Risk Transformation in Financial Organizations
A Functional Comparison of Third-Party Observations of Creditworthiness Using Credit Rating Grades and CDS Prices

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Abstract

This study advances a sociological framework on comparisons of both credit ratings and CDS prices as instruments to assess creditworthiness in financial markets. Drawing on Niklas Luhmann’s concepts of risk and decision-making in organizations, I argue that the limiting value of rating grades and the level of CDS prices – as company-driven and market-driven indicators of creditworthiness – represent different forms of standardized third-party observations. Financial organizations absorb and translate such depersonalized observations into own decision premises. In form of conditional programs observations about rating grades and CDS prices deliver apparently reliable expectations. Transforming uncontrollable credit dangers into decidable credit risks (risk transformation) the alternative to either rely on credit ratings and/or CDS prices sociologically represents a way of how to handle risky decisions about creditworthiness in financial organizations (risk management).

Keywords

risk transformation; financial organization; uncertainty absorption; creditworthiness observations; decisional premises; conditional programming
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The Working Paper Series „Analysis in Organizational Sociology“ is published by the Working Group „Organizations“ at the University of Bielefeld Faculty of Sociology. The Series is open for papers addressing at least two issues. First, we welcome papers that deal with risky and original questions of widely unexplored topics beyond the sociological mainstream. Secondly, the authors develop theses or apply methods that take on Niklas Luhmann’s contra-intuitive tradition of both describing and explaining organizational phenomena.
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<th>Abbreviation</th>
<th>Description</th>
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<tbody>
<tr>
<td>AIG</td>
<td>American International Group</td>
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<tr>
<td>BIS</td>
<td>Bank for International Settlement</td>
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<td>Bps</td>
<td>Basis Points</td>
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<td>CDS</td>
<td>Credit Default Swap</td>
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<td>CDIS</td>
<td>Credit default Index Swap</td>
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<td>CDO</td>
<td>Collateralized Debt Obligation</td>
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<td>CME</td>
<td>Chicago Mercantile Exchange</td>
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<td>CRA</td>
<td>Credit Rating Agency</td>
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<td>CR</td>
<td>Credit Rating</td>
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<td>EBS</td>
<td>Electronic Broker System</td>
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<td>e.g.</td>
<td>exempli gratia (for example)</td>
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<td>EKN</td>
<td>Embedded Knowledge Networks</td>
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<td>et al.</td>
<td>et alia (and others)</td>
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<td>Fitch</td>
<td>Fitch Ratings</td>
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<td>FSB</td>
<td>Financial Stability Board</td>
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<td>i.e.</td>
<td>id est (that is)</td>
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<td>ICE</td>
<td>Intercontinental Exchange Corporation</td>
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<td>IMF</td>
<td>International Monetary Fund</td>
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<td>IOSCO</td>
<td>International Organization of Security Commissions</td>
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<td>ISDA</td>
<td>International Swap and Derivatives Association</td>
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<tr>
<td>Moody's</td>
<td>Moody’s Investor Services</td>
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<tr>
<td>NRSRO</td>
<td>Nationally Recognized Statistical Rating Organization</td>
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<tr>
<td>OTC</td>
<td>Over the Counter</td>
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<tr>
<td>SEC</td>
<td>Securities and Exchange Commission</td>
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<tr>
<td>S&amp;P</td>
<td>Standard and Poor’s’ Rating Services</td>
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<tr>
<td>$</td>
<td>U.S. Dollar</td>
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<td>U.S.</td>
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1. Introduction: Problem of Reference and Purpose of Research

For more than 100 years credit ratings have served as a unique source to assess creditworthiness of securities issuers. Throughout the financial crisis 2007-2009, credit rating agencies (CRAs), namely Moody’s Investor Services (Moody’s), Standard and Poor’s Rating Services (S&P) or Fitch Ratings (Fitch), have been called into question for not having accurately adjusted their creditworthiness certifications and predicted credit defaults. One of the most prominent examples has been the bankruptcy of the world’s largest insurance company American International Group (AIG).

At the beginning of 2008, the market capitalization of both of AIG’s competitors in a sum did not total the value of AIG itself. On September 12, S&P rated AIG with “AA-” denoting the fourth best rating on their scale. On Monday following the insurer only had been saved from bankruptcy by a multi-billion dollar credit facility from the U.S. Federal Reserve Bank. Meanwhile, S&P only readjusted the rating by a downgrade of three notches to “A-” still referring to an upper medium grade (Ruhkamp 2008; Swedberg 2010). Just a few years earlier, in the wake of prominent accounting fraud scandals such as Enron, Tyco International or WorldCom CRAs had already faced severe criticism for delayed rating adjustments. And still, the downgrades of Eurozone member states and its sovereign bonds are regularly revitalizing the debate on the role of CRAs in financial markets.

In light of these claims, economists have drawn attention to alternative indications of creditworthiness. In very recent years, credit default swaps (CDS) – a type of derivatives developed in the 1990s that allow hedging against credit default, and whose premium (spread) reflects the cost of protection against losses on debt and debt-like instruments – have been used as a surrogate creditworthiness mark. In opposition to the irregular evaluation periods of credit ratings CDS prices rest on real-time pricings.

This account focuses on both rating grades and CDS prices for three main reasons. Firstly, I draw a comparison as I consider comparing a fundamental economic practice of market participants for observing not only their environments but also themselves.

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1 The text is a revision of my master’s thesis submitted at the University of Bielefeld Faculty of Sociology in May 2010. I am grateful to Dr. Andrea Mennicken (LSE) for providing instructive suggestions and annotations of a previous version of this account. Acknowledgements are also extended to Markit Group Limited for delivering CDS price data on Greek bonds, and Fitch Ratings for providing material on both their sovereign and global financial institutions ratings criteria and methodology as well as on their rating process. An earlier version of this study benefited from conference talks at the 27th Colloquium of the European Group of Organizational Studies (EGOS) in Gothenburg (Sweden), July 6-9, 2011, and the 4th Annual Seminar of the Bielefeld Graduate School in History and Sociology (BGHS) in Bielefeld (Germany), February 8-10, 2012. I am indebted to the Heinrich-Böll Foundation for a graduate scholarship. The master’s thesis would not have been written without this support. Responsibility for errors remains mine.

2 With the shift in banking from the traditional role of taking in deposits to the financial practice of pooling various types of contractual debt known as disintermediation and securitization (Davis 2009: 37-38), in this account I use the term securities issuer (instead of borrower) mainly referring to organizations such as corporations, entities, and state and local governments.

3 A report of the U.S. Senate permanent subcommittee on investigations issued in April 2011 states that more than 90% of the highest ratings given to mortgage-backed securities (MBS) in 2006 and 2007 were later downgraded to junk status, defaulted or withdrawn (Wyatt 2011).

4 CDS spreads are the annual price of protection of the contract’s nominal value. They are not the same type of concept as credit spreads applied to debt instruments, such as corporate bond to a government bond (Nomura 2004: 3; Partnoy 1999: 704-709). In general, the terms CDS spread, price, or risk premium are used interchangeably. In what follows, I refer to “CDS price” in order to avoid misleading equations between CDS contracts and bonds, or CDS contracts and insurance policies.

5 Note that although ratings and CDS contracts can have both issuers and issuances as its (underlying) reference I presume that in any case the creditworthiness of a particular security is ultimately related and coupled to the respective issuer (Fitch 2011: 1, 3; 2012).
Secondly, I select these forms of market observing devices – which I will refer to as third-party observations – because comparisons of ratings and CDS prices are interorganizationally gathered and publicly available by way of online financial pricing services such as Bloomberg, Markit or CMA that in particular compile data on the OTC markets. These sources generally report intraday and end-of-the-day price verification for different CDS instruments based on aggregated reported CDS quotes – albeit according to different modes – and circulate these directly to its clients’. CDS prices are thereby provided almost real-time for a large number of issuers, audiences and for different maturities.

Thirdly, CDS prices are observable and comparable without owning the CDS instruments or the underlying assets. The same is true for CRAs that disclose the majority of their ratings for entities, corporations and governments regardless of whether the person or organization has issued a rating or any other securities. For instance, credit spreads have to be calculated separately depending on the individual investment and are thus neither reported directly nor regularly available. In contrast, several financial organizations post information such as tables juxtaposing credit ratings and CDS prices onto their websites with open access for clients and non-clients. Although there are other parameters for judging creditworthiness, as a matter of fact, these two are quite predominant.

Research on banking and finance has provided comparisons of ratings and CDS prices largely based on the principal-agent theory and quantitative data analyses (e.g. Hull, Predescu & White 2004; Kenneth & Jensen 2005; Pu & Zhao 2009). In contrast, political scientists have focused on power and regulation issues seeking to control antagonistic conflicts of vested interests, the quality of rating or financial speculation (White 2001; Gras 2003; Hill 2004; Sinclair 2000, 2005, Gonzalez, Sotelino & Savoia 2011). However, among sociologists there are only a few studies that relate to different aspects of rating agencies such as trust. For instance, Strulik (2004: 105-109; 2007: 307) conceptualizes CRAs as confidence mediators. On the one hand CRAs rely on their clients (as any organization). On the other hand, ratings thus provide a form of self-reinsurance to financial organizations that enables them to make decisions, in particular about conjoining payments (2007a: 294ff.; 2008: 6-10).

In addition, there have been intriguing attempts over the last decades to rethink markets by means of sociological concepts. In the 1980s, for example, the discussion on under- and oversocialized theories raised the question of how markets are affected by social relations leading to the development of the concept of institutions as mediators between individuals and society. Among the most influential were the work of Marc Granovetter on the problem of embeddedness (1985), Harrison White’s distinction between markets and interorganizational networks (1981, 2002) and Richard Swedberg’s studies on markets as social structures (1994). These accounts pioneered new economic sociology sharing the idea that both economic transactions are complex social actions, and hence embedded in socially constructed relations of uncertainty (Beckert 1996; Luhmann 2006: 34-38).

In the very last years, these works have encouraged specifically the study of financial market phenomena, in particular specific financial practices and devices. Arguably, most of contributions seek to connect sociology of knowledge with economic sociology. Prominent examples are the making of stock markets (Abolafia 1996), the social structure of liquidity (Carruthers & Stinchcombe 1999, 2001), the embeddedness of non-market information flows and lending costs between corporate borrowers and bankers (Uzzi 1999), the global microstructures in foreign exchange markets (Knorr Cetina/Brügger 2002; Knorr Cetina 2005; Knorr Cetina & Preda 2007), the creation of markets and the performativity of financial economics and practices (Aspers 2007; Garcia-Parpet 2007; MacKenzie 2004, 2006, 2011a/b, 2012), or the evolution of risk management and accounting standards (Power 1997, 2007; Holzer & Millo 2005).
Nevertheless, Bruce G. Carruthers and Jeong-Chul Kim characterize current sociological research on markets as a mosaic chiefly because it is more an assemblage of scholarly activity than a sustained, coherent, and unitary enterprise (2011: 253). Despite all these merits on financial markets, rating agencies and the fruitful accounts in the field of social studies on finance (SSF) (Vollmer, Mennicken & Preda 2009), there are only a few sociological works dealing with financial derivatives (Arnoldi 2004; MacKenzie & Millo 2003) in general, let alone certain types of derivatives in particular.

Probably the most prominent studies explore index-based derivatives (Millo 2007), interest rate swaps (Nollmann 1997), stock options (Millo & MacKenzie 2009), the future of futures (Esposito 2011), the legitimacy in CDS markets (Morgan 2010), the definitional and contractual ambiguities of credit derivatives (Huault & Rainelli-Le Montagner 2009), the limits of price materiality and knowledge-generation taking the example of collateralized debt obligations (CDO) on asset-backed-securities (ABS) (MacKenzie 2011a), or the ABX index covering CDS on mortgage-backed securities (MBS) (MacKenzie 2011b) or credit spreads of corporate bonds (Partnoy 1999: 702-709).

Only a small number of accounts in economic sociology focus exclusively on CDS (in particular only on very specific CDS contracts (Stulz 2010; MacKenzie 2011a/b). Outside economics no comparison of ratings and CDS prices has yet been carried out, though. Apart from generalized claims of performativity, only little efforts have been made to both specify and compare different logics of market devices. The organization of financial markets has not been addressed systematically either.

To be precise, this account does not study how substantial credit quality might be optimized. Despite the self-description of CRAs as providers of transparent, independent, and respected credit opinions (Moody’s 2012; S&P 2012) and the various trading functions of CDS including arbitrage, risk diversification or hedging, I will neither investigate whether CDS prices provide a more information-efficient indicator of creditworthiness than CRAs nor look at the quality of ratings or CDS prices – let alone judge whether CRAs or CDS are morally good or bad. What has been less widely explored by social scientists and economists alike is what particular role both credit ratings and CDS prices take in financial organizations. I thus start from a different point and reassess existing studies by referring to a constructivist sociological point of view.

Comparing the entity-based model of credit ratings with the market-driven model of CDS prices, the question arises of how volatile CDS prices have not only become important for profit-making but also as a common means of decision-making about creditworthiness in financial organizations?

As a start, it must be considered very improbable that the dominance of rating expertise dating back more than 100 years is now contested by CDS markets themselves. On the one hand credit assessments were the first form of standardized and organizationally provided credit judgments (Brunsson & Jacobsson 2000; White 2001, 2010) offering an alternative to informally embedded ties (Granovetter 1973, 1985) and private information flows based on personal trust (Zucker 1986; Luhmann 1988; Uzzi 1999). On the other hand – as the continuing debate on the path-dependency and the lock-in effect of the QWERTY-standard in typewriters and computer keyboards layout depicts – first-to-market standards even if they might be inferior compared with corresponding standards can persist due to the structural legacy they have built up (David 1986). Is the growth of alternative creditworthiness standards then a result of the claimed accuracy and reliability of credit ratings and CDS prices?
I argue it is not. In transferring and theoretically specifying the general finding of Yuval Millo and Donald MacKenzie (2009) related to risk management and financial derivatives markets, I hold that the remarkable reliance on credit ratings and CDS prices should be attributed primarily to their communicative and organizational usefulness, and less to the accuracy of the results they produced. This account suggests an unusual but insightful view on how to explicate the reliance on third party observations in financial organizations. In doing so, I raise the question of what problem is solved in financial organizations by adhering to rating grades and/or CDS prices?

For this purpose, I integrate Niklas Luhmann’s account on risk with his organizational sociology. In particular, I suggest comparing both rating grades and CDS prices as functionally equivalent options for making decisions about creditworthiness under the condition of an uncertain future.

My thesis in this study is that credit risks within financial organizations are managed and reproduced by the organizations’ specific reliance on rating grades and/or CDS prices, each of which assume the shape of conditional decision-making programs (Luhmann 1999: 98ff.; 1972: 227ff., 2006: 261). Both rating-centered and price-based indications of creditworthiness are forms of standardized observations delivered by third parties (Luhmann 1972: 66; Luhmann 1999: 98f.; Lindemann 2010: 494) namely CRAs and CDS markets. These observations provide apparently reliable creditworthiness expectations.

Financial organizations select and translate such external information into own internal conditions for organizationally correct decisions on creditworthiness that help transforming uncontrollable credit dangers into decidable credit risks (risk transformation). Nevertheless, this functional advantage of decision-based uncertainty absorption (risk management) is connected with the creation of new uncertain follow-up consequences (risk production). With other words, the organizationally structured reliance on rating grades and/or CDS prices cannot fully control the latent and simultaneous increase of uncertainty absorption and risk production generated as both resource and byproduct of decision-making within financial organizations.

In this account I pursue two objectives which I deem important: Methodologically, I attempt to make a contribution to a new field of functional comparison. Second and theoretically, I extend constructivist thinking to economic sociology. Understanding markets as a socially dynamic as well as stable orientation-point for decision-making (Luhmann 1997a: 52, 199, 266) in organizations, I seek to revisit discussions on the relationship between risk-taking and decision-making in organizations and markets.

Strictly speaking, I will suggest that the dynamic stability of CDS prices is reflected by the concomitant increase in uncertainty reduction and risk production dependent on the organizations’ specific programmatic reliance on rating grades and/or CDS prices. Both rating-centered and price-oriented adherences, in particular, represent competing third-party observations that are formally and informally used as triggers for the inception of previously conditionally programmed credit decisions. In this sense, the organizational decision to abide by rating grades and/or CDS prices for taking own decisions about the creditworthiness of securities issuers transforms uncontrollable credit dangers into decidable credit risks.

However, once financial organizations consider CDS prices as an alternative instrument to create apparently reliable creditworthiness expectations they have to learn how to cope with conflicting third-party evaluations. The question follows: What happens when a certain securities issuer (or his assets) is upgraded investment grade while the respective CDS price is rising at the same time, and vice versa? Due to the fact that no credit institute was open for a sociological inquiry this question is addressed analytically.
For this purpose, I will draw on empirical material provided by ratings agencies, financial organizations, and data services alike. I unfold my thesis in five sections. First, I sketch the main epistemological and methodological presumptions underpinning the functional comparison of rating grades and CDS prices (chapter 2). These include Luhmann’s concepts of risk, decision-making, third-party-observations, and his notion of functional analysis. In the third section, I will deal with the general characteristics of CRAs and the CDS market as well as the resultant forms of risk transformation (chapter 3).

