How Financial Information Asymmetry Alters Common Pools of Financial Risk

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Abstract

Finance has been grounded on the concept of information asymmetry since the beginnings of the industry. Financial intermediaries not only know more about those who supply and those who demand capital, but are encouraged by governments to gain and maintain information asymmetry advantages in order to effectively intermediate. Yet such advantages may combine with political influence and questionable ethics to engender excessive risk-taking, encourage self-dealing, and exacerbate financial crises. These advantages enable exploiters to access common pools of financial risk while also alienating others from access. Analyzing how informational asymmetry arises in finance and how organizational structures employ this asymmetry will enable us to understand the challenges of global financial governance, enhance financial resilience and protect common pools of financial risk. Modern financial intermediation involves the interlinked, network nature of financial risk and requires integrated governance explicitly designed around the common pool nature of financial risk.

Keywords

Information asymmetry; financial environment; banking and financial governance; banking and financial history; risk as common pool

INTRODUCTION

For half a century until his death in 1905, eminent banker Alexander Kleinwort fastidiously kept "information books" in which he recorded details on every one of his clients, the details of their financing and the particulars of each counterparty bank (Chapman, 1984: 72-5; also 43–5). Information in "the City", as London's financial district has long been known, was a powerful form of capital. Information linkages between London bankers and government officials were quite common, as English bankers "were guided by some brief public intimation, a speech in the House of Commons or at a political dinner…" (Feis, 1930: 86). Such linkages between governments and bankers, based on shared information can be traced back millennia, have grown through war (Kennedy, 1987: 76–84; Tilly, 1992), processes of macroeconomic management (Alessandri & Haldane, 2009; Bakır, 2013; Pérez, 1997) and diplomacy (Chapman, 1984; Ferguson, 1999; Tilly, 1992).

Financial intermediaries not only know more about those who supply and those who demand capital; they have long been encouraged by governments to gain and maintain information asymmetry advantages to effectively intermediate (Alessandri & Haldane, 2009; Chapman, 1984; Strange, 1990). This symbiotic relationship deepened considerably as governments grew larger through providing services and defending borders. The first known forms of bankers' acceptances and letters of credit were established in China in the 11th century A.D. as the imperial government enabled banks to issue "flying money" and notes based on tax revenues (von Glahn, 2005; Horesh, 2013: 49-64). An inflection point in government/banking relationships was reached in the European wars beginning in the late 17th century, as the "two-way system of raising and simultaneously spending vast sums of money acted like a bellows, fanning the development of western capitalism and of the nation-state itself" (Kennedy, 1987: 76, also 72-85).

Two hundred years ago, the Rothschild family maintained such an effective network of "private couriers to-ing and fro-ing with copies of letters . . . [that by the 1830s, this network was] used by the leading statesmen of the continent as an express postal service" (Ferguson, 1999: xxvii). Banks and bankers, particularly in Europe and America, began to develop large proprietary

stores of information which could be used to obtain, originate and structure deals (Chapman, 1984; Hidy, 1941; Morrison and Wilhelm, 2004). Governments sought out banks for their capacity to transmit, use and store information as well as for their capital-raising capacity. Modern governments use banks' information to plan economies, target industries for expansion, promote social programs, and monitor tax compliance. Banking theory holds that banks act as information conduits (Allen, 2001; Rajan & Winton, 1995) by accepting this social function to monitor their clients and pass on part of this information to governments, other financial institutions, private observers and the public at large (Diamond, 1984; Schumpeter, 1939). Yet such advantages derived through informational asymmetry may combine with political influence and questionable ethics to engender excessive risk-taking, encourage self-dealing, and exacerbate financial crises (Bhidé, 2009; Brewer & Jagtiani, 2013).

