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COMPUTERIZATION AND THE ABACUS: REPUTATION, TRUST, AND FIDUCIARY RESPONSIBILITY IN INVESTMENT BANKING

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Computerization and the ABACUS: Reputation, Trust, and Fiduciary Responsibility in Investment Banking

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In a market system based on trust, reputation has a significant economic value. I am therefore distressed at how far we have let concern for reputation slip in recent years.

Alan Greenspan, October 2, 2008
Markets and the Judiciary Conference
Sandra Day O'Connor Project
Georgetown University

On April 16, 2010 the Securities and Exchange Commission (SEC) filed a civil complaint against Goldman Sachs with the U.S. District Court (Southern District of New York). The complaint alleged that Goldman engaged in fraud in connection with a 2007 synthetic collateralized debt obligation (CDO) transaction, ABACUS 2007-AC1 SPV (ABACUS).¹ The immediate capital market reaction was very negative: Goldman Sachs's share price closed down more than 13 percent on the day, reflecting a reduction in market valuation of about \$10 billion. This price reaction anticipated the very hostile reception that the firm received in subsequent Congressional hearings, and, apparently, in the court of public opinion. It was also well in excess of the \$550 million settlement that Goldman agreed with the SEC on 15 July, 2010.²

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- 1 Under the CDO transaction, the ABACUS special purpose vehicle (SPV) sold notes whose value was tied to the value of a portfolio of residential mortgage backed securities (RMBS). The transaction was "synthetic" in that the reference portfolio was not purchased by the SPV, and, hence, did not appear on the SPV's balance sheet. Instead, the SPV used the money it received for selling the notes to purchase a portfolio of high-grade securities. These securities were used to collateralize a credit default swap (CDS), under the terms of which the SPV received regular payments in exchange for indemnifying its counterparty against losses incurred on the reference portfolio. These payments were used to enhance the return that accrued to investors in the SPV's notes, who bore the economic risk of default on the reference portfolio. We discuss the transaction in greater detail below.
 - 2 Goldman acknowledged that its marketing material for the ABACUS transaction "contained

The SEC's complaint is likely to be a watershed event for the investment banking industry. We argue in this essay that, in turn, the complaint reflects far-reaching structural changes in investment banks. The changes pre-date the financial crisis, and they are likely to result in further significant upheavals in the banking industry. The political and regulatory response to this change will affect the path of future upheavals, and, hence, will have a profound impact upon the future evolution of the investment banking sector. The \$10 billion capital market reaction to the SEC's complaint reflects this impact.

Goldman Sachs remained committed to the partnership form for longer than any of its bulge-bracket investment banking counterparts and, as a result, it was a relative latecomer to the large-scale risk-taking associated with the CDO market. Moreover, Goldman is widely regarded as one of the most reputable industry players. The ABACUS transaction was not particularly innovative, and its execution was not unusual.³ In singling Goldman out for criticism, the SEC is effectively criticizing received norms and ways of doing investment banking business.

The SEC's complaint focuses on the nature of an investment bank's fiduciary responsibilities to its counterparties. Fiduciary duties rest upon trust. But the role that trust plays in investment banking has changed significantly in recent years. Differing perceptions of the changing nature of fiduciary responsibilities may therefore lie at the heart of the dispute between Goldman Sachs and the SEC.

Trust is important in trade where the formal contracting environment is weak. A weak contracting environment may reflect ineffective or corrupt courts, or it may reflect technological barriers to recording information, and proving it in court. For investment banks, whose main stock-in-trade is information, the latter problem predominates:⁴ notwithstanding its centrality to economic life in developed economies, data about the quality of a stock issue or about market conditions is typically impossible formally to contract upon. Parties that require this type of information therefore rely upon trusted intermediaries to provide it. Such intermediaries place their reputations at stake when they trade; any factor, whether technological or legislative, that undermines the value of a reputation also undermines the intermediary's incentives and, hence, the level of trust that is vested in it.

incomplete information," but did not admit the SEC's charges. Goldman's shares closed 4.4% higher on the settlement date; at this level, they were still 20% below their level before the SEC filed charges. See "Goldman Sachs settles with SEC," *Financial Times*, 7/16/2010.

3 The first ABACUS transaction (ABACUS 2004-1) "was developed in response to IKB's desire to invest in AAA, AA, and A rated CDO notes referencing a portfolio of high-grade asset-backed securities" (Submission on Behalf of Goldman, Sachs & Co. in the Matter of ABACUS CDO, SEC File No. HO-10911, September 10, 2009, P. 10). ABACUS-2007-AC1 SPV refers to the bankruptcy remote legal entity, or "special purpose vehicle," created for the sole purpose of the transaction in question. IKB is a German Bank that invested in multiple previous ABACUS transactions and was the primary note holder in the 2007 deal.

4 Although the earliest investment banks emerged from the trans-Atlantic cotton trade, where the former effect was the most important obstacle to trade: see Morrison & Wilhelm (2007, chapter 4).

Historically, investment banks were small, lightly capitalized, private partnerships that were largely engaged in advisory work. The quality of client services was hard to measure, and almost impossible to prove in court. Reputation, the wellspring from which trust flowed, was the central asset for investment banks. The extent of the investment bank's fiduciary responsibilities was clearly understood by banks, clients, and regulators.

We show in this essay that technological changes have made some investment banking activities, particularly trading businesses, more susceptible to formal contracting. The incentive to maintain reputation has therefore eroded; trust-based contract has withered for the institutional traders that operate in these businesses, where any action within the formal rules is regarded as fair game. Regulatory input into rule creation is increasingly important in this setting, and fiduciary duties have been massively attenuated.

At the same time, trust and reputation are still central to advisory businesses, which remain unsusceptible to codification and formal contracting. In these markets, attempts at formal regulation inevitably rely upon imperfect information; they may therefore overturn the reasonable expectations formed by parties to a reputational contract. This lowers the rent that can be derived from a strong reputation, and so reduces incentives to maintain reputation. Formal regulation in very tacit businesses can therefore undermine the informal mechanisms that promote adherence to fiduciary responsibilities.