Specifically, in the case of credit ratings, I apply Luhmann’s concept of the limiting value (1997a: 195) to describe the bilateral form of rating grades, namely the distinction of investment grade/speculative grade, as a conditional program (Luhmann 2006: 256) in financial organizations. Similarly, with respect to CDS contracts, I argue that it is the instability of the CDS price that is the distinction of higher/lower that serves as a complementary conditional program. I relate the concrete organizational decision to adhere to ratings grades and/or CDS prices, to Klaus Japp’s notion of asymmetric incongruence (1996).

This strict constructivist approach provides insights into how both types of conditionally programmed decision premises represent a form of risk management that is exposed to a concurrent increase of uncertainty absorption and risk production. I conclude that the introduction of credit ratings and CDS prices reflects an active engagement of the financial economy to transform external dangers into organizational, and thus decidable, risks (chapter 4). Finally, I summarize how the risky reliance on both ratings grades and/or CDS prices fulfills profitable, although unsettling, functions in financial organizations, and identify issues for further research (chapter 5).

By providing a comparison of both ratings and CDS prices that follows functional analysis and constructivist risk sociology, this account seeks to advance an analytic and more complex account than the existing (quasi-)ontological studies. The theoretical and methodological proceeding of this study stands out perspicuously against the said approaches in both financial economics and financial sociology.

2. Epistemological and Methodological Presumptions

2.1 Functional Method and Systems Theory

The assumed functional equivalence between both CRAs and CDS as indicators of creditworthiness has been defined as point of departure. In economics comparisons of the business-driven and the market-driven models are based on causal explanations, mainly by statistical methods, such as correlations or time series of CDS pricing developments and credit rating notches. In order to reassess the discussed equivalence between CRAs and CDS from a sociological perspective, the comparison is reformulated into a functional analysis according to Luhmann (1962: 617-644; 1964: 1-25; 2005c: 39-67; 2010: 19-48).

6 For instance, the econometric analysis of Pu & Zhao (2010) claims that the observable risk factors at the firm, industry, and market levels and the macroeconomic parameters cannot fully explain the correlation in CDS spread changes, leaving at least 30% of the correlation unaccounted for. According to the authors, this finding implies that contagion is not only statistically but also economically significant in causing correlation in credit risks.
For this purpose, the relation between probabilistic and possibilistic (Schützeichel 2003: 250-254) methods of functionalism is to be discussed in the following. In terms of the history of science within sociology in general and systems theory in particular there has been a methodological shift from causal functionalism to equivalence functionalism. Whereas Herbert Spencer worked in the positivist tradition of evolutionism conceptualizing society as a social organism evolved from simple to more complex forms, Emile Durkheim advanced that approach by applying causal and functional analysis of social facts complementarily.

In that specific combination of methods he contributed to an advancement of anti-evolutionist and structuralist concepts. Compared to Durkheim, Max Weber was a central figure in the establishment of methodological anti-positivism presenting sociology as a non-empirical field. Studying social action through resolutely subjective means, he believed in both historical and sociological causality (Schützeichel 2003: 239-245). In contrast, Georg Simmel’s (1992, 2008) quasi-ontological account on formal sociology was less interested in historical analysis rather than in abstracting from concrete content and focusing on the forms of social life. Simmel attempted to show that no matter how diverse the interests and purposes are that give rise to specific associations among individuals, the forms of these interactions may be identical: For instance, both war and profit-making involve cooperation. Inversely, identical purposes such as economic interests can be realised in competition as well as in planned cooperation.

A mayor theoretical modification of functional thinking took place as the biologist Ludwig von Bertalanffy (1956) formulated a first interdisciplinary approach to a general systems theory. He refused to refer the production of systems to specific, invariant causes but to a class of functional equivalents considered as different events and processes meeting comparable conditions. Acting on the suggestions of the Bertalanffy program, Talcott Parsons ([1937] 1968) applied the terms of social system and function in his book entitled Toward a General Theory of Action (1951). Though his work is described as structural functionalism marking a particular stage in the methodological development of social science, he refused that description. However, whereas Parsons followed a notion of system that presumes the existence of certain norms and values consist of functions to be fulfilled in order to maintain the system’s structure, Luhmann took as starting point the assumption that function is precedent to structure. This way, he was able problematize structures. Drawing on cybernetic and older systems theoretical research, his sociology provides the possibility of an incongruent description of the society. In order to clarify functionalism’s epistemological implications, Luhmann (1962; 1964; 1979; 2010) distinguished a) causal method from comparative method and then b) linked the use of the latter (functional) method with a sociological theory, rejecting the traditional notion of functionalism.

7 The terms possibilistic and probabilistic are also referred to risk management in banks devised by Baecker (2008: 121).
8 The notion of incongruency in Luhmann’s works relates to Burke’s (1954) method of perspective by incongruity. Luhmann refers Burke’s approach to his concept of internal social differentiation. The relation between function systems, organization and interaction are not causal. In contrast to harmonic understandings of acting that pursue an exclusive tie between means and ends, Luhmann conceptualizes an incongruent perspective of social systems. Depending on the observer, a social action can be inclusively located to different types of social systems. Thus, an action can have concomitant (dys-)functional impacts on other systems in accordance with its specific selective structure (Luhmann 2010: 27, 43-48; Göbel 2000: 29). The prominent example of incongruency between organizational subsystems is demonstrated in his book Zweckbegriff und Systemrationalität (1973) in which he replaces the old rationality continuum by the concept of uncertainty absorption.
Unlike infinite causal explanations of invariant present means and future ends, he regards functionalism as a method of comparing variant and different but functionally equivalent causes and effects. The function, in this sense, is not to be seen as a special case of causality.

Causality is rather considered as special application of functional relations. Instead of regarding system maintenance as stable and systems consisting of parts of a whole, he proposes that social systems do not depend on specific performances but are capable to operate with equivalent contributions that substitute others. According to Luhmann, stability is then considered as invariance between social systems and its relative boundaries. Given a changing environment, the stability of social systems is less understood as a fact rather than as a problem that needs to take different possibilities into account. Functional equivalence exists when relations between causes and effects have neither regular nor substitutable but equivalent functions for solving a specific problem of reference.

Social systems are able to compensate the lack of specific performances through altering its structure in order to operate under changed conditions. From this point of view, the term function does not define steady performances but deals with problem solving capacity of social systems. Problems as well as their solutions take on their meaning not from assumed invariable, essential property but from particular positions in a framework of alternative possibilities. For the purpose of comparing heterogeneous alternatives, the possible solutions need to be related to a previously identified and abstractly framed problem of reference; for which they may serve as functional equivalents. Each performance can have an equal function for different problems, taking also dysfunctional consequences into account. Thus, equivalence functionalism represents an analytical-heuristic device.

However, the functional analysis itself does not offer any criteria to identify problems of reference. In order to hinder falling into relativism in comparing equivalents, the method needs to be controlled by theoretical premises. For this purpose, Luhmann developed his sociological systems theory defining communication instead of single actions as the element of social systems, and expectations as its structures (Luhmann 1984: 191ff.).

Both functional method and systems theory follow a common guiding idea: The rejection of essentially given problems. Much rather, Luhmann conceptualises social systems as producing the relation between problems and solutions in the course of their operating. Whereas earlier variants of systems theory regarded problem references as external to a system, Luhmann emphasises that social systems produce both, their problems and the compatible functional solutions by means of their own structures. Since all operations of systems are internally generated, no evidence about the internal operations of social systems may be gained from an external point of observation. Even though social systems are held to depend on energetic and material resources of their environment, Luhmann refused to describe them as trivial machines that are determined by a tight coupling of inputs and outputs. He argues instead that problems of reference do not converge across social systems: a linear relation between system and environment would only offer one appropriate problem solution. Thus, linearity does not enable to establish possible functional equivalents and its selection, so that the system would not be able to set-up an invariant border to its environment.

Although systems theory bases upon communication as the constitutive element of social systems, and although actions are attributed to communication, this account mostly makes use of the term action: In order to accomplish a functional comparison of CRAs and CDS the decomposition of action into communication is not necessarily required. The resolution power of communication is subordinated to the reconstruction of financial practices in organizations. Yet, the established terms such as communication medium or communication code will be used as suggested within the framework of systems theory.
Inconsistent and conflicting demands or dysfunctional effects can only be solved by building up (sub-)systems. The invariance of boundaries between system and environment relies not on a linear coupling, but on internal selection among different, yet functionally equivalent solutions to a certain problem of reference.

Social systems reduce the possibilities for future operations in accordance with its specific mode of selectivity. Limiting future possibilities, then, enhances a system’s ability to reduce complexity – allowing it to build up internal complexity. Although complexity represents the general problem of social systems each type of system within the three-fold internal differentiation of social systems (namely interactions, organization, and society) establishes a specific mechanism of uncertainty absorption (March/Simon 1958: 141f.; Luhmann 2006: 185). In contrast to mere interactions or society as the encompassing social system, organizations do not solely rely on role-taking in order to transform uncertainty into systemic structures but also on certain decision premises regarded as another form of expectations (Luhmann 1984: 426-436).

It is important to recognize that any social action can be attributed to several systems, so that systems may be interconnected in very complex ways. The effects of system building do not pertain to the exclusiveness of functions but inversely its structural openness for alternative possibilities. The possibilities are thus functional from an abstract perspective. For instance, any social system can react to disappointing expectations either normatively by way of sanctions or cognitively via learning.

As a guiding principle, in both methodological and theoretical analysis, Luhmann replaced the ontological question of why or what by asking how is a problem solved. Epistemologically speaking, he substitutes exclusiveness of explanations and teleological predictions of single actions for the concepts of selectivity and multi-functionality of structures in social systems: Social actions are not explained by laws of probability but seen as improbable selections of possible functional equivalents. In this sense Luhmann displaces causality of individual actions by selectivity of conjoined operations.

In order to harness this specific variant of functionalism as an analytic-heuristic tool for the concrete comparison of CRAs and CDS, the question of its empirical applicability needs to be addressed. For this purpose, the three crucial steps of functional comparison are summed up:

a) Functional analysis begins with the identification and formulation of a problem of reference.

b) The problem of reference, then, serves as an anchor for taking possible solutions into consideration. Hence, the problem of reference is set as an invariant parameter in order to focus on a broad range of functional equivalents. The identified problem meets two conditions: First, it determines the function x of a social event, defining X as the problem of reference. Second, the function fixes the social event a as one possible solution of the problem X, equivalent to the alternative events b, c, d etc.

c) Since the selection of structures as mechanism of problem solving is always transitory, functional analysis not only has to take functional equivalents into account but also subsequent problems of the opted selections. Hence, the causes and effects can also be categorized into series of functional equivalent subgroups marking different levels of functional analysis (Luhmann 1964: 23; 2005b: 132).
Luhmann claims a negative correlation between problems of reference and functional equivalence: The more subsequently problems are included, the smaller the amount of functional equivalents. In terms of social theory this relationship reflects the fact that increasing complexity goes along with a decreasing number of possible functional equivalents. Thus, depending on the interest of research the functional analysis can expand or limit the amount of equivalents.

Correspondingly, the comparison can take two forms: functional equivalence and non-equivalence. Either \( a, b, c \) can be equal in their function to solve the problem \( X \), or, \( a, b, c \) can solve the same problem, but in a different manner which meaning they are not viewed as functionally equivalent (Luhmann 1964: 20; 1979: 4f.; Schützeichel 2003: 259-261). In terms of the comparison of CRAs and CDS, the improbability of taking decisions about uncertain creditworthiness in financial organisations is chosen as problem of reference; financial organisations are chosen as system reference. In light of this, this study assumes that CRAs and CDS have to be considered as functional equivalents.

### 2.2 Financial Markets and Constructivist Risk Sociology

What unifies accounts of (new) economic sociology as well as SSF is the argument that decisions in financial markets are not made in a social vacuum but produce and refer to mutual observations and expectations (MacKenzie 2004). Nevertheless, no matter how powerful the set of knowledge-generating arrangements (Carruthers & Stinchcombe 1999) in markets may be, – for instance, standardization, auction coordination and price dissemination – buyers and sellers never dispose of complete information, e.g. about clients’ or competitors’ products.

In contrast to models of efficient capital markets (Fama 1970; Marshall 1991), any decision in society and thus also credit decisions between securities issuers and buyers (or resellers) of securities face the problem of uncertainty (Akerloff 1970; Garcia-Parpet 2007). Beckert argues that the problem of uncertainty has the potential to connect social theory with economic sociology (1996: 805). However, works within behavioral economics, new institutional economics or economic sociology mostly refer to the social embeddedness framework (e.g. Swedberg 1994, 2010; Rona-Tas & Hiß 2010) providing only partial answers. The standard claim is that information asymmetries\(^\text{10}\) are resolvable once the social space distorting the correspondence of price and value – a perfect market so to speak – is reduced (2011).\(^\text{11}\)

\(^\text{10}\) In particular principal-agent theory explains CRAs with reference to asymmetric information between securities issuers and investors. Asymmetric information exists in markets where sellers have superior information to buyers about product quality, yet cannot costlessly convey this information to buyers (Partnoy 1999: 632).

\(^\text{11}\) Apart from empiric insights into calculative practices and conflicting interests in rating markets, Hiß & Rona-Tas (2011) theoretically fall behind the findings of neo-institutionalism and the embeddedness framework. First, the term social space is misleading. It presumes that there are markets without social space, or even markets outside the social space? Second, the reference to Granovetter’s approach remains unclear. Granovetter does not distinguish between embedded and disembedded markets, but between informal interactive structures and networks based on trust and power for one thing and Williamson’s formal hierarchies for another. Thirdly, by focusing on asymmetric information and conflict of interests, the authors neglect that inconsistent demands of different organizational subunits, or environments, are manageable by coupling and decoupling mechanisms (Meyer & Rowan 1977; Weick 1985). In particular, Nils Brunsson (1985, 1989) illuminated organizational patterns of incorporating different expectations for the sake of legitimacy.

Consequently, incomplete knowledge about market participants is not a problem resolved by providing transparent information or sending the right signals. Sociological systems theory does not refuse that information asymmetries are inherent in markets. It rather generalizes this finding to any form of social order or rather social communication. The true vested interests or the authentic motives underpinning it cannot be shirked (Luhmann 2000a: 103, 152). Instead, Luhmann speaks of double contingency: the fact that alter and ego make their action and decision communication reciprocally dependent on each others’ anticipated expectations as to how the other might respond. In this sense, no credit assessment – be it a personal judgment, rating category or market price – provides an observer-independent reality.

There is always an inevitable discrepancy between market observations (made by persons or financial organizations) and their environments they intend to capture. The main reason is that communicating and thinking take place under different conditions and in different systems that have no causal or deterministic access to each other (Luhmann 1984: 191-195). Thus, there can be no point to stand outside these systems and monitor it, but only another system equally emerging out of contingent conditions.

Luhmann’s notion of communication, does not concentrate on one side of economic communication such as the supply side of market transactions: Many accounts using the embeddedness framework tend to believe that communication has an inception starting from an unsocial or disembedded space and then being biased towards social structures and informal networks. On the one hand, however, such a viewpoint disregards that economy is part of society. On the other hand it pays scant attention to the finding that there are boundaries between economic organizations (Weick 1985: 163; Luhmann 1994: 43, 91; Baecker 2008a: 109-123). Hence, I follow Luhmann and replace the concept of information asymmetries by asymmetric relationships of systems and their environments. More important, environments are constituted by the system as such according to its structural conditions (Luhmann 2006: 30-38).

A third point is associated with Luhmann’s concept of risk. For understanding processes of risk transformation in financial organizations it is crucial to rethink managerial concepts of risk. Traditional studies speak of risk if a problem allows rational calculation of probability (McGoun 1995).

As opposed to an objective and causal notion of risk, I follow Luhmann (1990a, 1991, 2008) who views risk as a social problem associated with decision-making. Whereas risk is defined as the imputation of a recognized loss to internally produced decisions by a social system, the term danger describes the attribution of undesired consequences to external circumstances that are beyond one’s own decisional control. Correctly, neither risk nor danger is a substantially given fact.

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12 To take solely the perspective of investors (including CDS protection sellers) as reference for a functional analysis (Luhmann 1962, 1964) would imply bias effects since CDS and ratings face different liquidity problems: While ratings refer to relative long-term credit risks, CDS prices include risks involved in investing in, or buying protection on, a security.
Whether an event is seen as risk or as danger does not only depend on the observer but also on time. With other words: One event can be conceived of as a risk at one moment, and it can be seen as a danger another moment later, or even by those who suddenly are affected by external decisions. The (sociological) observer of a decision maker may thus assess the risk of the decision differently from the decision maker himself (Luhmann 2008: 68). Consequently even the decision not to decide bears risks. Insofar as credit relationships in financial markets are concerned, the general dilemma lies between two risky decisions: On the one hand granting credit implies the risk of losing money.

