Too big to manage: US megabanks' competition by innovation and the microfoundations of financialization

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ABSTRACT

Disagreements over the systemic implications – the future – of financialization can be traced in part due to the absence of sustained attention to the role of banking firms in driving this secular shift forward. That is, the financialization literature lacks an adequate microfoundation. Accounting for the drivers of financialization processes solely at the macro level can only partially account for how these processes came about, and whether they are sustainable. This paper attempts to at least partially fill this gapby arguing that a key independent microeconomic driver of increasing financialization did exist: the incessant efforts by money-center banks in the US to break out of Depression-era restrictions on their size, activities, and markets. These banks' growth strategies in turbulent times led to an institutional (meso) shift – the rise of a megabank-centred shadow banking system – that now shapes global financial architecture even while operating in ways that are unsustainable. In short, "too big to manage" megabanks are at the heart of the fragility and instability of the economy today.

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1. Introduction

Explanations of the increasing financialization of economic relations have, to this point, emphasized macroeconomic and sectoral forces. The mechanisms by which financialization has become so pervasive have received relatively little attention. This paper explores one of its microfoundational roots, the rise of megabanking, and proposes answers to two central questions about financialization processes: what are their drivers? and can they continue indefinitely, or are they unsustainable?

Specifically, we show that US money-center banks' strategies for expanding profits in the 1960s, centring on competition through innovation, led both to these banks' growth into megabanks and to their increased risk-taking: in the 1980s, they were given 'too big to fail' protection so as to avoid systemic financial crisis. Megabanks' race for financial profits in the 1990s and 2000s, at a time when rapid technical change and deregulation have transformed financial markets and instruments, have led to their being too big to manage. The global growth of financialization has permitted megabanks to seek out excessive profits by expanding the scale and scope of globalized financial markets. Their sometimes ruinous competition over market share and return has come at the cost of the coherence of their own business models, and of increased financial fragility in the economy as a whole. This provides the key to understanding why financialization may be unsustainable in the longer run. The analytical perspective adopted here also lets us explore some ideas about the transformation of financial fragility that Hyman Minsky's late work (1995, 1996), written at the dawn of the new meso landscape of finance, elaborated only sketchily.

The term financialization denotes the increasing centrality of finance and financial behaviors in contemporary capitalism. Sawyer (2014, p. 5) argues that two broad explanations of financialization have emerged: one emphasizing "the growth of the financial sector in its operations, power, etc.," and a second emphasizing "a stage or epoch of capitalism." And while analysts agree that technological change and deregulation have altered not only financial instruments and institutions, but the very nature of economic reproduction, they disagree profoundly on the implications and stability of this transformation. Shiller (2012) and Mehrling (2012) argue that the consolidation of a shadow-bank-augmented system of market-driven finance will permit more efficient, less disruptive risk-sharing. Dumenil and Levy (2010), by contrast, argue that financialization has triggered a new, crisis-prone stage of capitalism, which will require a managerial approach (Dumenil and Levy 2018) to rein in its self-destructive tendencies. Harvey (2005), Streeck (2015), and Christophers (2016) view financialization as a stop-gap measure buying time for a failing post-Golden Age capitalism.

These analyses' disagreements over the systemic implications – the future – of financialization can be traced in part due to the absence of sustained attention to the role of banking firms in driving this secular shift forward. That is, the financialization literature lacks an adequate microfoundation. Accounting for the drivers of financialization processes solely at the macro level can only partially account for how these processes came about, and whether they are sustainable. Indeed, Christophers' (2015) warning against conceptually empty uses of financialization is rooted in researchers' failure to identify its mechanisms and institutional contexts. If an expansion in finance has filled in a widening gap between economic units' capacity to pay and their demand for goods and services, how did this happen? What micro-level

behavioural and organizational shifts on the financial supply side have met this expanded demand for finance?

We argue here that a key independent microeconomic driver of increasing financialization did exist: the incessant efforts by money-center banks in the US to break out of Depression-era restrictions on their size, activities, and markets. These banks' growth strategies in turbulent times led to an institutional (meso) shift – the rise of a megabank-centred shadow banking system – that now shapes global financial architecture even while operating in ways that are unsustainable. In short, "too big to manage" megabanks are at the heart of the fragility and instability of the economy today.

The remainder of this paper proceeds as follows. Section 2 defines competition by innovation. Section 3 reviews the banking crisis that necessitated "too big to fail" policies, Section 4 explains the links between securitization and megabanking, and Section 5 explores "too big to manage" megabanking practices. Section 6 considers why "too big to manage" banks have survived and been so consistently profitable. Section 7 comes to the question of the sustainability of financialized capitalism in the light of Minsky's ideas about financial fragility.

2. Competition by innovation

The literature on financial innovation (Solans, 2003; Frame and White, 2004; Lerner and Tulano, 2011) defines it very widely – the creation of new instruments, the linking of previously-unconnected markets, and so on. That literature assumes banks innovate in response to changes in technology or government regulation (Freixas and Rochet, 2008, pp. 1-2) when so doing improves their risk/return tradeoffs. Innovations that are observed have met this threshold: so no investigation of its systemic (meso-macro) implications is needed.[1] This micro-only approach certainly captures innovations deriving from technological advance. Our focus here is instead on banking innovations that work by generating meso-level changes.

To begin, then, a bank is defined as a financial firm that can supply credit by emitting liabilities that are accepted as payment (that is, deposits). Banking innovations consist of these firms' creation of new products, processes, or markets, as well as the early adoption of banking innovations before they pass into widespread use. As noted, we focus on innovations that transform the institutional structure (the meso level) of financial practices. These innovations thus involve taking unknowable risks in pursuit of higher returns, since risk/return parameters are undefined and regulatory oversight has not been established.

Banking innovations that seek micro-level profits by making changes in the meso level may be driven by either opportunity or adversity (Dymski 1987). Innovations are opportunity-driven when banking firms introduce instruments or practices aimed at increasing their assets and profits by expanding their market reach. Redmond (2013) links adversity innovations to financial crises. Here we define innovations as adversity-driven when they are undertaken to limit losses from asset-side defaults or unanticipatedly high liability costs.

Second, how do these innovations affect the overall levels of economic activity and well-being? Our answer builds on a distinction between Schumpeterian and speculative financial innovation

[1] Elson (1994) introduced the term 'meso' into economic analysis, as involving "the structures that mediate between individuals and the economy considered as a whole." This term has subsequently been defined in several different ways. Here it denotes the institutional rules, regulations, and practices that shape microeconomic markets and agents in those markets.

introduced by Leathers and Raines (2004). 'Schumpeterian' financial innovations enhance net employment and output growth in one or more non-financial sectors. 'Speculative' financial innovations, while they may increase bank revenues, do not affect employment or growth for non-financial economic units. Speculative financial innovations include 'buy to sell' asset purchases (Minsky 1986). The contrast is readily seen with balance-sheet accounting.