Between the highly codified activities of the trading room, where formal regulation has an increasing role to play, and the very tacit work of the advisory firm, where heavy-handed regulation may be counterproductive, lies a range of highly complex transactions that require high levels of technical skill, as well as reputationally intermediated solutions to severe informational problems. The boundary between private interest, where black-letter contracting is possible, and fiduciary responsibility, where it is not, is ambiguous in these complex transactions. As a consequence, so is the appropriate role of the regulator. The ABACUS transaction is a good example of this more complex environment, although it is by no means exceptional.

In short, increased codification has blurred the distinction between private interest and fiduciary responsibility. It has resulted in the formation of large full-service banks and, within those banks, it has shifted the power base from the advisory function to the trading room. This has undermined the power of reputational incentives, and has made it harder to design appropriate regulatory structures.

We believe that these changes set the stage for the 2007-09 financial crisis. It became increasingly hard to reconcile individual interests with those of financial institutions and their clients. It proved impossible to resolve these conflicts with risk-management systems, and poorly conceived systems may even have aggravated the problem. In this environment, a one-size-fits-all approach to regulation is doomed to fail: while the pre-crisis light-touch regulation was appropriate for advisory businesses where reputation concerns were paramount, it was dangerous in highly codified markets, and in situations where banks were perceived to be "too big to fail."

1. The Abacus Deal

1.1. Critical Dispute

Although the details of the Abacus deal are involved, the idea that underpinned it is simple. In late 2006, the hedge fund manager John Paulson approached Goldman seeking to establish a short position on a portfolio of Baa2-rated 2006-vintage residential mortgage-backed securities (RMBS).⁵ Because the transaction was initiated by Paulson rather than by Goldman, Paulson's initial request was termed a "reverse inquiry." Goldman identified counterparties for the transaction with Paulson and, because the trade was a complex one, served as an intermediating counterparty for the trade with all of the participants. Goldman did not lay off all of the exposure to Paulson's trade, and so retained a small long position in the portfolio of RMBS.

The ultimate counterparties to Paulson's trade were the German bank IKB Deutsche Industriebank AG (IKB), and ACA Management LLC (ACA). ACA had significant expertise analyzing RMBS credit risk, and, in addition to assuming long-side RMBS risk, they agreed for a fee to select the reference portfolio of RMBS. In fact, Paulson also played a significant role in selecting the portfolio. This fact is not contested. In 2007, participation in the reference portfolio selection process by the party bearing the most economic risk was not unusual in this type of transaction. Nevertheless, the SEC claimed that Goldman's marketing materials were false and misled investors by representing "that ACA selected the reference portfolio while omitting any mention that Paulson [...] played a significant role in the selection of the reference portfolio."⁶

Goldman was also alleged to have "misled ACA into believing that Paulson was investing in the equity of ABACUS 2007-AC1 and therefore shared a long interest with CDO investors"⁷ The reference to "equity" here has a specific meaning that we discuss below; the allegation suggested that ACA believed that Paulson held a very risky long position in the portfolio, and hence that he was confident of its quality.⁸ The SEC further alleged that, had ACA been aware of Paulson's short position, it would have been reluctant to have Paulson participate in the selection process for fear of damaging its reputation and would likely not have served as portfolio selection agent.⁹

5 SEC File No. HO-10911, September 10, 2009: p. 11.

6 Paragraph 36, SEC complaint.

7 See for example paragraphs 32 and 44 of the complaint.

8 The complaint supports this allegation by referring to the memorandum in which the ACA Commitment Committee approved the deal, and described Paulson as an investor "in the 0-9% tranche of a static mezzanine ABS CDO backed 100% by sub prime residential mortgage securities": See paragraph 51 of the complaint.