On the other hand not to grant credit runs the risk of not making higher profits. Thus, in contrast with the transfer of goods, the risk is not passed on along with the money (Luhmann 1991: 123-151; 2008: 175-186), it rather occurs where alternative perspectives are observed decisions. The concept of risk claims that the uncertainty of future outcomes is both an inevitable problem and the precondition to decide at all. Neither formal nor informal decision procedures are able to overcome uncertainty of decisions, but they help to take decisions under uncertain conditions by establishing apparent expectation security.

Another analytical purchase of Luhmann’s risk sociology lies thereby in his notion risk that transcends the boundaries of social systems. In modern societies there is no center of risk production (Luhmann 1993: 73-82). Risks do not relate solely to the health system, law, politics, economy, or to certain groups and organizations. Rather, the observation of risk depends on the observer. It is this growth of uncertainty absorption and risk production that takes different shapes depending on the personal or organizational systems and their environments involved. Luhmann denotes social systems, such as organizations, as different types of social order each producing its own relationship of problems and solutions.

Luhmann’s risk sociology (1990a, 1991, 1996, 1997a, 2005b, 2008) was broadened by the works of Klaus P. Japp (1992, 1996, 1997, 2000), Wolfgang Krohn (1993) and Georg Krücken (1997a, 1997b) who coined the term risk transformation for revealing the shift from ecological dangers to political risks. Regarding the political system, Luhmann described the nation state as a kind of lender of last resort capable to transform dangers into risks (2005b: 34-39; 2008: 152). Particularly, Krücken enhanced the thesis on risk transformation in his dissertation highlighting two aspects. Firstly, he assumed that in modern societies technological and ecological dangers tend to be transformed into risky decisions of political regulation, and these dangers are selected consistent with specific political criteria of perception and response. Secondly, the crucial task of politics is thus the handling of political risks associated with the process of collectively binding decision-making (Krücken 1997a: 73, 1997b: 118). As a result, the struggle for political power in democracies is highly exposed to the practice of surviving failures: Politicians seek to survive the failures of their political regulation, and vice versa (Luhmann 1996: 174). By following this notion of transboundary risks, I attempt to transfer the concept of risk transformation from politics to financial markets in order to ascertain how risk transformation in the case of credit ratings and CDS prices generates a specific relation between uncertainty absorption and risk production.

In the course of cultural evolution Luhmann identifies a proliferation of risk. Prior to the 17th century a perception of risk had not been developed; rather one trusted in divinatory practice. Whereas in pre-modern societies time was viewed as a cosmological unity in which every event was considered as circular, modern societies turned to a linear understanding of time resting upon the distinction between past and future. The notion of time – as the distinction between past and future – is crucial for the awareness and observation of risk. Since the future remains unknown and uncertain, the knowledge about events that are likely to occur is insufficient; so decisions are always risky.
Indeed, if the future were known, there would be nothing left to decide since the outcomes of decisions would be predictable. Future uncertainty implies that decisions are contingent, that is to say, they are neither drawn necessarily nor arbitrarily. In this sense, uncertainty is both a fundamental prerequisite and an unavoidable effect of decision-making (Luhmann 1991: 9-58, 2008: 1-72; Japp 1996: 21-28). Taking financial markets as a convenient example of risk transformation, two aspects play a crucial role for the scope and reconfiguration of risk-taking: a) the dissemination of novel technologies and b) the emergence of organizations (Luhmann 2005a: 141; Holzer & Millo 2005: 226).

a) Luhmann defines technology as a functioning simplification in the medium of causality (2008: 87) since it establishes strict couplings of means and results that become enriched to a higher complexity. If a specific technology is available to reduce, or can even prevent certain consequences, the fact of not making use of it can be described as a decision – no matter whether willingness or ability is present or not. In financial markets, the introduction of novel financial products emerged from the provision of new information technologies that made trading in derivatives markets and the computation of accurate pricing possible. Such complex computer calculations are closely related to the developments in theories of probability.

Both the emergence of new technologies and theoretical models enabled the dissemination of high frequency and coordinated trading strategies, e.g. program trading or arbitrage trading. These strategies consist of computer algorithms and promoted the establishment of sophisticated risk assessment methods, such as the prominent Value at Risk model for portfolio management or the Black-Scholes model for options pricing. Beside computer-based facilities for financial calculation and modeling, electronic digitalization promoted the launch of new infrastructures (email, online brokerage, intranet, and chat services) that transcend time and space (Arnoldi 2004; Millo 2007; Millo & MacKenzie 2009; Esposito 2011).

In general, derivatives as technological innovations reduce uncertainties in terms of pricing, purchase and execution by automatizing connections and thus transforming them into new decision situations. According to the performativity of economics (Aspers 2007; Mackenzie & Millo 2009; MacKenzie 2006) the innovation of new trading technologies and strategies as well as the entrance of institutional investors to derivative markets were accompanied by the development of theories that gave derivatives legitimacy and explained their complexities. For instance, MacKenzie and Millo documented in their account on constructing a Market (2003) that economics as an academic project was and still is actually part of economic processes. Nevertheless, it is worth noting that CDS differ from other types of derivatives in terms of technical specifications, delivery places and maturity dates, and trading procedures, which will be specified in the subsequent section.

b) As alluded to above, Luhmann’s sociology not only combines a general theory of social systems with a theory of society, it rather highlights organizations as systems which differentiate themselves from an environment (such as markets, groups, other organizations, or function systems) by reproducing formal decisions. The fundamental formal decision is to decide between members and non-members. From the decision to hire someone to the decision to fire the same person for not having fulfilled the conditions of membership, organizations reproduce themselves by decisions.

As a result, whatever happens in an organization – be it to conduct a new project, to hold jour fixe meetings, to effect transactions or to assess the creditworthiness of security issuers – can and must be interpreted as a decision attributable to its members in order to persist as a social system (Luhmann 2005c: 413).
An important virtue of systems theory is that it delivers a theory of society and therefore is furnished to address issues of the boundaries and resonances (2004b: 40-50) between organized systems and their social environments. To sum up, Luhmann's sociological notion of risk, organization and technology helps throwing decision-making on creditworthiness expectations into sharper relief: Risk transformation represents a mechanism to cope with uncertainty by producing apparently reliable expectations in general and recursive decision-making by financial organizations in particular. In order to substantiate the assumed functional equivalence of creditworthiness expectations provided by rating grades and CDS prices risk transformation was linked up with the development of novel technologies and the establishment of organizations viewed as the two main driving forces of risk proliferation. Whereas CRAs relate to the latter, CDS correspond to the creation of innovative financial products.

In the next section I disclose how the reliance on creditworthiness expectations based on third-party observations delivered by rating grades and CDS prices are converted into certain decisional programs that assist transforming the potential danger of credit default into risky decisions on creditworthiness made in financial organizations. Overall, taking the constructivist notion of risk into account, I subsequently show how risk transformation in each case generates a specific relation between uncertainty absorption and risk production.

2.3 Credit Ratings and CDS Prices as Standardized Third-Party Observations

As I have delineated above, the social processes behind the constitution of credit transactions are essential to understand social contingency in financial markets (Luhmann 1994). Accordingly, I hold that ratings and CDS prices help financial organizations to solve the problem of uncertainty in credit markets by delivering supposedly reliable expectations on the creditworthiness of securities issuers.

Again, it is thus neither the financial trans-(action) nor the motivation of a single payment (hedging, arbitrage or speculation) that serves as a sampling unit for the present functional analysis but decisions on creditworthiness made in financial organizations. This distinction is important in order to compare both rating grades and CDS prices as functional contributions to the same problem of reference: the uncertainty about a securities issuer's creditworthiness that is, as I argue, solved via the reliance on expectations based on third-party observations differently provided by credit ratings and CDS prices. I will elaborate on this specific type of observation in the following.

Implicitly following Georg Simmel's cross-market concept of competition (1992: 324-349) and explicitly referring to Harrison White's image of production markets (1981), Ezra Zuckerman denotes financial markets as mediated markets (1999: 1398-1438). In contrast to so-called fixed-role markets (Aspers 2007) – such as garment production where market participants are identified as either sellers or buyers – mediated markets are structured by role relationships of mutually monitoring buyers, sellers, and critics. Critics in this context additionally introduce third-party observations commonly rendered by research analysts, journalists or market participants themselves.¹³

¹³ In contrast, accounts using the social embeddedness framework focus on so-called embedded ties of informal, private or rather non-standard information flow. As Uzzi & Lancaster (2003: 383-399 2004: 321) state private knowledge is not verifiable by standardized third parties and idiosyncratic across exchange partners that it is typically shared with trusted others. Here, I consider ratings and CDS prices as third party that are rather arm's length, formally organized and standardized expectations of creditworthiness. So, I do not
Situations involving third parties are typical for a modern financial system, where organizations interact and not individuals (Zucker 1986; Shapiro 1987; Luhmann 1988). In this functional comparison, financial markets are thus not merely viewed as two-sided switch-role markets (Aspers 2007) where buyers and sellers can be the same person, company or entity (market makers) but as triadic structures. Correspondingly, I investigate financial markets from the perspective of securities critics (Zuckermann 1999) that observe and evaluate the creditworthiness of issuers and that take the role of third parties. To the extent that market participants are influenced by their observations of others, they build expectations on their own behavior and on the behavior of others both contributing to the emergence of different forms of social order within markets (MacKenzie 2004).

What is more, Luhmann’s systems theory offers to consistently distinguish different forms of observation. Contrary to so-called first-order observations that liken what is observed second-order observations allow a reflection on how competing market participants observe each other (1994: 101; 2008: 68; 1997: 846). The provision of reviews and indicators of creditworthiness by third parties can thus be referred to as second-order observations. Considering securities critics in general and creditworthiness assessments in particular, financial organizations represent a market-observing and indicator-watching audience that has not necessarily to buy or sell CDS contracts in order to perform this function. Briefly, to answer the research question it is not decisive whether ratings or CDS are bought (or equivalently sold again which is also known as netting), but how the issuer’s creditworthiness is perceived by standardized third-party comparisons.

Pursuant on this perspective, I examine credit ratings as an established and in addition politically granted third party, and CDS prices as a newly emerging market-based third party that meanwhile challenges the organizational dominance of CRAs. This approach to control risks by mutually observing and communicating expectations (instead of single actions) as forms of a generalized other (Mead 1974) reaches thus well beyond the analysis of personal interactions or (quasi-)ontological decision and price theories. In this vein, the comparison of two heterogeneous third parties lends itself to integrate the dualism between agency and structure in economic sociology. Against this background, it is worth noting that in contrast to (trans-)actions decisions reflect normative pressures – although both are types of social communication (Luhmann 1994: 272-279; 293). With other words, decisions are sensitive to expectations and are differently institutionalized in societal norms and organizational structures.

meanwhile look at members of CRAs and face-to-face interactions between corporate securities issuers, or at how bank-client relationships and networks affect CDS price setting. Yet, at the end of this paper I recommend to systematically conducting empirical research in this area and will list related follow-up questions.

Luhmann claims that non-personal third parties have to be distinguished from a present third (observer) in dyadic face-to-face interactions. The latter functions as a rather abstract reference that enables the institutionalization of social order (1972: 66, 172, 260; 1999: 98ff.; Lindemann 2010: 494), such as through societal norms.

In addition, following Carruthers & Stinchcombe (1999: 353) market makers are those who for a small margin to take the risk of transferring large quantities and maintain a continuous price.

Swedberg (2010: 70-84) argues that the confidence problem is not when banks are solvent and there exist rumors to the contrary (the proxy sign is negative and the economic situation is positive). Rather more it would come when some banks were not solvent, and this fact was not known (the proxy sign was positive and the economic situation was negative). Accepting Luhmann’s risk sociology, by contrast, my argument is that Swedberg’s distinction neglects the phenomenon of post-decision surprises (Harrison & March 1984) that can be viewed if one accepts that possibly losses are always hidden. Again, the creditworthiness of a certain securities issuer remains unknown no matter how negative or positive the information about the securities issuers are in present or future.
Today, decision-taking is a practice that specifically takes place in organizations and is influenced by formal and informal expectations inscribed in organizations as decisional premises. In modern societies organizations thus fulfill the general societal function of building up and stabilizing reliable normative expectations. Similar to legal systems organizations create their own positive law (Luhmann 1972: 227, 256, 271) that is nothing less than the formalization of organizationally relevant expectations and premises.

Finally, it is worth considering that the constructivist notion of decision, risk, organization, and expectation are consistently elaborated within a general social theory. The systems approach thus offers to systematically analyze how reliable expectations on the creditworthiness of securities issuers are built up, and how corresponding decisions are made in financial organizations. Presuming that the adherence on expectations based ratings and CDS prices can be described as functionally equivalent practices I identify banks and institutional investors (including hedge funds, pension funds, insurance companies, investment advisors, and mutual funds) as the relevant level of analysis and view these companies as organized social systems or rather as financial organizations. At first, what do we know about financial organizations?

Without being able to prove entirely whether this supposition complies with the instruments of sociological systems theory – as Dirk Baecker (2008b) developed in the case of banks – I build on the assumption that institutional investors, though being usually regarded as non-banks within economics, operate similarly to banks. Baecker holds that banks differ from commercial enterprises in the way they take risks as the source of their profits and as the basis of their business (2008b: 118). Extending this point, financial organizations aim to maintain and increase their own ability of funding by taking the risk to decide on other company’s ability to refinance with markets. For observing the creditability of securities issuers – as both market competitors and clients do – mechanisms to create and evaluate creditworthiness expectations are viewed as crucial in order to make profits not matter what kind of trade these profits are later ascribed.

3 Risk Transformation in Financial Markets

3.1 Risk Transformation via Credit Rating Grades

The concept of credit ratings traces back to the second half of the 19th century when in the U.S. Henry Varnum Poor began to regularly update his book on History of the Railroads and Canals of the United States of America, first published in 1860. At that time the railroad industry had been the most expansive and capital-intensive branch. To a large extent the business was financed by British investors who lacked local and up-dated reports about the soundness of the corporation’s creditworthiness to assign letter grades to railroad bonds.

Considering the needs for investment evaluation Moody’s, and a few years later Standard Statistics started publishing their first corporate rating followed by Poor’s editing in 1919. Many similar companies were founded, yet, after several consolidations, Moody’s and the merged S&P dominated the CRA industry. Only Fitch Ratings, founded in 1913, managed to establish itself as a smaller player in a duopolistic market, in which today Moody’s and S&P rate almost 90% of all traded bonds (Strulik 2004: 98; Sinclair 2005: 22-34; Partnoy 2006; Malcher 2008: 37).
According to their self-description Moody’s (2012) and S&P (2012) issue point-in-time opinions on the prospective creditworthiness of a particular company, entity, security, or obligation. Both agencies claim themselves to be among the most respected and widely utilized sources for credit ratings. For instance, Moody’s argue that their commitment and expertise contribute to stable, transparent and integrated financial markets, protecting the integrity of credit. Their ratings services cover more than 110 countries, 12,000 corporate issuers, 25,000 public finance issuers, and 106,000 structured finance obligations (Moody’s 2012). In addition, since 1957 S&P provides stock market indices, such as the S&P 500 widely held as the best single gauge of the U.S. equities market, including 500 leading companies in terms of market capitalization in the U.S. economy.

Likewise, S&P defines credit ratings as forward-looking opinions about credit risk, meaning the future about the ability and willingness of an issuer (such as a corporation, state or city government) to meet its financial obligations in full and on time, or the credit quality of a debt issue (such as a corporate note, a municipal bond, or a MBS) (S&P 2012). The rating shall indicate the relative creditworthiness of an issuer, a particular debt or debt-like security. It is believed that the higher the rating, the lower the probability of default. High ratings are thus associated with low volatility and high liquidity. However, the applied criteria and their weighting vary with the rated reference. Thereby, credit ratings combine qualitative (firm culture, internal organization and management know-how) and quantitative (sales, cash flow and debt-to-equity ratios) methods that are unique to each CRA, but are not disclosed (Everling 1991: 49; Gras 2003: 29; Wappenschmidt 2009: 3).

Following Carruthers (2010: 160) one consequence of the shift from originate-and-hold model to an originate-and-distribute model (Mizruchi 2010: 122-23) has been a decrease in the importance of a bank’s internal credit evaluation system (since they do not make as many loans, and do not keep them on their books) and an increase in the importance of the public ratings devised by the rating agencies.

In particular, several studies debunked such unintended consequences (Merton 1936) such as gaming the system (Rona-Tas & Hiß, 2010: 135) by self-enforcing strategic behavioral reactions in credit market. Gaming can be referred to as a form of reactivity (Espeland & Sauder 2007), counter-performativity (MacKenzie, 2006) and self-fulfilling prophecy (Merton 1948). This is a structural effect that has also been observed in research rankings (Frey & Osterloh 2011), law school rankings (Sauder & Lancaster 2009) and consumer credit ratings, the so-called FICO score (Poon, 2007, 2009; Rona-Tas & Hiß 2010). In generalizing these effects one might say that they contribute to substituting qualitative forms of observation and evaluation by quantitative and categorial symbols.