Figure 1: Bank and Non-Financial Firm Balance-Sheet and Income/Employment Totals

Changes in bank balance-sheet

ASSETS	LIABILITIES
ΔLoans (1)	ΔDeposits (1)
Δ(Interest paid in) (3)	ΔBorrowed funds (1*)
	ΔNet worth (3)

Changes in non-Financial Firm balance-sheet

ASSETS	LIABILITIESL
Δ(Plant & Equipment) (2)	ΔLoan (1)
Δ(Cash for labour & Intermediate goods) (2)	ΔNet worth (3)
Δ (Cash from income) (3)	

Non-Financial Firm flow totals: ΔLabour employed (2), ΔIncome earned (3)
Worker household flow totals: ΔWages earned (2), ΔCash or asset balances reduced(4)

Imagine an economy in which initially all non-financial firms are using all their available cash to support current operations, and have no reserves available to pay for the additional plant and equipment that would permit them to undertake income and employment-creating innovation. In this moment, the balance sheets above are blank. We then populate Figure 1's balance-sheet and flow totals with economic activity that unfolds in three temporal stages.

A Schumpeterian bank breaks the initial stagnant equilibrium only if a makes a new loan (ΔLoan) to one or more non-financial firms; this first move (designated (1)) above, permits the firm(s) to expand plant and equipment, to hire more labour, and to purchase more intermediate goods (2), thus expanding the overall level of labour employed and wages earned (2). This leads to the generation of income (3), which is paid into the firm's accounts (3), enabling it to retire its loan; when it does so, the bank's cash account swells with interest paid in. The net worth of both bank and non-financial firm increase (3). Note that if the bank's initial loan is made for a non-Schumpeterian purpose, the above balance sheets remain blank, except for the increase in loans paid in and net worth for the bank.

This brings us to financial innovation. A liability-managing bank can increase its loans by creating and selling a new borrowed-fund instrument (1*).[2] If the loan facilitated by this instrument triggers the three-step process described above, including non-financial income and employment growth, following Leathers and Raines (2004), it is a Schumpeterian financial innovation; if the loan thus facilitated is used for another purpose, it is a speculative financial innovation. We add a third category to these two: 'predatory' financial innovations create loan instruments that initially ease borrowers' short-term budget constraints – possibly facilitating their acquisition of assets – but whose terms and conditions lead to more binding longer-term budget constraints or to asset repossession. Such predatory innovations effectively represent the inverse of Schumpeterian innovations in their effects on economic activity.

[2] This statement does not imply a rejection of endogenous-money doctrine (Moore 1983). Banks create money in making loans; how many deposits are held on their balance sheets is a separate matter.

3. From liability management to systemic instability and "too big to fail" banks, 1960s-1980s

Aggressive growth-oriented bank behavior based on financial innovation was pioneered by money-center banks in the early 1960s. Money-center banks – defined as banks which service the credit needs of large corporations, and which guarantee the liquidity of nearby smaller banks – in the early 1960s. In the earlier post-war period, restrictions on geographic expansion and rate competition, together with the 1933 Glass-Steagall Act's separation of investment from commercial banking, protected the US banking system from market forces. However, this gradually changed once the Federal Reserve began to raise interest rates in response to inflationary pressure in the mid-1950s: bank customers with large balances began liquidating deposits and relending them in the then-emerging corporate paper market.

Money-center banks fought back by undertaking "liability management" – they set asset (credit) growth targets, and met them by borrowing habitually in the Federal Funds (interbank) market (Minsky, 1957). This was a feasible strategy because money-center banks systematically extended more loans, and smaller banks extended fewer loans, than their respective retained deposit bases could support. When the limits of interbank borrowing were reached – especially in cyclical downturns – they generated opportunity-driven liability-side innovations so as to access the borrowings needed to cover their asset-side commitments.

They borrowed against government securities in the repurchase-agreement (repo) market. And in 1961, Citibank sponsored the creation of the negotiable CD market; this made jumbo (over-$100,000) CDs liquid, and attracted large wealth-holders away from money markets. Subsequently, big banks borrowed more aggressively in interbank markets, and also tapped the Eurodollar market (Theilman, 1970; Dymski, 1999). The Federal Reserve undertook various restrictive measures, especially rate-maxima on instruments, to rein in these efforts. This move-countermove scenario ended in victory for the big banks in April 1970: market turbulence after the Penn Central bankruptcy forced the Federal Reserve to deregulate jumbo CDs, as it could not otherwise provide lender-of-last-resort support to New York markets in a crisis moment. This concession by the Federal Reserve both affirmed money-center banks' centrality in the financial system, provided them with access to wholesale borrowing markets, and let them further encroach onto investment banks' market turf. As Wojnilower (1980, p. 286) put it:

> The banks had always served as lenders of last resort to the rest of the financial community, while the Federal Reserve, although disciplining the use of the discount window, acted as lender of last resort to the banks. Both relations were profoundly altered by the introduction of CDs. … the role of the banks was greatly enlarged. It now made sense for banks to open much larger credit lines for other lenders …

Money-center banks' innovations in this period were Schumpeterian insofar as they expanded lending to non-financial firms generating income and employing labour. These innovations led to competition between money-center banks and investment banks in some markets (such as trusts); they also demonstrated that there were revenues to be gained by breaking through regulatory restrictions on borrowing and saving instruments.

A combination of meso and macro factors soon undercut this system. At the meso level, the Federal Reserve's concession on jumbo-CD rates enabled the creation of money-market mutual funds (MMMFs) in 1972. MMMFs purchase jumbo CDs (and other large bills) by bundling smaller deposits and paying money-market rates on their investors' semi-liquid shares. From the mid-1970s on, MMMFs were a destination of choice for savers pulling deposits out of banks.

This disintermediation forced commercial banks to replace lost deposits with borrowed funds at rates often exceeding those on their outstanding loans. Money-center banks were hit especially hard, as the larger corporations that had comprised much of their borrower base shifted into direct credit (bond and commercial-paper) markets. These banks compensated for these lost revenue sources via two innovations driven jointly by adversity and opportunity considerations: they extended loans to areas benefitting from exploding commodity prices, notably resource-rich Latin America and the southern "oil patch" states; and they used loan-participation schemes to enhance their leverage. From the standpoint of the US economy, this Latin American lending boom constituted speculative financial innovation.

In 1980 and 1982, banking reform legislation permitted banks to create money-market-like instruments so as to slow the migration of savings to MMMFs. However, the high short-term interest rates imposed by the Federal Reserve in this era turned banks' net interest margins upside down. The combination of high borrowing rates, severe recession, and the discovery of new commodity sources decimated commodity price levels and forced Latin American economies into default. The money-center banks that had pioneered competition by innovation were technically insolvent, as their outstanding loans to less developing countries (primarily to Latin American countries) amounted to more than 233% of their capital and reserves (FDIC, 1997, Table 5.1a, p. 196) and "oil patch" loan failures. Most of the thrift institutions offering mortgage finance were illiquid, and many insolvent.