9 Paragraph 45 of the complaint.

1.2. Deal Structure

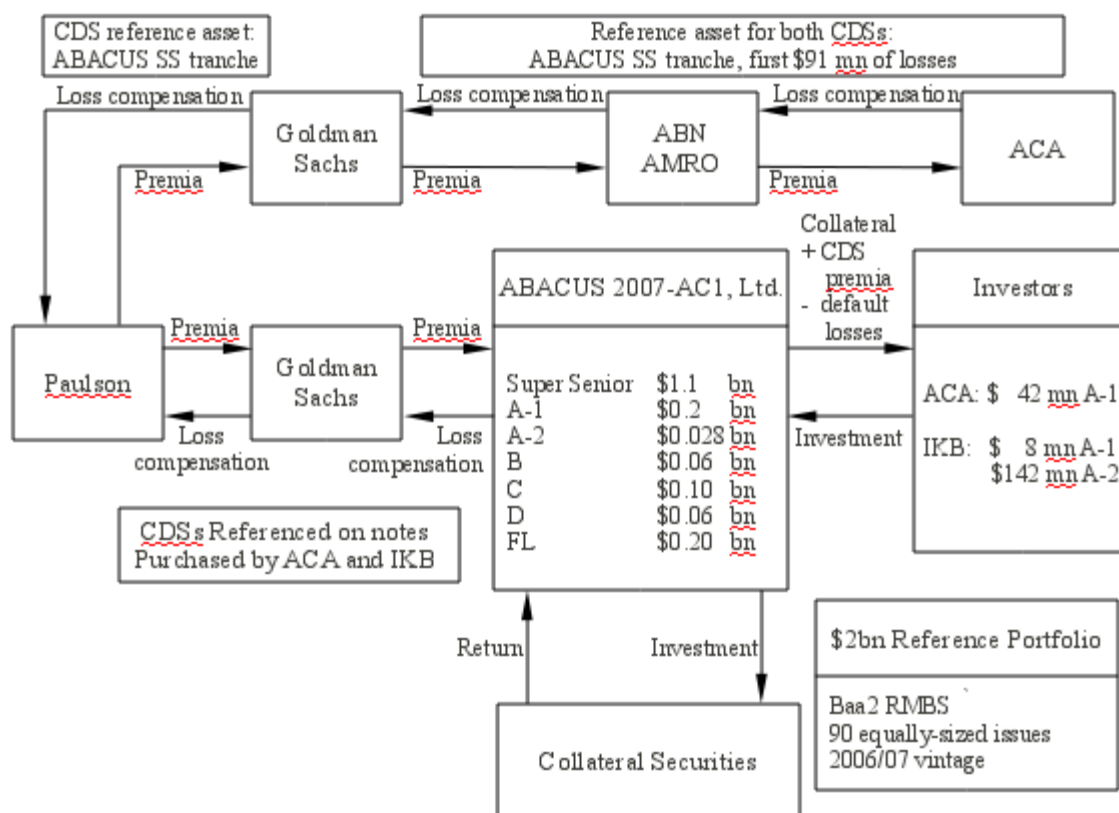


Figure 1: The Abacus transaction.

The context of the SEC’s actions can be best understood in light of a more detailed explanation of the transaction. It is illustrated in Figure 1. At the heart of both the deal and the SEC’s complaint is a portfolio of \$2 billion of RMBS. This comprised 90 equal-sized Baa2-rated securities, originally issued in 2006.¹⁰ The design of this portfolio was initiated by Goldman, who provided Paulson with a spreadsheet listing securities that reflected his rating and vintage preferences. He suggested 123 securities for inclusion in the reference portfolio. In early January ACA began meeting with Paulson and Goldman representatives to negotiate the structure of the reference portfolio. ACA rejected more than half of the original 123 securities suggested by Paulson. Negotiations continued over the course of the next month¹¹ and, according to Goldman’s September 10, 2009 response to the SEC’s Wells notice, included IKB.¹² ACA’s Commitments Committee approved participation as the selection agent on February 12, 2007.¹³ “On or about February 26, 2007,” ACA and Paulson agreed to a reference portfolio containing 90 RMBS

10 SEC File No. HO-10911, September 10, 2009, p.11.

11 Paragraphs 26-35 and 46-51, SEC complaint.

12 SEC File No. HO-10911, September 10, 2009, p. 24.

13 Paragraph 51 of the SEC’s complaint.

bonds of the risk and vintage sought by Paulson.¹⁴

The deal was structured as a securitization. In a traditional securitization, an economic agent transfers its ownership of a portfolio of real or financial assets that it has originated to a new company, or “Special Purpose Vehicle” (SPV). The SPV issues notes backed by the cash flows generated by the bonds, and returns the proceeds from the notes to the originating agent. Transferring the assets to a SPV ensures that the securitization deal is unaffected by the bankruptcy of the originating agent, and, similarly, that holders of securitized notes have no claim upon the originating agent after a payment default.

The ABACUS transactions were *synthetic* securitizations. Synthetic securitizations were originally a response to the cost and legal complexity of transferring the originator’s assets to the SPV in a traditional securitization. Instead, the originator in a synthetic deal keeps the assets on its balance sheet, and is indemnified against losses on those assets by the SPV, via a transaction called a “credit default swap”. The SPV’s indemnification is credible because it invests the proceeds from the notes it sells in high-quality securities upon which the originator has first claim after default. In exchange for providing protection against default loss, the SPV receives regular payments from the originator, which are used to enhance the returns generated by the collateral securities, and so compensate the note holders for the risk of default.

The ABACUS 2007-AC1 deal has many of the features identified above. As discussed above, and illustrated in Figure 1, there is a reference portfolio of 90 2006 vintage, Baa2-rated securities. The SPV, a Cayman Island-incorporated vehicle, created notes backed by these assets for sale to investors. These are organized in a standard “waterfall” structure, under which notes in the hierarchy illustrated in the Figure are senior to those below them. Hence the \$1.1 billion Super Senior Tranche incurs no losses until everything below it has been wiped out, the \$0.2 billion of A-1 notes incur losses only after A-2 note-holders have lost everything, and so on. The FL, or “First Loss”, notes are the riskiest, and are the fraction of the portfolio that the SEC referred to as “equity.”

Proceeds from the sale of ABACUS notes were used to purchase collateral securities, and these were used to collateralise a credit default swap with the originator, Goldman Sachs, under which the ABACUS SPV protects Goldman against losses incurred on the reference portfolio. Goldman Sachs also provided some hedging trades to the SPV (basis swaps and collateral puts), which we do not illustrate.

The ABACUS transaction has two important features. First, none of the parties to the transaction actually owns the reference portfolio. Compensation payments under the credit default swap are based upon the default losses that a holder of the reference portfolio would have experienced, had he existed. The payments that Goldman Sachs received under the terms of its credit default swap therefore represented profit, not compensation. It passed these profits on by trading an opposing credit default swap with the same reference portfolio with Paulson.

¹⁴ Paragraph 35, SEC complaint.

The second important feature of this transaction was that not all of the notes that ABACUS established were sold. In the event, only IKB and ACA invested before the deal closed on April 26, 2007: ACA bought \$42 million of the A-1 notes, and IKB bought \$8million of the A-1 notes and \$142 million of the A-2 notes. The losses from these notes were again calculated as they would have been had every note been sold. In practice, therefore, neither Paulson nor anyone else held the equity for this transaction. The collateral portfolio consisted of \$192 mn of securities. A securitization deal of this type, which does not generate sufficient funds to purchase the reference portfolio, is referred to as an *unfunded* transaction.

The sale of the A-1 and A-2 notes ensured that they could be rated, and both received a Aaa rating. The super senior tranche, which had higher seniority than either, was therefore at least of Aaa quality. Paulson wanted to short this part of the deal: that is, to profit to the extent that defaults exceeded 45% of the notional value of the \$2 billion reference portfolio. He established this position by entering into a credit default swap with Goldman Sachs, referenced by the Super Senior tranche of the ABACUS reference portfolio. This CDS is illustrated at the top of Figure 1. Goldman Sachs was unable to pass the whole of this position on, but ACA was willing to sell default protection on the safest \$1bn of the Super Senior Tranche. Goldman was unwilling to accept ACA's credit risk without collateral, so ACA's parent, the Dutch bank ABN AMRO, intermediated the trade:¹⁵ Goldman was therefore exposed on this CDS only if reference portfolio losses exceeded 50%, and both ABN AMRO and ACA failed.

