxide and nitrogen oxides.[117] The emissions trading scheme was born from the Acid Rain Program established by the federal enactment of the Clean Air Act Amendments of 1990.[118]

CARBON: THE NEXT TOXIC ASSET (2009), http://www.tradeobservatory.org/library.cfm?refID=106995 (noting that the Congressional Budget Office predicts that carbon credits will be worth between $50 and $300 billion annually).

116. *See generally id.* (discussing potential problems within the carbon market, including instability and price volatility).

117. *See* U.S. Envt'l. Prot. Agency, Acid Rain Program, http://www.epa.gov/airmarkets/progsregs/arp/basic.html (last visited Feb. 6, 2010) [hereinafter EPA Acid Rain Program]; *see also* Andrzej Zwaniecki, *Acid Rain's "Cap and Trade" is Potential Model for Climate Fixes*, Nov. 13, 2009, http://www.america.gov/st/energy-english/2009/November/20091113133419saikceinawz2. 802676e-02.html.

118. U.S. Envt'l. Prot. Agency, Laws & Regulations, http://www.epa.gov/airmarkets/progsregs/arp/basic.html (last visited Feb. 6, 2010).

Managed by the U.S. Environmental Protection Agency, the success of the Acid Rain Program speaks for itself.[119] The Acid Rain Program successfully demonstrated that the use of a market-based approach to reduce industrial pollutants could enable emission-reduction up to 50% more cheaply than a command-and-control approach typical of previous environmental protection programs.[120] The cost of meeting target emissions requirements under the Acid Rain Program was a quarter of the United States' original cost estimates.[121] On its face, historical data gathered from the success of the Acid Rain Program foreshadows the success of a U.S. carbon market and the ability of the carbon market to capitalize on the power of the marketplace to reduce greenhouse emissions in the most cost-effective manner possible while allowing carbon to be optimally valued through natural market forces. Yet despite the historical success of the Acid Rain Program,[122] it is important for policy makers to recognize the limited applicability of its success going forward.

The Acid Rain Program and its emissions trading scheme is rooted in an entirely different economic environment. U.S. financial markets were not as deregulated in the 1990s as they are now,[123] and the economic environment in the 1990s would have lessened, if not all together prohibited, the development of the more complex and exotic securitization and derivative instruments, and the volume of secondary market transactions, seen at the start of this decade.[124] Most importantly, the

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119. *See id*.

120. Jillian Button, *Carbon: Commodity Or Currency? The Case For An International Carbon Market Based On The Currency Model*, 32 HARV. ENVT'L. L. REV. 571, 580 (2008) (citing Richard Rosenzweig, Matthew Varilek & Josef Janssen, *The Emerging International Greenhouse Gas Market* 1, 3 (2002), *available at* http://www.pewclimate.org/docUploads/trading.pdf).

121. *Id.*

122. *Id.*

123. *See, e.g.*, MATTHEW SHERMAN, CTR. FOR ECON. & POL'Y RESEARCH, A SHORT HISTORY OF FINANCIAL DEREGULATION IN THE UNITED STATES 10–11 (2009), http://www.openthegovernment.org/otg/dereg-timeline-2009-07.pdf.

124. *See* Thomas Frank, *Bring Back Glass-Steagall: Banks That Behave Like Hedge Funds Don't Deserve Guarantees*, WALL ST. J., Jan. 12, 2010, http://online.wsj.com/article/SB10001424052748704586504574654751857203602.html

historical success and positive data from the Acid Rain Program does not account for the multi-faceted nature of carbon credits.[125]

Unlike the Acid Rain Program, the Kyoto Protocol presents unique features beyond the framework and scope of the Acid Rain Program.[126] Consider, for example, the use of CDM and JI mechanisms.[127] Offset credits present real concerns about the viability of carbon assets because the value of offset credits is solidified only once several layers of approval have been met.[128] Consider also the international scope of the Kyoto Protocol, which opens the door to a host of international issues not present in the U.S.-confined Acid Rain Program.[129] Further, consider the lack of a solitary uniform body or uniform standard to judge the quality of a carbon credit, unlike the EPA's Clean Air Markets Programs, which oversees the cap-and-trade scheme of the Acid Rain Program.[130] Thus, just as historical mortgage lending data overlooked subprime loans, the historical Acid Rain Program data overlooks the uncertainty associated with carbon credits.

(noting that the Glass-Steagall Act, which was repealed in 1999, permitted a "wave of consolidation in the financial industry" and allowed "commercial banks to take gambles on high risk schemes").

125. *See The Invisible Green Hand*, ECONOMIST, July 6, 2002, *available at* http://www.economist.com/surveys/displaystory.cfm?story_id=E1_TNDDNDV.

126. *See* Kyoto Protocol, *supra* note 1.

127. *See* UNFCCC, Mechanisms Under the Kyoto Protocol: Emissions Trading, the Clean Development Mechanism and Joint Implementation, http://unfccc.int/Kyoto_protocol/mechanisms/items/1673.php (last visited Feb. 6, 2010) (defining both the CDM as a project-based mechanism that involves investment in sustainable development projects that reduce emissions in developing countries and the JI project-based mechanism that enables industrialized countries to carry out joint implementation projects with other developed countries).

128. *See* The Kyoto Mechanisms: A Business Perspective (June 8, 1999), http://www.iccwbo.org/collection4/folder165/id407/printpage.html?newsxsl=&articlexsl=.

129. *See* Kyoto Protocol, *supra* note 1, Annex B (referencing the parties to the Kyoto Protocol, which are all of the parties to the U.N. Framework Convention on Climate Change).

130. *See* Bank of New York Mellon, *Towards a Common Carbon Currency: Exploring the Prospects for Integrated Global Carbon Markets* 20–24, Dec. 2008, http://www.bnymellon.com/news/commentaries/issuerservices/carbonmarkets.pdf; U.S. Envt'l. Prot. Agency, Cap and Trade, http://www.epa.gov/captrade (last visited Feb. 6, 2010).

Although financial predictive models are useful, their application should be constrained by the limited number of benchmark data—in this case, the history of the Acid Rain Program—and by the sheer fact that sulfur dioxide and carbon do not exhibit the same risk profiles.[131] Moreover, predictive modeling is most useful when large amounts of historical data exist. For carbon, this is simply not yet the case.

b. EU ETS

Policy makers, U.S. financial institutions, and investors looking toward the success of the EU ETS[132] as an indicator of the future success of a U.S. carbon market should be cautious. The EU ETS has gained its share of criticism.