4. From deregulation and securitization to megabanks, 1990s-present

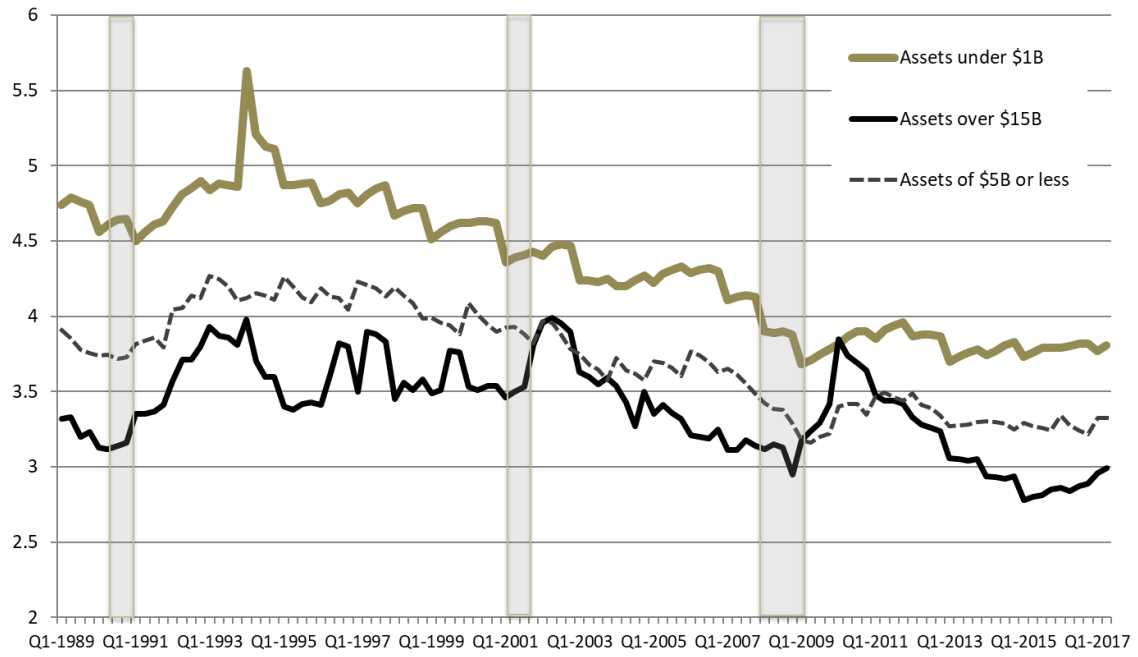
As Minsky (1986) put it, how could the unstable financial system be stabilized? The possibility of restoring the low 1960s-era interest and inflation rates disappeared in the unstable 1970s, and the future was no more promising. The alternative chosen had three components: transitioning to a banking system that could survive more turbulent times; protecting the system's money-center core; and restoring the viability of housing finance, given its political sensitivity and centrality in macroeconomic fluctuations (Leamer, 2015).

The Reagan administration, backed by the newly-formed Shadow Financial Regulatory Committee (SFRC), pursued deregulation forcefully: regulatory staffs were cut to the bone, and existing anti-trust law was ignored in favor of the "contestable markets" doctrine. Regulatory and Federal Reserve staff, backed by the SFRC, maintained that the US was overbanked, and set a bank merger wave in motion (Dymski, 1999). Next, money-center banks' undeclared insolvency demanded special treatment. Continental Illinois, which had relied on wholesale borrowing to support speculative lending to the US "oil patch," was in especially dire straits. When in September 1984 a run on the borrowing market threatened Continental's collapse, US Comptroller John Conover declared that 11 money-center banks were "too big to fail" (TBTF). This declaration was followed some years later by a subsidy which primarily benefitted TBTF banks: US Treasury-subsidized Brady Bonds in the late 1980s removed Latin American debt from private lenders at an estimated 68% of their par value, implicitly recapitalizing the banks holding this debt (FDIC, 1997, p., 209).

The final policy shift involved the question of how to protect housing finance, given the collapse of the thrift sector. The solution was to permit commercial banks to enter the market and to vastly expand the securitization of "plain vanilla" mortgage loans by having government-sponsored enterprises (GSEs) provide guarantees against default for loans meeting safety criteria. By the end of the 1980s, plain-vanilla securitization had turned the mortgage market into a securitized market.

While the 1980s triple banking crisis was unfolding, information-processing and communication technological breakthroughs were bringing about the "era of particle finance" (Sanford, 1994): financial services that had previously been bundled together could be broken into their constituent parts and priced separately. Algorithms began to replace relationships. Standardized products could be developed for market niches by intermediaries able to reach customers electronically as well as face-to-face. Banks' fees from such products were limited only by the size of their customer bases. Several money-center banks and regional banks, building on these technological shifts and exploiting the acquisition opportunities created by thrifts' and "oil patch" banks' insolvencies, built "superregional" customer bases.

Figure 2: Net interest margin, US banks by asset size, 1989Q1-2017Q2



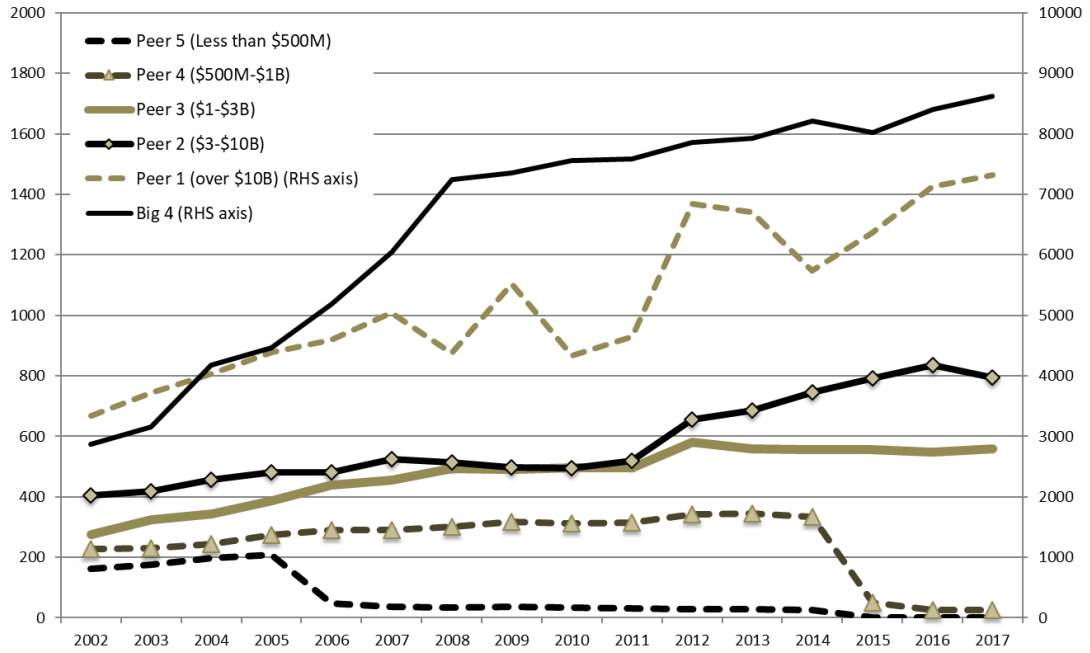
Source: Federal Financial Institutions Examination Council, reported in the Federal Reserve Economic Database maintained by the St. Louis Federal Reserve Bank. See https://fred.stlouisfed.org/.
Note: the shaded areas on the figure represent cyclical downturns.