Note that the chain of \$1.1 billion CDS transactions was independent of the ABACUS transaction, although, like the ABACUS transaction, it referenced the Super Senior Tranche of a portfolio that no one held, and which was used only to determine the profits and losses of deal counterparties. Paulson paid Goldman a 1% upfront fee to open this transaction, and 85 basis points per year (about \$18.5 million for the first year).¹⁶ Goldman's only market exposure to the transaction was to the \$91 million of Super Senior Tranche CDS that it was unable to lay off:¹⁷ in the event, it lost the whole of this sum. Estimates of Paulson's profits are around the \$1 billion mark.¹⁸

15 At the same time, Goldman provided ABN with \$27 million of CDS protection against default by ACA: see Exhibit #125, "Hearing on Wall Street and the Financial Crisis: The Role of Investment Banks," Permanent Subcommittee on Investigations, U.S. Senate, April 26, 2010.

16 See Exhibit #125, "Hearing on Wall Street and the Financial Crisis: The Role of Investment Banks," Permanent Subcommittee on Investigations, U.S. Senate, April 27, 2010.

17 This related to default losses on the Super Senior Tranche arising as a result of defaults of between 45% and 50% of the value of the reference portfolio; losses beyond 50% were covered by the ABN AMRO CDS trade. Goldman continued to market this "junior super senior note" at least until June 5: see Exhibit #126, "Hearing on Wall Street and the Financial Crisis: The Role of Investment Banks," Permanent Subcommittee on Investigations, U.S. Senate, April 27, 2010.

18 Paragraph 5, SEC complaint.

1.3. Justifying Complexity

The ABACUS transaction required some complicated financial plumbing. Why was it necessary? In particular, why could Paulson not simply establish a short position by trading directly with Goldman Sachs?

Had Goldman taken the long side of Paulson's short then it would have assumed a significant economic exposure to the RMBS market. This would have required a correspondingly large buffer of risk capital, which could not have been employed elsewhere. For a bank like Goldman, much of whose value derives from its ability to use its market knowledge and contacts rapidly to structure deals, this would not have been the most efficient use of risk capital. A better strategy for such an institution is to re-cycle risk capital so that it can be used to support future originations.¹⁹ It is therefore natural that Goldman should seek the most efficient mechanism to pass on its transaction risk: this mechanism appears to have been the ABACUS transaction.

A secondary consideration is Paulson's need for liquidity. The notes issued by ABACUS could be rated because they were based upon a CDS swap with a rated counterparty. A straightforward bilateral transaction between Goldman and Paulson would have been unrated, and, hence, would have been less easy for third parties to evaluate. As a result, it would have been harder for Paulson to exist such a transaction before its maturity.

In short, if we accept that developed capital markets should enable traders like Paulson to take short positions, we should expect efficient mechanisms for doing so to emerge. ABACUS appears to have been such a mechanism.

2. Conflict and Ambiguity in ABACUS

It is clear even from the simplified discussion of Section 1 that the ABACUS SPV sat at the heart of a web of very complex transactions. What were Goldman Sachs' obligations as facilitator of these deals? Was it simply a sophisticated intermediary between sophisticated and willing traders? Or did it assume fiduciary responsibilities to the parties to the ABACUS transactions, and then abnegate its responsibilities to IKB and ACA by failing to communicate Paulson's intentions to them?

2.1. Transactional Perspectives on Trade

It would be easy to answer these questions if Paulson had simply used Goldman as its broker when shorting an exchange-traded stock. While there is some debate as to whether short-selling destabilizes markets or strengthens them, the practice is legal. Brokers are not required to reveal

¹⁹ See Merton and Perold (1993) and Perold (2005) for a detailed discussion on this perspective on capital allocation by financial firms. Note that our discussion ignores the potential for diversification or netting opportunities with respect to the bank's existing book. It is possible that Goldman was able to exploit such opportunities to mitigate some of its risk from the unsold Super Senior CDS.

short sellers' intentions: indeed, they are required not to reveal them, and instead "to maintain the confidentiality of client information."²⁰ The broker's clear obligation in this case is to the stock seller, and not to the buyer.

Can we think of the ABACUS deal as a more complicated version of the short-selling discussed in the preceding paragraph? That is, can we adopt a purely *transactional* perspective on the ABACUS deal? As far as we know, there is no evidence to suggest that Paulson was acting on privileged information. Indeed, several other commentators were arguing at the time of the deal that the US housing market was over-inflated. Paulson simply backed his opinions with hard cash. ACA and IKB clearly had an opposing perspective, but it does not appear to have been based upon inferior data. Both ACA and IKB were players of long-standing in this market; if one adopts a transactional perspective on the ABACUS deal, one could argue that, as professional traders, neither ACA nor IKB needed the SEC's protection.

If Paulson was not trading on inside information, did Goldman have an obligation to inform ACA and IKB of his intentions with respect to this deal? If the analogy with quoted stock short-selling holds, then the answer is surely that Goldman had a legal and a moral obligation *not* to lay bare its client's short-selling. The strength of the transactional analogy is therefore critical. It rests upon the transparency of the ABACUS deal.

Every party to the deal knew the identity of the reference securities, which were described in the offering document. Whether every counterparty understood Paulson's role in selecting the securities is contested. But the instigator of a stock short sale selects the stock, and its counterparties do now know that it has chosen to short it. Hence, if we adopt a purely transactional perspective on the ABACUS deal, Paulson's intentions were not germane. Similarly, whether he retained the equity portion of the deal would be irrelevant if the deal were treated as a series of arm's length transactions, since Paulson could easily reverse any position in a liquid market, and would not then be expected to report his actions to every prior counterparty.