Critics that argue the European Union over-allocated free allowances at the start of Phase I.[133] As with any market, the over supply of an asset dilutes its value. As a result of this over-allocation, critics suggest the EU ETS is less effective, and EUAs therefore less valuable than originally thought.[134] The over-allocation continues to fuel volatility and uncertainty among investors.[135] Thus, not only is historical data from the EU ETS drawn into question, it also potentially suffers from the same overvaluation issues as mortgage-backed securities.

The problem with the use of financial models to predict the future viability of carbon securitization and derivative instruments is that, with respect to the vast majority of carbon emissions projects, there are few or no comparable projects to serve as a benchmark for future success.[136] Thus, carbon

131. *See* Chemical Profiles: Carbon Monoxide, Scorecard Pollution Information Site,http://scorecard.org/chemicalprofiles/nationalriskcharacterization.tcl?edf_substance_id=630%2d08%2d0 (last visited Feb. 6, 2010); Chemical Profiles: Sulfur Dioxide, Scorecard Pollution Information Site, http://scorecard.org/chemical-profiles/edf-risk-characterization.tcl?edf_substance_id=7446%2d09%2d5 (last visited Feb. 6, 2010).

132. Emission Trading System, http://ec.europa.eu/environment/climat/emission/index_en.htm (last visited Feb. 6, 2010).

133. James Kanter, *Carbon Trading: Where Greed is Green*, N.Y. TIMES, June 20, 2007, http://www.nytimes.com/2007/06/20/business/worldbusiness/20iht-money.4.6234700.html.

134. *Id.*

135. *See id.*

136. *See* Jessica Stillman, *What is Carbon Credit?*, BNET, http://www.bnet.com/

securitization and derivative instruments may be less suited to financial modeling. There is also no time-tested marketplace for such carbon instruments to serve as a surrogate for determining a viable market value for a carbon credit between a buyer and a seller. Thus, although U.S. financial institutions and investors will likely rely on financial models using data gathered from the U.S. Acid Rain program and the EU ETS to determine the predictability and growth of a carbon market, the historical data is too lacking to be convincing.

There is little disagreement regarding the success of the U.S. Acid Rain Program.[137] However, a cap-and-trade system for sulfur dioxide presents far fewer valuation complexities when compared to that of carbon credits. This Article has hinted this in its discussion of the Acid Rain Program and EU ETS above. The following discussion provides a further nuanced evaluation of the valuation concerns of carbon credits.

C. The Collateral Behind the Security

Structured finance is a delicate balance. Securities collateralized by particular underlying assets retain their value only if the assets perform as expected.[138] Investors invest in securitization and derivative instruments based on the risks associated with the underlying assets and the predictability of future return on investment.[139] One of the most difficult questions that secondary markets will face is how to assure investors that emission-reduction projects will fulfill promises to deliver carbon credits, thus keeping afloat the ultimate value of carbon securitization and derivative instruments.

2403-13241_23-187036.html (noting that the EU ETS is the only mandatory cap-and-trade program and that carbon offset credits "reflect a fast-growing and unregulated market").

137. Zachary Coile, *'Cap-and-Trade' Model Eyed for Cutting Greenhouse Gases – Method has Proved Successful in Reducing Emissions that Produce Acid Rain Pollution,* San Francisco Chron., Dec. 3, 2007, http://www.sfgate.com/cgi-bin/article.cgi?f=/c/a/2007/12/03/MNMMTJUS1.DTL&hw=Cap+trade+Acid+Rain&sn=001&sc=1000.

138. *See generally* Coval et al., *supra* note 11 (explaining the essence of structured finance).

139. *See id.*

Regardless of the rate of return, no rational investor will invest in securitization and derivative instruments if the underlying assets are not expected to perform. The value of such instruments and their ability to be traded and exchanged rely on the quality of the underlying asset to perform as predicted. Moreover, the nature of the asset itself must sustain its quality, otherwise, securitization and derivative instruments collateralized by such assets will become devalued.[140]

Mortgage-backed securities did not perform as predicted.[141] The failure of mortgage borrowers to meet mortgage payment obligations and the subsequent foreclosure or default on the mortgage loan rendered the securities collateralized by these mortgages worthless.[142] Had the foresight existed to enable predictive models to price such risks into the value of mortgage-backed securities, their value would have been dramatically less, expected return lower, demand lessened, and collective impact on financial markets reduced.

The same cause for concern can be applied going forward in a U.S. carbon market. The failure of an emission-reduction project to produce its expected number of carbon offset credits immediately disrupts the structured finance balance by causing a devaluation of the securitization and derivative instruments supported by the offset credits. Moreover, the issuance of carbon credits, and the use of securitization and derivative instruments to secure the delivery of carbon credits at an agreed on price and quantity presents problems of delivery failure and of how to value an asset at one point in time when the value of the asset at a subsequent period of time may have drastically fluctuated from the original contracted price.

As discussed above, compliance and voluntary buyers utilize securitization and derivative instruments to hedge against expected supply and price fluctuations in the carbon market.[143] Financial institutions produce such instruments based on the

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140. *See id.*

141. *See* This American Life, *supra* note 81, at 10.

142. *See, e.g.*, Eric Dash & Julia Werdigier, *Citigroup Warns of 60% Earning Drop in Third Quarter*, N.Y. TIMES, Oct. 1, 2007, http://www.nytimes.com/2007/10/01/business/01cnd-bank.html.

143. *See supra* Section III.B.

expected cash flow to be generated from the sale of promised carbon credits.[144] In each instance, entities are heavily dependent on the underlying projects to produce real, market-worthy carbon credits.

