Lead Firms and Sectoral Resilience:

How Goldman Sachs Weathered the Global Financial Crisis

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Abstract

Research on resilience in evolutionary economic geography is predominantly underpinned by structuralist ontologies and studied with positivist scientific methods. As a result, most frameworks tend to overlook important reflexive mechanisms of resilience including agency, power and politics. In this paper, we postulate that in economic contexts characterized by high power asymmetries, lead firms may come to shape their adaptive paths, as well as that of entire sectors and regions, by controlling key resources and influencing their policy environment. To study these mechanisms empirically, we take the US financial system as our sectoral and regional context. Using mixedmethods, we examine the role of Goldman Sachs, a premier US investment bank, in shaping the resilience of the US financial sector in the lead up to. during, and out of the global financial crisis. Our analysis shows that Goldman's rise to prominence is linked to the firm's strategic move to aggressively securitize and trade the booming US real estate market up to 2006. As such, Goldman Sachs contributed significantly to the build-up of systemic market risk. While it showed remarkable foresight in spotting early signs of the imminent collapse of the US real estate market, it underestimated the interconnectedness of the US financial sector. Documenting the firm close relations with government agencies and lobbying power, we show Goldman's leading position in the negotiations towards policy and regulatory responses to the crisis. Notwithstanding conspicuous efforts to appear self-reliant. Goldman Sachs relied on \$995bn of government public monies to weather the crisis. Finally, we analyze Goldman's post-crisis adaptive path. In particular, we illustrate the firm's strategic shift towards technologically intensive financial services including asset management and retail banking. We link these changes to the firm's changing geography of office networks and its increasing presence in new financial centers including Salt Lake City and Bengaluru.

Introduction

We had tremendous liquidity through the period, but there were systemic events going on... it was a more nervous position than we would have wanted. We never anticipated the government help, we weren't relying on those mechanisms. (Lloyd Blankfein, CEO of Goldman Sachs, Financial Crisis Inquiry Commission (FCIC), 2011, p. 362).

As crises threatening the survival of socio-economic systems arise, a critical question emerges: does society allow the established order to disintegrate and build a new and presumably better system, or does it commit resources to maintaining the status quo? Politically, the question triggers a contest of values reflecting the interests and agendas of different stakeholders. Conceptually, it is a question central to the notion of resilience in evolutionary economic geography (EEG), yet one that remains critically under-researched (Bristow and Healy, 2014). Indeed, most empirical research in EEG has been concerned with identifying characteristics of socio-economic systems, primarily at the regional and cluster level, that enable them to resume their pre-crisis performance (Cellini and Torrisi, 2014; Holm and Østergaard, 2015; Martin et al., 2016; Ray et al., 2017).

In this paper, we take a different approach and postulate that under certain conditions, the resilience of industrial sectors, and indeed whole socio-economic systems, can be intricately tied to the agency and power of lead firms. Following Bristow and Healy's work (2014, 2015), we argue that to understand sectoral and regional resilience we have to explicitly incorporate lead firms in our conception of resilience. Our contribution is twofold: firstly, we propose to piece together leading scholarship in regional and sectoral resilience with more recent theoretical discussions of the role of agency and power in EEG. Secondly, we use this metatheory of resilience to frame an empirical analysis of how Goldman Sachs, a premier US investment bank, affected the resilience of the US financial sector during the 2007-9 global financial crisis.

Our analysis sheds light on the role of lead firms in the process of negotiating an economic crisis. In particular, we focus on firm level strategic management as well as the agency of powerful actors influencing their political and regulatory milieu. Our results suggest that Goldman Sachs did not come out of the crisis unscathed or unchanged. Yet they suggest that its staying power is as much due to its ability to adapt to a changing environment as it is to its capacity to shape it. Our analysis implies Goldman Sachs' efforts to ensure its own survival had wider consequences for the survival of other key companies in the financial sector and by extension the resilience of the financial sector as a whole. Our study therefore offers contributions to understanding the role of lead firms in shaping sectoral and regional resilience.

Our analysis is based on the complex adaptive systems framework of Bristow and Healy (2014, 2015), which is designed to consider multiple types of actors and their agency during economic crises. We center our analysis on Goldman Sachs and consider its interactions with other key stakeholders, including other globally-

systemically important financial institutions (G-SIFIs), strategic investors, the US Treasury, the Federal Reserve (FED) and the Securities Exchange Commissions (SEC). To structure our analysis temporally, we follow Martin and Sunley's (2015) conceptualization of resilience and divide our analysis into three key time periods:

- (1) 1999 to 2006 with focus on positioning Goldman Sachs in the context of developments that led to the build-up of systemic risk in financial markets. This corresponds to Martin and Sunley's (2015) first stage of resilience, characterized as "vulnerability and exposure to shocks" (p. 13).
- (2) 2007 to 2009 with focus on how Goldman Sachs interacted with other actors including G-SIFIs, regulators, and strategic investors to not only protect itself, but to also ensure the survival of other G-SIFIs, whose failure would have destabilized the financial system to the point of threatening Goldman's own survival. This corresponds to Martin and Sunley's (2015) second and third stage described as "depth of reaction to shock" and "extent and nature of adjustment to shock" (p. 13).
- (3) 2010 to 2017 with focus on organizational change at Goldman Sachs in response to the crisis and its heavy-handed approach to fight back against reregulation. This corresponds to Martin and Sunley's (2015) fourth stage of resilience "recoverability" (p. 13).

To study Goldman's role in the resilience of the US financial sector, we use a case-study approach and mixed-methods, utilizing both quantitative and qualitative data. Our methodological choice is motivated by our focus on agency and power. We draw insights from quantitative data on investment banking transactions from Dealogic databases on underwriting deals and mergers and acquisitions, company level data from S&P Global, manually collected data from G-SIFIs' financial statements and data on regulatory capture sourced from the Centre for Responsive Politics. We complement these sources with content analysis of academic research, government reports, news articles and books written about Goldman Sachs and the global financial crisis, as well as a handful of interviews with Goldman Sachs employees.