In short, a transactional perspective would justify the actions of all parties to these deals by arguing that they knowingly entered into a contract for which they had shared design responsibility, and which was documented according to standard SEC reporting requirements. The only potentially useful information that may have been imperfectly revealed to ACA and IKB was Paulson's trading strategy. But, from a transactional perspective, this was the only piece of information that Goldman Sachs, as Paulson's broker, was explicitly required *not* to reveal. The ABACUS deal originated on a trading desk, and transactional attitudes to trade naturally predominate on trading desks. Perhaps it is unsurprising that the main source of conflict with the SEC was over what Goldman Sachs did and did not reveal about Paulson.

2.2. *Trust-Based Agreements*

This argument is not intended to suggest that the SEC's complaint was without foundation. It

²⁰ In re Thomas v. Heath, III, Sec Rel. No 59223, at 4 (January 9, 2009).

does, however, suggest that the complaint must rest on a non-transactional view of the ABACUS deal. If ABACUS was based on complex, *trust-based* agreements, then, arguably, Goldman had fiduciary responsibilities to its counterparties that ran deeper than its obligations under arm's length transactions.

A trust-based perspective is more appropriate than a transactional view in two types of economic situations. The first is where critical information cannot be observed, or cannot form the basis of a formal legal contract. In this situation arm's-length trade may be impossible, because both parties to the trade are unable to trust their opposite number to take the actions that make trade worthwhile. This type of non-contractibility lay at the heart of corporate finance for the whole of the nineteenth century, and for most of the twentieth century; it remains important today. A failure to resolve it results in significant economic losses: for example, it is probably impossible to write a formal contract referencing the quality of an entrepreneur's business plan, or the productivity with which he works. Hence, entrepreneurs who cannot rely upon trust-based agreements to persuade investors that their ideas are strong, and that they will not waste investment on questionable pet projects, cannot attract the capital required to develop their ideas. A failure to fund the entrepreneurial sector then undermines innovation and economic progress.

The investment bank's historic *raison d'être* was in resolving conflict in situations where the formal law was ineffective.²¹ It did so by staking its reputation on promises to both parties to a transaction. Because both parties trusted it, the investment bank received fees for making these promises and, because it valued the fees that sprang from its continued trustworthiness, it worked hard to make meaningful promises, and to maintain its reputation.

Trust-based transactions are also important in situations where, although information about the quality of traded goods or about the actions of a counterparty is observable, it is costly and difficult for one party to a transaction to perform the observation. In such situations, a trusted intermediary can put its reputation at stake by guaranteeing the quality of goods, or by guaranteeing its own or another counterparty's behaviour. Once again, concern to maintain the stream of rents that flow from this type of deal keeps the reputational intermediary honest. And devolving informationally intensive activities to a specialist reduces the costs of doing business and, once again, raises efficiency and welfare.

This type of intermediation is also practiced by investment banks, for example when they undertake to provide accurate information about a securities offering or about the quality of a stock tender offer. It is also central to the credit ratings industry, to auditing, and even to the news media.

We have argued that there is a clear transactional component to the ABACUS deal, and we argued that the deal involved no information that was not somewhere in the public domain. Nevertheless, there may have been an element of the second type of trust-based trade involved in the transaction. This was the case if any party to the deal based its decisions upon beliefs about

²¹ See Morrison & Wilhelm (2007, chapters 2 and 3).

the behaviour of Goldman Sachs, or about the quality of the trades that Goldman intermediates. To the extent that this happened, Goldman Sachs was trading on its reputation, rather than serving as an arm's length broker in a transactional marketplace. If that was the case, Goldman was balancing the interests of the various parties to the ABACUS deals, rather than merely representing one of them.

If we wish perfectly to determine whether the ABACUS deals involved an element of trust-based trade then we need to observe the beliefs of the parties to the deals. This is impossible: *ex post* statements of beliefs and intentions are hardly credible, particularly when so much rides upon them. But we can attempt to understand the norms that prevailed in the securitization markets in 2007. Did market players think that their investment bank counterparts were placing their reputation on the line when they traded, and did they make investment decisions accordingly? And did investment banks attempt to trade on their reputations?

Reputation certainly played an important part in the securitization markets in the first decade of this century. We know for example that many sophisticated investment funds relied upon the assessments of reputable credit ratings agencies rather than their own analysis when investing in securitizations. Whether this was an efficient decision or a failure of fiduciaries to shoulder their responsibilities is open to question. But it is harder to make a clear case that investment banks made tacit promises about the quality of the assets that they securitized. They certainly needed reputations as competent and reliable market makers, as technical savants, and even as experts in arcane regulations. But we are unaware of any convincing evidence that investment banks staked their reputations on statements about the likely performance of the securitized investments that they structured.

Two questions arise in this context. First, why have investment banks turned away from trust-based transactions in complex deals like ABACUS? Second, how should regulators and supervisors respond to this type of complexity?

3. The Management of Investment Banks

The publicly quoted investment bank is a recent phenomenon. Prior to 1971, all investment banks were partnerships or closely held private firms. Even after the NYSE changed its rules and permitted investment banks to float, the blue-blooded wholesale banks retained the partnership form until the mid-1980s. Goldman Sachs did not float until 1999.