As the late 20th century progressed, banks and financial intermediaries increased return to capital-holders (Piketty, 2014) and increased their political power (Pauly, 1997) as the financial sectors of modern economies grew relative to other sectors (Bush, 2014; Philippon & Reshef, 2009). A consequence of modern financial intermediation is that banks and financial intermediaries also created excessive risk (Aliber, 2005; Alessandri & Haldane, 2009; Woolley, 2010). In effect, these informational advantages enable exploiters to access common pools of financial risk while also alienating others from access.

Analyzing how informational asymmetry arises in finance and how organizational structures employ this asymmetry (Hu, 2012) will enable us to understand the challenges of global financial governance. Implementing policies which encourage bankers and financiers, and their financial institutions, to act as stewards will strengthen financial environments and enhance financial resilience (Selmier, 2016a, 2016b; Wooley, 2010). Modern financial intermediation involves the interlinked, network nature of financial risk (May, Levin & Sugihara, 2008; Rajan, 2006) and requires integrated governance explicitly designed around the common pool nature of financial risk (Selmier, 2017; Selmier, Penikas & Vasilyeva, 2014).

Banks' informational advantages combined with political influence and questionable ethics have encouraged excessive risk-taking (Carruthers, 2013; van Horne, 1985) as well as self-

dealing (Wooley, 2010). This combination may also deepen, broaden and extend financial crises (Bhidé, 2009; Rajan, 2006). Long gone are the days when "American banks were chartered because they were considered… in the more mystical terminology of the 18th and 19th centuries, 'public blessing[s]'" (Polski, 2003: 42). Analyzing how informational asymmetry arises in finance and why organizational structures employ this asymmetry will enable us to understand the challenges of global financial governance. Implementing policies which encourage bankers and financiers to act as stewards will strengthen financial environments and enhance financial resilience (Bakır, 2013; Selmier, 2016a, 2016b). Insisting upon such stewardship will help instill- or help re-instill- a sense of moral primacy into financial actors and financial markets. Modern financial intermediation and the interlinked, network nature of financial risk have developed together (Allen & Babus, 2009; Selmier, 2013, 2017; Zaloom, 2006). Thus it requires integrating governmental regulation with private actor governance structures which employ informational asymmetries as well as a sense of moral rectitude and stewardship among bankers and financiers.

This paper begins in the next section by discussing the informational, financial and reputational capital of financial intermediaries, and why their informational advantage is theorized by bank economists as requiring them to use their informational resources to monitor clients and make public their findings through actions and pronouncements. Information enables financial intermediaries to create new products and financial structures, and the following section applies this capacity to examine systemic risk problems in financial markets. A key part of this section is the construction of club structures in finance to deal with common pool nature of financial risk. Section 3 looks at how politics and governance influence, and are influenced by, this common pool nature of financial risk. The last section gives final thoughts as to the intimate linkages between delegated monitoring and the soft budget constraint.

FINANCIAL INTERMEDIARIES, INFORMATIONAL ADVANTAGE, AND DELEGATED MONITORING

Banks are fundamentally important to any economy. In their role as financial intermediaries, banks intermediate across both *space* and *time*. In *space*, a bank accepts deposits from those who have capital and then makes loans to those who require capital; in *time* a bank converts short-term deposits into long-term loans. Through this intermediation, banks engage in "qualitative asset transformation" (Boot, Greenbaum & Thakor, 1993; Greenbaum & Thakor, 1995). This simple, but fairly accurate, archetypal intermediation model allows banks to profit by exploiting interest rate spreads between deposits and lent/invested funds, and also accurately represents the bank's risk inherent in maturity mismatches. However this intermediation model is bank-centric rather than encompassing the network nature of finance (Allen & Babus, 2009; Zaloom, 2006), financial networks' heavy dependence on organizations which span multiple financial intermediaries (Bakır, 2013; Selmier, 2013; 2016b), and the common pool nature of financial risks. As discussed throughout the rest of this paper, financial networks and organizational structures directly influence information flows and informational asymmetry amongst financial intermediaries and between financial intermediaries and the broader public.