The "particle finance" era vastly expanded loan securitization through a series of opportunity-driven innovations. Loans were bundled together and divided into 'tranches' paid over time, and then sold off to customers willing to take on the risks of these subdivided cash-flow commitments. Securitization offered a more flexible means than had liability management of eliminating institutional tie-ins between specific borrowers and specific savings pools. Private-sector underwriters emerged to facilitate the securitization of housing not qualifying for GSE underwriting. Hedge funds and other investment vehicles emerging in the deregulation era, all seeking above-market returns, provided ready market demand for these assets. Consequently, ever more classes of credit were securitized, and total securitization climbed from $400 billion in 1995 to $2.7 trillion in 2008 (Tymoigne, 2009, Figure 16, p. 29).

The explosive growth of securitization showed that credit could be provided through either intermediated or direct credit markets. Investment banks, hungry for returns due to the shift of many larger firms to public ownership (Hays 1979), muscled into securitization; they not only

issuing securitized debt but used these instruments as new vehicles for zero-sum speculation (Lewis 1989). Drexel Burnham Lambert, an investment bank, created a market for "junk bonds" – below-investment-grade corporate securities. Below-investment-grade (subprime) mortgage volume emerged in the mid-1990s, and investment banks purchased some of the mortgage brokers originating these contracts (Dymski, 2013). In sum, credit markets were integrated: first through syndicated loans and junk bonds (Thomas and Wang, 2004), then through the bundling of loans and bonds into securities. As Figure 2 shows, large US banks have consistently had lower net interest margins than smaller banks; as one consequence, they felt more pressure from this integration than smaller banks.

Figure 3: US Bank Holding Companies by Asset Size:
Peer Groups 1-5 and "Big Four", 2002-2017 (in $M)

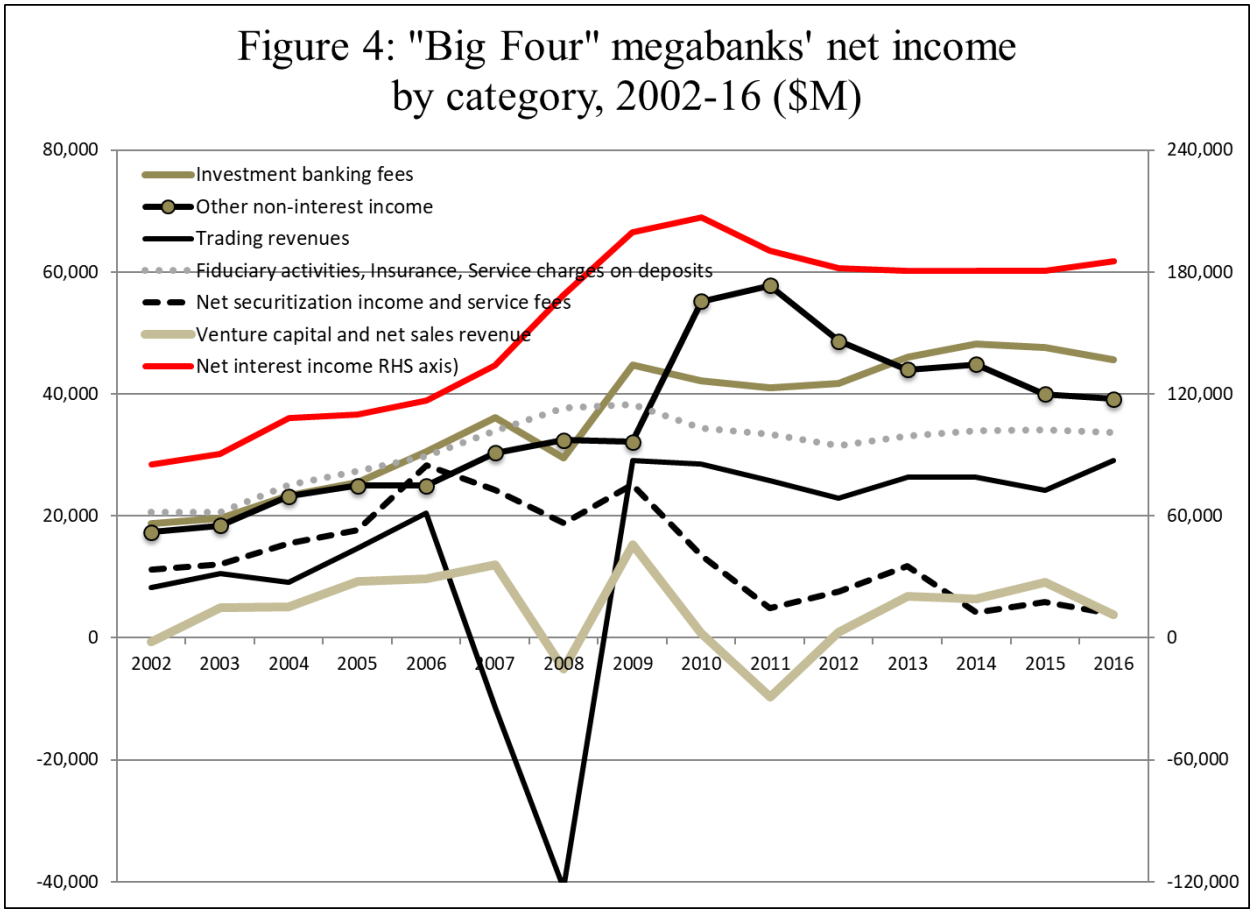


Source for Figures 3-6: Bank Holding Company Performance Reports, from the National Information Center, Federal Financial Institutions Examination Council - https://www.ffiec.gov/nicpubweb/nicweb/nichome.aspx. Note: data for Goldman Sachs and Morgan Stanley have been removed from, 2009-2016 data for Pier 1 bank holding companies. The "Big Four" are JP Morgan Chase, Citibank, Bank of America, and Wells Fargo.

These developments piled pressure on the last remaining feature of 1930s-era bank regulation: the Glass-Steagall wall between commercial and investment banking. Something had to give: either financial markets' incursions onto banks' turf or banks' inability to operate freely in the markets. The path-dependent policy bias toward ensuring the viability of money-center banks predetermined the answer. The Financial Services Modernization Act of 1999 removed market barriers between commercial banking, investment banking, and insurance.

This Act, its impact accelerated by the effects of the ongoing merger wave, resulted in the emergence of four surviving money-center banks as the dominant forces in US banking. Their large scale and market reach enabled them to provide both traditional and sophisticated banking services within their retail market areas, while also building their share of spot, futures, and contingent market-based activities." And in the 2000s, their potential for multimarket interdependence gave them a special advantage in meeting the rapidly-growing demand for securitized assets, especially those containing subprime mortgages (and thus yielding above-

market returns). Analytically, these activities unleashed a wave of opportunity-driven speculative and predatory banking innovations. These securities' uniform terms and conditions promoted their globalization, as Minsky had foreseen (Minsky 1987). It is due to this hyper-accelerated growth in size and market presence that the term "megabank" has become more apt than "money-center bank."