Investor fears are grounded on meritorious concerns. One fear is that the project will fail to fulfill its promised number of carbon credits.[145] Another fear is that, circumstances will arise so as to negatively disrupt the value of carbon securitization and derivative instruments.[146] Other fears closely parallel mortgage-backed securities, *e.g.*, just as mortgage lenders approved the mortgage loans of less-than-credit-worthy mortgage borrowers, unscrupulous intermediaries may over promise on carbon-reduction projects by selling carbon credits based on projects that simply do not achieve the promised level of greenhouse gas reduction, and thus do not deliver the promised number of carbon credits.[147]

Policy makers need to understand that the carbon credit environment is rife with risks that may limit, or altogether prevent, a project's ability to recognize valid emission-reduction credits and provide liquid securitization and derivative instruments.[148] Moreover, fluctuations in various sectors may cause the supply and demand of carbon credits to fluctuate, thereby making the valuation process (as discussed above with predictive models) increasingly difficult. With respect to each of these broad concerns, policy makers are encouraged to recognize the following areas of concern:

i. Global Economic Growth: Economic growth in countries could affect the demand for carbon credits.[149] Japan, for instance, is experiencing rapid economic growth.[150] Economic growth is largely dependent on the utilization of energy.[151] In a carbon-constrained

144. *Id.*
145. Offsets & Lessons, *supra* note 76, at 1.
146. *See id.*
147. *Id.*
148. *See id.*
149. Gunther, *supra* note 60.
150. *Id.*
151. *Id.*

country, as demand for energy increases, so too will the price of carbon credits. The reverse is also true. Countries who experience slow economic growth—as is the case with many countries amidst the recent financial crisis[152]—will demand less energy and place less pressure on enforcing greenhouse gas emissions compliance, thus reducing the demand and price of carbon credits.

ii. Technology-based Alternative Energy Sources: As the demand, and thus price, for carbon credits increases, the pressure to pursue cheaper alternative energy sources will drive technological innovation. Technological innovation may lead to energy sources that do not require burning fossil fuels. While salutatory, this will nevertheless affect the demand for and price of carbon credits.

iii. Climate-based Alternative Energy Sources: Weather patterns may cause shifts in the availability or scarcity of alternative energy sources.[153] Consider for example, the rains in Spain.[154] Increased rainfall translates into increased energy derived from water power and less demand for energy derived from burning fossil fuels.[155]

iv. Weather Patterns/Natural Disasters: Weather and natural disasters, including avalanches, volcanic eruptions, drought, wild fires, earthquakes, and floods, may each affect an emission-reduction project from producing the promised number of carbon credits.[156]

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152. Maria Caracota Dimitriu & Ruxandra Mihala□cu, *The Impact of Investments in Global Financial Crisis*, 12 ECONOMIA SERIA MANAGEMENT 19, 21, *available at* http://www.management.ase.ro/reveconomia/2009-2s/5.pdf.

153. Gunther, *supra* note 60.

154. *Id.*

155. *Id.*

156. *See* PROSPECTUS, AIRSHARES (TM) EU CARBON ALLOWANCES FUND 57 (2008), http://www.xsharesadvisors.com/data/Unsorted/AirShares_PRO-64725-1.pdf [hereinafter PROSPECTUS].

v. Oversupply of Carbon Credits: As discussed above, critics of the EU ETS argue too many allocations were issued to regulated companies during Phase I.[157] Any oversupply of carbon credits will immediately dilute the value and liquidity of carbon credits.

vi. Geopolitics: Geopolitical events may cause large fluctuations in the price of carbon credits. Consider the "hot air" phenomenon in Russia and Ukraine.[158] This phenomenon refers to what some believe is the huge over allocation of carbon credits to countries that will subsequently flood the carbon market with them, thus sinking their value.[159] "The countervailing view is that the Russians will not dump their hot air into the market because [Russia] want[s] to keep carbon prices high to drive demand up for natural gas, which [conveniently] emits less carbon than coal . . . "[160]

vii. Regulatory: Changes or proposed changes in regulation of greenhouse gases will inevitably affect the price of carbon credits. Carbon-related legislation is a "constant moving target."[161] Coupled with an undefined greenhouse regulatory environment post-2012, uncertainty exists as to what value, if any, carbon credits will have in the future.[162] Add to this that in the wake of the recent fallout of mortgage-backed securities, recent regulatory attention under the Obama administration to regulate the parameters in which financial markets operate could affect return on investments.[163]

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157. *Supra* Section III.B.2.ii.

158. Gunther, *supra* note 60.

159. *Id.*

160. *Id.*

161. Hiranya Fernando & Shally Venugopal, *Subprime Carbon: Preparing for the Dangers of Hidden Carbon Risk*, World Resources Institute, Oct. 30, 2008, http://www.wri.org/stories/2008/10/subprime-carbon-preparing-dangers-hidden-carbon-risk.

162. ASSESSMENT OF THE INTERNATIONAL CARBON MARKET, *supra* note 5, at 11.

163. *See* CHEN, *supra* note 6, at 6.

viii. Currency Risk: The value of carbon credits traded in the marketplace will necessarily be valued by a particular country's currency. Changes in the value of currency—even currency as traditionally stable as the U.S. dollar—will affect the trading value of carbon credits and carbon securitization and derivative instruments. While financial institutions are savvy enough to employ futures contracts to hedge against currency risks, there is no assurance that futures contracts will be available, or if used, that they will be effective.[164]

ix. Project Risks: A project may fail to produce carbon credits for any number of reasons: labor disputes or strikes, unexpected delays, unexpected technological or operational problems, and underperformance of carbon-reduction technologies to reduce greenhouse gas emissions. Economic circumstances surrounding the project also pose real risks. Moreover, for any number of reasons a project may lose its financing to continue the operations. In such an event the project could collapse all together. Additionally, countries that fail to meet their compliance targets are penalized by the regulating body.[165] These may include fines or additional reduction commitments added to the next compliance period, which may prove overly burdensome and consequently detrimental to a project.[166]

x. Natural Gas/Oil Markets: Fluctuations in the supply and demand of natural gas and oil present challenges in determining the value of carbon credits. An inverse relationship exists between prices for natural gas and oil and carbon credits.[167] Natural gas is an alternative energy fuel.[168] A drop in the price of

164. PROSPECTUS, *supra* note 168, at 76.

165. *See id.* at 14.

166. *See id.* at 25–26.

167. *See id.* at 15.