In their intermediation role, banks have long relied not only on *financial* capital, but also on *reputational* and *informational* capital (Boot, Greenbaum, and Thakor, 1993; Morrison and Wilhelm, 2004, 2008). *Financial* capital includes not only the bank's deposits, reserves, and equity and debt outstanding, but also its capacity to obtain more financial capital through central banks, other private banks, and both public and private investors. Banks' *informational* capital comes through gathering, saving and using information. This information includes "hard data" which may be considered as that data which can be manipulated through alphanumeric calculation, and "soft data", obtained through personal interactions with various contacts including clients as well as other financial actors and government officials (Boot, 2000, Greenbaum & Thakor, 1995). This soft data is less easily managed, due in part to the complexities of organizing and codifying the experiences, tacit knowledge and financial talent within the bank (Boot, Greenbaum, & Thakor, 1993; Ferguson, 1999; Morrison & Wilhelm, 2004, 2008). *Reputational* capital is accumulated through trust and successful financial contracting which leads to recognition within the industry, by government officials and among

active and potential clients. To become and remain successful, such intermediaries must rely on information, communication, capital and above all, reputation.

Importantly, banks may be considered as intermediaries in property rights as well as in financial capital flows. Those property rights which are intermediated or possessed by banks and other financial institutions present complex challenges. While an industrial firm may protect its business through patents and intellectual property rights (Schwartz, 2017), banks and financial firms rarely can construct such IPR portfolios around financial products and processes. So while a bank or financial institution may have proprietary information about its clients' IPR portfolios- these are often assets upon which loans or investments are made- it has a more limited IPR portfolio of its own.

Rather, the most important corporate asset for a financial firm is its people and its capital, both highly mobile. In order to compete, a financial firm must constantly and creatively employ these corporate assets to design new financial products (Allen & Santomero, 1997; Palmer, 2012) and redesign its corporate structure around these new products (Eccles & Crane, 1988; Selmier & Frasher, 2013), utilizing its informational and reputational capital and profitably deploying the financial capital it has or can access. In so doing banks and financial firms innovate and embrace new technologies.

An example illustrating this concept of constant, creative design and limited IPR portfolio may be seen in the development of "Treasury strips", which were synthetic fixed income instruments created by US banks and brokerage firms in the early 1980s. At that time the yields on US Treasury bonds were historically high. At the simplest, banks and brokerage firms split Treasury bonds into principal and interest coupon streams: clients who wished to acquire an income stream bought the coupon instruments; those who wanted a payout in the longer term bought the principal coupon (for instance, someone planning for retirement income in 20 or 30 years). The plethora of brand names and the speed at which competitors rushed to bring out "me-too" products indicates the difficulties of constructing IPR protection around new financial products. Treasury strips were first developed in 1981 by Merrill Lynch and called LYONS [Liquid-yield Option Notes], and soon competing investment banks brought out similar instruments with names like TIGRs ["tigers", Treasury Income Growth Receipts], CATs, ZEBRAs, STAGs and so on (Rybczynski, 1988; Sandretto, 1993).

Partly because they cannot defend their business behind the walls of IPR portfolios and must develop products as quickly as possible (Palmer, 2012), banks are often at the forefront of new ICT and organizational/financial technologies. Over the last two centuries banks and financial firms have been among the first to adopt use of the telegraph, the telephone, and computing. Such new technologies enabled banks and financial firms to gain a temporary advantage over their competition. For instance, in the 1870s Montagus became the first London-based bank to extensively use the telegraph, locating their offices so as to trade based on telegraphed information (Chapman, 1984: 47).

To put this into modern perspective, the global financial services industry invested more than any other aggregated buying group- more than even governments- with an estimated information technology budget of $500 billion in 2009 (Economist, 2009). This high level of IT investment has been long-established; large financial firms were among the early investors in supercomputing, investing on what technologists call the "bleeding edge" because of the costs of acquiring the latest technology. Citibank's mid-century effort to develop the world's most advanced check-processing system resulted in the scrapping of a multi-million USD automated check processing machine before it was even completed- the "iron" was towed out and sunk in the Atlantic (van Cleveland and Huertas, 1985: 291–93).