The remainder of the paper is structured as follows. In the next section, we review literature on the resilience of socio-economic systems, stress the limitations of structuralist conceptions of resilience, and explain the importance of integrating human agency, power and politics in resilience frameworks. In the following three sections, we present the three stages of Goldman Sachs' development and their implications for sectoral resilience prior to, during, and after the global financial crisis. The forth section concludes and discusses future research.

An agency perspective on regional and sectoral resilience

The concept of resilience has become a central theme in EEG. It has been adopted by economic geographers interested in the responses of clusters (Martin and Sunley, 2011) and regions (Hill et al., 2011; Boschma, 2015) to economic shocks and crises

and generated many qualitative and quantitative studies (Bristow and Healy, 2015; Holm and Østergaard, 2015; Martin et al., 2016; Ray et al., 2017).

There are three distinct definitions of resilience (Martin, 2012; Boschma, 2015). Engineering resilience is the ability of a system to recover to its prior equilibrium following a shock (Holling, 1996)—for instance, the resilience of regions is assessed by their ability to return to their pre-shock growth path within a set period (Hill et al., 2011). This definition is typically rejected by economic geographers, due to its reliance on an equilibrium-based conception of the economy. Ecological resilience is the ability of a system to withstand shocks and maintain its core function, structure and feedbacks. In contrast to engineering resilience, it relates to systems far from equilibrium and allows for shifts to new equilibria (Martin, 2012). Finally, adaptive resilience stems from complex adaptive systems (CAS) theory and is generally understood as the ability of complex systems to adapt to various market and environmental shocks and maintain their core functions, if necessary by reallocating resources and altering their structure (Simmie and Martin, 2010). It is the most widely adopted definition of resilience in EEG and the one we follow here.

According to Martin and Sunley (2015), regional resilience is a four-stage process. Prior to a shock or crisis, regions vary in their vulnerability and exposure depending on a range of factors including their industrial structure, economic openness, technological profile and policy regime. Once a shock is realized, the depth of reaction of a region, defined as "resistance", depends on the same set of inherited factors. Adjustment to the shock is then linked to the robustness of a region, which is believed to depend on productivity, export orientation, labor skills, policy regime and external connections among other factors. In a final stage, regions recover depending on their ability to reconfigure and develop a post-shock regional growth path.

Although Martin and Sunley (2015) position agency and decision-making as central constructs in their conceptualization of regional economic resilience, these are framed in a weak form. In particular, economic agents seem to react to, rather than shape, their environmental conditions. The underlying assumption seems to be that the influence of powerful economic actors is superseded by the structural characteristics of regions. This point becomes apparent when we examine firm-level adjustment strategies, as suggested by Martin and Sunley (2015), which are predominantly responsive (reducing prices, wages, costs, moving to other locations, and seeking short-term rescue finance) and do not consider the possibility of firms influencing their economic and policy environment.

To address this gap, we argue that resilience research ought to be better linked to the study of industrial sectors, value chains and production networks. Since economic shocks are oftentimes not region-specific, the adjustment strategies of firms may not necessarily prioritize the recovery of any specific region, but instead focus on firm performance and industrial sectors. As such, individual regions may be influenced by processes of adjustment at firm and sectoral level which might not depend on region-specific resources, economic actors or policy makers (see Coe et al., 2004 for a thorough discussion of the "multi-scalarity" of regional development).

Instead, regional resilience may come to depend upon the actions of extra-regional lead firms, as well as national and supra-national policymakers influencing the reconfiguration of sectoral development paths (Fromhold-Eisebith, 2015).

Case-studies have provided valuable insights on the specific mechanisms that make socio-economic systems resilient (see Bristow and Healy, 2014, 2015 on Wales; Evans and Karecha, 2014 on Munich; Simmie and Martin, 2010 on Cambridge and Swansea; Cowell, 2013 on Buffalo and Cleveland; David, 2018 on Sweden; Masik, 2018 on Poland; Walther et al., 2011 on Luxembourg). Bristow and Healy (2015) and Masik (2018) offered detailed accounts of the interactions between various key actors, including government agencies, large employers, universities and employees in responding to the challenges of the global financial crisis, while David (2018) focused on the closures of large local employers. This body of research contends that resilience rests on the concerted efforts of influential economic actors, policy-makers and government bodies¹. It corroborates quantitative studies showing that regional resilience relies heavily on key industries and sectoral resilience (Martin et al., 2016).

To formally bridge the regional and the sectoral resilience literature, Fromhold-Eisebith (2015) proposed that sectoral resilience is incorporated as a complementary dimension of regional resilience to conceptualize links within value chains that transcend regional boundaries². To do so, she integrates sectoral and regional dimensions into a common framework featuring economic actors who allocate resources and respond to economic shocks by engaging with other firms within their sector and across multiple regions of operations. Wójcik and Cojoianu (2018) apply this framework to study the resilience of the US securities industry as a whole to the global financial crisis.

In the sectoral resilience approach, regions are understood as spaces where multilocational firms deploy resources and engage with other firms in their value chains. Since firms and whole sectors aim to ensure their survival through the implementation of supra-regional, often global strategies, the resilience capacity of regions is deemed limited. The secondary importance of regional outcomes in firms' decision-making becomes apparent, when we observe changes in the distribution and structure of employment in the financial sector during the global financial crisis (Wójcik, 2012; Wójcik and Cojoianu, 2018). As a result, the resilience of regions often depends on their strategic positioning within value chains and productions networks of MNEs, in addition to region-specific resources that affect the attractiveness of regions in respect to various sectoral configurations (Martin and Sunley, 2015; Fromhold-Eisebith, 2015).

¹ Actors such as individual employees and households typically have a limited capacity to reconfigure the developmental paths of their regions.