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17 Frank Partnoy (2006) assessed the CRAs’ free speech claims protected by the First Amendment. In several cases including the Enron litigation judges have dismissed CRA defendants on free speech grounds. Partnoy critiqued those claims, but found they are consistent with the agencies’ past success in obtaining exemptions from securities law requirements. Drawing on Brunsson’s heuristic concept of hypocrisy (1989) Partnoy’s finding can also be read as a prominent example of how certain organizations learn to achieve legitimacy by legally making sense (Weick 1985) of their existence in their political and economic environments.

18 Compared with sovereign ratings that are mostly disclosed publicly without any charges, ratings for structured assets are purchased by a small number of issuers and for high fees. A recent study (Cornaggia, Cornaggia & Hund 2011) found relative to traditional corporate bond ratings throughout a 30-year sample period (1980-2010) sovereign bonds were judged more harshly, whereas structured products had been assessed more generously. Marc Joffe concludes that the concerns about the issuer-paid model would therefore not apply to sovereign ratings. Since CRAs are regulated by public authorities they fear retaliation from their regulators rather than losing seizable revenues (2011).
Taken together, the diversification in types and quantities of securities represents a challenge to investors. Given the increased complexity and expansion in financial markets there was and still is soaring demand for standardized statistical information and assessment services. This demand was additionally stimulated by the bankruptcies of several corporations throughout the recession in the 1970s. The resulting exposures prompted issuers to seek out the services of agencies that would independently rate their entities in order to attract investors.

Meanwhile, this encouraged the CRAs to charge issuers for their services and to impose rating fees. Until then the rating industry was characterized by investor-paid revenue streams. Nevertheless, CRAs conduct only 10% of their ratings as public information, namely as unsolicited ratings (Strulik 2004: 101; Willke 2006: 87-90; White 2010: 214-216).

U.S. regulators first used credit ratings in the 1930s attempting to limit the hazardousness of assets held by regulated entities. The practice expanded significantly in the 1970s when the Securities and Exchange Commission (SEC) created Nationally-Recognized Statistical Ratings Organizations (NRSRO) aimed at the provision of credible rating certifications. Ever since money market funds had to invest in securities that received favourable ratings by at least one of the NRSROs. Similarly, insurance regulators require securities to be reported in statutory financial statements in one of six National Association of Insurance Commissioners (NAIC) designations categories that denote credit quality. The NAIC designations are primarily designed to assist regulators (as opposed to investors) to monitor the financial condition of their insurers (Partnoy 1999: 681-703; BIS 2009: 6; White 2010: 212-214).

There are ten firms currently registered as NRSROs. Several reform acts (Sarbanes-Oxley Act of 2002, Credit Rating Agency Reform Act of 2006) reflect the severe criticism passed on the SEC for not having qualified more NRSRO designations, for inadequate supervision, and for not establishing formal designation criteria. In particular, the financial crisis 2008-2009 led to widespread calls for changes in financial regulation. Numerous examinations mandated in the Dodd-Frank regulatory law passed in 2010 found that the agencies had issued inaccurate reports, failed to report or manage conflicts of interest, appeared to put generating revenue ahead of rigorous financial analysis, and had weak controls or inadequate policies for ownership of securities by employees (Malcher 2008: 37-40; Wappenschmidt 2009: 20; Wyatt 2011).

Whilst in the U.S. rating-centered regulation (Gonzalez, Sotelino & Savoia 2011; Opp, Opp & Harris 2013) was initiated and enforced by the SEC, in the E.U. designation of CRAs was created under the Capital Requirements Directive (CRD) that implemented Basel II by 2008. These rules were intended to match capital requirements with the risk associated with the different asset types held. Henceforth, the 100% risk-weighted asset (RWA) category for corporate exposures in Basel I gave place to a classification of RWAs ranging from 20% to 150% dependant on the external rating of the securities issuer or the nature and amount of the collateral to be post.

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19 Namely, A.M. Best, DBRS, Egan-Jones, Fitch, Japan Credit Rating Agency Ltd. (JCRA), Kroll Bond Ratings, Moody’s, R&I, Realpoint, and S&P’s.
Since 2009 CRAs need to receive the special status of External Credit Assessment Institutions (ECAIs)\(^{20}\) if they seek to provide external ratings for risk weighting of net capital reserve requirements under the Basel II Standardized Approach (SA). As large banks and financial services institutions were approved for the use of own internal rating-based models to estimate credit risk, the SA mainly meets the needs of the small and medium-sized entities lacking sophisticated risk methodologies (Gonzalez, Sotelino & Savoia 2011: 4-17).\(^{21}\) \(^{22}\)

Likewise, the European Central Bank (ECB) in the frame of its liquidity analysis accepts debt instruments issued or guaranteed by Eurozone governments only as collateral against ECB loans under the condition that these fulfill the minimum credit-rating of a triple-A rating, again, classified by the ECAIs. Yet in the wake of the current European sovereign debt crisis the ECB recently has lowered its collateral rules to help member state in distress (such as Greece and Ireland) and modified the minimum credit-rating thresholds, at the time of writing, from previously triple-A to single-A (ECB 2012; Vits 2011).

As it pertains to classification methodology, the rated creditworthiness is ranked on an ordinal scale (Table 1). Credit ratings are presented in a combination of letters (A through D), numbers (1 through 3), and modifiers (symbols of plus + and minus -) in order to demonstrate the relative standing by simple symbols. Nevertheless, each CRA has a slightly different rating convention. For instance, on Moody’s scale the best possible rating is Aaa indicating extraordinarily high financial stability. The lowest rating is C and displays significant solvency problems. Correspondingly, the scale assigned to S&P starts with AAA as the highest and D as the lowest rank.

\(^{20}\) In Germany there are currently seven CRAs recognized as eligible when determining the risk weights of counterparty risk positions for the Basel II Standardized Approach: Creditreform Rating AG, DBRS, Euler Hermes Rating, Fitch, JCRA, S&P, and Moody’s (Deutsche Bundesbank 2012a). Until 1991, ratings were less relevant since emissions had been obligated to obtain a permit so that investors believed emissions had met certain requirements. The abrogation of this obligation left a credibility gap later bridged by CRAs and research departments of large investment banks (Willke 2006: 90).

\(^{21}\) Basel I of 1988 did not allow using external ratings to ascertain capital reserve requirements. It neither took differences in risk management and loan recovery capabilities among financial organizations into account. RWAs were 100% for all loans, and for all types of credit exposure 8% capital charges had to be posted as collateral. In contrast, with the implementation of Basel II, external ratings have become as good as collateral allowing lower RWA and a reduction of capital charges (Gonzalez, Sotelino & Savoia 2011: 8).

\(^{22}\) Note that Basel II.5 finalized in 2009 aimed at mitigating regulatory arbitrage between trading book and banking book for securitization products requiring a significant increase in regulatory capital for the trading book (Gonzalez, Sotelino & Savoia 2011: 11-12; Opp, Opp & Harris 2013).
During their long-lasting existence, CRAs have regularly found ways to differentiate their business. Beside their core ratings on countries, branches, corporations and securities, CRAs additionally offer to gather research data, create analytics and publish commentaries for further assessments of creditworthiness. They also disclose different outlook information including CreditWatch that suggests a prospective direction of a short- or long-term rating revision. CreditWatch listings occur more often and cover shorter periods of time than rating announcements. Moreover, Moody's and S&Ps evaluate their performance regularly and compile historical default rate tables (Hill 2004; White 2001; Strulik 2004: 105f). In general, ratings are updated consequent to structural effects in order to give a fundamental analysis and to guarantee certain stability beyond cyclical effects (Deutsche Bundesbank 2004: 51-53; Wappenschmidt 2009: 3-21).

For analyzing how financial organizations translate external ratings as third-party judgments internally, it is important to understand how they sensitize themselves for changes in their environments. Then, the concrete question to be addressed is: What behavior is expected in financial organizations when a downgrade to speculative grade occurs that falls short of their previous expectations about the creditworthiness of that security issuer? First of all, it must be assumed that such a downgrade produces disappointment and uncertainty upon the ability of the respective securities issuer to refund, and the question of how follow-up are to be made? Since organizations differ from their environments they do not resonate with every modification in their environments. Organizations rather react only selectively according to their own structures (2004b: 40-50).

**Table 1: Credit Ratings for Long Term Bonds**

<table>
<thead>
<tr>
<th>Moody's</th>
<th>S&amp;P</th>
<th>Fitch</th>
<th>Rating Grade</th>
<th>Regulation Grade</th>
</tr>
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<tbody>
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<td>Aaa</td>
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<td>Investment Grade</td>
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In what follows, I transfer the concept of limiting values established by Luhmann (1997b 2008: 166) to credit ratings in order to describe the process of how financial organizations cope with the uncertainty about the creditworthiness of issuers. In Luhmann’s essay on the function of thresholds in ecological politics (1997a: 195-221), he focuses on the political handling of technological changes, put more precisely, of technological dangers. Limiting values hereby serve as a scheme consisting of two sides – for example the distinction between tolerable/intolerable – each generating its own information processing. Fixing a value as tolerable digitalizes the problem of technological uncertainty about what is permitted and what is forbidden. The two sides of the form are combined under a single marking, and this marking can be shifted if changes in the state of knowledge make this advisable. In this manner, politics attempt to govern enterprises without having direct access to these organizations.

Although credit ratings are subdivided into several notches, I propose that the concept of limiting values in ecological politics can be applied to financial markets related to the distinction of investment grade/speculative grade. Here, the limiting value speculative/investment works according to an if-then rule. For instance, if a security issuer is BBB- or higher ranked on the S&P or Fitch scale, or Baa3 or higher by Moody’s, then he is awarded investment grade.

Contrary, if a security issuer is assessed below Baa3 on the Moody’s scale or below BBB- on the equivalent ratings systems from S&P and Fitch, then he is denoted speculative grade. Put briefly into the language of sociological systems theory: If specific credit conditions are certified by certain CRAs, then particular creditworthiness information is circulated in their environments. Such information thus becomes absorbable by financial organizations that are respectively sensitized. Once the distinction between investment and speculative grade is updated, expectations about the creditworthiness of the respective securities issuer are altered.

Originally, the distinction between investment and speculative grade refers to requirements of the U.S. financial regulators and was thereafter adopted by the SEC by virtue of its common use (White 2010: 213). Although rating categories were not designed as regulatory tools by the CRAs, in fact, they function as such due to extensive cross-referenced political rules and guidelines in the U.S. and in the Eurozone markets. Similarly, Opp, Opp & Harris (2013) recently showed that introducing rating-contingent regulation that favours highly rated securities may increase or decrease rating attentiveness, but unambiguously increases the volume of highly rated securities. The authors explain, if the regulatory advantage of highly rated securities is sufficiently large, delegated information acquisition is unsustainable, since the rating agency prefers to facilitate regulatory arbitrage by inflating ratings. As a matter of fact, ratings issued by credit rating agencies serve a dual role: they provide information to investors and are used to regulate institutional investors (Opp, Opp & Harris 2013).

A central side-effect of rating-contingent regulation is the so-called regulatory cliff (White 2011: 220) between a rating downgrade to speculative grade by ECAIs or NRSROs and the subsequent re-evaluation and restructuring of respective portfolios by rating-constrained investors and issuers particularly enforces situations of tight couplings between otherwise loosely linked up observations of financial organizations (Luhmann 2008: 87; Weick: 1976: 1-19, 1985: 163). Generally, such tight couplings that are exclusively due to the above-mentioned specific political formalization of interlinkages between decisions of CRAs regarding the marking of the limiting value and decisions on creditworthiness made in financial organization.
Two ways of couplings can be distinguished empirically: First, banking organizations that dispose of respective securities and that use external ratings for adequate collateralization of their assets have to hold more net capital reserves for fulfilling banking supervisory standards of Basel II, or to meet the guidelines of the ECB credit standards required for collateral in Eurosystem monetary policy operations. Secondly, institutional investor organizations restricted by prospectus eligibility or by other policies against owning non-investment grade securities (mainly in compliance with eligible portfolio investments, e.g. for public old-age insurances or pensions plans sponsored by state and local governments) have to reassess their positions and possibly to dump the speculative assets.\(^{23}\)

However, the question is not simply to assign external CRAs decisions to internal decisions in financial organizations. More important, there are loose couplings reckoned by the creditworthiness-observing audience which, again, does not necessarily have to invest in or to issue respective securities. In any event, financial organizations expect potential impacts, a) on the buy side, and b) on the sell side of financial markets to occur in their environments when one of the NRSROs or ECAIs downgrades a particular securities issuer to speculative grade, or, upgrades it to investment grade without fully knowing who owns what securities.

a) On the sell side of securities a downgrade of a particular issuer to speculative grade circulates to other creditworthiness-assessing organizations the information that the corresponding CRA expects a higher relative probability of default.\(^{24}\)

Consequently, these organizations anticipate that in the market investors may demand higher yields from issuers for bearing higher implied relative credit risks. A decreased security price will then put the current yield of the bonds in line with issuers at similar credit ratings. Meanwhile, bonds already listed are devaluated and any new issuance will be charged with higher points. In both cases, the respective securities issuers face increased cost of funding which is expected by the other financial organizations.

b) On the buy side, financial organizations checking third-party observations on creditworthiness assume that once a rating is lowered to speculative grade different follow-ups for banks and institutional investors are likely to occur. Beside the use of external ratings in securities and banking regulation for determining capital adequacy and disclosure requirements for financial institutions or legal restrictions for (social) insurance policies, there are anticipated knock-on effects on indices. For instance, if an issuer or its bonds are judged speculative grade by one of the approved CRAs, he will be removed from particular bond benchmark indices (such as iBoxx sovereign bond indices, Citi indices, or Barclays’ legacy indices).

\(^{23}\) For instance, fiduciaries in the U.S. and in U.K. must invest within prudent man rule (legislated under The Uniform Prudent Investor Act and The Employee Retirement Income Security Act in the U.S. or the Pension Acts in the U.K.) that regulate investment responsibilities of trustees varying from state to state (Galer 2002). In contrast, in the EU, the existing (re-)insurance directives do not contain any provisions that place direct reliance on external ratings. However, a number of member jurisdictions’ national laws implementing investment rules of the current Solvency I directives do refer to, or place reliance on, ratings in order to determine whether a certain asset is authorized or eligible to cover technical provisions (Joint Forum 2009: 5).

\(^{24}\) Although the same issuer may have different credit ratings for different securities, a downgrade to speculative grade implies that all securities of an issuer are ranked on the respective junk notch (Fitch 2011: 1-3, 2012). Whilst this is true for countries, as the case of Iceland (Bases 2011) or Greece (Fitch 2012) currently demonstrate there may be a one-notch difference regarding entities, corporations and affiliations dependent on the respective liabilities and the letter of comfort, for instance (Fitch 2010). This notching convergence confirms the abovementioned coupling between the creditworthiness of an issuer and his issuances.
As a result of such a change in their environments, yet, not politically formalized, a substantial majority of financial organizations, particularly portfolio managers, is then likely to adapt their positions. And again this leads presumambly in a fall in demand and lower securities prices as the classical price theory suggests (White 2001: 20; Strulik, 2004: 104-115; Alloway 2011; Dohms 2012).

What does this all mean sociologically? Taking the perspective of reviewers of creditworthiness, it is the form of the limiting value that sets the investment grade as a threshold – not the credit rating as such. As a matter of fact, the distinction between investment and speculative grade functions as a bipolar scheme.

To be precise, this applies not only for observers that are regulatively constrained in their investment decisions. What counts for the functional analysis, is that there are not only tight couplings between external third-party observations and internal investment decisions in financial organizations. Additionally, there are loose couplings between external third-party observations and internal expectations on anticipated changes in their environments that prewrite in certain nuances but do not completely determine decisions about creditworthiness in financial organizations. This is true regardless of whatever instruments are hold.

Drawing on expectation forming rather than on tight coupling of organizational decisions, I hold that financial organizations do not merely conform to institutional pressures for rhetoric and symbolic reasons (Meyer & Rowan 1977) to buffer their internal structures from disruption as neo-institutional thinking claims. Corresponding studies examine the originators, distributors and the recipients of external standards by asking either how standards are produced or how they are adopted within or ganizations (Brunsson & Jacobsson 2000: 1-17). Although this study involves the question of how credit standards render structural guidance for decision-making about creditworthiness in financial organizations, the neo-institutional account is, nevertheless, limited in explaining the specific internal conversion of a certain standard into organizational structures.

In particular, the variation of decoupling processes within organizations remains undertheorized since it lacks adequate consistent definitions. For this reason, in the following, I would like to theoretically specify the heuristics of tight and loose coupling in greater details, since the systems theory approach on organizations (Luhmann 1999, 2006) offers a more nuanced view towards the organizational management of uncertain creditworthiness expectations. For one thing, as stated above its definition of organization is incorporated into a societal theory (Luhmann 1975: 5-20).