Insert Graphic 1 here

Quite simply, banks attempt to develop asymmetric advantages vis-à-vis competing financial institutions and other social actors through their massive IT investment programs. However these huge IT investments can become inefficient, leading to the silo-like nature of large banks' and financial institutions' information systems. So large, segmented and sometimes ill-coordinated are the resulting stores of information that financial institutions themselves sometimes experience problems accounting for complex instruments (Economist, 2009; Sandretto, 1993), managing them (Eccles & Crane, 1988; Lewis, 2009) and even understanding them (Crosman, 2011; Hu, 2012; Zink & Selmier, 2013). The LYONS, TIGRs and CATs noted above provide an example, as corporate managers struggled to account for the informational complexity of the embedded income streams on their balance sheets (Sandretto, 1993). In effect, the information silo effect takes a financial institution- thought to be a unitary actor operating

under hierarchical rules- and weakens that unitary control. And yet banks are expected to use these informational stores in socially-beneficial ways.

Because banks have access to such immense stores of information, and also because they are fragile institutions, banking economists extend their argument to say that banks are charged with a *social responsibility* to employ their informational advantages to monitor financial contracts (Diamond, 1984; Schumpeter, 1939), whether banks are in developed or developing economies (von Mettenheim, 2006; Stallings & Studart, 2006). In other words, they must use their information to monitor then transmit information embedded in that monitoring to society at large (Allen, 2001; Diamond, 1984; Rajan & Winton, 1995). Loan and debt covenants are constructed around this function (Krasa & Villamil, 1992; Rajan & Winton, 1995).

This function is termed delegated monitoring. Societies have delegated to financial intermediaries this monitoring function to improve economic efficiency (Diamond, 1984; Krasa & Villamil, 1992). Monitoring is costly in that information collection and analysis requires expertise, time and money, as evidenced by the financial industry's very high IT investment, the above-average compensation for those working in the industry, and the fees charged. Some of these fees may come in the form of rents extracted through obtaining oligopolistic positions in the financial industry. Delegated monitoring not only provides information in a direct form, but indirectly the information provided improves the discipline of both borrowers and lends, enables risk management in regional and national economies, and thereby improves overall management in intermediated financial markets (Diamond, 1984; Krasa & Villamil, 1992) and in traded financial markets (Allen & Santomero, 1997). These benefits are theorized to permeate out through an economy whether banks hew to a relationship model of banking or a transactional model of banking.[1]

[1] Relationship and transactional banking are archetypes of modern banking theory. Relationship banking is theorized around the banker/client relationship, in which a banrker invest a considerable amount of time in face-to-face interaction to gain a proprietary knowledge advantage which can be used in credit allocation and risk management decisions (Boot, 2000: 10). Transactional banking is seen as arms-length, hard data-driven financial contracting transacted at sufficiently high volume to justify the considerable expense required for data processing. In practice, relationship bankers still employ hard data as well as the soft [tacit] data gathered through face-to-face interaction, while transaction-oriented banking still invovles person-to-person contacts through trading and client interaction. In both archetypes, information storage, usage and intra- and inter-bank transmission of the data is costly (Berger & Udell, 1992; Boot, 2000; Hayes, 1979).

WHY ROB BANKS- BECAUSE THAT IS WHERE THE INFORMATION IS

Systemic problems in financial markets are better understood by looking at how the structure of finance and the organizations created within the industry help to manage information flows. These organizational structures channel those flows and lead to repositories of information within the firms, structures and industry itself. Information enables the holder to better manage risk through enhanced awareness of outcomes and the capacity to use information to alter some outcomes and avoid others.

Selmier, Penikas, and Vasilyeva (2014: 123) define risk as "the estimated exposure to a situation of uncertain outcome." Information helps at every stage in the risk management task: estimation can be made, and made more approximate to the risk position at hand (Knight, 1921; Watkins, 1922). Exposure can be minimized or avoided. Uncertainty can be reduced through more accurate probability measurements, and possible outcomes more accurately forecast (Allen & Santomero, 1998; Boot, 200), improving financial system governance as well (Houben, 2013).