² Sectoral resilience is defined as: [T]he ability of the firms and other organizations that contribute to the same industry's value chains to interactively adapt to major global shocks in market, production, technological and related conditions in sector-specific ways that distinctively shape the longer-term evolutionary trajectory of that industry (Fromhold-Eisebith, 2015, p. 1679).

Earlier research on resilience in EEG has been criticized for its structuralist focus and lack of attention to human agency, power, politics and scant treatment of actors beyond firms (Mackinnon et al., 2009; Hodgson, 2009; Bristow and Healy, 2014). Indeed, much of the empirical research on regional economic resilience has been preoccupied with the effects of inherited structural regional economic factors and has omitted other important factors, including the decisions of lead firms within industrial sectors and policymakers outside of regional contexts (Cellini and Torrisi, 2014; Holm and Østergaard, 2015; Martin et al., 2016; Ray et al., 2017). In general, existing scholarship has not fully unpacked the reflexivity of resilience mechanisms. In particular, we note little engagement with the fact that firms may not only be influenced by but may also come to shape their environments.

The lack of appreciation for reflexivity and the scope of agency is linked to the origins of resilience thinking in ecology. While physical and ecological systems can be argued to evolve in a predictable manner, human agency allows for the reconfiguration of socio-economic systems in ways, which may be difficult to anticipate (Fromhold-Eisebith, 2015). Instead of simply responding to their environment, economic actors use foresight and power to actively and consciously shape it. To improve upon structuralist models of resilience, Bristow and Healy (2014) developed a conceptual framework that puts human agency, ingenuity and foresight at its center. As such, their framework recognizes differences in the capacity of economic actors to influence economic change in response to shocks and crises.

Bristow and Healy (2014) identify three stages during which human agency enters the process of adaptive resilience. Firstly, economic actors can anticipate shocks and prepare themselves accordingly. In particular, they can calculate the probabilities of different types of shocks and identify the vulnerabilities of socioeconomic systems. Secondly, once a shock materializes, economic actors have the capacity to react. Responses to shocks include a variety of firm level strategies (Martin and Sunley, 2015), in addition to actions undertaken by labor organizations, policymakers and households. Thirdly, following a shock, economic actors can transform to adapt to their altered environment and learn lessons from economic crises. Economic actors are therefore understood as active participants, rather than being deterministically influenced by the inherited structural characteristics of their regions (Bristow and Healy, 2014).

Another important aspect of agency is that economic actors vary considerably in their individual capacity to respond to shocks. As such, the reconfiguration of regional economies following a shock depends on the adaptive capacities of individual actors (Martin, 2012). Furthermore, individual actors' adaptation may be contingent upon the adaptive capacities of other actors. Accordingly, in order to incorporate individual responses into a CAS framework, it is essential to consider economic actors reflexively.

Power structures are inherently tied to the concept of resilience. The question of "what precisely it is that is being made resilient [...] for whom and by what specific criteria this is good or bad, and whether such resilience is consequently problematic

or not" opens debates surrounding the agendas and interests of different actors and groups (Smith and Stirling, 2010, p. 20). In regional contexts, such debates often involve conflicts between workers, businesses and the state. When challenged by shocks and crises, powerful economic actors can use their position to defend the status quo and in turn slow down or avert adaptive processes that would lead to the loss of their privileged position (Bristow and Healy, 2014). Ultimately, resilience is evaluated based on outcomes and cannot be easily separated from societal values and norms. To be sure, the assessment of regional resilience and the desirability of outcomes depends on the point of view of the observer.

Due to substantial power asymmetries between economic actors, socio-economic systems tend to evolve and reconfigure in response to the actions taken by the most influential actors. *Strong agents* have the capacity to actively shape their environment and influence the actions of others (Bristow and Healy, 2015). They have advanced cognitive abilities, are goal-oriented, and their decisions are the product of their own agendas as well as their interactions with other agents. In contrast, *weak agents* are influenced by their environment and the actions of strong agents (Ramalingam and Jones, 2008). Following a shock, when collectives (regions, sectors, national or supra-national economies) decide on how to restructure themselves, economic actors with the most significant resources, political power and network capital are often called upon to draw the contours of economic change, or a lack thereof (Smith and Stirling, 2010). By controlling key resources and influencing policy, strong agents shape the opportunities and choices available to weak agents (Pain and Levine, 2012; Bristow and Healy, 2015).

"[W]ho governs?" [...] [W]hose system framing counts? [...] [W]hose sustainability gets prioritized?" become key questions for the identification of strong agents driving the process of resilience (Smith and Stirling, 2010, p. 1). As a result, the analysis of crisis response warrants an approach that seriously engages with governing bodies, such as states and regulators, as well as influential lead firms. Although complex systems cannot be controlled by individual actors, governance structures tend to bring together a handful of strong agents to collaborate and resolve systemic problems (Shaw and Maythorne, 2013). As a result, crisis management is often a reflection of regional-cum-sectoral power asymmetries. The role of US government agencies in bringing together leading financial services firms, strategic investors and broker-dealers in financial distress illuminates the importance of facilitated cooperation (Davidoff and Zaring, 2009).

1999 to 2006: The trading boom

The turn of the century was marked by mounting competitive pressures in the residential mortgage market in the United States. Traditionally, mortgages used to be held to maturity by the commercial banks that issued them. However, in the late 1990s originators of mortgages started to sell them off to wholesale mortgage companies. Investment banks, government sponsored mortgage companies and insurance companies then proceeded to package these mortgages into tradable

mortgage-backed securities (MBS) to then resell them to institutional investors. The trend marked a "...shift from a 'locally originate and locally-hold' model of mortgage provision to a securitized 'locally originate and globally distribute' model" (Martin, 2011). It not only allowed commercial banks to underwrite considerably more mortgages than their balance sheet could support but further aggravated the problem of moral hazard as mortgage issuers would no longer bear full responsibility for the credit-risk associated with newly issued mortgages (Wilmarth, 2009).