168. *Id.*

natural gas and oil places downward pressure on carbon credit prices.

xi. Carbon-Reduction Technology: The viability of carbon-reduction technology is unproven and has not matured.[169] Thus there is uncertainty about an emission-reduction project's ability to reduce carbon emissions enough to generate the promised number of carbon credits when relying on such unproven technology.

xii. Continued Willingness of Countries to Adhere to Greenhouse Gas Reductions: The value of, and more importantly the need for, carbon credits depends on the continued willingness of countries to continue complying with commitments under the Kyoto Protocol.[170] Avenues, such as the International Court of Justice, are in place to enforce compliance; however, they remain untested.[171]

With these considerations in mind, policy makers should question whether U.S. financial institutions and investors understand the necessary risks and complexities associated with carbon credits.

Another cause for concern is that intermediaries may over promise on the delivery of future carbon credits. Moreover, consider third parties charged with evaluating the quality of emission-reduction projects to produce carbon credits. Investor over-reliance on these third parties may cause over confidence in a project's ability to deliver the promised number of carbon credits. Reliance on third parties, particularly credit rating agencies and insurance companies, is discussed below.[172]

At the same time, the cynical viewer of carbon investing might argue "buyer beware,"[173] *i.e.*, investors should only

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169. *See Carbon Capture and Storage*, Oct. 10, 2006, http://www.euractiv.com/en/climate-change/carbon-capture-storage/article-157806.

170. PROSPECTUS, *supra* note 168, at 14.

171. *Id.*

172. *See infra* Section III.E.

173. 'BUYERS BEWARE' WWF'S RESPONSE TO THE RELEASE OF THE VOLUNTARY CARBON STANDARD, WWF 1 (2007), http://assets.panda.org/downloads/vcs_response_final_hv_19_nov_07.pdf.

purchase securities reflecting their individual appetite for risk.[174] And while this may be true, policy makers should question whether a prudent investor can truly evaluate the potential risk associated with carbon securitized and derivative instruments. As discussed in the following Section, the structured finance process adds so many layers of complexity to the process that determining the risks associated with the asset may be nearly impossible.[175]

D. Layers: Increasing Complexity & Risk/Value Determinations

Financial markets have spurred the innovation of exotic and complex structured finance products that allow investors to manage risk and capitalize on the smallest fluctuations in market price.[176] However, so complex and fine tuned are these products that by the time the assets are tranched and repackaged for investors the risks associated with the underlying asset are dangerously unclear. Policy makers should recognize that even when U.S. financial institutions and investors have the best intentions of due diligence, pricing the risk associated with, and determining the value of, a collateralized security is easily lost in the opaqueness of the structured finance framework.

The framework of structured finance rests upon the concept of layered risk.[177] Assets are collected, tranched based on their individual characteristics and sold to investors with varying appetites for risk.[178] However, the transformation process works in such a way that by the time an asset makes its way from the books of a mortgage lender to the portfolios of investors, the cash

174. *See generally* STANDARD & POOR'S, EVALUATING RISK APPETITE: A FUNDAMENTAL PROCESS OF ENTERPRISE RISK MANAGEMENT (2006), http://www2.standardandpoors.com/spf/pdf/media/Evaluating_Risk_Appetite.pdf (describing a general approach to risk management).

175. *See infra* Section III.D.

176. *See* Viral V. Acharya et al., *A Bird's-Eye View, The Financial Crisis of 2007–2009: Causes and Remedies*, 1, 3–4, http://media.rgemonitor.com/papers/0/prologue.pdf.

177. Fernando & Venugopal, *supra* note 173.

178. *Id.*

flow properties of a once whole asset have been separated and repackaged to create multiple securitized products.[179]

In the process, the assets themselves become obscured under multiple tiers of ownership,[180] and the risks associated with the assets become difficult to track.[181] "These problems [are] exacerbated by [increased] financial sophistication that adds [more] complex" layers[182] and ultimately makes it difficult for markets to determine the actual value of assets. The risk-management function is subverted[183] and markets may be unable to adequately determine the risk of an underlying asset in order to avoid overvaluing the collateralized security.

One of the most innovative (and economically destructive) financial instruments that evidenced the market's inability to value and appropriately price risk was the collateralized-debt obligation.[184] Collateralized-debt obligations stemmed from the rich vein of financial innovation. Comprised of collectively the lowest level tranches of pools of mortgage-backed securities, a collateralized-debt obligation is best characterized as a "pool of pools."[185]

The risk assessment of a pool of assets naturally yields assets that are at higher or lower risk than other assets within the same pool. As securities are collateralized by such assets, higher-rated securities—investment-grade securities with credit rating designations at BBB or above—are financially attractive and quickly purchased by investors.[186] Securities rated BB or

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179. *See* FITCH IBCA: THE INTERNATIONAL RATING AGENCY STRUCTURED FINANCE: UNDERSTANDING ASSET-BACKED COMMERCIAL PAPER 3 (1999) http://www.securitization.net/pdf/UnderstandingABCP.pdf (graphical description).

180. Fernando & Venugopal, *supra* note 173.

181. *Id.*

182. *Id.*

183. *Id.*

184. *See* Frank Partnoy & David A. Skeel, Jr., *The Promise and Perils of Credit Derivatives*, 75 U. CIN. L. REV. 1019, 1040–46 (2007) (explaining why the collateralized-debt obligation value is inconsistent with basic economic theory and subject to manipulation). Collateralized-debt obligation is one of the two main categories of credit derivatives, which are new and controversial instruments used in financial markets. *Id.* at 1020–21.

185. This American Life, *supra* note 81, at 11.

186. Jonathan Cheng et al., *Demystifying the Credit Crunch: A Primer and*

below are less palatable to investors and more illiquid.[187] The higher risk of default associated with this latter category of securities earns them the name "junk bonds"—so speculative and high risk in nature, that these non-investment grade securities are considered junk to investors.[188] Even still, a strong market existed for these non-investment grade securities when they were repackaged and sold to investors as collateralized-debt obligations.[189]

The appeal of collateralized-debt obligation hinged on its high credit rating, appearance of low risk, and solid return on investment.[190] Using the same financial risk assessment discussed above, the lowest level tranches of mortgage-backed securities pools were collected and reprioritized by risk.[191] Within this new collateralized-debt obligation pool of high-risk assets, securities that rose to the top as less risky than other assets within the same pool were granted AAA credit ratings.[192] Thus, through sheer financial alchemy, once high-risk, non-investment grade, illiquid securities were repackaged and reclassified as securities so financially sound that they mirrored the liquidity of cash.[193] With such a transformative process at Wall Street's fingertips, backed by the support of credit rating agencies (discussed further in the following Section),[194] investors purchased as many collateralized-debt obligations as

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Glossary, PRIVATE EQUITY COUNCIL, Nov. 2008, at 12.