> Knight's famous distinction between business risk and uncertainty [1921] is partially predicated upon information asymmetry; if information is available, and the risk holder can access that information, then risk can be probabilistically estimated. Estimation enables insurance contracting, so risk may also be taken on through underwriting an insurance contract and offset by buying one. But such contracts are inherently based on the writer's and buyer's estimation of risk and on their understanding of the property rights surrounding that risk. (Selmier, 2017: 218- 219).

Informational asymmetry not only exists (Allen, 2001; Diamond, 1984) but in fact enables financial institutions and markets to function (Allen & Santomero, 1998; Rajan & Winton, 1995). But it also leads to systemic problems, and at the heart of these problems sit the variable property rights nature of financial risk. Selmier et al (2014) argue that financial risk- as a good- may be consumed individually as a private good, but "as risk increases it crosses certain boundary conditions and shifts, or transmutates,[2] from a private good to a good shared with others (Selmier, 2017: 216). As financial risk grows in impact it expands beyond individuals or financial institutions to become a common pool. As with other common pools it may be considered a resource- expanded pools enable individuals and institutions to share large amounts

[2] Selmier (2014, 328, 332) defines transmutation as an financial engineering process "in which actors employ technology and developments in theoretical finance to package financial goods into new financial products whose resultant property rights shift their good type in this typology matrix."

of financial risk which one or a few economic actors could not take on by themselves. And yet there is sometimes an unwilling sharing of financial risks.

Financial "Clubs" as the Obverse Side of the Common Pool of Risk

Over much of long history of banking, banks and bankers organized into clubs to manage information, share or lessen financial risks, and to govern themselves. A club is "a voluntary group deriving mutual benefits from sharing one or more of the following [characteristics]: production costs, the members' characteristics, or a good characterized by excludable benefits" (Sandler & Tschirhart, 1997: 335). In the financial industry we find organizations which illustrate all three of these characteristics: production costs are lowered in firms which accumulate the expertise to engage in a variety of financial deals, gather the informational stores to gain a competitive advantage over their competitors, and obtain the capital and contacts required to spread out risk. Banking partnerships, venture capital and private equity firms, and mutual fund complexes all exhibit these tendencies. It is not a stretch to say the unique, specialized expertise resident within these organizations constitute unique characteristics. And certainly those who work within enjoy goods such as profits, informational advantages, and privileged access. That is not to say that there is equal enjoyment of these goods in such industry structures, as some within the club walls may gain more and suffer less risk (Scotchmer, 1985; also see Siquiera, 2001, for a broader game-theoretic approach to this point).

The scope of banking clubs have gradually shifted from firm structure to groups of firms such as bank clearing houses and syndicates toward industry-spanning forms of clubs (Chapman, 1984; Selmier, 2013). A prominent example of an industry-spanning club consists of the banks which are considered too-big-to-fail [TBTF]. The club-like characteristics of American banks who are members of the TBTF club include access to implicit insurance underwritten by the US government which serves to lower these banks' costs of funding by a substantial amount (Alessandri & Haldane, 2009; Hughes & Mester, 1993; Mester, 2005) as well as raise their market capitalization (Brewer & Jagtiani, 2013).

TBTF presents the sharp edge of increasing capital-concentration in the industry. In 1979, Hayes warned that American investment banking was being "transformed" as capital requirements to compete for the larger, more prestigious deals required rapidly growing capital reserves. This

shift accelerated the ongoing decline of investment banking partnerships whose capital was limited by their partners' reserves and retained earnings (Chapman, 1984; Morrison & Wilhelm, 2004). The symbiotic ties between increasing levels of capital requirements and IT investments widened the growing gap in informational asymmetry, political power and the capacity to capture profits in new financial profits between larger, well-capitalized commercial and investment banks and smaller ones. IT investments could not be funded without capital to invest in deals, to retain profits, and to develop new products. New products and larger deals could not be structured without higher IT investments.