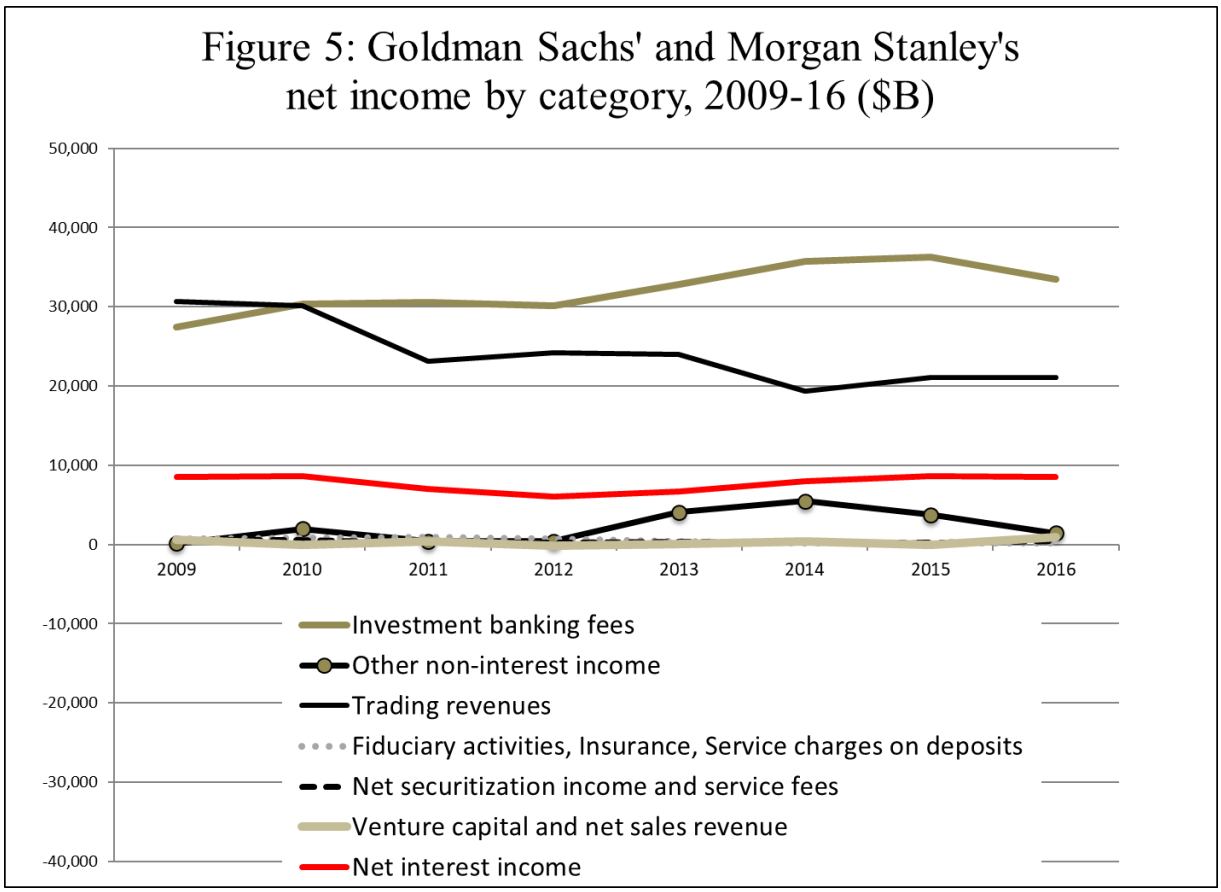


Notes for Figures 4 and 5: Figure 4 aggregates data for JP Morgan Chase, Citibank, Bank of America, and Wells Fargo. Figure 5 aggregates data for Goldman Sachs and Morgan Stanley.

This said, these megabanks faced competitors on two fronts. First, they had to contend with other "Tier 1" bank-holding companies (those with more than $10 billion in assets) for retail and even wholesale customers. Figure 3 depicts the asset size of US bank-holding companies by size clusters for the 2002-17 period. The "Big Four" megabanks are depicted separately from the other Tier 1 banks (those with over $10 billion in assets). Note that while smaller bank holding companies steadily lost ground, Tier-1 institutions' growth paralleled that of the "Big Four." Second, the megabanks had to compete with the increasingly concentrated investment banking sector (Rogowski and Sorensen, 1985; Cornett *et al*., 1996), whose leading US and overseas firms had dominant positions in the entire range of deregulated financial markets – equity trading, trust and insurance, hedging services, brokerage, and so on – into which the megabanks were expanding. Further, investment banks and their affiliates competed with the megabanks in originating, selling, and taking positions on securitized credit.

Vulnerabilities in the pricing and underwriting of securitized loans were brutally exposed in the 2007-08 crisis (Blankenburg and Palma, 2009; Crotty, 2009). One of the drivers of this event was precisely the undisciplined competition to issue, sell, make derivative contracts based on, and

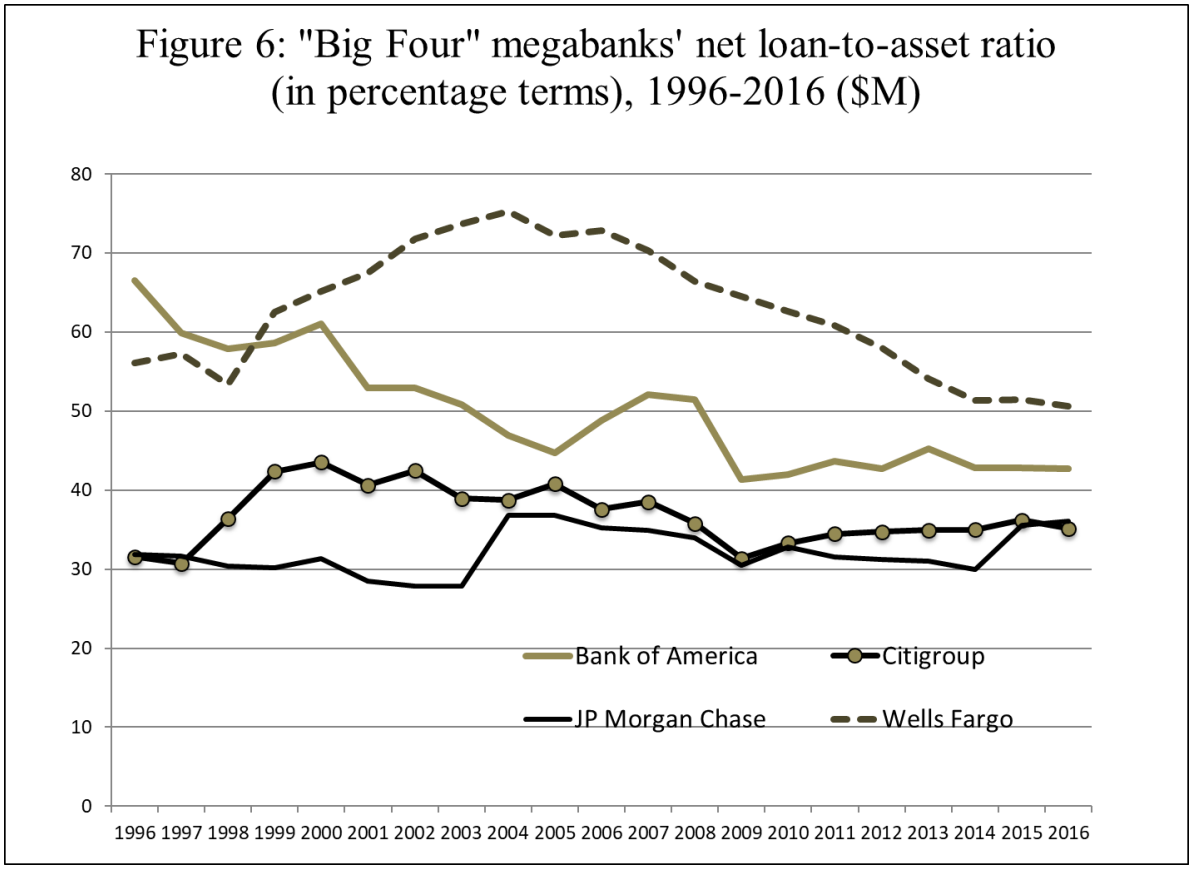
underwrite US-mortgage-backed securities. Ex post, it became clear that large global banks' managers frequently knew little about positions taken by subordinates who, in turn, did not understand the risks they were taking (Lewis, 2010). Ironically, this crisis in US banking markets consolidated the dominance of the megabanks that had nearly brought the system down: by 2009, the "Big Four" held nearly half of all loans on the balance sheets of US commercial loans (Dymski and Kaltenbrunner, 2016). In addition, the two largest investment banks were forcibly converted into bank holding companies and given lender-of-last-resort support.