To exploit such opportunities, financial institutions started to develop increasingly sophisticated products and expand the size of their balance sheets to support the issuance and the market making for MBS. In the 1990s, in order to access adequate funds for expanding their operations, many US broker-dealers became publicly listed companies. Goldman Sachs was the last major broker-dealer to go public in 1999 (Wilmarth, 2009).

An increasing number of commercial banks and mortgage providers began to exploit the so called 'subprime' mortgage market by lowering their standards to expand their clientele and lend money to individuals with low income, minimal assets and poor creditworthiness. Any doubts about the viability of this business model were downplayed in the light of record growth in house prices. Indeed, in the late 1990s, as a result of the mortgage frenzy, the US real estate market was booming, consistently delivering double digit percentage growth every year. In 2004, home ownership rate peaked at 69.2% (FCIC, 2011). Between 1999 and 2006, the annual value of MBS issued worldwide quadrupled to reach \$1.56tn in 2006³. The same year, the proportion of subprime mortgages reached a staggering 23.5% of all US issued mortgages—the only other country that was a significant subprime issuer was the UK, but the numbers pale in comparison; in the same year, *only* 8% of UK mortgages were subprime (FCIC, 2011).

Goldman Sachs was actively involved in the securitization of residential and commercial mortgages. Analysing Dealogic data we find that between 1999 and 2006, the investment bank was amongst the top 10 largest issuers of MBS worldwide and generated MBS-related revenues trailing those of large universal banks including Bank of America, JPMorgan and Citigroup. Specifically, Goldman Sachs issued over \$492bn of MBS earning \$528mn in revenues. In addition to its underwriting activities, Goldman also lent billions of USD to mortgage originators, primarily the subprime lenders Ameriquest, Long Beach, Fremont, New Century, and Countrywide. According to the FCIC, between 2004 and 2006 Goldman further bought back \$53bn worth of mortgages from subprime lenders to securitize and sell them off to clients (FCIC, 2011). Finally, Goldman was an active player in market-making and held significant positions on its own account in MBS and collateralized debt obligations (CDOs⁴ - *ibid*).

Historically, Goldman Sachs' business-model entailed four core activities: investment banking, asset management, brokerage (trading on behalf of clients) and

³ 52% were issued by US financial institutions and 5% by Goldman Sachs alone.

⁴ CDOs are derivative contracts created by packaging several tranches of lower and higher credit rated MBS into a single tradable instrument.

proprietary trading (trading on its own account). Although proprietary trading has been Goldman's primary source of revenue for decades, it grew disproportionately in the years leading up to the crisis. Up until 2006, business was buoyant and few, if any, knew that the relentless securitization and circulation of bad debt would foment the worst financial crisis since 1929. Figure 1 shows the revenue breakdown of Goldman Sachs as well as its profitability relative to its peer-group between 2000 and 2006.

By 2006, more than half of Goldman's revenues (55%) came from proprietary trading, while investment banking and asset management made-up *only* 15% and 12% of revenues respectively. Fueled by rapidly growing trading revenues built on the expanding US real estate bubble, Goldman Sachs broke through in 2004 and began to consistently outpace competition in terms of profitability. At that time, like other US broker-dealers, Goldman relied heavily on leverage to maximize its profitability. Between 2000 and 2006, its leverage ratio increased from 17:1 to 23:1. It eventually peaked at a staggering 40:1 in 2007 (FCIC, 2011). At this point, a mere 2.5% decrease in the value of the bank's assets would have wiped out the whole of its \$35.8bn of equity capital.

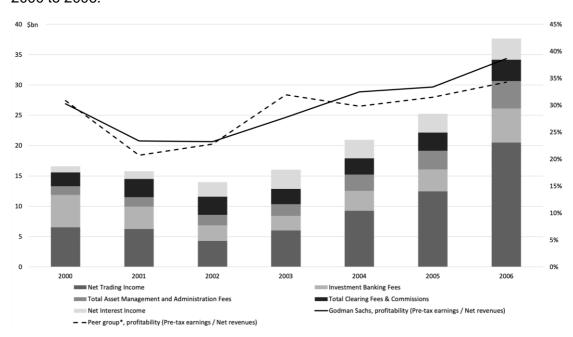


Figure 1. Goldman Sachs' revenues breakdown and profitability against peer group, 2000 to 2006.

Source: authors' calculations based on annual financial statements.

Notes: *Peer group data is calculated by taking the average profitability of the following 7 banks: JP Morgan Chase, Bank of America, Citigroup, Goldman Sachs, Morgan Stanley, Lehman Brothers, Merrill Lynch.

To insure its dealings of MBS and CDOs, Goldman Sachs relied heavily on credit default swaps (CDS) underwritten by AIG Financial Products⁵ to hedge its positions. AIG's high credit-rating, issued by S&P and Moody's, allowed AIG to borrow cheaply and provided reassurance on its ability to honor these contracts in the event of widespread defaults. As a result, AIG underwrote \$533bn of CDS on MBS, CDOs and other assets between 1998 and 2007 and became a leading derivatives underwriter with a portfolio with a notional value of \$2.7tn. Because CDS were not regulated as standard insurance policies, AIG's reserves to cover payoffs on these contracts were not regulated either. Prior to the crisis, AIG Financial Products estimated a 99.85% chance of zero loss on the CDOs it underwrote its CDS against and consequently made no provisions for payoffs on these contracts. Goldman Sachs was a counterparty to \$20bn worth of CDS underwritten by AIG. The bank relied on this position to hedge its long position in MBS and CDOs backed by subprime mortgages in structured CDOs (FCIC, 2011).