For another thing, Luhmann’s decision premise concept (Luhmann 1976: 99-113, 2006: 222-255) epistemologically exceeds the neo-institutionalist distinction between formal directives and informal norms (Brunsson & Jacobsson 2000: 1-17) that is also followed by studies that apply the embeddedness or performativity framework. However, these scholars call scant attention to the benefit from systematically distinguishing between formal and informal expectations in general and conditional programming as a type of decisional premise in particular both as social mechanisms of producing organizational order.

From the constructivist sociological perspective, mutual expectations reduce the scope of possible decisions and thereby set the frame in which formal and informal communication come about. Decision premises are thus different from operative decisions. The operative decisions take the decision premises as an accepted reference point that is not questioned or checked when relied to. In this sense, premises serve as facts in order to connect decisions by taking recourse to past decisions and in anticipation of subsequent decisions.
Yet organizational behavior is never completely determined through mutual expectations in general or decision premises in particular, but they limit the scope of alternatives and structural contingencies for repeated formal and informal use and acceptance. This idea relates to the sociological concept of expectation (instead of (trans-)actions that structure organized social systems (Luhmann 1976: 105, 2006: 222-239). Luhmann (1999; 2006) classifies three types of expectation frameworks that he denotes decision premises, namely decisional programs, communication channels and personnel that are variously differentiated in organizations.

Such depersonalized rules embody analytically speaking either formally or informally normative expectations. Whereas programs specify regulative conditions for deciding what is to do, communication channels rule who decides. Finally, the organization’s personnel are a decision premise insofar as it informs who is in charge of a decision and who is potentially to blame for failures.

Each form of decision premise sets a frame to absorb external information for internal processing and respecification. With other words: Decision premises are an organization specific foil against which their environment becomes accessible by internal operations. The concrete shape of these premises thus allows illumination of how selectively an organization resonates with its environments. For instance, whether an organization establishes norms to react on changes of ratings grades or also on CDS prices, or whether it rather relies on the creditworthiness decision of specific personnel, or the decisions coming from certain positions (Luhmann 2006: 222-255).

Specifically, if personnel, programming and communication are seen as functional equivalents in determining behavior, they can step in for one another within a specific field. Good personnel can save exhaustive programming, for instance. Difficulties arising in detailing programs, for another thing, can be compensated to some extent by informal programs or informal communication channels. Functional equivalence obviously does not mean that all these alternatives ultimately amount to the same. They are alternatives only as decision premises and as such are interesting just because they can be chosen deliberately under different circumstances and can have different consequences (Luhmann 1976: 105).

Although, it is an empirical question of how standardized third-party observations resonate exactly with concrete organizational structures, I claim that the marking of investment grade or speculative grade serves as a trigger for conditional programming in organizations – not directly to take certain decisions as it applies to rating-constrained organizations –, but more important, to absorb external information and to build and assert own expectations on creditworthiness.

As Luhmann discloses (1972: 227; 1999: 98f., 2006: 256; 2014: 174) the basic form of conditional programming runs the following scheme: if specific conditions are fulfilled (if previously defined constituent facts are given), then a certain decision has to be made. With the concept of program Luhmanns says that organizational problems are defined by stating conditions of their solution and on the basis of this definition are resolvable by decision. Furthermore, the definition of the problem itself arises from decision-making and is tested by decisions. That is, dependent on what side is marked by an assigned CRA, each organization interprets and translates ratings differently according to its own expectation structures.
Generally the conditional programming runs as follows: If a certain creditworthiness mark is absorbed as an organizational information, then it becomes subject as such to the organization’s own special system of rules that anticipates and generalizes certain follow-up expectations setting the frame for own decisions upon the creditworthiness securities issuers.\(^{25}\)

Applying this concept of conditional programming to the functional analysis, it becomes clear how externally formalized rules (such as the described banking supervisory and disclosure requirements, collateral guidelines of the ECB credit standards, prospectus eligibility or other policies against owning non-investment grade securities) need to be put into practice and are thus subject to different interpretations and adoptions within financial organizations.

Financial organizations translate such rules either strictly into formal manuals and, for instance, combine these with their internal credit risk tools, or, they even permit a broad and more informal anticipation and reinterpretation of these external and standardized third-party assessments. Both Luhmann’s concept of decision premises in general and conditional programming in particular allow analyzing these practices in more depth. In this account his notion thus sets the backdrop against which responses of financial organizations become comparable analytically.

Having applied the concept of limiting value to describe the third-party observations of CRAs as bipolarized information inscribed in conditional programs one can how the mark of investment grade/speculative grade (though being as such a conditional program of CRAs) is harnessed as a trigger for prompting follow-up programs in financial organizations. As a matter of fact, the limiting value of investment grade represents a scheme for financial organization to pick up external information to translate and incorporated these into generalized expectations, namely, into conditional programs of how to decide on the creditworthiness of issuers. The reliance on the marking of CRAs for the absorption of external information and processing them internally thus serves as a security equivalent (Luhmann 1997a: 195-121; 2008: 166; Japp 1996: 234; Strulik 2007a: 294).

In this way, the conditional programming functions as a binary rule to filter expectations for repeated use that thereby contribute to reduce the scope of connecting future decisions rendering certain decisions more probable than others (Luhmann 2000: 330-332).

Meanwhile, serving as an indication for the inception of internal premises in financial organizations, rating grades – even for not politically restricted investments – prevent financial organizations from making uncontrolled creditworthiness decisions. The rightness of such decisions applies thus not to better or perfect knowledge but to how decisions are delimited by own premises. Translated into a conditional program (if investment grade/then proved creditworthiness of securities issuers) it serves as a suitable link between various independently changing organizations (Luhmann 1997a: 195-121; 2008: 166; Japp 1996: 234; Strulik 2007a: 294). A central advantage of conditional programming thus consists in the opening up of variation possibilities. One can retain the defined situation (granting credit) whilst modifying the programmatically caused decision-making that is providing the same situation with different effects (for instance by alteration of the limiting value, or as I will argue below, by complementarily relying on CDS prices).

\(^{25}\) According to Nils Brunsson (1985) one could state that conditional programs reduce the calculation of multiple alternatives to a concrete manageable level that facilitates action rationality (as opposed to decision rationality).
Apart from the possibility of directed variation, Luhmann highlights the technical suitability of conditional programming (2014: 176-179) by which he means the release of experience processing from actually having to conduct an accompanying implementation. The decision-maker only needs to know the program (or to interpret it if necessary) and to examine whether the information given therein is applicable or not, this being supported by the differentiation of particular procedural systems for carrying out the program. Important gains in time can thus be attained, themes can be demarcated for rapidly achievable consensus and, all in all, more information can be processed with constant mental capacity.

A special consequence of this release has considerable advantages with a view to the release of attention and relatively less strict hierarchical supervision and control of disturbances and crises. Conditional programming thereby opens up better chances for delegation since they can be communicated without precise knowledge of the details associated with the situation in which they are to be applied. As conditional program thus give a kind of authority to interested parties, that is, a derived non-hierarchical authority over the instances which bring about decisions (for instance, the downgrade of securities and the subsequent failure of loans previously granted from certain financial organizations) the responsibility for the consequences of the decision (the bankruptcy of the respected securities issuer due to the failure of favourable loans) is released from the executing units.

A likely result, uncertainty absorption in general and risk transformation based on conditional programming then quickens the risk appetite of financial organizations for seizing otherwise missed opportunities, which, yet results in new uncertainties that have been thereby masked out. Conceiving of risk transformation as a mechanism that enables to turn dangers into risks by attributing losses to decisions, risk transformation can be precisely understood as a process that makes uncertainty accessible for organizational decision-making. In this context, risk transformation lends organizations the ability to ensue decisions, notably via the decision to rely on rating grades or not.

To be precise, the overall advantage of conditional programming lies in that every higher complexity can in this way be converted into congruently expectable decisions. It thus fulfills the function of a structure. This function is not the removal of insecurity but the increase of bearable insecurity. It helps to deal with it but cannot eliminate the ignorance that losses and accidents can happen in the aftermath, though.

As a concurrent mechanism this uncontrollable relation between increasing uncertainty reception and risk production has to remain latent in order to protect the system from its specific decision selectivity (Strulik 2004: 103, 2007a: 295-304; Luhmann 2014: 175), namely to adhere to rating grades as triggers for the inception of own conditional programs. If this decision selectivity of the organization was explicitly stated, it would have structural impacts on the connectability of expectations and thus of decisions (Luhmann 1991b: 68; Japp 1997b: 226): Once organizations reflect the ambivalent fragility of their structures, they begin to search for functional equivalents meaning alternative mechanism that help building expectations. In the case of financial organizations these are expectations upon the creditworthiness of securities issuers. And this is exactly what happened in the last decades and what I describe as an organizationally specific feature of unsettling established forms of market observation and thus (re-)interpretation.

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26 Instead, manifest functions of structures are consequences that are observed and thus explicable without running the risk of reflecting the fragility of own structures (Luhmann 1984: 456). Since Luhmann reserves the term latency for describing how the contingency of expectations is masked and thereby protected, his distinction goes beyond what is described by unintended consequences (Strulik 2012: 67).
As already described, CRAs profess to offer long-term credit opinions rather than up-to-the-minute assessments. Unanticipated and massive downgrades by one or several of the ECAs or NRSROs may prompt pro-cyclical effects in financial markets: Increasing cost of funding, higher capital requirements and bulky sell-offs of securities can assist to accelerated liquidity problems, and may finally lead to a severe credit obligations. These cliff-effects do not only represent a mere causal mechanism, but sociologically speaking base upon reflexive assumptions about market behaviour. Both the expectation that a downgrade to speculative grade is likely to happen (although it has not yet been announced) as well as the consideration that counterparties might get involved in possible feedbacks can support self-uncertainties in financial markets that even may cause the presumed effects.

According to the Thomas-Theorem one can then explicate the result of such self-uncertainties as a self-fulfilling prophecy: If financial organizations define, that expect, downgrade impacts as real, they are real in their consequences (Thomas & Thomas 1928: 527; Merton 1948: 193-210, Schwarting 2010, 2011). Following Zuckerman (1999: 1402), attempts to gain favourable classifications by CRAs denote illegitimacy costs in mediated markets that induce issuers to show their financial performance and their comparability with the investment grade standard. Having early included the liquidity and capital criteria detailed in Basel I from 1988 into their rating processes, the CRAs acted as institutional agents and imposed normative pressure on non-member states of the Group of Ten in Europe (Strulik 2007a: 293; Willke 2006: 94).

Although CRAs are slightly regulated private authorities (Cutler, Haufler & Porter 1999), as a matter of fact, they function as embedded knowledge networks (Sinclair 2000) and gatekeepers (Lewin 1943: 40; Partnoy 1999: 698; 2006) that erect barriers to market entry and discipline issuers of securities. It is worth noting that risk transformation through the reliance on the limiting value of rating grades referred to as a trigger for the prompting of own conditional programs in financial organizations, depends also on societal conditions, in particular on what mechanisms are available for encountering frustrated creditworthiness expectations.

Drawing on Luhmann (2014: 186) the question arises: Under which conditions are organizations internally capable of actualizing the selectivity of its structure and bring it under control as an instrument of adaptation to changing environments, such as those in financial markets?

Luhmann conceptualizes such a destabilization of structures as a "lowering of the social system’s threshold of change". Every organization reacts to crises of dangerous proportions with structural changes – in the limiting case even by dissolution. Compensatory arrangements for the simplification of conditional programming, in particular, can be found in the possibility of still deciding about decision-making programs. This permits the differentiation between programming and programmed decision-making and the subjection of the corresponding decision-making process to different types of and, indeed contradictory, requirements and conditions of acceptance.

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27 For instance, in order to hinder the initiation of pro-cyclical effects in financial markets, the ECB lowered the minimum standards for eligible collaterals for its credit operations (Vits 2011).

28 Partnoy (2006) holds that CRAs differ from other financial market gatekeepers, such as underwriters and accountants since they are more profitable than other gatekeepers, face different and potentially more serious conflicts of interest, and are uniquely active in structured finance.

29 Mechanisms to handle such disappointments are ignorance, violence, or, more likely in this case, verbal explanations aiming to label the attributed reason (be it a person or an organization) as deviant or conspired against other, for instance (Luhmann 1972). Nevertheless, not every disappointment causes response.
I argue that this is occurred as CDS prices become relevant as a complementary indication, and in particular once ratings differ extraordinarily from CDS prices. It is thus further possible in this way to correct the optical bias of conditional programs toward higher decision-making levels through the opposite principle – namely through the fact that one decides politically with purpose-oriented viewpoints on the passing and alteration of conditional program (Luhmann 2014: 179). And a purpose-oriented viewpoint, for instance, would be to bestow even greater diligence on the organization’s evaluations of securities issuers or on the granting of loans.

By observing not only changes in the status credit rating grades of particular securities issuers but also in the price level of a respective CDS, and comparing both as conditions for deciding about creditworthiness financial organizations increase their structural variability by way of lowering the organization’s threshold of change (Luhmann 2014: 186). It is this lowering of their threshold of change that permits an advance movement and reduction of the crisis threshold and therefore a gain in time and chances of reaction. Even the first signs and small shifts in strength are then sufficient to trigger off structural change. The system becomes more sensitive to the environment such as financial markets.

Apart from the question as to whether and how unanticipated changes of creditworthiness markings by CRAs result in disappointed expectations in financial organizations at all, rating grades work in the described way just as much as financial organizations confide in credit markets as well as in CRAs as providers of reliable and thus transformable third-party observations. For one thing, the politically granted licensing of certain CRAs has contributed to this confidence. For another, and I return to this point below (chapter 5), changes in financial markets are mainly considered as being caused by cumulative effects and hence viewed as dangers.

Such dangers may result in a loss of confidence in other organizations or markets, which then can only be restored symbolically by collectively binding decisions (Luhmann 1979: 8-38; 2002: 159-220; Schwarting 2009): 30 A function that is in modern societies exclusively fulfilled by via politics. This, in turn, will be an empirical question of how financial organizations as well as the political system are able to deal with disappointments. The search for alternative, standardized third-party observations of creditworthiness, in this context, can be read as an indication that the confidence in CRAs, financial organizations or/markets as a whole has been eroded. The tendency toward numeric, figures and quantitative forms of comparisons has attracted a host of sociological analyses (Vollmer 2004; Vollmer, Mennicken & Preda 2009; Heintz 2010). What has been much less widely and empirically explored is how quantitative parameters and its comparison are translated into organizational premises and practices (recently for consultancy see Gruber 2014).

What is more, due to the self-reference of risks, that also the decision not to decide is a risky affair, attempts to reduce risks are risky themselves, and can affect even those who are subject to decisions designed to reduce risks. Not until configured as a limiting value it becomes clear that rating grades contribute to the transformation of the potential danger of debt losses into the risk of financial organizations to lean on ratings or not. Credit rating grades thus furnish financial organizations with a form of self-reinsurance that permits conjoining credit decisions in accordance to respective organizational investment criteria.

30 The state as an organizational address endowed with financial assertiveness and authority is the only entity in modern societies whose formal rules are not limited to the exercising positions but to all members, namely all citizens of the state (Luhmann 2002: 189-273).
Notwithstanding this, the illusion of having risks under control before making the decision keeps the fact invisible that those security equivalents cannot eliminate the uncertainty about future outcomes of decisions. Again, here lies the epistemological difference to quasi-ontological accounts, such as principal agent theory, which basically consider information asymmetry to be only a problem of transition.

3.2 Risk Transformation via CDS Prices

According to Luhmann an attribution of harm to a specific decision can only be made if a choice between alternatives is conceivable and appears to be reasonable, regardless of whether the decision-maker, in any instance, has perceived the risk and the alternative, or has overlooked them (1993: 26).

In transferring this argument to the functional comparison of rating grades and CDS prices, I argue that the reliance on rating grades is a risky decision as soon as alternatives to credit ratings come into consideration. Then, uncertainty about the outcome of creditworthiness decisions results from the organization’s decision-making itself, and thus can be observed by it. In this sense, the provision of CDS prices helps financial organizations to transform the conventional danger of credit default into risky decisions to count on rating grades and/or CDS prices, or not.

Originally, derivatives (such as forwards, futures, options and swaps) evolved in the 1990s in order to capitalize on increased volatility of financial markets consequent to the entrance of free exchange rates in the 1970s.

Whereas forwards and futures as the simplest type of derivative exist since the 16th century, swaps are the most recent financial products. Beside the development of markets for credit securitization particularly assigned by CRAs, new types of credit derivatives are particularly used by financial organizations as a tool to shift credit exposure for commercial loans and to circumvent commercial banking regulatory capital restrictions. In opposition to spot markets, derivatives are traded in future markets in which delivery is due at a later date.