Some commentators have suggested that the crisis of 2007-2009 can be attributed to the demise of the partnership form on Wall Street. Former partners at Goldman Sachs and Morgan Stanley have argued that bankers have better incentives in partnerships, where their own fortunes depended upon the continuing success of the firm, than in joint stock corporations.²²

²² See "Wall Street Shareholders Suffer Losses Partners Never Imagined," Christine Harper, <http://www.bloomberg.com/apps/news?pid=20601109&sid=a8xWme0GUnco>, February 11, 2008

We think that it is probably true that investment bankers had stronger reputational incentives in the partnerships of twenty five years ago than they do today. Their wealth was tied up in the firm, and it was extremely hard to extract. Any loss to the firm's reputation affected its ability to generate fee income and, hence hit the value of their partnership stake. Hence, as Gus Levy of Goldman Sachs has said, they were forced to be "long-term greedy:" the need to protect the firm's reputation informed every one of its partners' decisions.²³

Investment bankers appear to have changed their focus in the last two and a half decades. For example, Lloyd Blankfein, Chairman and CEO of Goldman Sachs, appeared in his recent testimony to the US Congress to focus upon the transactional role of investment banks.²⁴ Mr Blankfein stressed Goldman Sachs' trading function in dialogue with Senator Levin, stating that "we are a part of the market process. We do hundreds of thousands, if not millions of transactions a day as a market maker."²⁵

Mr Blankfein drew a distinction in his testimony between transactional business and trust-based trade. For example, when asked by Senator Levin whether Goldman is conflicted when it sells a security that it plans to short, Mr Blankfein responded "In the context of market making, that is not a conflict." [...] What the clients are buying [...] is [...] an exposure. The thing we are selling to them is supposed to give them the risk they want. They are not coming to us to represent what our views are. [...] They shouldn't care."²⁶

Mr Blankfein's testimony indicates that he views the transparency of securitization trades in the transactional way that we have argued is characteristic of stock exchange transactions: "the markets work on transparency with respect to what the item is. It doesn't carry representations. [...] Just think of buying [...] on a stock exchange or futures market. [...] You're not even supposed to know who's on the other side."²⁷

Mr Blankfein's arguments stress the transactional perspective on banking that we attributed in Section 2.1 to trading rooms. And, in line with this observation, Mr Blankfein's background is in sales and trading.²⁸ His March 2009 appointment as CEO coincided with the departure of Jon

23 When in 1976 John Weinberg became co-chair of Goldman Sachs along with John Weinberg, he wrote down fourteen core business principles for the firm, of which the second was "Our assets are our people, capital and reputation. If any of these is ever diminished, the last is the most difficult to restore." See <http://www2.goldmansachs.com/our-firm/about-us/business-principles.html>

24 Senate Homeland Security and Governmental Affairs Subcommittee on Permanent Investigations Hearing on Wall Street and the Financial Crisis: The Role of Investment Banks, Panel 3. Available at http://hsgac.senate.gov/public/index.cfm?FuseAction=Hearings.Hearing&Hearing_ID=f07ef2bf-914c-494c-aa66-27129f8e6282

25 Page 20 of the transcript.

26 Page 7 of the transcript.

27 Page 9 of the transcript.

28 See "Lloyd Blankfein: A Profile", *Forbes.com*, 16 December 2009, Jeffrey M. Cunningham and Anna Snider, available at <http://www.forbes.com/2009/12/16/lloyd-blankfein-goldman-leadership-managing-directorship.html>

Winklereid, a traditional banker and co-president of the firm with a Garry Cohn, a trader. After his arrival, Goldman was controlled for the first time entirely by traders.

A recent on-line New York Times piece discusses the change that resulted in Blankfein and Cohn's ascendancy. One former senior Goldman partner is quoted as saying "Not so long ago, [...] if there was a choice between making a quick buck or protecting client relationships, we would side with the client every single time."²⁹ The same former partner goes on to say "The guys who succeed in this industry are the guys who say, 'I care about the reputation of the firm. I care about my reputation. I care about doing the right thing. I care about having a great firm. I care about attracting and retaining the best people.' [...] But in this top five, there is nothing about making money. The guys for whom making money is in the top three almost always get themselves into trouble. And this is the essence of how Goldman has changed."

Goldman Sachs has always been acutely aware of the importance of its culture and of its people. It is highly unlikely that the firm would undergo a cultural shift from a trust-based, relationship-oriented business model to a more transactional one accidentally, and without a great deal of thought and introspection. To the extent that this change has occurred, it reflects economic imperatives. In particular, it is a response to technological change and, in particular, to changes in information technology.

The arrival in Wall Street of cheap computing had profound implications. In the first instance, it affected retail-oriented banks with high back office volumes, and it had relatively little impact upon wholesale banks like Goldman Sachs. But powerful desktop computers enabled wholesale banks to measure and to record data that previously had to be taken on trust. It enabled banks to adopt academic models like the Black Scholes formula for option valuation, and to build financial engineering businesses that rested upon these models. Financial engineering and better information technology both substituted for the trust-based intermediation that formerly was at the heart of investment banking business. Activities that previously had been the sole preserve of the relationship banker shifted increasingly to the trading room.³⁰

Computerization and financial engineering slowly shifted the center of gravity within investment banks from the relationship managers to the trading room. Goldman Sachs, which was traditionally a very relationship-oriented bank, resisted this shift for longer than other bulge-bracket banks, but it was no more able to hold back the economic tide than its competitors. Its 1999 flotation gave it access to the high levels of financial capital needed to operate at the scale that the new, trading room-oriented, business model required. The concomitant cultural shift reflected the new way of doing business.

We have already argued that the transactional, trading room-oriented, business model relies more

29 "Goldman: Still Greedy, No Longer Patient," William D. Cohen, New York Times Opinionator Blog, April 29, 2010. Available at <http://opinionator.blogs.nytimes.com/2010/04/29/goldman-still-greedy-no-longer-patient/>

30 For a discussion of these changes, and their effect upon investment bank business models, see Morrison & Wilhelm (2008).

upon technical competence than upon tacit, trust-based contracting. The general industry shift towards transactional business therefore appears to suggest that the relative value of investment bank reputation in businesses like securitization has dropped over the last two decades, because clients rely upon it less when they make investment decisions. If this hypothesis is correct then we should expect Goldman Sachs to experience little damage to its client relationships as a consequence of the publicity surrounding the ABACUS transaction. As yet, we have seen no hard evidence on this point. One striking datum, apparently supportive of our hypothesis, comes from Professor Joseph A. Grundfest of the Stanford Law School and the Rock Center for Corporate Governance, who presents some (rather preliminary) survey evidence that people with more understanding of the securitization market are far less likely to think that Goldman Sachs is guilty of any misdemeanor.³¹ This suggests that, in a transaction-oriented market place, counterparties evaluate Goldman along technical and competence-oriented lines, rather than according to its ability to sustain trust-based private contracts.