2007 to 2009: The politics of resilience

A decline in US house prices coupled with record levels of foreclosures at the end of 2006 set off the global financial crisis. As MBS and CDOs plummeted, global credit markets froze, and a number of mortgage companies and hedge funds bankrupted. Meanwhile, broker-dealers, central actors in the securitization and trading of MBS, wavered (Wilmarth, 2009). Early on, what separated Goldman Sachs from other broker-dealers and hedge funds was the superior foresight of its Mortgage Department Structured Products Group. Already in 2006, alerted by a drop in the ABX BBB, a subprime MBS index, Goldman Sachs started reducing its long position in MBS and CDOs on subprime mortgages. To do so, it utilized CDS underwritten by AIG to short the subprime market and sold off its MBS and CDOs in the form of structured products to its own clients. Alone, the controversial Hudson Mezzanine 2006-1 transaction yielded a gross profit of \$1.7bn for Goldman at the direct expense of its clients (Merkley and Levin, 2011). Between December 2006 and August 2007, Goldman Sachs underwrote and sold a total of \$25.4bn of CDOs to its clients to reduce its inventory of MBS (FCIC, 2011).

In addition, Goldman relied on some \$20bn notional value of CDS underwritten by AIG to hedge its position in subprime MBS. The counterparty risk associated with this position came under scrutiny when AIG lost its AAA credit rating and struggled to post collateral to Goldman Sachs. This led to fears about the financial stability of AIG and, consequently, Goldman's ability to rely on its CDS hedge. From then on, Goldman Sachs' risk management focus shifted from its own market positions to its counterparties, which it would come to rely on for its financial stability (FCIC, 2011).

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⁵ AIG Financial Products introduced CDS in 1998 and offered them as insurance against default on a wide range of debt securities, including MBS. AIG collected premiums from counterparties wishing to hold CDS in exchange for the promise of paying out compensation in the event of a default or decline in their market price.

Goldman's exposure to other large broker-dealers and the associated counterparty risk became a key concern during the crisis. After numerous meetings in 2007 and 2008 involving leading broker-dealers, the US Treasury, the Federal Reserve (FED), the Federal Reserve Bank of New York (FRBNY) and the Securities and Exchange Commission (SEC), political and regulatory elites finally concluded that a failure of one of the large broker-dealers could set off a domino effect leading to the widespread collapse of financial institutions (Sorkin, 2009). At that time, the US Treasury and the FED postulated that broker-dealers could be stabilized, if acquired by large universal banks with strong balance sheets and the capacity to provide financing for their activities. Goldman Sachs, an important participant in the crisis-response negotiations, was initially reluctant about acquiring competitors and favored the idea that major financial institutions contribute to a fund that distressed organizations could draw on to regain stability (Sorkin, 2009).

Meanwhile, representatives from the US Treasury and the FED became increasingly involved in matchmaking between potential acquirers, large US universal banks, and broker-dealers in financial distress (Davidoff and Zaring, 2009). These efforts led to the acquisition of Bear Sterns by JPMorgan, Merrill Lynch by Bank of America and Wachovia by Wells Fargo. As the crisis deepened in September 2008, Lloyd Blankfein, Goldman's CEO was reported to call Vikram Pandit, Citigoup's CEO, to discuss the possibility of Citi taking over Goldman Sachs, a proposition Mr Pandit rejected at once (Financial Times, 2008). The story underscores the sense of urgency amongst Wall Street giants to find strategic solutions to weather the crisis.

Attempts to find an acquirer for Lehman Brothers failed and the firm filed for chapter 11 bankruptcy protection on September 15, 2008. The news set off a sharp drop in investors' and creditors' confidence and propagated fears about the financial stability of Morgan Stanley and Goldman Sachs, the two largest broker dealers at the time (Sorkin, 2009). Lehman Brothers' bankruptcy led to major outflows from hedge funds. In turn, in an effort to regain liquidity, hedge funds started withdrawing funds from their brokerage accounts with investment banks. Coupled with difficulties to access short-term financing in money markets, it precipitated the fall of Goldman's liquidity pool, which went from \$120bn to \$57bn in the week following Lehman's bankruptcy (Sorkin, 2009).

Goldman's precarious financial position and mounting counterparty risks forced the firm to start nurturing its relationships with US government agencies. Although there is no conclusive evidence that Goldman Sachs received any preferential treatment from US government agencies, it is clear that the firm enjoyed privileged relationships with their representatives. Henry Paulson, the US Treasury's Secretary and a key figure of bailout negotiations, held the position of CEO of Goldman Sachs until 2006. Paulson's close connections to Wall Street and Goldman Sachs' dealings gave him a unique perspective on what was to unfold when he took office. The financial crisis inquiry revealed that, by the time Paulson came into public service, he was already well aware of the widespread circulation of bad loans. In his

own words: "most of the toothpaste was out of the tube... and... there really wasn't the proper regulatory apparatus to deal with it" (FCIC, 2011, p. 142).

In fact, much of Paulson's efforts were directed at circumnavigating his limited powers. At the height of the crisis, Paulson was granted an ethics waiver allowing him to engage in meetings with Goldman Sachs' executives to discuss contingency plans (Sorkin, 2009). Paulson actively lobbied to be granted emergency powers to use public funds to rescue failing non-bank financial institutions, including systemically important broker-dealers (Sorkin, 2009; Barron's, 2018):

"It's very frustrating to feel a great sense of responsibility to act and not have the emergency powers you need, and to know that you can't get them from Congress. For a long time we knew that if we went to Congress and tried to get emergency powers and failed we would precipitate the crisis we were trying to prevent" (Henry Paulson in interview with Barron's, 2018).

In these testing times, economic and political elites argued that saving the financial system was paramount to the financial stability and economic resilience of the country; it meant no less to Goldman Sachs. Starting in 2008, a succession of bailout facilities was put in place. Looking back, Felkerson (2011) estimates that the bailout funds dispensed to stabilize the financial system totaled close to \$29tn. While the majority of these funds were provided to alleviate pressures in credit and money markets by using market mechanisms, swaths of public money were also dispensed to bailout specific institutions posing systemic threats.