The term derivative refers to the fact that their value is linked to underlying market variables, such as the price of a stock, commodity, interest rate, credit, or even market index. These products make it possible to buy or sell the rights to ownership of an asset without purchasing the asset itself. Derivatives thus break up with the linking between money and property alike. Although the price of the underlying plunges, the price of the derivative may increase (et vice versa) (Arnoldi 2004: 25; Esposito 2011: 175; Strulik 2004: 184-201; Huault & Rainelli-Le Montagner 2009; Morgan 2010).

Historically, credit derivatives originate from privately tailored agreements between banks and their customers. As the most commonly traded type of credit derivatives, CDS arose in response to demand by financial institutions, mainly banks, for a means of hedging and diversifying credit exposure similar to those already used for interest rate and currency exposures. In general, a CDS represent a bilaterally negotiated and customizable contract between seller and protection buyer of protection on the debt of a corporation or other entity (which is also called the name and is not a party to the contract).
Under a CDS the protection buyer seeks to shift the conventional danger of losses on debt to the protection seller by paying a quarterly fixed premium based on the nominal amount of protection agreed upon.\(^{31}\) In return, the protection seller is obligated to pay the protection buyer a fixed amount in case of any losses, or a credit event\(^{32}\), occurred with respect to the assets referenced (such as bonds, securities portfolios, mortgages, MBS, indices, or other CDS) and predetermined in the trade’s documentation until the maturity date of the contract, thus explaining the term credit default swap (see Figure 1).

Whereas the protection buyer believes that the sum of the premium will be lower than his potential loss in the case of a credit event, the protection seller expects the opposite. In fact, contrary to an insurance policy, the buyer of a CDS does not necessarily has to hold the underlying asset (called naked CDS) while the seller neither has to be a regulated entity nor is he required to maintain any reserves to pay off buyers. Briefly speaking, the secured party enjoys protection no matter whether a (partial or total) default implies any loss to him. For financial organizations the CDS market thus offers an attractive instrument to transfer credit risks without removing assets from its balance sheet, or involving borrowers (Deutsche Bundesbank 2004; Nomura 2004; Merrill Lynch 2006).

CDS contracts began to be traded in the early 1990s. One of the first CDS provided protection on Exxon by the European Bank for Reconstruction and Development (EBRD) to JP Morgan and took months to negotiate (Tett 2009: 46-47). The standardization of them by the main trade body, the International Swaps and Derivatives Association (ISDA), was a fiercely contested process, but it was sufficiently successful to permit liquid markets in swaps on the debt of several hundred corporations to emerge by the start of the 2000s (Morgan 2010; MacKenzie, Beunza & Millo et al. 2012: 8).

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\(^{31}\) The protection seller may occasionally demand an upfront payment of premium in a case of distressed credit (Nomura 2004: 3; Merrill Lynch 2006: 29). For example, CDS on Greek sovereign bonds were traded in points upfront from June 2010 till March 9, 2012.

\(^{32}\) The determination of whether a credit event occurs under CDS documentation is made by the ISDA Determinations Committee (DC), a body consisting of ten sell-side, and five buy-side firms. A supermajority of votes (12 of 15 DC members) is required to find that a credit event has happened without the decision being subject to external legal review (ISDA 2011c). For instance, in terms the Eurozone proposal of a Greek bond swap the ISDA announced on March 9, 2012 that the debt deal constituted a restructuring credit event, triggering off payout under existing CDS contracts and hence the de facto re-distribution of the losses within the financial system (ISDA 2012d). With a voluntary participation rate of more than 83% of private investors holding Greece’s debt, the retrospective application of collective action clauses in the Greek domestic law bond contracts was set off in order to raise the participation rate to 95.7%. As a result, the right of all holders of the affected bonds to receive payments had been reduced (Kaminska 2012; ISDA 2012b, 2012c). Since there were more CDS contracts outstanding than bonds in existence, an auction for eligible Greek bonds was held setting the final price (recovery level) at 21.5, meaning that buyers of $10 million CDS protection on a default of Greek receive a payout of $7.85 million (the payout is equal to the nominal value minus the recovery level). The payments were thus less than the nominal value of the bonds held (ISDA 2012d; Creditex 2012).
Although maturity ranges from one to ten years, the most liquid maturity term for CDS is five years. Most contracts fall between $10 to $20 million in notional amount. The premium is usually quoted as a percentage of the nominal value of the asset issued by the reference organization (Figure 2).\textsuperscript{33} Yet, unlike futures, CDS premia are, in general, traded electronically in the over-the-counter (OTC) market rather than on an organized exchange.

Following a credit event, the protection seller makes a payment (cash settlement) to the protection buyer who ceases paying the regular premium, or the protection seller takes delivery of the defaulted securities for the par value (physical settlement). The Depository Trust & Clearing Corporation (DTCC) maintains details on CDS contracts, and, additionally automates the exchange of payments in the OTC market (Deutsche Bundesbank 2004: 43-45; Nomura 2004; Merrill Lynch 2006: 11). As other types of securities CDS contracts can be also assessed by CRAs. For single-name instruments, the rating of the underlying reference obligation(s) is used. If a CDS refers to a specific underlying reference asset for which several ratings are available, the lower of the two highest is considered.

For multi-name CDS that do not terminate after the first credit event and where the reference entity is more than one name – as in portfolio or basket CDS or CDS indices – the rating of the entire basket, portfolio, or index is used. In this case, a protection buyer can purchase protection against all defaults by the corporations making up the index. The most influential indices can be structured according to specific level of loss (Stulz 2010: 74-83; MacKenzie 2011b: 8-24).

\textsuperscript{33} Whereas sovereigns were prevalent as reference in the early days of the CDS market, today, corporate reference entities have become more common (Nomura 2004: 2). However, according to the ISDA the five most actively traded reference entities were France, Italy, Germany, Brazil, and Spain (ISDA 2011b).
When the portfolio or basket underlying a multi-name item is unrated or not available, then the BIS recommends that the contract should only be allocated to investment grade if all underlying contracts are investment grade, and to below investment grade if the underlying reference entities are sub-investment grade if it either does not have any rating or if it is not possible or very burdensome to classify the contract based on the ratings of the underlying reference entities (BIS 2012c: 7-11).

As one of the fastest growing derivatives markets, CDS trades demonstrated an explosive growth in the past years. The ISDA, generally determining standard guidelines for CDS agreements, began compiling and aggregating notional amounts of outstanding CDS in 2001. Whereas the notional amount of CDS outstanding in its initial survey comprising the first half of 2001 accounted for $631 billion, the volume augmented steadily from $8 trillion at the end of 2004 to $34 trillion at the end of 2006 (Figure 2 above).

After reaching its peak of more than $62 trillion in the second half of 2007 the outstanding notional amount of CDS decreased by half in 2008 on the level of $31 trillion finally dropping to round $21 trillion in the first half of 2011 and 2013.\textsuperscript{34} Not surprisingly, this reduction was driven mainly by the credit events occurred 2008 and 2009 in the course of the global financial crisis leading to massive settlements. In particular, the fall stems from the AIG collapse (Morgan 2010; ISDA 2011a, 2012a; BIS 2014).

\textbf{Figure 2:  Half Year Notional Amount of CDS Outstanding in Billions US$ 2004-2013}

\begin{center}
\includegraphics[width=\textwidth]{figure2.png}
\end{center}


\textsuperscript{34} As in past surveys, the $26 trillion notional amount was evenly divided between bought and sold protection: Bought protection was approximately $13.3 trillion and sold protection was about $13.0 trillion, with a net bought notional amount of $359.0 billion (ISDA 2012a).
What is more, as of end-December 2004 the BIS began releasing semiannual statistics on CDS breakdowns and time series. At mid-2011 the BIS first reported an increase to $32 trillion. However, notional amounts outstanding decreased to $29 trillion at end-2011. That decline was worldwide and due to banks headquartered in the euro area facing pressures to reduce their leverage. In the course of 2011, the BIS statistics disclose a value of $16.9 trillion for single-name CDS, and $11.8 trillion for multi-name contracts of which $10.5 trillion were index products.

The rating categories behind the decline in notional amounts differed for single-name and multi-name contracts. Among single-name CDS, non-rated contracts fell from 11% of total contracts at end-June 2011 to 10% at end-2011. By contrast, among multi-name contracts, the investment-grade category drove the decline, falling from 57% to 51% (BIS 2012b, 2012c: 3, 12).

By counterparty, the BIS data distinguishes between reporting dealers, other financial institutions, and non-financial institutions. Overall, more than 60% of all CDS transactions are traded between the G14 dealers, namely Bank of America-Merrill Lynch, Barclays Capital, BNP Paribas, Citigroup, Credit Suisse, Deutsche Bank, Goldman Sachs, HSBC, JP Morgan Chase, Morgan Stanley, Royal Bank of Scotland, Société Générale, UBS, and Wells Fargo Bank. G14 dealers were on at least one side of all trades, but were more likely to be sellers of credit protection, making up 78% of the population of CDS protection buyers and 85% of protection sellers (Chen, Fleming & Jackson et al. 2011: 7-9).

As of June 2010, according to the ISDA Research Note these dealers hold 90% of the total notional amount outstanding (2010: 3). CDS premium prices are generally quoted in basis points (1 bp = 0.01%). A rise of one basis point in a five-year CDS spread equates to a $1,000 increase in the annual protecting cost for a nominal amount of $10 million of debt obligation or debt-like items. Taking the example of Goldman Sachs on May 11th 2010, a quotation of about 208.10 bps (= 2.081%) says that the protection buyer of a nominal value of $10 million has to pay $208,100 annually to the protection seller for five years to insure himself against default of the securities issuer (see table 2).

Due to the fact that there can be different CDS prices among financial organizations assigned to the same credit rating, there are no strict couplings between CDS prices and rating grades. In the list presented below both Deutsche Bank and JP Morgan are judged A+ on S&P ratings (or, Aa3 on Moody’s scale), but have a rounded 43-point difference in their CDS spreads (158.87 bps for Deutsche Bank and 110.3 bps for JP Morgan).

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35 As of end-June 1998, the central banks of the 11 reporting countries introduced reporting by leading global dealers as a regular feature of the collection of statistics on derivatives markets. From December 2011, Australia and Spain began contributing to the semiannual survey, bringing the number of reporting countries to 13 (BIS 2012c: 5).

36 In Germany reporting dealers are large international banks who hold in the frame of their consolidated financial statement (CFS) an outstanding notional amount of all OTC derivatives of more than €1 trillion, or a notional outstanding value of credit derivatives of more than €100 billion, and whose data on trading activity and security positions will be forwarded by the Federal Bank to the BiS (Deutsche Bundesbank 2012b: 12).

37 Among financial institutions the BIS ranks: Central counterparties, banks and security firms, insurance and financial guaranty firms, SPV, and other financial customers (2011b; 2001c: 15).

38 On April 16, 2010, the SEC announced that Goldman Sachs was charged with fraud in the structuring and marketing of synthetic collateralized debt obligations (CDO) tied to the performance of subprime mortgages. Among the shareholders the charges provoked extended uncertainty since they are likely to go along with a cash settlement (The Economist 2010a).

39 However, there are also several sources that provide juxtapositions of CDS prices, default probabilities and credit ratings according to approved agencies (or based on so-called implied ratings). For instance, data provider Credit Market Analysis (CMA), which compiles prices quoted by CDS dealers, calculates implied ratings using a proprietary model and input with CDS pricing data from CMA Datavision (CMA 2012: 3-4).
The inverse can also be true. Credit Suisse shows a similar CDS spread (110.63 bps) to JP Morgan (110.30 bps), though there is a one-notch differential for ratings reviewed by Moody’s and S&P.

### Table 2: Credit Ratings and CDS Prices on Banks

<table>
<thead>
<tr>
<th>Bank</th>
<th>S&amp;P</th>
<th>Moody’s</th>
<th>5-year CDS in bp</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rabobank</td>
<td>AAA</td>
<td>Aaa</td>
<td>91.67</td>
</tr>
<tr>
<td>BNP Paribas</td>
<td>AA</td>
<td>Aa2</td>
<td>117.46</td>
</tr>
<tr>
<td>HSBC Bank</td>
<td>AA</td>
<td>Aa2</td>
<td>97.48</td>
</tr>
<tr>
<td>ING Bank</td>
<td>A+</td>
<td>Aa3</td>
<td>106.72</td>
</tr>
<tr>
<td>Barclays</td>
<td>AA-</td>
<td>Aa3</td>
<td>77.55</td>
</tr>
<tr>
<td>Société Générale</td>
<td>A+</td>
<td>Aa2</td>
<td>138.17</td>
</tr>
<tr>
<td>Deutsche Bank</td>
<td>A+</td>
<td>Aa3</td>
<td>152.87</td>
</tr>
<tr>
<td>DZ Bank</td>
<td>A+</td>
<td>Aa3</td>
<td>-</td>
</tr>
<tr>
<td>JP Morgan</td>
<td>A+</td>
<td>Aa3</td>
<td>110.30</td>
</tr>
<tr>
<td>Natixis</td>
<td>A+</td>
<td>Aa3</td>
<td>161.15</td>
</tr>
<tr>
<td>UBS</td>
<td>A+</td>
<td>Aa3</td>
<td>141.67</td>
</tr>
<tr>
<td>Bank of America</td>
<td>A</td>
<td>A2</td>
<td>175.39</td>
</tr>
<tr>
<td>Erste Group Bank</td>
<td>A</td>
<td>Aa3</td>
<td>196.67</td>
</tr>
<tr>
<td>Goldman Sachs</td>
<td>A</td>
<td>A1</td>
<td>208.10</td>
</tr>
<tr>
<td>Raiffeisen Zentralbank</td>
<td>A</td>
<td>A1</td>
<td>207.59</td>
</tr>
<tr>
<td>Royal Bank of Scotland</td>
<td>A</td>
<td>A1</td>
<td>-</td>
</tr>
<tr>
<td>Skandinaviska Enskilda Bank</td>
<td>A</td>
<td>A1</td>
<td>111.72</td>
</tr>
</tbody>
</table>

Source: Own illustration based on selective data from BNP Paribas (see www.derivate.bnpparibas.com retrieved May 11, 2010).

Unlike ratings CDS prices are determined in the market. In this regard, accurate and timely pricing is a crucial prerequisite for the CDS market. It is assumed that market efficiency augments by higher trading volumes (Deutsche Bundesbank 2004: 50-58).

Given the real-time reporting and data availability (e.g. on bloomberg.com, markit.com or cmavision.com), CDS prices hold an additional resource for revealing market-based information about a company’s financial situation. Generally speaking, CDS prices have proven to be very volatile. In the special case of the Greek deficit crisis, premia on Greece’s 5-year sovereign CDS from February 2011 until March 2012 ranged between 800 and 25,000 bps (Figure 3).40

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40 Corporate defaults leading to payment of CDS insurance are routine but a sovereign credit event is a novelty (The Economist 2012).
In 2010 CMA’s Global Sovereign Credit Risk Report showed a so-called widening in the short-term spread (meaning an extraordinary increase in price) of the five-year CDS on Greek government debt, while the price of the underlying – the respective bonds – was untypically stable: The CDS rose by more than 657 bps, or 190%, from 346 in mid-April to 1,003 in mid-June. In March 2012 Greek bonds tracked down to 24% from 65% in March 2011 (Kurtz 2012). Since the actual price of the single underlying and the CDS market are related, these numbers are quite consistent with the losses bondholders expected to incur on restructuring in the frame of the bond deal.

Correspondingly, by the end of the fourth quarter 2011 CMA’s Global Sovereign Credit Risk Report showed a 93.8% chance (cumulative probability of default) that Greece would be unable to honor its debt obligation in the next five years. Greek bonds were thus judged to be the world’s riskiest paper to hold with a spread at 8453.3 bps at the end of December (CMA 2012: 4). Yet for widened CDS prices it is not meaningful to measure the spread in basis points since transactions are then done based on points upfront\(^4\), though (Figure 4).

\[^{4}\text{Trading points upfront includes the assumption that a credit event takes place before the protection seller has received any income from the credit default swap. As a market-wide convention CDS typically start to trade with points upfront once their spreads rise above about 500 basis points (Creditflux 2011). Note that this shift does not qualitatively equate with the described distinction of investment/speculative grade, since the widening in CDS prices and the conversion to points upfront already signals deterioration in the creditworthiness.}\]
The widening implies that the market had been already pricing in the expectation that a credit event in the near term is more likely than in the longer term (Yassin 2010). As the CDS is more likely to have a credit event (trigger), contracts are expected to be more valuable and thus traded on higher prices.

Figure 4: Five-Year CDS Prices on Greek Government Bonds in Points Upfront\textsuperscript{42} (March 2011 – February 2012)

![Graph of CDS Prices](image)

Source: Own illustration. Chart data provided by on March 20, 2012 on request.\textsuperscript{43}

With the uncertainty about CDS on Greek bonds being triggered off or not in the months from March 2011 to March 2012 the cost of protection were around 29% and 76% points upfront meaning CDS contracts backing $10 million of Greek bonds for five years would had cost between $2.9 and $7.6 million in advance, and $100,000 annually, quarterly in arrears until a scheduled maturity date or a credit event decided by the ISDA Committee (Markit 2012).