In short, it may be that Goldman was not perceived in the transaction-oriented securitization market to be placing its reputation for tacit contracting at risk. If this is the case then that reputation will not be harmed by the revelation that it behaved in the securitization market as it would have done were it representing a client in a stock market transaction. If Goldman Sachs was taking decisions and conducting its business in a way that would have been unthinkable thirty years ago, then it was also taking a smaller risk with its reputation today than would then have been the case then.

As large investment banks embrace transactional modes of doing business and the relative importance to them of trust-based trade diminishes, the expectations that their counterparties have of them change accordingly. While this allows them to perform liquid securitization trades without risking their franchise value, it may undermine their ability to undertake reputationally intermediated trust-based trade: if clients do not believe that a bank is risking its reputation on a deal, then it cannot profit from doing so. It is therefore very difficult to sustain close relationship-based modes of economic interaction within organizations that also perform high volumes of arm's length transactional business. Nevertheless, relationship-based business remains important in situations characterized by poor information and conflicts of interest. Intermediaries that can stake their reputations against the satisfactory resolution of these conflicts remain economically important. Bulge bracket banks continue to serve a purpose in this environment, but they now compete with small "boutique" banks.

Boutique investment banks have become important in the last two decades, as their larger competitors have struggled to reconcile transactional and trust-based trade. While some commentators have argued that boutique banks are successful because they avoid conflicts of interest, we do not think that this is a completely accurate characterization of their business

31 Professor Grundfest's presentation, "The United States Securities and Exchange Commission v. Goldman, Sachs & Co. and Fabrice Tourre," is available at www.law.stanford.edu/.../SEC%20Goldman%20Complaint%20Analysis_Joe%20Grundfest.pdf

model. Boutique banks are important in situations where conflicted interests are inevitable, and where these conflicts cannot be resolved through arm's length contracts. Boutique firms do not avoid this type of conflict. But they *do* steer away from the transactional style of trade at the heart of the ABACUS transaction. In doing so, boutique banks ensure that nothing dilutes the reputational incentives that make them credible in conflicted situations.

If transactional and trust-based trade are uneasy bedfellows, what conclusions should we draw for regulation? In particular, can good regulation substitute for the attenuated private reputational incentives of bulge bracket investment banks? We turn to this question in the following section.

4. Regulating Modern Investment Banks

Investment banking has been transformed by simultaneous advances in computer technology, financial engineering, and financial contracting. The extent of the investment bank's purely transactional business has expanded, and the center of mass for the modern investment bank is now in its dealing room. At the same time, trust-based trade remains important in traditional banking businesses where information is hard to come by and service quality is difficult to record. A successful system of financial regulation has to accommodate both modes of trade without impeding either.

Increased computerization and information codification within banks has generated more hard data upon which regulations can be based. For example, all large banks now use something like a Value at Risk (VaR) system for risk control,³² and often for capital allocation. Regulators have taken advantage of the information generated by VaR systems, incorporating them into capital adequacy calculations. VaR-type metrics also feature in modern supervisory approaches to operational risk: that is to the risk that losses will arise because of fraud, poor systems, or other failures of execution.³³

Value at Risk systems are valuable tools, which would have been unfeasible before the advances in computer science and financial engineering of the last two decades. But, for at least two reasons, we should tread carefully when we introduce VaR metrics into financial regulation. First, regulation is usually regarded as necessary in situations where market participants will ignore some important consequences of their actions. To the extent that VaR models are used by bankers, they measure the things that bankers care about. It is not clear that regulators can use them to identify the important systemic effects that bankers do not care about.

The use of VaR in formal regulations gives rise to a second concern: namely, that in focusing on the things that they can measure, regulators may downplay or ignore the things that they cannot.

32 A VaR system uses the estimated statistical properties of a portfolio's returns to estimate a maximum loss for a given time period and confidence level. For example, on average a bank should exceed a loss in excess of a 99% one week VaR one week in every one hundred.

33 See Basle Committee on Banking Supervision (1993) and Basle Committee on Banking Supervision (2006).

As a result, the tacit may come to play a diminishing role in financial regulation. In other words, because bankers were increasingly concerned with the codifiable at the expense of the tacit, so were regulators. To the extent that this allowed supervisors better to understand regulated institutions, this was a desirable measure; to the extent that it resulted in the loss of socially valuable tacit knowledge, it represented a subtle form of regulatory capture.

The recent regulatory emphasis upon the codifiable may reflect practice in the investment banking market, but, in turn, it has had an effect upon regulations and, hence, the behaviour of the regulated. When a regulated firm is evaluated on the basis of codified information generated by a computer system then its behaviour is affected in two ways. The first, and most obvious, is that it may over-invest in activities that are measured by the regulator, and under-invest in others. Partnoy (1999, 2001) argues that this happened in the credit markets: he suggests that investors were prepared to accept potentially unreliable credit ratings in the run-up to the financial crisis because they were permitted by regulation only to invest in rated products.³⁴ Hence, Partnoy argues that the traditional role of ratings agencies as certifiers of quality was supplemented by a secondary role as regulatory gatekeeper. The latter role undermined the importance of the first and, with it, the strength of the reputational incentives that ensured the accuracy of rating agency assessments. The codification of credit market regulation thus damaged the effective functioning of the tacit incentives that underpinned the market.