Early emergency facilities included the Primary Dealer Credit Facility (PDCF), which offered overnight loans of cash in exchange for collateral, and the Term Securities Lending Facility (TSLF), which functioned as an extension of the FED's Treasury lending program. In the week following Lehman Brother's bankruptcy, Goldman accessed \$5bn from the PDCF and \$13.5bn from the TSLF to increase its liquidity pool. This was followed by a strategic investment of \$5bn from Berkshire Hathaway. Throughout the remaining months of 2008, Goldman Sachs would keep resorting to the FED's emergency facilities (FCIC, 2011). Paulson kept actively collaborating with Ben Bernanke, the chairman of the FED, and Tim Geithner, the chairman of the FRBNY, to find a way to address their concerns over the liquidity and survival of Goldman Sachs and Morgan Stanley. On September 21, 2008, they approved the immediate transformation of both firms into bank holding companies in order to give them access to emergency lending facilities available to commercial banks.

On October 3, 2008, US president George W. Bush signed the Troubled Asset Relief Program (TARP) into law. TARP gave the US Treasury the authority to stabilize financial institutions by purchasing toxic assets from them (FCIC, 2011). As a result, troubled financial institutions could offload illiquid and hard to price assets (including MBS and CDOs) from their balance sheets and regain liquidity. Goldman received 10bn of the 700bn authorized by congress for TARP. It further benefited indirectly from TARP by trading AIG's stock on its own account to bet on the insurer's government rescue (The Guardian, 2011). A total of \$180bn of TARP monies were allocated to asset repurchases aimed at preventing the failure of AIG. As the FCIC

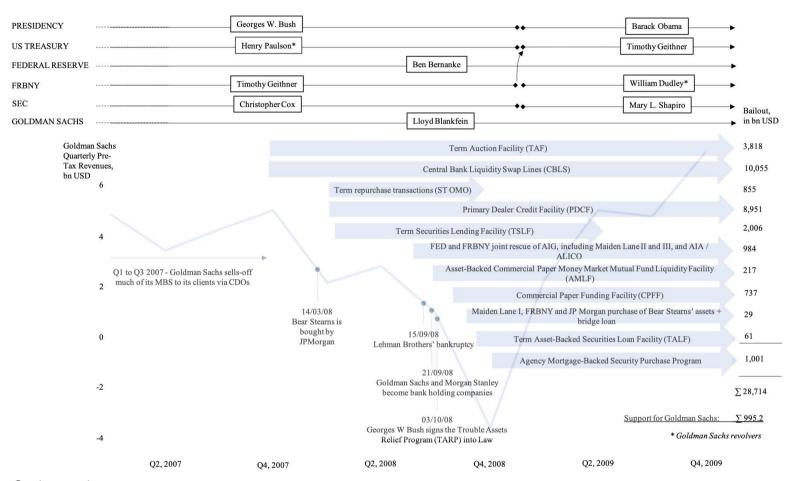
report reveals, Goldman Sachs was one of AIG's largest counterparties, both in terms of lending and CDS, and has been paid \$4.8bn for lending commitments and \$14bn for CDS obligations from the rescue financing received by AIG (FCIC, 2011).

Although Goldman worked hard to remain free of government shackles and appear as self-reliant as possible—Lloyd Blankfein's statement introducing our paper is quite revealing in that respect—there is little doubt that, in the acute phase of the crisis, Goldman's fate came to rest on public institutions. In fact, Goldman Sachs was the eighth largest corporate recipient of government help with \$995bn (Felkerson, 2011). In MacDowell's words: "It is salutary to recall that in November 2009, Lloyd Blankfein...rather incautiously (and apparently seriously) defended bankers by stating 'we do God's work'" (2011). Figure 2 provides an overview of how Goldman weathered the crisis by overlaying a timeline of salient stakeholders, bailout facilities and Goldman Sachs' quarterly revenue.

In 2009, Goldman Sachs moved to its new \$2bn headquarters at 200 West Street, a high-profile location facing the Hudson River. Interestingly, "the name of the firm appears nowhere on the exterior, or in the lobby, or even on the uniforms of the security personnel or the badges given to visitors... the Goldman building appears to have been designed in the hope of rendering the company invisible" (Goldberger, 2010). Although investment banks do not need to advertise themselves to retail customers on the street, the firm's efforts to hide in plain sight in the aftermath of the crisis may have been enhanced because of reputational damages.

2010 to 2017: Regulatory capture and corporate reorganization

The acute phase of the crisis was followed by a regulatory rollercoaster. The Obama administration, which came into power in January 2009, was quick to the task. Within six months, several bills aimed at reforming the financial sector were sent to Congress. These bills would later become part of the promising and eventually controversial text known as Dodd-Frank Wall Street Reform and Consumer Protection Act. In 2010, after signing the new law, Barack Obama announced: "These reforms represent the strongest consumer financial protections in history [...] The American people will never again be asked to foot the bill for Wall Street's mistakes. There will be no more taxpayer-funded bailouts. Period." (Administration of Barack H. Obama, 2010, p. 2). The objective of the new law was ambitious: "to promote the financial stability of the United States by improving accountability and transparency in the financial system, to end 'too big to fail', to protect the American taxpayer by ending bail-outs, to protect consumers from abusive financial services practices, and for other purposes" (Dodd-Frank Wall Street Reform and Consumer Protection Act, 2010, p. 1).



*Goldman Sachs revolvers

Figure 2. The resilience of Goldman Sachs to the global financial crisis Sources: authors' calculations based on Felkerson (2011) and FCIC (2011).