As sketched above, markets are an internal but inaccessible environment of the economy and are thus mediated by several third-party observations. Neither payments give complete information about the real good quality, the production process or the motivations of the buyers behind them, nor do prices indicate sufficiently how many proper payments have taken place.

Yet in contrast to principal agent theory, the information problem cannot be handled entirely by concepts of signaling or monitoring ex ante or ex post payments. Instead, it can only be managed by mechanisms that help building up apparently reliable expectations.

\textsuperscript{42} Whereas CDS prices quoted in bps are available at bloomberg.com (see Figure 3), CDS prices recorded in points upfront are viewable through fee-based, leased data services, such as Bloomberg Terminal or by CMA subscription. The data represents about 90% of the CDS transactions as end-of-the-day composites with a minimum of three contributors thus providing an approximation of transactions by market makers (Markit 2012).

\textsuperscript{43} I gratefully acknowledge the data provider Markit for compiling the above-cited chart parameters exclusively for this study. All remaining errors are mine.
Not despite but because of inevitable lack of complete market information the instability and reproducibility of prices reflect information about expected (in contrast to effected) credit relations and price trends. Luhmann places emphasis that this notion of price leaves open who is expecting and thus includes buyers, sellers and unconcerned third parties alike (1994: 18-30). This is also true for CDS prices. CDS prices are updated with each market transactions. Each time the distinction between higher and lower is updated it alters expectations about the creditworthiness of any underlying reference.

As a bipolar scheme CDS price split information into a form of two sides. Baeccker (1988: 252) highlights that two-valued pricings require multiple-valued observations. First, because a certain price can only be contrasted and ensured in comparison to other prices, and secondly because only price comparisons provide the foil against which expectations (price-shaped or not) become visible.

Consequently, in CDS market it is believed that the higher the CDS premium compared to other prices the higher the expected probability of debt losses. The distinction of higher/lower serves as a reference for comparisons of creditworthiness. To be precise, as a selective if/then rule it runs as a conditional programs similar to the above described rating grades. The distinction as a bipolar scheme filters and interprets decisions about creditworthiness: If a particular CDS price increases, then the creditworthiness of the respective underlying reference, and ultimately also the associated securities issuer, is judged worse.

Taken together, the CDS premium price thereby gives indications about the potential credit default of the securities issuer. Nevertheless, a high CDS price does not necessarily mean that a financial organization issuing respective securities will actually face any losses on debt. Rather more, CDS prices handle future uncertainty about creditworthiness of issuers in financial markets via the creation of apparently reliable credit expectations.

Although there is no external regulatory fixed value in the CDS market, at the time of writing, the mark of 100 bps is proposed as a formal threshold for market-based capital regulation. Following Luhmann’s concept of decision premises, I argue that if once established as an formal or informal expectation in a financial organization (to what extent will be a matter of empirical research), then the distinction of lower/higher as a third-party observation provided by the CDS market would be supplemented and rebalanced with the formally or informally internalized value of below/above 100 bps, and ultimately work similar to a value as described for the distinction of investment/speculative.

Assuming the shape of a conditional program as described above, CDS prices expand the capacity of considering variation in terms of the concrete distinctive rule while the attentiveness on CDS prices as well as on the coordination and responsibility for the consequences of respective decision-making upon an issuer’s creditworthiness.

Again, it should be noticed that these forms of credit expectations are provided regardless of whether respective investments are made (or not). Akin to rating grades, CDS prices are used as a conditional program for decisions on creditworthiness that permits turning the danger of debt on losses into the risk of building on CDS prices.

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44 In finance, Oliver Hart and Luigi Zingales (2010) suggest that intervention should be deployed whenever the CDS price is above 100 bps for at least 20 of the last 30 trading days. In this case, the financial organization in question shall be forced to issue equity until the CDS price and risk of failure back down. Otherwise, the regulator shall take over in order to impose discipline on management and shareholders (2010: 22). Nevertheless, taking the example of credit spreads, Partnoy claimed in 1999 that a market-based regulator potentially substitute the politically granted regulation licensing and reputation capital of CRAs (201: 704-709).
Since the reliance on CDS prices does not eliminate the fact that future outcomes of decisions remain risky, the temporalization of uncertainty and its concomitant risk production represents a latent function. This effect is ignored while taking decisions, since organizations can only bear risks by means of their decisional criteria. It is thus the specific organization’s selectivity that absorbs the instability of CDS prices (Luhmann 1983: 162, 1994: 30).

To conclude the last two chapters, the point can be made that both rating grades and CDS prices are two forms of risk transformation which come to expression in conditional programs and that functionally supplement one another in opening up considerable release from attention, hierarchical control and communication as well as responsibility for consequences.

In addition, whereas CRAs provide long-term and discrete assessments of creditworthiness, CDS prices are viewed as predictors of short-term market changes. However, neither ratings nor CDS prices replace other indications of creditworthiness (such as internal risk management tools) entirely. Investment analysts also offer their own views on the risk profile (and specifically, investment worthiness) of firms.

Despite the functional equivalence and the interdependencies of rating grades and CDS prices, both types of third-party observations originate from different expectation structures: First, rating grades provide formal and informal conditional programs stemming not at least from tangible financial and political regulations according to which certain positions are explicitly structured in the organization’s portfolio. Secondly, CDS prices are used, in turn, as conditional programs that emerged rather implicitly from financial routines and common practices developed in response to the organizationally specific adaptation to changes within the external market environment.

Under what conditions would CDS prices no longer be used as an internal premise? Tautologically speaking, the functioning of CDS prices as third-party observations of creditworthiness depends on the confidence set in CDS price-making. In general this relates to the expectation that contracts are made without causing legal disputes, or, how credit events are standardized by the ISDA, in particular, given the fact that OTC markets are, at the time of writing, not cleared. For another thing, how prices are made, reported and quoted depends on to what extent CDS prices are accepted as such. In this context, I argue that concepts of materiality or liquidity in markets can be reformulated as forms of legitimacy production. Nevertheless, I would not have drawn on sociological systems theory in the presented depth if only liquid and effective markets would represent the condition for encountering the uncertainty to decide upon creditworthiness of securities issuers.

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45 International guidelines related to capital and liquidity standards such as Basel III and Solvency II seek to strengthen internal risk management tools independently from credit ratings, or securities spreads (BIS 2010). With the introduction of Basel III in 2013 more restrictive definitions of capital, higher minimum capital adequacy ratios and higher RWA for different securities trading activities (such as securitization, securities lending or derivatives trading) shall enter into force (Gonzalez, Sotelino & Savoia 2011: 11). It is, however, argued that the most serious failure – the contribution of Basel II to the last financial crisis is not addressed, that is the zero risk-weight of all sovereign debt (Economist 2010b; Wallison 2011).

46 Regarding price-making and reporting of CDS contracts, which both have not yet been researched, it would additionally be worth to examine how personal trust (as opposed to confidence in systems (Luhmann 1979, 1988; Schwarting 2009) via telephone dealing is established as well as affected by the confidence set in the financial organizations – be it the buyer, seller or reseller of the CDS. For the observers that not equally trade in CDS it would also be interesting to study how they confide in the reporting and compiling practices of OTC data providers, such as Bloomberg or CMA. Since CDS markets are not subject to financial clearing, not every deal is reported. Not least, the provision is largely dependent on information technologies, so that markets inevitably are interrupted by normal dangers, to rephrase Charles Perrow’s notion of accidents (1999).
Again, equally important as their environments is the question of whether and how unanticipated changes in CDS prices result in disappointed expectations legally and within financial organizations at all, for instance, how such effects are expanded and compensated by additional formal or informal conditional programs and/or purposive programming.

As financial organizations and their environments are furnished with different mechanisms to cope with uncertainty and disappointments about creditworthiness expectations, the same CDS price, or the same rating grade, may thus empirically result in very different – particularly differently risky – decisions within financial organizations.

Briefly, by following a constructivist notion of risk management, the question of how creditworthiness marks, such as ratings grade or the level of CDS prices, are evaluated as well as how disappointments are encountered, depends likewise on the risk appetite. With other words: Uncertainty absorption is thereby accompanied by new risk production associated with using new, hitherto unseen and unused, opportunities.

Yet when financial organizations consider CDS prices as an alternative instrument to create apparently reliable creditworthiness expectations they have to learn how to cope with conflicting third-party evaluations. With other words: What happens when a certain securities issuer (or his assets) is upgraded investment grade while the respective CDS price is rising at the same time, and vice versa? I address this question in the following section.

## 4. Risk Transformation as Risk Management in Financial Organizations

For the purpose of understanding more deeply how contrary ratings grades and CDS prices are recognized and thus interpreted within financial organizations, it is worthy to recall the notions of decision and expectation within sociological systems theory. In contrast to accounts that conceive of decisions as preferences, Luhmann suggests to view as a decision any behaviour that reacts towards an expectation directed towards it (1994: 278). An action only becomes a decision when it is exposed to the pressure of expectations for only then, the possibility is established to adhere to the expectation or to deviate from it. Each time a decision fulfils an expectation, the organization’s self-observation reaches the realms of manageable possibilities. Thus, only the building of (internal or external) expectations turns the behaviour into a decision and thus makes an event recognizable. It is then to decide whether to abide a certain expectation or refuse it. In this way, Luhmann’s notion of expectations includes the distinction of conform/deviant (1994: 279).

The importance of this distinction is particularly evident for decision-making in financial markets. Due to its high uncertainty and volatility market actors direct their behaviour towards their expectations upon other actors’ behaviour. Expectations of market participants are based on an assessment to what extent past behaviours meet the role expectations associated with occupying a particular market position.

If we apply this argument to the functional comparison of CRAs and CDS, it becomes clear how credit ratings (and CDS pricing) produce the expectation to orientate one’s behaviour towards the expectation to decide consistent with credit ratings (and CDS prices) or not. Thus, to conform to or to deviate from credit rating or CDS prices – both as materialized forms of expectations on market behaviour – remains a risky decision, independent of whether the rating is classified as investment grade or speculative grade or if the CDS price is relatively high or low.
This holds true even in the case that a credit rating and the respective CDS value are not contradictory. The reason is that the already mentioned relation of risk transformation and risk production derives from two forms of contingency inherent in each decision. Here, before making the decision the risk of opting between conforming and deviant exists, and after making the decision risk emerges of having opted for the wrong alternative. Consequently, only the anticipation and remembrance of an expectation gives the ability to decide and to observe risky decisions that both guarantee the connectability of decisions in organizations (Luhmann 1994: 282).

This argument illustrates why the only possibility to reduce risks is the observation of consequences associated with own decisions for it is this observation that enhances options to ensue follow up decisions (Japp 1996: 56). Japp describes the management of the self-reference of risks as asymmetric incongruence (1996: 67-78, 2000: 25-31). He reserves the term for functionally complementary contexts of risk taking. Generally speaking, risk aversion and risk appetite represent incongruent perspectives of one distinction, so that none of the two sides is a rational solution to meet with uncertainty: Acting accordingly to risk aversion, for instance by trading supposedly secure bonds that are rated investment grade or that show a low CDS price, financial organizations run the risk to miss the opportunity of benefiting from higher or more profitable chances. Contrary, being prone to accept risks, e.g. trading bonds that are classified as speculative or whose entities dispose of a high CDS price, runs the risk of losing capital. And the loss of capital is likely to be compensated by trading with even higher speculative bonds. Thus, either way the opting for one side cannot be considered rational in any case.

For making both sides available despite their incongruence, Japp proposes to let the distinction of risk aversion/risk appetite re-enter either on the side of risk aversion or on the side of risk appetite. For instance, the re-entry of the distinction on the side of risk appetite puts the option of risk aversion into perspective. Since both sides of the distinction are inserted on the side of risk appetite, the latter is dominant but relativized by risk aversion.

The same is true for to the incorporation on the side of risk aversion. In this manner, an observer enhances the range of options available for consideration. And each time the insertion establishes an asymmetric relation of options that are considered as incongruent. Notwithstanding, accepting Japp’s account the form of asymmetric incongruence increases the capacity of action orientation in the sense of enlarging possible connections of joint decision-making. Thereby, the possibility to make decisions is advanced in a transitional manner. This is due to the fact that no third value is inserted that could entail too much uncertainty. Rationality seen from this point of view is created by the notion of taking decision options into account that comply with a system-specific mode of selectivity.

Thus, rationality can be defined as anything that enhances the possibilities of dealing with decision outcomes (Japp 1996: 56, 77, 2000: 28-31).

Either risk perspective, that is, to act deviant or consistent with rating grades (and/or CDS prices), can be regarded as functionally complementing one another. The concept of asymmetric incongruence thus highlights that both rating grades and CDS prices cannot be conceived of as substantial or even substitutional alternatives. Instead, the presented comparison debunks that credit ratings and CDS prices arise as different – for one thing more politically formalized and for another more informal – forms of conditional programs upon which financial organizations have decided to rely on. As a matter of fact, decisions to complement the reliance on rating grades with the observation of CDS prices are accompanied by growing decisional pressure not least to look at CDS prices but at the possibility that CDS prices may alter, remains a risky decision.
Nonetheless, the purpose of this study is to explicate by means of strict constructivist risk sociology that both expectation structures help solving the problem of uncontrollable credit expectations in financial markets, notably, by building up apparently reliable credit expectations. In any case, the adherence presupposes uncertainty as a necessary resource and effect built on decision-making in financial organizations. Risk transformation thus is to be understood as a form of self-induced search and tolerance of uncertainty characterizing a central feature of financial organizations.

Opposed to other commercial enterprises, financial organizations aim to enhance their own creditworthiness and to reduce their costs of refunding by interpreting third-party observations as nevertheless uncertain indications of other enterprises’ creditworthiness. The consideration of CDS prices simultaneously has the effect to unsettle entrenched organizational credit purposes and practices and thus to gain flexibility in reacting to changes in the market environment. In this way, the functional comparison of rating grades and CDS prices throws light on crisis management that can be understood as a capacity to doubt and drop routines in order to detect and cope with potentially costly ambiguities and unpredictabilities. Capitalizing on uncertainty in this manner, however, includes possible repercussions. Last, to accomplish functional comparison, I highlight subsequent problems of risk transformation with respect to a constructivist notion of risk management.

As I have stated above, whether a loss is attributed to external or internal references lies in the eye of the beholder. Nevertheless, there are events and situations where the risks taken by financial organizations become a danger for others, or even for the same organization. Luhmann argues that in the accumulation of the effects of decision-making, in long-term consequences of decisions no longer identifiable, in over-complex and no longer traceable causal relationships, there are conditions that can actuate considerable losses without these being attributable to specific decisions. Yet without decisions having been made such detrimental effects would not have occurred (Luhmann 2008: 26). Such events can be viewed as dangers as long as alternatives are lacking.

In financial markets, I suggest that these dangers identify subsequent consequences of risk transformation for there are events, such as so-called counterparty risks or systemic risks. While the former defines losses associated with the failure of a counterparty to adhere to its debt agreement, the latter denotes that the whole financial market is affected adversely by the default of one or a few large counterparties. In light of the practices of naked CDS trading or CDS netting, where CDS protection is resold to third parties without owning the underlying reference, the triggering of a CDS reinsurance and compensation chain are likely to have cumulative impacts on relocating losses and counterparties. Since CDS contracts are traded privately on OTC markets, financial organizations do not able fully consider to what extent they may be tied to other organizations via CDS transactions chains.

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47 The abovementioned pro-cyclical effects initiated by sudden bulky downgrades to speculative grade (such as high declines at stock markets) can also be described as systemic dangers. For instance, Hand, Holthausen & Leftwich (1992: 733-752) analyzed the influence of bond rating changes on bond and stock prices. The authors found evidence consistent with a stock price response for both upgrades and downgrades. The coupling effects of rating-centered regulation in this sense may increase such dangers.

48 The default of a CDS counterparty has to be reported as liability in the balance sheet by every party involved (Arnoldi 2004: 30-32).

49 To prevent such dangers, finance ministers in the U.S. and Europe committed to move CDS and other types of derivatives onto clearinghouses. At the moment, only a small number of swaps are cleared centrally, but not CDS on European sovereign debt, even though they are traded relatively frequently. Instead, banks remain largely responsible for making sure the various parties can meet their debt obligations (Eavis 2012).
In addition, CDS are also closed for multi-name CDS based on a combination of different underlying portfolios, baskets or index tranches that create and amplify forms of complex interlinkages between different market segments, assets and financial organizations alike. The default of one or a few counterparties involved in CDS markets may also have a variety of spill-over effects spreading to markets of the underlying references or even to other parts of financial markets.

A recent example of dangers in quantitative computer trading was the flash crash on May 6, 2010.\(^5\) This breakdown was apparently the result of future orders that were generated by a high-frequency trading (HFT) firm as part of a certain hedging strategy entered at the Chicago Mercantile Exchange (CME) (Pitzke 2010).