The second impact of regulatory codification relates to its effect upon bilateral tacit contracts between market players. Tacit contracts of this type abound in finance and in wider economic life. For example, it is widely believed that investment banks use tacit contracts with their investor networks to ensure that new issues are accurately priced, and that they are fully taken up by investors. An investor who gives false information about an issue's value, or who refuses to invest in an issue, finds itself excluded from future issues, and, hence from a reliable source of income.³⁵ Similarly, trades in diamond and cotton markets rest upon trust and reputational sanctions,³⁶ and many day-to-day transactions in such an apparently quantifiable activity as manufacturing rest upon reputation, trust, and repeated interaction.³⁷

Codified regulation may reduce the number and the variety of tacit contracts possible between market players. One reason for this is that regulators may codify rules for market exchange that, while detailed and enforceable, fail to account for all of the subtleties and nuances of real transactions. A rule may prevent deals from happening both in situations where they are undesirable, and where they are not. In the latter case, a willing counterparty to a welfare-enhancing tacit understanding may later be able to overturn the agreement. Fear that this may

34 In support of this argument, Cantor, Gwilym & Thomas (2007) survey 200 pension plan sponsors and investment managers in the USA and Europe, and find that 75 per cent face minimum rating requirements for their investments.

35 See for example Benveniste & Spindt (1989), Benveniste & Wilhelm (1990) and Morrison & Wilhelm (2007, chapter 3).

36 See Bernstein (1992) and Bernstein (2001).

37 Macaulay (1963)

occur will prevent the original tacit agreement from being reached, and the resultant benefits from being realized.

The codification of regulation may also undermine tacit contracting by making it easier to find alternative contracting arrangements. When formal regulations improve to the level where they can support a transactional business arrangement, market participants can always fall back on the transactional arrangement if tacit contractual arrangements fail. The consequence is that traders have less to lose from a failure of tacit contractual arrangements and, as a result, they are less concerned to honour such arrangements. The socially superior outcomes attainable via trust-based tacit contracting can therefore be crowded out by crude but enforceable formal regulations.³⁸

In designing investment bank regulations, we therefore face a trade-off. On the one hand, more precise and codified regulations can help to fix expectations, and they may facilitate valuable trade that would not have proceeded without the aid of the formal law. On the other hand, codified regulations can crowd out tacit contracts. It is very hard in any specific case to say which of these effects dominates. But, in general, codified and formal regulation seems most likely to succeed in a market place that is dominated by arm's-length transactional trade of the type that we discussed in Section 2.. Reputational incentives are of least importance in such a market, and, moreover, traders in these markets rely to a greater extent upon black-letter law, so that more codified contract may broaden the contract space in these markets.

In contrast, formal regulation is of least value in markets where the most important agreements are tacit, and so are not susceptible to codification. These markets are characterized by the trust-based trade of Section 2.2. Codified regulation seems unlikely in these markets to expand the range of possible contracts in a useful way. At the same time, it serves to undermine the ability of market participants to resolve their conflicts through reputationally underpinned private arrangements. A more tacit, relationship-based, form of "light-touch" regulation may be more appropriate in this case.

How does the SEC's action against Goldman Sachs fit into the framework that we have presented? Our analysis refers to two cases, one in which trade is largely arm's length and transactional, and another in which trade is trust-based and reputational. We argued in Section 2.1 that if the ABACUS deal were transactional then, while there would be a case for codified regulation, there would be little support for an action predicated upon a failure of fiduciary duty. Suppose, on the other hand, that the deal could be characterized as trust-based. We have argued that, beyond a framework that gives the parties recourse against theft and outright misrepresentation, codified regulation has little to offer in this situation. On the contrary, any attempt to write detailed formal laws governing the relationship between parties engaged in trust-based contract is likely to undermine their relationship, and crowd out their own, superior, contracting relationships. In short, unless the SEC expected to prove that Goldman Sachs lied to

38 For a more detailed discussion of this point, see Bernstein(1996), Baker, Gibons and Murphy (1994, 2002), and Morrison & Wilhelm (2007, pp. 57-58).

or stole from its counterparties, it is unclear that its action could have accomplished a great deal.

5. Conclusion

Investment banking has been transformed by computerization. Better information processing, more precise codification of data, and advances in financial economics have all served to shift an increasing proportion of the business of large investment banks into their dealing rooms. Within their dealing rooms investment banks rely upon a transactional, arm's-length model of business, so that they need a reputation for competence and transparency, but not for their ability to sustain private, trust-based trade. These technological and economic imperatives have caused changes to investment bank culture, which we illustrated in this essay with reference to Goldman Sachs, a bank that has long been associated with a focus upon client relationships.

Regulators have responded to the changes within banks by relying to an increasing extent in their work upon codified data, frequently generated by bank-level computer systems. While these systems represent an important source of information, and hence have an important role to play in regulation, they must be deployed appropriately. Better data and codified law make it easier to write arm's length contracts and so can improve trading conditions in transactional markets. But an attempt to use codified law in place of tacit information to supervise markets that are largely dependent upon reputation and trust-based contracting is likely to alter the ways in which these markets operate. In particular, it may crowd out the tacit contracting upon which these markets rely.

The SEC's charge against Goldman Sachs' behaviour with respect to its ABACUS 2007-AC1 transaction was particularly interesting in light of these observations. If Goldman Sachs had been proved to have misrepresented the facts of this transaction to its counterparties then, clearly, it would have had a case to answer. But it is difficult to see how one could go much further than this.

Our analysis indicates that the central question for supervisors is whether a given deal was largely governed by arm's-length transactional business norms, or whether it was an example of the trust-based contract that predominated in investment banking thirty years ago. If the ABACUS transaction fell into the former category then the SEC's case appears to have been rather weak.

If the ABACUS transaction relies upon trust-based contracting then we have argued that formal codified law has little to offer; it may even crowd out more efficient reputational trade. If the Senate hearings were a prelude to codified law on the conduct of trust-based business then they are likely to reduce the volume of such trade: it is possible that the violent market reaction to the SEC's complaint was in anticipation of this. Beyond its ability to police the truthfulness of statements by market participants, the SEC can enhance economic efficiency in this case only if it is able after the fact to determine the beliefs and the incentives of the deal parties, and, hence, to identify a failure on Goldman's part to abide by the reasonable expectations of its counterparties. It is precisely because this sort of determination is impossible that trust-based contracting remains important in finance.

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