So while entire communities experienced massive adverse effects – including home foreclosures and wealth-stripping, the fiscal starvation of affected cities, unemployment, and homelessness, among others – the structure of banking remained largely unaffected.

Figure 4 provides a window into continuity and change in megabank activities by contrasting net interest and non-interest income by category for the Big Four megabanks. Net interest income grew steadily between 2002 and 2009, slowed in 2010, declined slightly for two years, and subsequently remained flat. Investment-banking and trading revenue have increased steadily, except for a wobble in the latter in 2007 and 2008. Net securitization income and service fees peaked in 2006 and have subsequently declined drastically. The "other non-interest income" category, which includes innovative activities omitted from regulatory reporting, has exceeded every non-interest income category apart from investment banking since 2009.

Data on net returns for the two investment banks, Goldman Sachs and Morgan Stanley, now converted into the fifth and sixth largest US bank holding companies are shown in Figure 5. Four things stand out in Figure 5: the relatively flat and even revenue stream from investment banking and trading revenues; the insignificance of net securitization income; the remarkably low level of net interest income; and the low level of other non-interest income.



5. Competing by innovation in the "too big to manage" megabank era

As we have shown, deregulation and technical changes have changed the organizational logic of megabanks, which now compete or merge with investment banks. Megabanks, unlike the money-center banks they replaced, no longer innovate primarily to expand their credit creation capacity, as is demonstrated by the low and/or declining loan-to-asset ratios shown in Figure 6. Today, their innovations frequently aim at non-core banking activities: new servicing, hedging, trading, or risk-taking opportunities, often in collaboration with affiliated shadow banks. Indeed, megabanks compete by innovation: they identify a new market niche, such as an underserved credit market, an unhedged risk, or an arbitrage opportunity; design instruments designed to reach it – by consolidating a new market base, slicing up an old one, or connecting two or more previously segregated markets; and they use their shadow-banking-linked supply chain to implement the plan. These are almost invariably opportunity-driven speculative innovations.

The result has been a huge growth in the complexity and size of these institutions. Operationally, megabanks' balance sheets now encompass all the elements previously associated separately with money-center and investment banks: loan, bond, and equities portfolios, deposits and borrowed funds, contingent contracts (derivatives positions), and so on. Net income now can flow into the megabank from channels open to commercial and investment banks before the 1999 repeal of the Glass-Steagall Act, and from new channels as well. A partial list includes net return from equity and bond trading, net interest income, net fees from hedging and other services, net transaction fees, takings from derivatives positions, and so on. A significant share of megabank income derives now from contracts with and services provided for other financial firms, and a significant share derives from zero-sum position-taking in contingent markets. Of course, As Figures 4 and 5 show, Big Four megabank net interest income (Figure 4) vastly exceeds that of the two "too big to fail" former investment banks (Figure 5).

There are four important differences in how these firms operate – and thus in their competition by innovation – in the pre- and post-Glass-Steagall era. First, the opportunities for and risks of income-earning are magnified and complexified for firms with the scale and reach to compete in global financial markets. Asset positions became super-complicated since shadow-banking practices matured in the 1990s. The incessant growth of cross-border supply chains and financial commitments has exposed both non-financial and financial firms to risks from fluctuations in exchange rates, stock-market indices, and commodity prices, among others, Megabanks and investment banks both provide hedges against these risks and engage in zero-sum speculation aimed at exploiting the arbitrage opportunities generated by these same fluctuations. Indeed, some subunits of a megabank sometimes provide hedging or spot-market sales, while other subunits of that same megabank speculate against it.[3] Megabanks' approach to their role in both identifying and generating income from emerging risks was aptly summarized by Goldman Sachs CEO Lloyd Blankfein in January 2010 testimony before the Financial Crisis Investigation Commission (FCIC, 2010, p. 28):

> "In our market-making function, we are a principal. We represent the other side of what people want to do. We are not a fiduciary. We are not an agent. … we are not managing somebody else's money."

The second key difference is identified by Luyendijk (2016). This journalists' extensive interviews with City of London bankers revealed that these institutions' behavior is not centrally mapped out by well-informed managers or owners; instead it reflects the actions of decentralized, competing sub-units disciplined, at best, by ex-post rate-of-return or loss criteria. To understand contemporary megabanks you must:

> … look beyond the façade at the perverse incentives, at the silos and the climate of fear, at how zero job security breeds zero job loyalty and at their unmanageable size and complexity and you do not see a rationally organized command structure. You see a cluster of islands in the fog, staffed by mercenaries. (Luyendijk, 2016, p. 145)

Interviews conducted by co-author Petratou in 2016 with City of London bankers verify Luyendijk's finding. Firms seeking to maintain market share as opportunities and practices change must continually develop new positions and even new departments based on highly specialized labour. At the same time, these firms must attempt to restrict employees' control within the organization, as employees who know the firm's business model could counter-trade and game its logic. An interviewee noted that in the UBS scandal of 2011, "quant" Kweku Adoboli used his knowledge of UBS' models to take – and hide – excessive risks, leading to £2 billion in losses.

The third change involves the problematic nature of information. While advanced mathematics and technological advances can lead to the creation of new market opportunities, there exist no pre-given statistical distributions that can accurately predict net returns. Indeed, this will depend on whether "early adopter" competitors jump in, and how fast they do so. And for "early adopter" firms, speed is of the essence; winning a share of a brand new product-line, such as an over-the-counter instrument, is for the quick, not the well-informed. As one of Petratou's interviewees put it, problems arise when "you don't necessarily have the whole picture of the risk that is in the product." Another interviewee observed: "it [innovation] serves a purpose,

[3] Lewis (2010) illustrates just this sort of both-sides behavior for the case of Goldman Sachs in the months before the September 2008 Lehman Brothers bankruptcy.

and ideally it passes risk on from a guy who doesn't want to hold this risk to another guy who wants to hold it. Not necessarily in favour of complex products, because most of the people cannot price them or understand them, and they get exploited." A third interviewee commented that "the danger (of financial innovation) starts when there is too much of it, it is not clearly understood, the structures aren't transparent."