187. *Id.*

188. *Id.* at 15.

189. *See id.* at 2–3.

190. *See* Bryan J. Orticelli, *Crisis Compounded By Constraint: How Regulatory Inadequacies Impaired the Fed's Bailout of Bear Stearns*, CONN. L. REV. 647, 654 (2009); Stéphane Rousseau, *Regulating Credit Rating Agencies After the Financial Crisis: The Long and Winding Road Toward Accountability*, CAPITAL MKTS. INST., July 23, 2009, at 6–7, *available at* http://ssrn.com/abstract-1456708.

191. *See* Rousseau, *supra* note 202, at 6–7 (explaining how tranches of securities are issued and ranked).

192. *See generally* Ingo Fender & John Kiff, *CDO Rating Methodology: Some Thoughts on Model Risk and Its Implications* (Bank for International Settlements, Working Paper No. 163, 2004), *available at* http://www.bis.org/publ/work163.pdf (explaining models for rating CDOs).

193. *See generally* Orticelli, *supra* note 202 (explaining how the restructuring of assets contributed to the financial crisis).

194. *See infra* Section III.E.

they could, and the collateralized-debt obligation seeped into domestic and global portfolios.[195]

The idea behind collateralized-debt obligations was laudable: combine lower-tranched securities (those that the most susceptible to risk) and use diversification to mitigate those risks.[196] But as the risks of collateralized-debt obligations became clear, collateralized-debt obligations quickly became the poster child of the financial fallout, as the most exotic, yet fundamentally flawed structured finance product.[197] It illustrates how financial sophistication adds complex layers to the process, so much so that each layer adds to the information gap between the underlying asset itself and the investor. Determining the risk of the security is thus lost in the opaqueness of the structured finance framework.

Policy makers should apply forward the lessons learned from collateralized-debt obligations. The complex structured finance techniques employed by Wall Street make it difficult to fully appreciate the risks of these collateralized assets. When information is unclear or muddied, the risks associated with an asset are dangerously lost. Without the appropriate regulatory and legislative responses, this will undoubtedly be the case with carbon assets.[198]

Fortunately, U.S. financial institutions can rely on the expertise of credit rating agencies to add independent, transparent, and credible analysis to financial instruments and markets. However, as the recent financial collapse has made clear, even these assurances can lead to market failures if they are not curtailed at the outset.[199]

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195. *See* Engel & McCoy, *supra* note 51, at 2071 (explaining that collateralized debt obligations were so popular that they were sold on a "to be announced" basis).

196. Green, *supra* note 2.

197. *See* Janet Tavakoli, *Congress Exposes Potential Profiteering in AIG's Deals: Delay Enabled Further Cover-Up*, HUFFINGTON POST, Jan. 28, 2010, http://www.huffingtonpost.com/janet-tavakoli/congress-exposes-potentia_b_440361.html (calling the CDO the "poster child" for Wall Street's contribution to the financial crisis).

198. Fernando & Venugopal, *supra* note 173.

199. Green, *supra* note 2.

E. Credit Rating Agencies

The recent collapse of U.S. financial markets has left policy makers to question which market failures led to the sudden downturn in economic prosperity and what lessons can be learned from its dramatic implosion.[200] As discussed throughout this Article, no single failure is wholly at fault for the recent financial collapse. Rather, failures and miscalculations on an aggregate level outweighed the economic harmony of the market, thus causing its eventual topple.

One contributing failure involves the role credit rating agencies play within U.S. financial markets. Policy makers concerned about an appropriate legislative and regulatory response are well served by understanding the value added by, and necessity of, credit rating agencies within an efficient and transparent financial system.

The three largest and most widely utilized U.S. credit rating agencies include Fitch Ratings, Moody's Investor Service, and Standard & Poor's.[201] Each credit rating agency adds independent, transparent, and credible analysis to financial instruments and markets.[202]

The value added by credit rating agencies within U.S. financial markets cannot be underestimated. United States financial institutions and investors benefit greatly from the industry and market expertise provided by credit rating agencies. Transparency of investment and credit risks are provided at a level that could not otherwise be achieved. Each adds predictability and liquidity to the markets—key elements of any efficient and balanced financial system. So highly valued are these services that the analysis of credit rating agencies is often an integral and necessary element of securities offerings.[203] Moreover, time and cost savings achieved through

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200. *See* Brescia, *supra* note 15, at 282–92. *See generally Hearing on Protecting Homeowners*, *supra* note 54.

201. David Segal, *Debt Raters Avoid Overhaul After Crisis*, N.Y. TIMES, Dec. 7, 2009, http://www.nytimes.com/2009/12/08/business/08ratings.html?_r=2&hp.

202. FitchRatings, http://reports.fitchratings.com (last visited Feb. 6, 2010); Moody's Investor Service, http://www.moodys.com (last visited Feb. 6, 2010); Standard & Poor's, http://www.standardandpoors.com (last visited Feb. 6, 2010).

203. *See Do the Credit Rating Agencies Deserve to Exist?*, INT'L ECON., Fall 2008,

the use of credit rating agencies enable financial institutions to remain profitable.[204]

The role credit rating agencies play within U.S. financial markets places them in a powerful and authoritative position. They are not only sought after, but also heavily relied on.[205] Precisely a function of what makes credit rating agencies an attractive element of a financial system is also what can cause the susceptibility of U.S. financial institutions and investors to set aside their own individual investor due diligence and instead rely on the seemingly infallible informational authority and analysis provided by credit rating agencies.

As discussed earlier in this Article, before the advent of securitization and structured finance techniques, U.S. mortgage lending institutions protected themselves against the default risk of a mortgage borrower through their own due diligence efforts.[206] An institution's proprietary lending standards served as a protective barrier to its overexposure to default risk.[207] At that time, the few mortgage-backed securities and derivatives instruments collateralized by such mortgage loans were thus stable and produced predictable returns to investors.[208] But as capital markets began to take shape and derivative instruments became increasingly sophisticated during the 1990s, lending institutions became less concerned with their own due diligence efforts.[209] The innovative structured finance techniques engineered by U.S. financial institutions enabled default risk to be offloaded into the financial markets.[210]

As U.S. financial institutions developed securitized and derivative instruments, each undertook its own due diligence

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at 13, *available at* http://international-economy.com/TIE_F08_CreditRatingSymp.pdf.