The financial sector reacted by fighting every word of Dodd-Frank's 2,300 pages. At this stage, the freshly ratified law was still "a skeletal structure with few affirmative commands [...] heavily dependent on administrative implementation" (Coffee, 2012, p. 1065). The industry attacked it vigorously and with much success. The watering down of a once promising regulatory project entailed a process of attrition led by Wall-Street sponsored lobbyists and facilitated by the revolving door of American politics. According to data collected by the Centre for Responsive Politics, the securities and investment industry's lobbying efforts peaked precisely in 2010. The same year, Goldman Sachs, the sector's largest contributor to corporate lobbying over the last two decades, increased its lobbying spending by 63% compared to the year before. Goldman's lobbying firepower was further aided by its unique relationship with public institutions. Besides Henry Paulson, the Centre for Responsive Politics holds records of another 47 individuals that have held positions at Goldman and as legislators or regulators, a record number for the industry. While the actual sway of Goldman's revolvers is difficult to assess, there is little doubt over the firm's extensive and influential network in political and corporate spheres (for more details see The People From 'Government Sachs' in DealBook, 2017).

The Volker Rule, one of the central pieces of Dodd-Frank intended to address the 'Too Big To Fail' (TBTF) problem, was subject to significant alterations to the benefit of banks. Leaving the problem of bank size unaddressed, the rule was designed to avoid bank failures by constraining their risk-taking (Whitehead, 2011). In negotiations on the final version, Treasury Secretary Tim Geithner and Senator Chuck Schumer (New York) were instrumental in offering banks leeway to keep their proprietary trading activities at 3 percent of Tier 1 capital. Incidentally, Geithner has built strong ties with industry by hiring numerous top Wall-Street bankers to work for him at the FED. Notably, he hired Goldman's ex-chief economist William Dudley in 2007 to run the FED's trading floor. Dudley eventually succeeded Geithner as the head of the FRBNY in 2009 when Geithner was appointed to replace Paulson as the head of the US Treasury (see Figure 2).

Although Wall Street won numerous regulatory battles, banks including Goldman Sachs had to adjust to new constraints. In particular, to comply with newly enforced regulation, Goldman had to significantly reduce its leverage. In two successive rounds, in 2008 and 2009, Goldman raised \$11.5 billion in new equity capital and reduced its leverage threefold compared to pre-crisis levels (S&P Global, 2019). In spite of stricter capital requirements and the end of the golden era of trading, Goldman has managed to maintain solid revenues through a number of strategic changes. To compensate falling revenues from trading (down 48% between 2009 and 2017), investment banking and asset management divisions delivered strong results (up 48% and 37% respectively since 2009)⁶.

Following the crisis, the group underwent a significant re-organization of its personnel expenses. Interestingly, employment data suggest that although the bank

⁶ In spite of the correction, revenues from trading still largely outweighed other revenue sources in 2017 (40% of total compared to 23% from investment banking, the second largest revenue contributor).

remains a labor-intensive firm, the nature of work at Goldman Sachs is undergoing notable transformations reflective of the bank's strategic repositioning as well as broader transformations in financial service provision. As we show in Figure 3, between 2009 and 2017 the number of Goldman Sachs' full-time employees increased by 13%, while total personnel expenses have declined by 27%.

According to Goldman Sachs' annual reports, the increase in headcount largely reflects an increase in regulatory compliance needs post-crisis. On the other hand, improvements in "operating efficiency" were achieved "...through a combination of shifting to a greater percentage of junior employees and relocating [some of Goldman's] footprint to lower-cost locations... such as Salt Lake City, Dallas, Irving, Warsaw, Singapore and Bengaluru" (2015, p. 3) which now host a quarter of Goldman's workforce. Although, top executive compensation dropped by 60% since 2007 (when it peaked at a staggering \$331mn) long term trends indicate that Goldman's executives have enjoyed rising compensation—since 2000, top executive compensation is up by 50%. By the company's own admission, the gender pay gap remains a problem at Goldman. It primarily reflects the significant under-representation of women in senior positions—in 2017, in the UK, 62.4% of employees in the bottom quartile for pay were women compared to only 17% in the top quartile (Goldman Sachs, 2017).

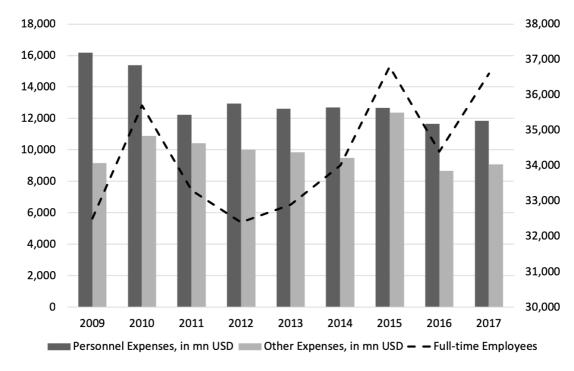


Figure 3. Goldman Sachs' expenses and full-time employees, 2009-2017.

Source: Goldman Sachs' annual statements.

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⁷ Remuneration for top executives (CEO, CFO and COO) is, if only slightly higher, comparable to the remuneration observed at Morgan Stanley. However, differences are very small between the top 3 at Goldman indicating a relatively flat rewards system at the top of the organisation.

The contraction of non-executive employees' compensation reflects a number of factors. First, asset management, which accounts for a growing share of Goldman's revenues (18.2% in 2017), is undergoing technologically-driven transformations that are putting pressure on revenues and gradually substitute human capital with technology (Haberly et al., 2018; Urban, 2018). In asset management, rather than strictly replacing workers with machines, we are seeing a qualitative shift in labor where star performers that typically commanded high compensation packages are being replaced by star algorithms and digital platforms that rely on development and maintenance staff. The latter are increasingly found in non-traditional financial centers, which offer large pools of cheap and tech-savvy workers.