Luyendijk's interviews highlighted the fact that not only is information incomplete, it does not flow to the top. The locus of valued 'information' no longer concerns borrower creditworthiness, but contacts – those who know and trust subunit employees and thus will do deals with them. This knowledge is captured by megabank subunits, which operate independently and are each accountable for meeting a hurdle rate of return. Subunit members preserve their valuable information by disclosing as little as possible to outsiders about the positions they take. Those breaking this code of silence are banished.

The fourth shift is a consequence of the other three: managers' use of often-crude rule-of-thumb methods to incentivize and discipline workers. Luyendijk describes City of London firms in which the least productive 10% of firm employees are fired annually, regardless of overall firm performance. Petratou's interviews verified the existence of arbitrary re-assignments and firings, though not at uniform 10% levels. This turns subunits into what Luyendijk (2016) describes as hostile, competing armed camps, which may often work at cross purposes. There are no core banking activities; unprofitable activities are simply cut or offloaded.

These four shifts, taken together, show how "too big to manage" megabanking emerges from the intersection of 'too big to fail' guarantees with cutting-edge technology and with zero-sum trading strategies in volatile and increasingly interconnected financial markets. The "too big to manage" landscape described above for the City of London has close parallels in Wall Street. For one thing, Wall Street firms have a strong presence in London. Further, Ho (2009), an investment banker-turned-anthropologist, describes how investment banking feeds boom-bust cycles, in part through practices of job insecurity and arbitrary treatment that desensitize employees to the human costs of their decisions. And in a *Financial Times* interview (McLannahan, 2016), Jamie Dimon, CEO of JP Morgan Chase, affirmed the "too big to manage" understanding of the banking firm, in coded language:

> "The US financial services industry does not conform to simple narratives. It is a complex ecosystem that depends on diverse business models coexisting because there is no other way to effectively serve America's vast array of customers and clients."

6. How does "too big to manage" megabanking survive?

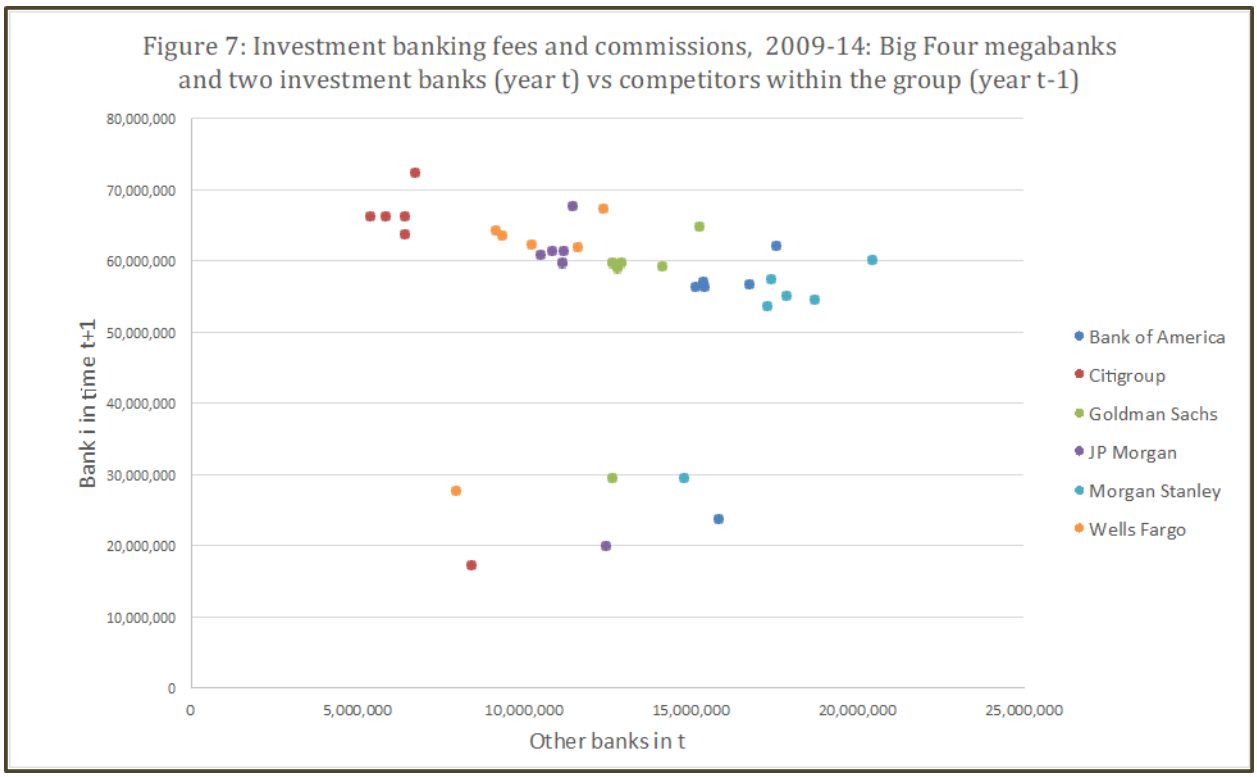
The analysis in section 5 suggests that megabanking, carried out in largely unregulated global markets is extremely dysfunctional both in terms of the economic role of the financial system and on its own terms. Some innovations may indeed mitigate some non-financial firms' and households' risks; but other units will be subjected to predatory financial practices. Overall, megabanking is a far cry from Schumpeterian finance. Megabanking firms, as we have seen, are hard or impossible to control, given the broad landscapes in which they compete. How then do such dysfunctional firms survive?

Crotty (2008) looked into this question in an essay that asked why financial profits are so high, if competition within the industry has been so fierce. Christophers (2013, chapter 6, 2018) raised a parallel question: is the increasing financialization of non-financial firms, and the growing prominence of financial firms in economic activity, problematic for capital accumulation?

Christophers (2013) provides a clear answer to the second question: the growing share of financial activities is not problematic for accumulation because the financial sector (and financial activities) are highly profitable. Since financialization means financial profits, no contradiction arises.

This brings us to Crotty's question. Christophers (2018, p. 875) summarizes Crotty's answer as follows: "rapid growth in demand for financial products and services; increased risk-taking by all major financial market actors; and rapid financial innovation in over-the-counter derivatives," and then highlights Crotty's fourth factor – rising concentration in financial markets, which has created the conditions for 'corespective' competition. He goes on to argue that the rising share of financial profits in all US profits is due to monopolistic competition in finance, which is fed by increasing concentration, collusion, and barriers to entry.

The factors highlighted by Crotty and Christophers are consistent with the brief historical sections of this paper.[4] The Crotty/Christopher perspective resonates with our argument that megabanks' problematic architecture can generate crises in banking and in the broader economy. Indeed, Christophers' (2018) figures depicting the secular rise of financial-sector profitability clearly show the collapse of this sector's profits in the 2008 crisis. Megabank traders' and bond desks' intense competition for leveraged returns during the subprime boom clearly was among the root causes of what Adam Tooze (2018) has termed the "decade of financial crisis."