204. *See id.*

205. JAMES HAMILTON, WOLTERS KLUWER L. & BUS., SEC CREDIT RATING PERFORMS DIFFERENTIATE ASSET-BACKED SECURITIES PRODUCTS 1 (2009), http://business.cch.com/securitiesLaw/news/nrsro.pdf.

206. *See generally* Engel & McCoy, *supra* note 51 (discussing the role of traditional, limited due diligence).

207. *See id.*

208. *See id.*

209. *See id.*

210. *See id.*

efforts to add transparency to the pools of assets collateralizing these instruments.[211] But as the demand for, and the complexity of, these instruments grew, investors questioned the ability of U.S. financial institutions to adequately protect investors.[212] Credit rating agencies were increasingly relied on to provide the independent, transparent, and credible analysis demanded by investors.[213] The end result, however, was a dangerous departure from individual investor due diligence, and an over reliance on the seemingly infallible informational authority and analysis provided by credit rating agencies.

What the markets experienced in the first half of this decade was not a reliance on the analysis of credit rating agencies to buttress the individual investor due diligence of U.S. financial institutions and investors, rather they experienced a substitution of this analysis for that of the credit rating agencies.[214] Yet neither U.S. financial institutions and investors, nor credit rating agencies, can bear the entire burden of the collapse experienced by U.S. financial markets. The volume and complexity of securitized and derivative instruments, and the cost benefits added by credit rating agencies, fueled the disproportionate level of reliance on the analysis of credit rating agencies. The recent financial collapse—and the now seemingly obvious market failures—provide policy makers with evidence of the powerful and authoritative position credit rating agencies play within U.S. financial markets.[215]

Most ironic is the infusion of collateralized-debt obligations into U.S. financial markets. Collateralized-debt obligations represented complex combinations of the lowest tranches of

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211. *See* SENIOR SUPERVISORY GROUP, OBSERVATIONS ON RISK MANAGEMENT PRACTICES DURING THE RECENT MARKET TURBULENCE 19 (2008), http://www.newyorkfed.org/newsevents/news/banking/2008/SSG_Risk_Mgt_doc_final.pdf .

212. HAMILTON, *supra* note 218, at 1.

213. *Id.*; *see also* Overview, http://www.fitchratings.com/jsp/creditdesk/Aboutfitch.faces?context=1&detail=1 (last visited Feb. 6, 2010).

214. Caitlin M. Mulligan, *From AAA to F: How the Credit Rating Agencies Failed America and What Can Be Done to Protect America*, 50 B.C. L. REV. 1275, 1289 (2009).

215. Press Release, U.S. Sec. & Exch. Comm'n, SEC Examinations Find Shortcomings in Credit Rating Agencies' Practices and Disclosure to Investors (July 8, 2008), http://www.sec.gov/news/press/2008/2008-135.htm.

pools of mortgage-backed securities.[216] As discussed above, through sheer financial alchemy, the risks associated with collateralized-debt obligations were under-priced. Nevertheless, collateralized-debt obligations achieved investment-grade ratings from credit rating agencies that were relied on to provide credible analysis of the risks associated with complex financial instruments.[217] Operating under the guise of predictable returns on investment and low risk, these grossly overrated securities permeated the marketplace.[218] When the investment and credit risks associated with collateralized-debt obligations became transparent, their value immediately collapsed,[219] causing national and global investment portfolios to collapse as well.[220]

Recent commentary suggests that the role of U.S. credit rating agencies in connection with the recent financial collapse reflects the classic case of the blind leading the blind.[221] These commentators question whether U.S. credit rating agencies ever held the capacity and resources to meaningfully evaluate the securitized and derivative instruments that permeated the U.S. financial markets during the first half of this decade.[222] Such discussions suggest the sheer volume of underlying assets and collateralized securities being generated, pooled, and repackaged by U.S. financial institutions must have necessarily diminished the ability of credit rating agencies to effectively provide credible analysis to investors.[223]

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216. *See supra* Section III.D.

217. *Id.*

218. *Id.*

219. *Id.*

220. *See generally* Ronald D. Utt, Heritage Foundation, *The Subprime Mortgage Market Collapse: A Primer on the Causes and Possible Solutions*, Apr. 22, 2008, http://www.heritage.org/research/economy/bg2127.cfm (detailing the history of the subprime mortgage collapse).

221. *See, e.g.*, Patrick Rucker, *U.S. Releases New Credit Rating Rules to Curb Power*, REUTERS, July 21, 2009, http://www.reuters.com/article/idUSTRE56K4JH20090721 (describing "blind-faith reliance" on credit rating); Eric Dash & Julie Creswell, *Citigroup Saw No Red Flags Even as it Made Bolder Bets*, N.Y. TIMES, Nov. 22, 2008, http://www.nytimes.com/2008/11/23/business/23citi.html (describing the "blind faith" put in credit-rating agencies).

222. *See* Offsets & Lessons, *supra* note 76, at 2.

223. CHEN, *supra* note 6, at 2.

As a function of such constraints, credit rating agencies likely relied on financial models that utilized irrelevant data to predict the success of mortgage-backed securities and derivatives markets.[224] As discussed above, these financial models utilized historical data that bore little application to the future success of the mortgage lending industry.[225] By the time the disconnect became apparent, U.S. financial markets had already begun to unravel.[226]

1. Carbon Rating Agencies: Their Role within an Emerging U.S. Carbon Market

As a U.S. carbon market begins to take shape, so too will credit rating agencies that will be designed to support investors of carbon securitized and derivative instruments.[227] These carbon rating agencies should function to bridge the informational gap between a U.S. carbon market and U.S. financial institutions and investors. At the outset, policy makers should recognize the value added by carbon rating agencies in a complex carbon-reduction regulatory environment and the role these agencies will play.