HFT consists of programmed algorithms that are designed to make profit by capitalizing on short-term positions in equities, options, futures, or currencies. While putting on OTC trades would require a minute or two of telephone conversation, automated share trading on an organized exchange can be conducted in milliseconds and all trades have to be posted. Algorithms used in HFT, for instance, may watch for large transactions that could affect a stock’s price and make trades in a few millionths of seconds before the rest of the market reacts. Those nearly instantaneous trades and similar strategies created a market in which transactions accounted for around $8 billion in 2009. Given the possibility of trading high volumes in very short times, market fluctuations and intraday volatility increased rapidly (Giles 2010; MacKenzie et al. 2012; MacKenzie 2012; Schwarting 2014, 2015).\(^5\)

Again, the consequences of HFT practices are difficult to attribute to a single decision. Despite the current discussion in the mass media that uses the term systemic risks, risk sociologists would label such technical failures in electronic trading or program trading as dangers as long as there are no alternative instruments to these technologies.

Yet, I would say that once such events occur, they are likely to be considered in the future and are thus viewed as so-called systemic risks of financial markets. In a functional differentiated society, social systems are always exposed to decisions made by others. Those dangers, however, are mostly observed with reference to the society as a whole. From the perspective of the economy, the society – and politics in particular – is affected by economic decision-making. Nevertheless, financial organizations need to provide confidence to the self-regulation of markets, and if not, pricings or political decisions are believed to alleviate the effects of calamities (Luhmann 1991: 35, 199; 2005b: 155-156).

\(^{50}\) Taking the example of program trading in the 1980s and the near-collapse of the hedge fund Long-Term Capital Management (LTCM), Holzer & Milo describe (2004) these technical and mathematical models as second-order dangers that do not account for the influence they have on the markets as a whole when a whole branch relies on them organizationally or individually. Second-order dangers in financial markets therefore turn out to be the paradoxical consequence of the increasing sophistication and quantification of financial risk assessment. They thus can also be referred to as unintended consequences (Merton 1936, see above).

\(^{51}\) HFT estimated to account for around 30-70% of daily trading volumes, depending on the electronic stock market. By now, its impact on shaping financial markets are not well defined, but influenced by economic ideology. While proponents claim that HFT tightens spreads and add liquidity in the market, critics believe these practices are dysfunctional and unethical (Lattemann, Loos & Gomolka et al. 2012; The Economist 2011). However, HFT operations compete against each other in a zero-sum game, mostly making and losing money through arbitrage, and less via directional bets on the market designed as trend followers (Kostohryz 2011). It thus seems that it rather has a boosting than a triggering effect for as once certain securities and index values are undercut algorithms break out of predicted patterns.
Although CDS are not traded electronically, and are incompatible with investment algorithms, the aforementioned or any other (unintended) interlinkages to CDS underlyings can impinge on its price in unexpected ways (MacKenzie 2011b, MacKenzie et al. 2012). Since financial organizations transform dangers into risks via adhering to ratings grades and/or CDS prices for exploiting uncertainty, they can be seen as risk-seeking systems that invent decisions to accept the attribution – for example to invest in securities (Luhmann 2008: 26; 1990: 42).

Baecker (2008b: 134) shows that risk attribution implies a type of risk management that rests upon the sequencing, separation and redistribution of decisions in banking organizations. Acting upon risk appetite, organizational techniques are created that do not so much reduce uncertainty as deploy it in order not to miss lucrative opportunities. This argument also holds for the functional comparison of rating grades and CDS prices. Both forms of risk transformation are not realized to cope with organizations or novel technology itself but for the purpose of generating gains by resorting to uncertainty. In general, with the development of technologies and organizations in modern societies the degree of contingency and the concurrent ignorance of outcomes are increasing. At the same time, the potential for making subsequent decisions is enhanced so that higher risk appetite is combined with riskier opportunities in order to make profits (Japp 1992: 35; Luhmann 2005b: 153-157).

Decision problems and risk transformation in financial markets are highly dependent on time as the only remaining resource in an increasing self-referential economy (Arnoldi 2004, 38; Esposito 2011). And it is the short time horizon of CDS prices that makes the market-based reliance attractive as an alternative to adhere to the internalization of organizationally based credit rating expertise. As much as it provides different expectations in factual sense it builds new expectations in a temporal sense. In this vein, CDS prices design a sort of new decision time.52 Yet both can become subject to a loss of confidence, either in markets as well as in organizations.

Taken together, what this account suggests is that financial organizations represent profitable dealers of risk transformation by way of establishing conditional programs for judging creditworthiness. The need to gather information means to execute transactions at their peril rather than seeing themselves as victims of external circumstances. In a competitive market, banks have to seize any available opportunity to increase their return on capital.

Nevertheless, the relationship between concomitant uncertainty reception and risk recreation must remain latent in order to protect the organization’s structural selectivity, namely its reliance on absorbing creditworthiness marks as internally produced control illusion. Otherwise no decision would be made at all. Yet financial organizations not least are capable of producing risks but also to take their self-made risks into account to further decision-making (Baecker 2008b: 117-126; The Economist 2010b).

52 In contrast to the longer time horizon of credit ratings that are likely to be reassessed every three to six months and are often announced in advance, CDS prices thus imply higher decisional pressure than the respective credit rating since they can instantly (at least daily) be monitored by third party observations of the financial press, in particular by private blogs such as www.zerohedge.com or soberlook.com. Thus, from the perspective of the mass media instantly updated CDS prices provide more – so to speak high and low – news values (Luhmann 2004a: 59) for creditworthiness observers. With reference to a non-quantitative concept of present (Luhmann 1990b: 95-130; Esposito 2007), I would thus argue that the contraposition between rating time and CDS market time reveals the fact that there are different decision times that need to be synchronized. Each time a CDS price changes, it actualizes a new present in form of a different hitherto non-actual horizon of past and future.
This argument corresponds to the self-referential notion of risk that even the decision not to decide is risky since it may miss profitable opportunities. Once an event is attributed to internal decision-making, financial organizations cannot ignore it but rather more have to manage it. In so doing, they make sure to conceive of themselves as a part of financial markets.

5. Conclusion

On the basis of a functional analysis of decisions on the creditworthiness of securities issuers in financial markets, I have argued for a risk-sociological perspective that recognizes the epistemic merits of uncertainty absorption and risk production. By comparing the functions of rating grades and CDS prices two different types of risk transformation have been identified: Both rating grades and CDS prices make a functionally contribute to absorb uncertainty by the provision of conditional programs. In this way, the binary form of limiting value of rating grades (investment/speculative) and CDS prices (higher/lower) permits to turn the uncontrollable danger of debt losses into the risk of financial organizations to conform to credit rating grades and/or on CDS prices (or not).

The simultaneous relationship between uncertainty absorption and risk production depicted by this functional analysis, implies that neither CRAs nor CDS replace other mechanisms of building reliable creditworthiness expectations used in financial organizations. As third-party observations both feature different forms of time horizons and system trust. Whereas CRAs are providers of discrete and long-term assessments of creditworthiness, CDS prices are more adaptive to distress in markets. This is why the latter are also referred to as marks or as an early warning model that incorporates short-term credit expectations in financial markets.

Additionally, both sources of materialized expectations functionally (opposed to substantially!) complement each other assuming the shape of conditional programs that help to decide about creditworthiness in financial organizations. The function does not give any hint for the quality of credit assessments observed by respective market observers: Every decision – deviant or conform with organizationally established credit expectations on certain securities issuers – unsettles internal risk assessment and data research. It does not substitute alternative qualitative and quantitative evaluations, though, such as forecasts of corporate income and expenditures, the issuer's stock price volatility, indices or macroeconomic variables. It is of course an empirical question as to what extent alternative indicators complement comparisons of ratings and CDS prices. As exhibited above, the consideration of alternative indicators can be understood as a compensatory arrangement to react to contradictory events, disappointments and crises in financial markets through the destabilization of internal structures. In evaluating different (third-party) indications of creditworthiness financial organizations increase their structural variability by way of lowering their threshold of change (Luhmann 2014: 186).

53 Apart from the ABX index consisting of CDS based exclusively on subprime MBS used as a specific mark for subprime portfolios studied by Stulz (2010) and MacKenzie (2011b), there are traded credit indices such as the CDX North America, the Markit iTraxx SovX Western Europe Index covering 125 names from the Eurozone region or the Markit iTraxx Europe Crossover comprising the 40 most liquid sub-investment grade names. Theses indices render publicly available and constantly updated horizons of comparisons based on mutual market observations. An increase is deemed to signal deterioration in expectations of credit quality.
It is this lowering of their threshold of change that permits financial organizations to become more sensitive to market environments. For instance, one thereby can explain that despite designated CRAs being a major source of creditworthiness indicators especially for rating-sensitive investors (such as politically constrained insurance companies) even smaller rating firms – most notably those which had investor-paid business models – were able to survive (White 2010). Such smaller firms provide compensatory, apparently reliable expectations on creditworthiness for financial organizations, particularly relevant in times of crisis.

In general, Luhmann states that the more alternatives are available and the more losses (or chances) are subject to financial decision-making, the more risks (and dangers) come into consideration (Luhmann 2008: 219-231). What remains is that, as Japp claims, the only rationality in modern times is trying to take decisions that maintain and enhance future decision capacity (1996: 56-78; 2000: 25-31). Thus, his concept of asymmetric incongruence can be read as a radical constructivist reformulation of Merton’s institutionalized scepticism (1973; Frey & Osterloh 2011) and Power’s account on preparing for financial surprise (2011).

Yet in contrast to analyses of ratings and CDS prices conducted by economists (Deutsche Bundesbank 2004; Pu & Xiao 2009)\(^{54}\), the sociological reformulation and specification strongly debunks epistemological differences. Following Luhmann’s risk sociology and particularly his concept of limiting values, I tried to show that it is the bipolar scheme of rating grades and CDS prices that is crucial for the understanding of how uncertainty is absorbed and reproduced via risk transforming conditional programs designed in financial organizations. Furthermore, with reference to Japp’s concept of asymmetric incongruence, I illuminate how expectations on creditworthiness orient decisional processes in financial organizations. This approach highlights the self-reference of risks and the latent function of apparently reliable creditworthiness expectations, and thus opposes the hypothesis of information-efficient markets.

It was not the aim to compare which indications of creditworthiness are used most in the market, nor in certain organizations, in particular. Rather more I tried to elaborate on a constructivist notion of risk management, which I described as risk transformation, viewing financial markets not only as crucial for profit making but also as a means of uncertainty production and absorption. The insights gained from functional analysis debunk that economic sociology and sociology of finance could considerably benefit from comparing different organizational practices in financial markets. Generally speaking, exploring functional equivalents in financial organizations has the potential to become a promising managerial instrument.

Overall, the theoretically illustrated functional comparison of credit ratings and CDS prices shed light on how financial organizations adopt third-party evaluations of unsecure creditworthiness expectations. In particular, the comparison showed how they convert their observations into uncertainty-absorbing formal and informal decision premises, namely, in the assumed form of conditional programs.

\(^{54}\) In particular, Vink & Fabozzi (2009) found empirical evidence that ratings have a major impact on movements of primary market spreads. Conversely, in applying statistical methods Daniels & Jensen (2005) revealed that CDS prices react faster and more significantly to changes in credit ratings – in particular to downgrades – than bond spreads. What's more, rating announcements are often anticipated by market participants (Hull, Predescu & White 2004), that is to say the threat of an official downgrade can resonate with the real-time unofficial downgrade that is already underway in the CDS market. For any statistically controlled comparisons, however, the accuracy of CDS prices on unrated securities has to be taken into account. Further, Vink & Fabozzi (2009) conclude that despite tight politically induced reliance on ratings, financial organizations also take factors into account that CRAs state to consider. The authors argue that there is reason that the notion of pure reliance on ratings may be overstated.
Related fields of research are first of all other mediated markets (Zuckerman 1999) such as those for stock, pharmaceuticals and academic publishing. With regard to methodological implications, the perspective of functional analysis trains the observer to look for new and more abstract criteria of comparison, to consider both different solutions for the same problem and associated side effects. In many cases this method forces the researcher to question certain structures that are taken for granted, as Cristina Besio and Andrea Pronzini conclude (2010).

Nevertheless, the results of this account are not limited to theoretical risk analysis of uncertain creditworthiness assessments or to the methodological approach applied here. Rather more, the question of the empirical differences in relying on rating grades and/or CDS prices shaped within concrete financial organizations, yet, is an important one since the implications of the possible answers revisit the boundaries and self-logics of financial markets and organizations themselves. Unfortunately my inquiries addressed at several financial organizations to conduct empirical research on how certain financial organizations observe and translate ratings and CDS prices into their formal and informal structures were denied. All the more, in this last section, I turn to questions worth asking for empirical follow-up research. I divide these questions into three fields of related structural problems.

a) Forms of Learning and Trust in Financial Markets

Observations considered as deviant to rating grades of CRAs are likely to provoke disappointments contributing to what Luhmann calls a turn from a style of normatively built expectations to cognitively adapted expectations (1972: 42-49).

For this shift Luhmann reserves the term learning (1972: 43-50). Strulik & Willke (2007), for instance, have provided insightful contributions to the question of how such a turn can be researched empirically in global finance in general and banking supervision in particular. Studying such collective shifts in decision-making about creditworthiness would shed light on the disjuncture of impersonal trust (Shapiro 1987) and confidence in markets (Luhmann 1979, 1988, Schwarting 2009) – compared with confidence in organizations – and how both forms of expectation building interrelate with each other in financial organizations.

Considering mechanisms to cope with disappointments in financial organizations another question is: What happens when third-party observations of creditworthiness are less regarded as credible hints?

Luhmann argues that any formal organization includes its own deviation or negation inscribed in its informal structures. If the illusion of resilience (Power 2011) has excessively led to frustrations, the rigid absorption of creditworthiness marks and the reliance on own decisional programs can be rebalanced by the presence of other more informal programs and vice versa. As Lipartito found: We are used to thinking of credit reporting in third-party provided quantitative and standardized forms, but the form mutual observation and evaluation about credit in the 19th century was largely a narrative one when third parties where mostly not organizations but persons. Through close assessment of a person’s character, as revealed in their life story, merchants and lenders established a sense of the risks they undertook when extending credit (Lipartito 2011).
b) Forms of Credibility and Organizational Reliance

Second, in terms of further research, systematic research should be devoted to empirically investigate how rating grades and CDS prices not only have become relevant as a decision-making program for the elaboration of creditworthiness historically but also how both program interfere and resonate with other, e.g., personal, forms of normative expectations used inter- or intra-organizationally. For instance, questions worthy to address are how potential tensions between conflicting decision premises are thereby managed and to what extent the consideration of alternative decision premises might affect financial organizations for encountering changes in adhering on previous third-party observations.

I suppose that related studies would illuminate the limits of formalizing forms of reliance on third-party observations of creditworthiness, such as the limits of creating alternative CRAs or securities markets (credibility by confidence in systems and media, such as markets), that thereby can set conditions for advancing and adapting more public standards (credibility by certification and imitation) which can involve an overreliance on certain persons, roles, decisional programs or societal values (Luhmann 1972: 64-116) (credibility by inscription and internalization).

Regardless of what the general effects of such normative or conservative forms of structural resilience are, the question of how the organizational reliance on rating grades and/or CDS prices interferes with other functional equivalents. Yet, these are less standardized, less materialized and thus less visible forms of third-party observations – such as personal relations between members of different companies or personal ties between member belonging to different subunits of the same organization – at the time of writing, are unexplored. Not least, the differences between financial markets and organizations as providers of third-party observations have the potential to revisit and to overcome classical dualisms of markets and hierarchies, or structure and agency, and are thus worthy of further consideration.

c) Price-building in CDS markets

Finally, I recommend systematically conducting empirical research about the price-making of CDS contracts. In applying the embeddedness framework Uzzi (1999) and Uzzi & Lancaster (2004) convincingly found that the price of lending or law services is more likely to lower if a firm’s network of banking relations or law ties consists of a mix of both embedded ties motivating network partners to share private resources and arm’s-length ties facilitating access to public information on market prices and service opportunities.

Despite the study of Hiß & Rona-Tas on price-making in commercial and corporate credit markets (2011) and MacKenzie’s work on the ABX index (2011b), particularly in the CDS market where prices are built over the counter, personal trust and the influence of personal ties on capital costs have not yet been explored.\(^{55}\) For instance, following MacKenzie’s performativity approach on the materiality of price-making, it would be interesting to investigate to which extent CDS markets could (not) be described by the canonical mechanism ideal of a single universally-knowable market price (Carruthers & Stinchcombe 1999), and what influences their functioning as a knowledge-generating device. It would be fruitful for the further engagement between new economic sociology, sociological systems theory cultural sciences and ethnography and organizational studies alike to advance empirical research on these areas.

\(^{55}\) As mentioned above Hiß & Rona-Tas (2011) study personal trust rather than principal-agent theory.
References