This leaves the questions of why 'too big to manage' megabanks have not collapsed. One part of an answer involves an external factor: the 'too big to fail' guarantees these institutions have received. This commitment was first made, as we have seen, in the 1980s US money-center bank crisis. These guarantees have explicitly or implicitly been extended to the leading banks in several countries (Ioannou, Wojcik, and Dymski 2018). They have encouraged risk-taking,

[4] Like this paper, Christophers cites Dymski (1999) on how bank mergers led to rising concentration in US banking.

especially by US banks, who operate in the long shadow of the only global lender of last resort (Dymski 2009).

Megabanks themselves take internal measures to maintain performance and avoid collapse. They are forced to do this by shareholders and investors, who hold them accountable to meeting or exceeding the performance standards of their peer-group institutions. In the competition by innovation context, as argued, megabanks must continually hire people whose skills its managers cannot assess, taking risks they do not understand, to enter new markets whose parameters are unknown. Megabanks square the circle between shareholders' expectations and limits to monitoring via several different responses. The first of this is undertaking regular reorganizations of their activities, and moving from more hierarchical to 'flatter' organization structures. All US megabanks follow both strategies.

A second set of responses involves reward and punishment strategies. Not only are arbitrary means of sacking 'unproductive' workers used, as discussed, excessive bonuses are paid for employees bringing in additional profits (Crotty 2009). These strategies encourage imitative innovation and 'early adoption' strategies. As one interviewee remarked to Petratou: "You are always looking what your competitors are doing, and if it is something that you could do, of course you are going to do it." This pattern of imitative innovation is illustrated in Figure 7. This figure arrays investment-banking income for five of the six megabanks included in a given year (year t) against the investment-banking income earned by the remaining bank in year (t+1). A positive relationship is found: so results in investment-banking income for its five close competitors are followed a year later for the remaining bank.

A third response, as Crotty (2008) points out, is to engage in co-respective competition. This is encouraged in part by megabanks' poaching of their rivals' star performers, and in part by the fact that securitization and shadow banking have developed in supply-chain-like networks centred around different megabanks. Many innovations involve over-the-counter derivatives. customized) contracts, further discouraging price wars. Recent evidence suggests that banks engaging in securitization and derivatives activities have been able to expand their loan-origination activities; but these activities are so complex that they require substantial expertise and large expenditures (Comert 2013). Each megabank can protect its own network by swiftly offering its own versions of new products at fair prices. The fact that all six of the megabanks analyzed here were among the 11 most-fined banks for misconduct (primarily mis-selling) in the 2012-16 period, with penalties totaling $140 billion (Hodgson, 2017), suggests that their co-respective competition even extends to collusion. In any event, Herfindahl index numbers computed by activity for the group of six US megabanks analyzed here indicate no shift toward greater competition over time.

7. Conclusion: some implications of "too big to manage" megabanking

The paper has argued that the very largest US banks' competition by innovation is a key element in the evolving dynamics of financialization. In the pre-1980 (pre-financialization) period, money-center banks' financial innovations aimed primarily at permitting more credit creation for productive purposes. Since 1980, this has not been the case. The same macro shifts that increased the need for financialization destabilized the regulated banking system. Time-worn banking practices of the pre-1980 period were gradually swept away, in favour of a system at whose centre is a set of megabanks that, together with the largest remaining investment banks, represent the survivors of the "too big to fail" money-center banks. These megabanks compete by innovation, like the money-center banks that preceded them. But financial innovation today is typically unrelated to core banking activities. Speculative and even predatory innovations have

largely superseded Schumpeterian innovations. These innovations are often based on risk-taking by subunits that occasionally escape centralized control, and they draw on the intertwined, leveraged funding networks that connect global financial firms. Consequently, megabanking has become an independent and endogenous source of financial instability and crisis.

This brings us to Minsky's later writings. Minsky, in 1996, characterized the new institutional phase of financial capitalism as "…'money manager capitalism,' in which the proximate owners of a vast proportion of financial instruments are mutual and pension funds. The total return on the portfolio is the only criteria used for judging the performance of the managers of these funds" (Minsky 1996, pp. 358-9). Minsky was prescient in describing how how bottom-line short-term performance – and not the financial sector's performance of any designated 'role' in the overall economy – would dominate the new banking landscape. Wray (2009), writing at the height of the subprime crisis, argued that money-market capitalism would collapse; it was a failed form of finance capitalism.

Minsky (1987) saw money-market capitalism as centred on securitization, due to the globalization of finance and banks' loss of prominence in credit processes. This view certainly did not anticipate that while banking in the traditional sense would lose prominence, very large – mega – banks would implant themselves at the centre of the post-banking financial system precisely because they had become central to all facets of the new market-based system. He would have appreciated the irony that these banks' survival and now prosperity is due to their ability to reduce and offload risk. He wrote, in 1995, that "financial fragility is not a characteristic of a structure of financial liabilities in isolation. It is a characteristics of an economy in which the funds available to meet payments commitments on liabilities are determined by income flows"… (Minsky, 1995, p. 5). The fact that contemporary megabanks have escaped the consequences of the fraud, credit defaults, and instability that their behavior has generated does not mean that these acts had no impact. To the contrary.

This brings us, finally, to the problem of the sustainability of financialization. The argument developed here suggests that megabanking-driven financialization may be unsustainable for three reasons. First, the very success of these megabanking complexes gives rise to an unavoidable structural contradiction. Fueled by competitive behavior based on bypassing regulatory controls, megabanks' business models measure success by standards of growth that exceed the absorptive capacity of the economies in which they are embedded. But because megabanks' hyper-leveraged on- and off-balance sheet positions are interwined with households' and nonfinancial firms' balance sheets, any decline in their net incomes threatens generalized economic crisis and taxpayer bailouts.

Second, as argued here, megabanks' own business models are now pushing them into incoherence. They are too big and complex to manage, and the ex-post methods that have been applied in lieu of ex-ante institutional goal-setting are coercive. The growth and expansion impulse that led money-center banks to drive for expanded credit creation prior to 1980 remains built into the DNA of the megabank. Too big to manage never means too unmanageable to grow.

Finally, despite megabanks' success in generating high profits in tranquil macroeconomic circumstances, their increasingly interconnected strategies, borrowing and placement markets, and affiliated shadow banks have given rise to successively more severe financial crises since the 1960s. In each case, the Federal Reserve has been able, as lender of last resort, to provide the backstops needed to stave off these banks' insolvency. The challenges have become ever more taxing, and every crisis has only led to the US banking system being more dependent on the

strength of the Big Four (now Big Six) banks. Tooze (2018) has shown how close a thing it was for even the globe-girdling Federal Reserve to rescue the system in the 2008 crisis. The capacity of the Federal Reserve to play this role is irrevocably linked to the prestige and global role of the United States. The loss of that key external prop against megabanks' collapse in a moment of crisis prefigures an untimely end for US megabanking, unless its member banks can rediscover how to again undertake Schumpeterian innovations that build non-financial income and well-being, rather than feeding more net global resources into megabanks' networks.

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