The generation and issue of carbon credits is rife with complexity and uncertainty—particularly those in connection with offset carbon credits.[228] Carbon rating agencies will function to provide credit ratings for carbon credits based on the

224. *See* Offsets & Lessons, *supra* note 76, at 2.

225. *See id.* Much analysis has also been directed toward the independence of credit rating agencies. Lam C. Wang, *Insights From the Subprime Fiasco*, HKTDC, Apr. 1, 2008, http://www.hktdc.com/info/mi/a/ef/en/1X0022HD/1/EconomicForum/Insights-From-The-Subprime-Fiasco.htm. Credit ratings agencies are compensated handsomely for their rating services, thus raising natural questions regarding conflict of interests. Schwarcz, *supra* note 39, at 400–01. Under such a scheme, how does an "independent" credit rating agency remain independent? The great debate over the impartiality of credit rating agencies is beyond the scope of this Article, but suffice it to say that the debate will continue to question whether credit rating agencies were corrupted and whether credit ratings were compromised as a result of competitive pressures to incrementally reduce rating standards to curry favor with Wall Street institutions. *Id.* at 403–04; Rachelle Younglai, *U.S. SEC Mulls Further Credit Rating Reforms*, Apr. 15, 2009, http://www.reuters.com/article/idUKN1551466420090415.

226. *See* Drew, *supra* note 10.

227. *See* CHEN, *supra* note 6, at 6.

228. Offsets & Lessons, *supra* note 76, at 1–2.

likelihood of an emission-reduction project to deliver its promised carbon credits.[229] As with mortgage-backed securities, the complexity of the asset itself—emission-reduction projects and offset credits—will necessarily require the analysis of industry experts to achieve transparency of investment and credit risks. With both cost and time considerations in mind, U.S. financial institutions and investors will turn to carbon rating agencies to demand levels of analysis that could not otherwise be individually achieved.

Carbon rating agencies have begun to take shape within an emerging U.S. carbon market. For instance, CIS Carbon Ratings and The Carbon Rating Agency have each endeavored to bring independent, transparent, and credible analysis to U.S. financial institutions and investors.[230] CIS Carbon Ratings offers a package of services: carbon credit ratings; due diligence services in the assessment of greenhouse gas emission-reduction projects; and carbon credit pricing "to include Mark-to-Market pricing of carbon credits."[231] Similarly, the Carbon Rating Agency offers services to add transparency and better risk management to support U.S. financial institutions and investors.[232] It has also teamed with Bloomberg to provide subscribers of Bloomberg Professional market data service access to its ratings.[233] This reflects the Carbon Rating Agency's strategy to vertically

229. The Carbon Rating Agency, *Welcome*, http://www.carbonratingsagency.com (last visited Feb. 6, 2010).

230. *See* CIS Carbon Ratings, *Carbon Credit Ratings: Conceptual Background*, http://www.ciscarbonratings.com/ConceptualBackground.html (last visited Feb. 6, 2010); The Carbon Rating Agency, *supra* note 242.

231. CIS Carbon Ratings, *supra* note 243. If the mere mention of "mark-to-market" causes you to reach for your heartburn medication, you are not alone. The use of mark-to-market accounting treatment was a contributing factor of the demise, and ultimate collapse, of Enron in 2001. HAROLD BIERMAN, ACCOUNTING/FINANCE LESSONS OF ENRON 11 (2008), *available at* http://www.worldscibooks.com/etextbook/6706/6706_chap01.pdf.

232. The Carbon Rating Agency, *supra* note 242.

233. *Bloomberg Now Features Carbon Reduction Project Ratings: Carbon Rating Agency and Bloomberg to Provide Ratings for Rapidly Growing Market*, IDEACARBON, Jan. 20, 2009, http://www.ideacarbon.com/media/index.htm/Bloomberg%20now%20features%20carbon%20reduction%20project%20ratings.

integrate its carbon rating analysis into U.S. financial markets.[234]

Policy makers looking to avoid a repeat of history should fashion an appropriate legislative and regulatory response that gives careful consideration to how apt carbon rating agencies are to ascertaining the complex and uncertain risks associated with trading securitized and derivative instruments backed by offset credits. Relevant considerations include: whether carbon rating agencies can adequately weigh the full range of largely unknown risks associated with the introduction and volatility of offset credits;[235] whether sufficient amounts of historical data exist to compensate for the uncertainty and complexity of a U.S. carbon market; and once carbon ratings have been issued, whether sufficient transparency exists to enable U.S. financial institutions and investors to comprehend the investment risks associated with carbon securitized and derivative instruments.[236]

Credit rating agencies held a powerful and authoritative position in connection with mortgage-backed securities. In a U.S. carbon market, carbon rating agencies will hold a similar position. Unless the informational gap between a U.S. carbon market and U.S. financial institutions and investors is shortened, the anticipated value of a U.S. carbon market, and the volume of carbon credits expected to be traded and exchanged, will give rise to the real possibility that individual investor due diligence will once again become secondary to the informational authority and analysis provided by rating agencies. Under such a scenario, if carbon securitized and derivative instruments become overvalued, uncertainty will

234. *See id.*

235. Fernando & Venugopal, *supra* note 173.

236. CHEN, *supra* note 6, at 13. With respect to conflict of interests, the broader implications on the effectiveness of a rating system itself have yet to be resolved. In what is expected to be the largest and most profitable commodity ever exchanged, how can assurance be given that carbon rating agencies will remain impartial and unbiased? Graciela Chichilnisky, *Who Needs a Carbon Market?*, Jan. 13, 2010, http://www.environmentalleader.com/2010/01/13/who-needs-a-carbon-market.
Commentators have pointed out that such conflict of interests are of paramount concern, and without further action, will compromise the integrity of a U.S. carbon market from both a financial and environmental perspective. CHEN, *supra* note 6, at 6.

exist as to whether U.S. financial institutions and investors will be able to make a clear break from authority when the destructive effects of such instruments become patently clear.[237]

Individual investor due diligence is the fundamental principal of experienced investing.[238] To better enable U.S. financial institutions and investors to ascertain the investment and credit risks associated with carbon securitized and derivative instruments, policy makers should consider legislative and regulatory responses that add transparency to the due diligence process. But simple transparency and oversight are not enough.