Secondly, since the crisis, Goldman Sachs is increasingly leaning towards technologically intensive banking activities which require a qualitatively different kind of workforce (for an earlier account of the evolutionary path of retail banking see Leyshon and Pollard, 2000). In 2016, it launched Marcus by Goldman Sachs, an online retail bank named after Marcus Goldman, who founded Goldman Sachs in 1869. In 2017, Goldman reported serving 350'000 online retail customers across loans and deposits. The online bank accounted for \$17.1bn of personal deposits and issued \$2.3bn of personal loans since its launch. The firm's 2017 annual report stated:

...consumers are moving away from brick-and-mortar branches to solutions that use technology to more seamlessly meet their needs (Goldman Sachs, 2017).

To meet the firm's reorientation towards back-office and technology-intensive activities (online retail banking and asset management in particular), Goldman Sachs has opened a number of new offices in cities like Salt Lake City and Bengaluru in India—the former is now the firm's second largest Northern American office after New York City.

Thirdly, as we show in Figure 4, we observe a significant geographical shift in Goldman's investment banking clientele. Although domestic business remains by far the largest source of investment banking revenues for Goldman, in 2012 Asia overtook Europe as its second largest source of business. This is explained by the sluggish post-crisis recovery of Europe and the continued growth in Asia. Unlike asset management and retail banking, traditional investment banking activities (M&A, IPOs, debt and equity capital market emissions) remain human capital-intensive and require boots on the ground. To meet new client-orientated needs in Asia, Goldman Sachs has opened new offices in Perth, Shenzhen, Jakarta and Kuala Lumpur.

\$bn Americas Asia-Pacific EMEA

Figure 4. Goldman Sachs' Gross Fees from Investment Banking by clientele time zone, 2000 and 2015

Source: Dealogic

Conclusions and implications

Our paper offers a contribution to both theory and empirics. Conceptually, we build on the theory of adaptive resilience, understood as the ability of complex systems to adapt to various market and environmental shocks and maintain their core functions (Simmie and Martin, 2010). Engaging critically with existing scholarship, we stressed some conceptual limits to regional resilience frameworks. Firstly, following Fromhold-Eisebith (2015) we argued for the importance of studying sectoral resilience in combination with regional resilience, with consideration for the global value chains and the production networks through which firms and industrial sectors operate. Secondly, we contended with a number of resilience scholars on the critical importance of power asymmetries, agency and governance to the study of resilience (notably see Smith and Stirling, 2010; Pain and Levine, 2012; Shaw and Maythorne 2013; Bristow and Healy, 2015). In particular, we emphasized that in economic contexts characterized by high power asymmetries, strong agents such as lead firms may come to shape the threats and opportunities of weak agents by controlling key resources and influencing policy environment.

Empirically, we took the US financial system as our sectoral and regional context and used a case-study approach to examine the role of Goldman Sachs in shaping the resilience of the US financial sector in the lead up to, during, and out of the global financial crisis. Firstly, we showed that Goldman's rise to prominence was linked to the firm's strategic move to aggressively securitize and trade the booming US real estate market. In doing so, Goldman Sachs contributed significantly to the build-up of systemic market risk. In 2006, when legislators, regulators and the rest of the US securities industry seemed to be fast asleep at the wheel, Goldman showed remarkable foresight in spotting early signs of the imminent collapse of the US real estate market. As a result, the company started offloading much of its long exposure to subprime securities in a move that would spark much controversy on the legality and morality of investment bankers selling securities they deem worthless⁸.

Although Goldman's premonition proved to be right, the firm underestimated the interconnectedness of the US financial sector. Following Lehman Brothers' bankruptcy, Goldman's fate, not unlike a number of other G-SIFIs, came to depend on government agencies (Sorkin, 2009). What we need to keep in mind, however, is that the massive government-sponsored bailout was largely motivated by G-SIFIs' interest to preserve the status quo and was probably not the only course of action. Indeed, the US Treasury and the FED's response to the global financial crisis were largely borne out of close negotiations with executives of G-SIFIs. As we documented, Goldman Sachs played center stage in these negotiations and worked tirelessly to promote its interests and steer regulators and government agencies to avoid both failure and reforms.

Although the firm has made every possible effort to distance itself from the idea that it was bailed out, we showed that it was one of the largest recipients of government aid. We demonstrated that in the aftermath of the crisis, Goldman was one of the leading actors fighting tooth and nail the reregulation of the US financial sector. Although, Goldman did not come out of the crisis unscathed or unchanged, our analysis suggests that its recovery is as much due to its ability to adapt to a changing environment as it is to its capacity to shape it. Indeed, the evidence suggests that, to insure its own survival, Goldman Sachs played a lead role in the financial sector's resilience. In a twist that epitomizes power dynamics in US capitalism, Goldman Sachs not only navigated but tamed what Coffee aptly coined a "Regulatory Sine Curve"— "a cycle driven by the differential in resources, organization, and lobbying capacity that favours those interests determined to resist further regulation" (2012, pp. 1078-1079).

Beyond regulatory capture, Goldman Sachs has shown its capacity to alter its business model to adapt to the changing demands of the market. It has been a global and diversified firm for decades, but since the crisis, it has arguably become even more global and diversified. Today, its extensive network of 61 offices spans leading financial centers including New York, London, Frankfurt, Paris, Hong Kong, Tokyo and Singapore, and emerging financial centers focused on mid- and back-

⁸ Interestingly, a recent study shows that investment banks' misconduct might actually act as a positive signal to clients and industry insiders (Roulet, 2018).

office operations as well as technology, such as Salt Lake City and Bengaluru. In doing so, the company is contributing to the recent dispersion of employment in the US financial sector as highlighted by Wójcik and Cojoianu (2018).

As we stressed, technology is set to take on increasing importance in Goldman's dealings across all its activities, but especially in asset management and retail online banking. In 2017, one-quarter of Goldman Sachs' workforce had a background in science, technology, engineering or maths (STEM) (Goldman Sachs, 2017, p. 6). Although the financial industry has so far defied the predictions of wide-spread automation, technology is already recasting its geography. This emerging new geography of finance begs for more research, and evolutionary economic geography is well positioned to complement financial geography in order to address this challenge.

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