Complex innovations led eminent financial economists Allen and Santomero (1997: 1480) to suggest that financial markets are more accurately viewed as segmented by informational asymmetry:

> *… Who is the market? From our perspective it consists of two different groups… The first of these are the market participants of economic theory. They are fully informed at each instant of time and are active participants in the dynamic management of their portfolio of financial assets... [T]he second group… are usually described as uninformed. They are making decisions with limited information on both the nature of the financial claims involved and the most recent information on fair market value. It is to this group that the financial intermediary offers participation services…*

Over the last half-century power over information and capital allocation led to increasing political power. Political power, like information-linked advantages, accrued more to the dominant nodes in financial networks. This led to structural power derived through finance (Cerny, 1994; Strange, 1990), especially from the dominance of financial institutions' and countries' positions in financial networks (May, Levin & Sugihara, 2008; Oatley, Winecoff, Pennock & Danzman, 2013). Financial economics has been based on maximum entropy models in which "banks spread their lending as evenly as possible" (Allen & Babus, 2009: 372-74).

These models ignore three important aspects of financial markets: one, bankers and financiers prefer to deal with those they trust. Dealing increases information flow to those who dominate trade flow. Two, markets had long been hierarchically structured. With dominant nodes (May et al, 2008) and informational asymmetry within markets (Allen & Santomero, 1997; Zink & Selmier, 2013), hierarchies became more prominent. And three, the actors in financial networks

are consistently gaming both the market and systemic risks to take advantage of their informational advantages and lower exposure to individual (Bhidé 2009; Woolley, 2010).

Rather than markets developing along the lines of maximum entropy models, financial markets have developed into disassortative financial networks, wherein fewer counterparties handle more of the transactions. These types of networks engender different individual and systemic risks than those encountered under maximum entropy models and, as much of financial market governance is based on the more accepted model accepted in financial economies, considerable governance challenges arise.

POLITICS, GOVERNANCE, AND THE COMMON POOL OF FINANCIAL RISK

Those banks and financial institutions who occupy the dominant nodes in their respective disassortative financial networks are often able to use their advantages regarding regulation and governance (Congleton 2009; Weder di Mauro, 2009). In addition to gaining leverage through TBTF (Alessandri & Haldane, 2009; Brewer & Jagtiani, 2013; Mester, 2005), scholars have described a broad range of regulatory challenges as "boundary issues." Goodhart and Lastra (2012) see innovation and the ways in which adaptive actors engage in opportunistic behavior as causal links in the challenges to demarcate regulatory responsibility between regulated and unregulated financial institutions, as well as how to set geographic boundaries when an actor operates across borders where legal and regulatory structures vary from one side to the other. Very large banks not only cross regulatory as well as geographic borders; in some cases banks take advantage of boundary conditions by purposefully creating boundary-crossing innovative products (Allen & Santomero, 1997; Goodman & Pauly, 1993; van Horne, 1985) which may come with unknown consequences (Hu, 2012; Rajan, 2006). An example would be multi-currency swap arrangements with embedded options, whose embedded opportunities and risks can only be assessed through complex mathematical modeling (Rybczynski, 1988; Sandretto, 1993). Misuse of complex financial products may damage common pools of financial risk.

A recent example involved credit-default swaps and the operations of AIG. A specialized unit within AIG took advantage of AIG's capacity to engage in this business under insurance rather than bank regulations, and operated across both regulatory and geographic borders (Lewis, 2009; Lo, 2017). Part of this regulatory arbitrage stemmed from AIG's corporate culture, one which

emphasized growth at all costs and a loyalty to the former Chairman, "Ace" Greenberg, who was pushed aside in 2005 (Lo, 2017). This type of behavior led AIG to purposefully withhold information on credit default swap exposure during the recent financial crisis (Morgenson & Story, 2010). The $180 billion collapse of AIG and the damage to other market actors' attempts to hedge shows that the common pool of risk can be severely injured by one major actor. Congleton (2012) notes that AIG's bailout evidenced the implicit insurance available to very large financial firms which are recognized as TBTF.