As with mortgage-backed securities, the risks of offset credits are easily lost among the layers of ownership involved with securitized and derivative instruments that exist within capital markets.[239] Legislative and regulatory responses that specifically allow these complexities to be understood and traced by U.S. institutions and investors, and that dissuade emission-reduction project developers from offloading excessive risk into the marketplace, will establish greater confidence in a U.S. carbon market and temper the traditional role rating agencies play within U.S. financial markets.

F. Insurance Companies

As with credit rating agencies, the role of insurance companies in the recent financial collapse cannot be ignored.[240] Perhaps the most visible and controversial insurance company to fall as a result of the financial collapse is American International Group ("*AIG*").[241] Lessons learned from its failure strike similar parallels when looking toward the emergence of carbon insurance.

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237. CHEN, *supra* note 6, at 6.

238. *See id.*

239. *See generally Lessons Learned from the Financial Crisis: Designing Carbon Markets for Environmental Effectiveness and Financial Stability: Hearing Before the H. Comm. on Ways & Means*, 111th Cong. (2009) (statement of Michelle Chan, Director, Friends of Earth), http://waysandmeans.house.gov/media/pdf/111/chan.pdf.

240. *See* CHEN, *supra* note 6, at 6.

241. *See id.*

AIG provided mortgage lending institutions insurance against the purchase and sale of mortgage-backed securities.[242] AIG surmised—as did credit rating agencies, U.S. financial institutions, and investors—that home prices would continue to rise and that providing insurance to companies dealing with mortgage-backed securities would nevertheless remain profitable in the event AIG was called on to bail out a mortgage lending institution whose mortgage-backed securities failed to perform as expected.[243] What was not anticipated by AIG was that the bottom would fall out of the lending market entirely, and that AIG would be called on to bail out troubled companies beyond its own means. Most importantly, AIG did not anticipate that it would ultimately need to be bailed out, too.[244]

What we learn from AIG is that a lack of understanding regarding the risks associated with asset-backed securities and derivative instruments can cause companies to make detrimental business decisions. Such decisions can expose insurance companies to unanticipated amounts of risk, such that the insurance company cannot help keep afloat its insured customers, much less itself.[245] However, it seems these lessons have not been applied forward to an emerging U.S. carbon market. With respect to carbon trading and those companies seeking to engage in the trade, we see the same companies that once provided insurance against mortgage-backed securities gearing up to provide insurance to protect companies against carbon default risks.[246]

Several insurance companies have developed products specifically designed to cover carbon derivatives and carbon

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242. Posting of Shah Gilani to The Credit Crisis and the Real Story Behind the Collapse of AIG, http://www.moneymorning.com/2008/09/22/credit-default-swaps-2 (Sept. 22, 2008, 12:51 CST).

243. *See* CHEN, *supra* note 6, at 4, 6.

244. *See* Gretchen Morgenson, *Behind Insurer's Risk, Blind Eye to Web of Risk*, N.Y. TIMES, Sept. 28, 2008, http://www.nytimes.com/2008/09/28/business/28melt.html?_r=1&pagewanted=print.

245. *See id.*

246. *See, e.g.*, *Alliant Insurance Develops Risk Program for Carbon Credit Projects*, BNET, Apr. 9, 2008, http://findarticles.com/p/articles/mi_m5CNK/is_2008_April_9/ai_n25148415 [hereinafter *Alliant Insurance*].

credit projects.[247] These insurers seek to insure companies against the following anticipated risks within a carbon marketplace: political risk, counterparty default risk, economic threats, political violence, civil unrest, terrorism or war, uncertainty of emerging markets, credit risks, currency risks, actions or inaction by a government that could prevent the completion of an emission-reduction project, failure of the project to deliver the promised number of carbon offset credits, breach of contract by the emission-reduction project or host government, foreign exchange restrictions, and actions that prevent or delay construction or operation of the project.[248] Yet with no historical data in which to judge the potency of risk within a carbon market, insurance companies are unable accurately project levels of risk that they are comfortably able to insure against, so as not to endure a similar ending akin to AIG.

As with the mortgage lending industry, policy makers must question whether insurance companies recognize the true unknown risks associated with a carbon market. While insurance companies look to capitalize on the emergence of the carbon market by developing specialized insurance coverage to meet its unique needs, policy makers must act to devise an appropriate legislative and regulatory response to prevent insurance companies from potential collapse.

IV. CONCLUSION

The establishment of the Kyoto Protocol, the EU ETS, the advent of carbon markets, and the international push to curb greenhouse gas emissions have each contributed to the commoditization of greenhouse gases.[249] With such commoditization will come lucrative opportunities for traders, brokers, U.S. financial institutions, and investors seeking to hedge their portfolios against the risks of a carbon-constrained economy.

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247. *See id.*

248. *See* LOUIS BERGER GROUP, INC., U.S. AGENCY FOR INTERNATIONAL DEVELOPMENT/INDIA MISSION, GREENHOUSE GAS POLLUTION PREVENTION PROJECT—CLIMATE CHANGE SUPPLEMENT 42–44, http://pdf.usaid.gov/pdf_docs/PNACY742.pdf.

249. *See* Zurich North America Surety, *supra* note 264, at 1.

The financial sophistication and complexity of securitization techniques and derivative instruments used before and during the recent financial collapse raised concerns largely ignored, and profits largely unquestioned. Lost among the complexities of structured finance were the inherent risks associated with mortgage-backed securities that prevented such securities from being appropriately priced, and risks from being appropriately understood. The complexity of a carbon market should raise similar concerns.

Policy makers should recognize that the high profit potential of a U.S. carbon market may create the misconception that carbon securitized and derivative instruments (as with mortgage-backed securities) are innovative ways to deliver both profitability and strong returns on investment to Wall Street free of the true underlying risks associated with carbon credits. As evidenced by the recent financial collapse such a financial fantasy cannot exist, and without adequate oversight can lead to the collapse of U.S. and international markets.

Securitized and derivative instruments do not defy the laws of financial gravity. By addressing the development of a U.S. carbon market though the lens of the recent financial collapse, policy makers can understand market failures associated with securitized and derivative instruments related to mortgage-backed securities and apply them forward to the developing carbon market. Only then will policy makers be equipped to temper market forces and fashion an appropriate legislative and regulatory response to avoid a repeat of history in an emerging U.S. carbon market.