Perverse incentives which arise through banks' channels of proprietary information may lead to challenges to systemic stability: first, banks and financial firms have been found to screen out, withhold, or signal-jam information for their own benefit. AIG's action on credit-default swaps in only the recent information-withholding example in a long line of historical financial crises (Reinhardt & Rogoff, 2009). Second, bank managers may privately benefit from informational advantages (Stallings & Studart, 2005; Reinhardt & Rogoff, 2009). Rajan (2006: 500) noted before the recent global financial crisis that "changes in the financial sector have altered managerial incentives, which in turn have altered the nature of risks undertaken by the system, with some potential for distortions." And third, not only are bankers' incentives misaligned against proper disclosure of information, regulators' incentives may also be misaligned against information disclosure. Bankers and financiers in fact use this: "As soon as crisis strikes, the optimal choice for policymakers differs from the pre-announced policy… the authorities will usually offer support. The banks anticipate this behaviour and run even more risks as a result" commented economist and member of the German Council of Economic Experts Beatrice Weder di Mauro (2009).

Banks' and financial institutions' information stores and embedded expertise have also translated into delegation of some responsibility by regulatory agencies concerning rule-making and self-regulation (Pauly, 2001; Underhill & Zhang, 2008; Young, 2013). Of course this delegation of authority increases banks' and financial institutions' political power. But such delegation also occurs under the presumptions that financial institutions are unified actors with ready access to those stores of information and datasets. The "silo" effect in banking information systems, wherein banks and financial institutions build vertical information systems to create, market and manage complex financial products (Eccles & Crane, 1988; Economist, 2009), undermines some

of the rationale for delegation of rule-making and hampers efforts to craft optimal rules and regulations. This occurs because financial institutions' representatives who are charged with crafting and advising on the rules may sit outside the silo without same knowledge of risk known to those within (Lewis, 2009; Selmier & Frasher, 2013).

Storing information "vertically"- in siloes- weakens banks' and financial institutions' capacity to manage risk and to disclose information as well. Hu (2012) suggests banks may not only be TBTF but also "too complex to depict" in that regulatory models depend on information disclosure by banks which is then gathered by regulatory bodies (2012: 1621-28). Difficulty in reporting information is compounded by financial products which are so complex that they may not be understood by senior management (Eccles & Crane, 1988; Zink & Selmier, 2013). To encompass this potentially dangerous mix of complex financial products, incomplete information sets and the bounded rationality of bankers, financiers, clients and regulators, an optimal "regulatory approach must be highly eclectic in nature, in terms of academic disciplines [economics, finance, law plus computer science, mathematics and psychology] and in terms of 'local knowledge' of marketplace realities" (Hu, 2012: 1679).

Lastly, there are conflicting incentives for national governments as to how to regulate or even how to structure regulation. Rothschild wrote in 1976 that "[American] banks' expansion has been most luxuriant where it is most free of government restrictions: above all, in the Eurocurrency business. Of all the flora of the boom, Eurobanking has been the most fecund." While the Interest Equalization Act was not intended to benefit American banks, it led to a burgeoning international banking business (Goodman & Pauly, 1993).

The American government has long been happy to continue to explicitly support American banks through business promotion, including governance structure which favors them. A century ago President Wilson linked the structural power of finance with his support of American banks: "… those who finance the world must understand it and rule it with their spirits and with their minds" (quoted in Frieden, 1988:71). Tight linkages between the American government and American banks engaged in international operations remain to this day. Oatley and Nabors (1998) noted that American negotiations for Basel Accords were shaded toward disadvantaging Japanese banks to support American ones. Japanese officials were conflicted as to whether to support their banks or to hew toward the "San Francisco System" wherein Japan

supported American financial interests in exchange for the security umbrella which the US provided (Calder, 2004). Indeed one can argue that the US is still willing to trade American bank support for more open information disclosure and more balanced bank regulation, as evidenced by US government pursuit of Swiss banks for information on offshore accounts while American banks were perhaps less rigorously pursued (Emmenegger, 2015).

INTEGRATED APPROACH TO FINANCIAL MARKET GOVERNANCE

Even if desired, informational asymmetry in finance will not disappear. Borrowers do not want known the details of their borrowing; corporate borrowers often do not wish the reasons for that borrowing to be known because it may give information to competitors. Private and corporate financial information is closely guarded (Allen & Santomero, 1997; Selmier & Frasher, 2013). Governments often consider financial information not only critical to macroeconomic management, but also a key component of national security (Steil & Litan, 2008) and so constrict access. Access to such information may provide leverage to some countries, with the US at the top of the pyramid in terms of leverage (Emmenegger, 2015; Oatley et al., 2013; Strange, 1990). And given these regulatory and governance issues arising from bank information disclosure at each level in the global political economy- individual, firm, country, international financial system- the challenges facing regulators and governance officials are compounded by informational asymmetry within financial systems.

With increasing financialization have come increased governmental attempts to access and control financial information. These efforts were due in part to a view of what constituted international financial stability built upon a belief that explicit institutionalization of financial governance would achieve greater stability (Ruggie, 1982; also see Ikenberry, 2001, and Snidal, 1985, for this argument in terms of hegemonic stability). While national governments remain the key actors in financial governance (Helleiner, 2014), banks and financial institutions hold the information which is critical to the success of financial governance. Banks and financial institutions must be forced to move beyond what Pauly (2001:469) criticized as "enforcers in a resurgent system of global capitalism" toward engaged participants in financial system governance.

The inherent fragility of banks and other financial institutions means that governmental support is needed. As banking expertise and information is required for good governance, governments can use- must use- fragility of financial institutions to combine microprudential regulation with macroeconomic governance (Houben, 2013). Governments can go further in using banks and financial institutions to self-govern, forcing them to employ the information they have to better regulate their counterparties. In the past the club nature of banking enabled such self-governance in the form of clearinghouses (Dowd, 1994; Nair, 2016), syndications (Chapman, 1984; Selmier, 2013) and the basic interactions between banks (Morrison & Wilhelm, 2004).

Pauly (1997) wondered if financial globalization may approach the limits of its legitimacy and provoke a backlash against banks and financial institutions. This legitimacy has been stretched partly through the tensions arising from informational asymmetry between "market participants of economic theory" and the "uninformed" as Allen and Santomero described them (1997: 1480). Banks and financial institutions will not lose their informational advantages, but these advantages may be turned to use in governance. Ultimately, banks and financial institutions must be physically domiciled somewhere. Tethered to a geographic location and fragile by nature, their information sets may be employed to improve governance.

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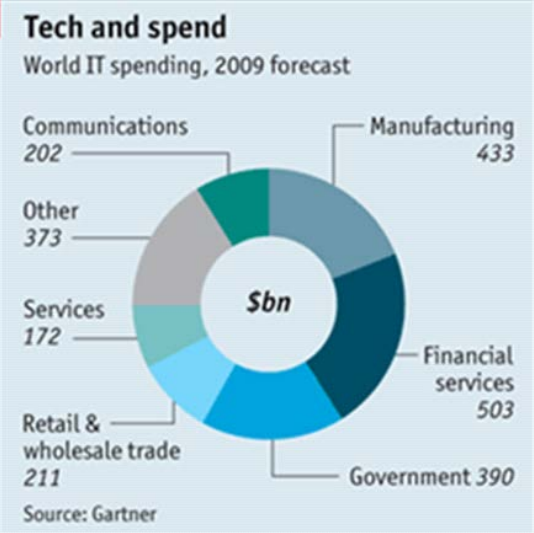
Graphic 1: ***Global IT spending by institutional group.***



Source: Economist (2009)